Australian Government

Civil Aviation Safety Authority

Part 91 Manual of Standards 2018

I, SHANE PATRICK CARMODY, Director of Aviation Safety, on behalf of CASA, make this instrument under regulation 91.040 of the *Civil Aviation Safety Regulations 1998*.

Shane Carmody
Director of Aviation Safety

Date 2018

Contents

Part 1 Preliminary

1.01 Name of instrument

(1) This instrument is the *Part 91 Manual of Standards 2018*.

(2) This instrument may be cited as the Part 91 MOS.

(3) Unless the contrary intention appears, references in this instrument to "the MOS", "this MOS" or "this instrument" are references to the Part 91 MOS.

1.02 Commencement

This instrument commences immediately after the commencement of Part 91 of CASR.

Note Part 91 of CASR is contained in the *Civil Aviation Legislation Amendment (Part 91) Regulations 2018*.

1.03 References to instrument and documents

(1) In this MOS, unless the contrary intention appears, a reference to an instrument or other document (however described) is a reference to the instrument or document as in force or existing from time to time.

(2) In this MOS, unless the contrary intention appears, a reference to any legislative instrument is a reference to the instrument as in force from time to time.

(3) If a provision of this MOS refers to any instrument or other document, then, unless the contrary intention appears, the instrument or other document, as in force or existing from time to time, is taken to be applied, adopted or incorporated by, into or for this MOS as the case requires.

Note This section applies to an AFM (which includes an AFM Supplement) because they are also documents.

1.04 References to ICAO documents

(1) In this MOS, unless the contrary intention appears, a reference to an ICAO document (however described) is a reference to the document as in force or existing from time to time.

(2) In this MOS, reference to a numbered ICAO Annex is a reference to the Annex of that number, as in force or existing from time to time, and as contained in the Chicago Convention.

(3) In this MOS, reference to a numbered ICAO Manual is a reference to the Manual of that number, or subsequent version, as in force or existing from time to time and issued by ICAO.

(4) In this MOS, reference to a numbered ICAO Circular is a reference to the Circular of that number, or subsequent version, as in force or existing from time to time and issued by ICAO.

(5) If a provision of this MOS refers to an ICAO document, then, unless the contrary intention appears, the document, as in force or existing from time to time, is taken to be applied, adopted or incorporated by, into or for this MOS, as the case requires.

Note 1 Relevant ICAO documents for this MOS may be accessed by navigating from the following link. http://www.icao.int/publications/Pages/default.aspx

Note 2 A reference to an ICAO document, including an ICAO Annex, which only occurs in a Note to a provision does not have the effect that the document is taken to be applied, adopted or incorporated for this MOS, unless the contrary intention appears. Such references in Notes are to documents which may be used as guidance or background information.

1.05 References to AS/NZS standards, TSOs, ETSOs etc.

(1) In this MOS, unless the contrary intention appears, a reference to a particular AS/NZS standard is a reference to the particular joint Australian and New Zealand Standard, as in force or existing from time to time.

Note For example, the joint Australian and New Zealand Standard AS/NZS 1754:2013 *Child restraint systems for use in motor vehicles.*

(2) In this MOS, unless the contrary intention appears, a reference to a particular TSO is a reference to the TSO, as in force or existing from time to time, even if the citation of the TSO in this MOS has an alphabetical version letter that is not the latest such version letter.

Note For example, TSO-C142a

(3) In this MOS, unless the contrary intention appears, a reference to a particular ETSO is a reference to the ETSO, as in force or existing from time to time, even if the citation of the ETSO in this MOS has an alphabetical version letter that is not the latest such version letter.

Note For example, ETSO-2C91a.

1.05A Table of Contents

The Table of Contents for this MOS is not part of this instrument. It is for guidance only and may be modified or edited in any published version of this instrument.

1.06 Definitions and abbreviations

(1) Subject to subsection 1.04 (3), in this instrument words and phrases have the same meaning as in Part 91 of CASR, unless the contrary intention appears.

Note Some definitions from the CASR Dictionary are repeated in this MOS for ease of reference, and some are referred to by way of reference.

(2) In this MOS, a numerical reference to a provision that includes the number 91 is a reference to the provision as contained in Part 91 of CASR, unless the contrary intention appears.

(3) In this MOS, a reference in a provision to an aerodrome includes a helideck unless a helideck is expressly excluded for the purposes of the provision.

(4) In this MOS, a reference to a Class of airspace means the volumes of airspace of that Class, as determined by CASA in or under the *Determination of airspace and controlled aerodromes etc. instrument*, as in force from time to time.

Note The Determination of airspace and controlled aerodromes etc. is a legislative instrument that is revised and reissued by CASA approximately every 6 months. Airspace details from the Determination in force at any particular time are also published by Airservices Australia in the Designated Airspace Handbook available free on line at www.airservicesaustralia.com

(5) In this MOS, any reference to a seat, a seatbelt, a shoulder harness or a restraint system is a reference to an approved seat, an approved seatbelt, an approved shoulder harness or an approved restraint system.

(6) In this MOS:

AA means Airservices Australia.

Act means the *Civil Aviation Act 1988.*

additional fuel means the supplementary amount of fuel required to allow an aircraft that suffers engine failure or loss of pressurisation at the critical point along the route, (whichever results in the greater subsequent fuel consumption) to do the following:

(a) proceed to an alternate aerodrome (or for a rotorcraft, a suitable rotorcraft landing site);

Note For a rotorcraft, an alternate rotorcraft landing site would constitute the alternate aerodrome.

(b) fly for 15 minutes at a holding speed at 1 500 feet above the aerodrome elevation, in ISA conditions;

(c) make an approach and landing.

Note Fuel planning in accordance with Part 7 of this MOS may place an aircraft in a fuel emergency situation if a failure or loss were to occur as described above. In that case, additional fuel must be carried.

adequate vertical margin, for a stage of a flight, is the minimum distance that a rotorcraft must be from an object during the stage, as mentioned in:

(a) the rotorcraft's flight manual; or

(b) if paragraph (a) does not apply — the rotorcraft operator's operations manual for aerial work operations; or

(c) if paragraphs (a) and (b) do not apply — a distance determined as a safe distance by the PIC.

ADF means automatic direction finder.

ADS-C means automatic dependent surveillance – contract.

adult has the same meaning as in the CASR Dictionary.

Note Adult means a person who has turned 13.

aerodrome has the same meaning as in the Act.

Note A helideck, and a heliport, falls within the statutory definition of an aerodrome if its use as an aerodrome is authorised under the regulations.

AFM means aircraft flight manual as approved by the aircraft manufacturer, and includes a Supplementary AFM.

Note A Supplementary AFM may be supplied by the original aircraft manufacturer, or by another person in accordance with Part 21.M of CASR.

AIP means the Aeronautical Information Publication published by AA, and includes the AIP Supplement.

Note The AIP is available through www.airservicesaustralia.com

AIP ENR means the en-route section of the AIP.

alternate aerodrome, for an aircraft:

(a) means an aerodrome:

(i) to which the aircraft may proceed when it becomes impossible or inadvisable to proceed to, or land at, the aerodrome of intended landing; and

(ii) where the necessary services and facilities for landing the aircraft are available; and

(iv) where the aircraft's performance requirements can be met; and

(v) which is operational at the expected time of use; and

(b) includes the following:

(i) a *take-off alternate* being an alternate aerodrome at which the aircraft may land if this becomes necessary shortly after take-off and it is not possible to use the departure aerodrome;

(ii) an *en-route alternate,* being an alternate aerodrome at which the aircraft may land in the event that a diversion becomes necessary while en-route.

(iii) a *destination alternate*, being an alternate aerodrome at which the aircraft may land if it becomes either impossible, or inadvisable, to land at the aerodrome of intended landing.

Note 1 The aerodrome from which a flight departs may also be an en-route or a destination alternate for the flight.

Note 2 The expression ***alternate aerodrome*** has a different meaning for this instrument to that given in regulation 2 of CAR 1988.

alternate fuel means the amount of fuel required to enable an aircraft to do the following in a sequence:

(a) perform a missed approach at the planned destination aerodrome;

(b) climb to the expected cruising altitude;

(c) fly the expected routing to the destination alternate;

(d) descend to the point where the expected approach is initiated;

(e) conduct the approach;

(f) land at the destination alternate.

altitude means the vertical distance that a point or object is from MSL.

AMSA means the Australian Maritime Safety Authority.

AMSL means above mean sea level.

animal means any member of the animal kingdom, other than a human being.

AOC means air operator's certificate.

approved means approved in writing by CASA, unless the contrary intention appears.

APU means auxiliary power unit.

APV means approach with vertical guidance.

area QNH means an altimeter setting which is representative of the QNH of any location within a particular geographical area.

ASAO means an approved self-administering organisation within the meaning of Part 149 of CASR.

AS/NZS means Australian and New Zealand Standard.

ATC means air traffic control.

ATIS, for an aerodrome, means an automatic terminal information service for the aerodrome, which automatically provides current, routine information to arriving and departing aircraft during all or part of a day.

ATS means air traffic service.

ATSB means the Australian Transport Safety Bureau.

ATS/*FLIGHTWATCH* is the call sign for the ATS unit that provides Flight Information Services.

ATSO means Australian Technical Standard Order.

Australian administered Oceanic airspace means the international oceanic airspace:

(a) responsibility for which has been allocated to Australia by ICAO under the Chicago Convention; and

(b) for which Australia has accepted responsibility; and

(c) the volumes of which are as determined by CASA in or under the *Determination of airspace and controlled aerodromes etc. instrument*, as in force from time to time.

Note The *Determination of airspace and controlled aerodromes etc.* is a legislative instrument that is revised and reissued by CASA approximately every 6 months. Airspace details from the Determination in force at any particular time are also published by Airservices Australia in the Designated Airspace Handbook available free on line at www.airservicesaustralia.com

authorised aeronautical information has the same meaning as in the CASR Dictionary.

Note Thus, in abbreviated and general terms, the expression refers in effect to the aeronautical maps, charts and other aeronautical information relevant to the route of the flight, and any probable diversionary route, that are published in the AIP, by a data service provider, or in NOTAMs; or, for a flight in a foreign country, in the foreign AIP-equivalent, or by a relevant NAA-approved publisher of such material.

authorised weather forecast means:

(a) in Australia — a weather forecast made by the BOM for aviation purposes; or

(b) in a foreign country — a weather forecast made by a person that holds an authorisation (however described) to provide weather forecasts, granted by the NAA of the country.

authorised weather report means:

(a) in Australia — a weather report made by 1 of the following:

(i) the BOM for aviation purposes;

(ii) an individual who holds a certificate from the BOM to perform weather observations and issue weather reports for aviation purposes;

(iii) an automatic weather station at an aerodrome that is approved by the BOM as an automatic weather station for the aerodrome;

(iv) an automatic broadcast service published in the AIP;

(v) an individual who holds a pilot licence;

(vi) a person appointed by an aerodrome operator to make runway visibility assessments under the Part 139 MOS;

(vii) a person included in a class of persons specified in the AIP for subparagraph (vii) of the definition of "authorised weather report" in the CASR Dictionary; or

(b) in a foreign country — a weather report made by a person or body that holds an authorisation (however described), granted by the NAA of the country, to provide weather reports.

avoid area of the HV curve, for a rotorcraft, means the area depicted in the height-velocity diagram contained in the AFM, which identifies the combinations of height above ground and airspeed in knots which should be avoided by a rotorcraft.

Note Under these combinations, successful autorotation is unlikely and, therefore, must be avoided.

AWK means aerial work operation.

BOM means the Bureau of Meteorology.

BECMG means becoming.

Note This is a BOM abbreviation.

CAR 1988 means the *Civil Aviation Regulations 1988*.

CASR means the *Civil Aviation Safety Regulations 1998*.

CASR dictionary means the Dictionary under regulation 1.004 of CASR.

Category A performance, for a rotorcraft operation, means the one engine inoperative performance (as derived from the AFM) from which the PIC determines the most

critical maximum weight that enables the rotorcraft to avoid all obstacles and complete its operation.

Category B performance, for a single-engine or multi-engine helicopter, means that the helicopter is not capable of Category A performance.

Note Category B helicopters have no guaranteed capability to continue safe flight in the event of an engine failure and a forced landing is assumed in such circumstances.

Category A rotorcraft means a multi-engine rotorcraft that is:

(a) designed with engine and system isolation features specified for Category A requirements in any of the following:

(i) Part 27 of the FARs;

(ii) Part 29 of the FARs;

(iii) EASA CS—27;

(iv) EASA CS—29;

(v) Part IVB of Annex 8 to the Chicago Convention; and

Note These documents are available as follows:

(i) Part 27 of the FARs — https://www.faa.gov/regulations_policies/faa_regulations/

(ii) Part 29 of the FARs — https://www.faa.gov/regulations_policies/faa_regulations/

(iii) EASA CS—27 — https://www.easa.europa.eu/document-library/regulations

(iv) EASA CS—29 — https://www.easa.europa.eu/document-library/regulations

(v) Part IVB of Annex 8 to the Chicago Convention — https://www.icao.int/publications/pages/doc7300.aspx

(b) capable of using take-off and landing data calculated for a critical engine failure, as specified in the rotorcraft's flight manual, being data which, in the event of a critical engine failure, assures:

(i) an adequately designated ground or water area for re-landing; and

(ii) adequate performance capability for continued safe flight or safe rejected take-off.

Category B rotorcraft means a rotorcraft that is not a Category A rotorcraft.

CAO means Civil Aviation Order.

CENSAR means an automated, centralised, SARTIME database software package used by an ATS to manage SARTIMEs.

CFL means cleared flight level.

child has the same meaning as in the CASR Dictionary.

Note Child means a person who has turned 2 but has not turned 13.

contingency fuel, for an aircraft in a kind of flight mentioned in an item of Table 9.04, means the amount of fuel required to compensate for unforeseen factors, and which must not be less than:

(a) the percentage (if any) of the planned trip fuel for the flight, as specified in column 4 of the same item; or

(b) in the event of in-flight re-planning — the percentage (if any) of the trip fuel for the re-planned flight, as specified in column 4 of the same item.

confined area, for a rotorcraft, means a relevant HLS where take-off or landing requires the rotorcraft to operate within the avoid area of the HV curve because the available take-off or landing space is constrained by:

(a) terrain; or

(b) the presence of other natural, or man-made, obstructions.

CTA means controlled airspace.

CTAF means common traffic advisory frequency, being a designated frequency on which pilots make positional broadcasts when operating in the vicinity of a non-controlled aerodrome.

critical engine means the engine whose failure would most adversely affect the performance or handling qualities of an aircraft.

D, for a rotorcraft, is the rotorcraft's maximum dimension when rotors are turning, and is the distance in metres measured from (a) to (b) as follows:

(a) the most forward position of the main rotor tip path plane of the rotorcraft;

(b) the most rearward position of the tail rotor tip path plane or of the rotorcraft's fuselage.

DA means decision height.

DAH means the Designated Airspace Handbook, published by AA as part of the AIP.

decision point means a point en-route at which an aircraft can:

(a) if the flight arrives at the point with adequate fuel to complete the flight to the destination aerodrome while maintaining the final reserve fuel and contingency fuel required under Table 9.04 — continue to the destination aerodrome; or

(b) otherwise — divert to an en-route alternate with adequate fuel to complete the flight to the en-route alternate while maintaining the final reserve fuel and contingency fuel required under Table 9.04.

destination aerodrome means the aerodrome which a flight is planned to fly to and land at.

discretionary fuel means the extra amount of fuel to be carried at the discretion of the PIC.

DME means distance measuring equipment.

EASA means the European Aviation Safety Authority.

EDTO means an extended diversion time operation as defined in CAO 82.0.

en-route aircraft means an aircraft that is engaged in 1 of the following phases of flight:

(a) Oceanic;

(b) remote area

(c) domestic en-route.

ERSA means the En-route Supplement Australia, published by AA as part of the AIP.

ERSA EMRG means the emergency section of the ERSA.

established, for the definition of ***holding fuel***, means any of the following:

(a) established by the aircraft manufacturer and published in the AFM;

(b) established by the use of a fuel consumption monitoring system, or

(c) established by the aircraft operator and published in the operations manual along with:

(i) the relevant data and methodology used; or

(ii) references to another accessible location of the data and methodology used.

ETA means estimated time of arrival.

ETD means estimated time of departure.

ETSO means a Technical Standard Order of EASA.

FAA means the Federal Aviation Administration of the United States.

FATO means final approach and take-off area.

M means a flight crew member.

final reserve fuel means the calculated amount of fuel that:

(a) is required to fly an aircraft:

(i) at 1 500 feet above aerodrome ***elevation*** in ISA conditions for the period of time specified for the flight in column 3 of Table 9.04; and

(ii) for an aircraft that is a helicopter conducting an I.F.R. flight, an aeroplane or an airship — at holding speed; and

(iii) for an aircraft that is a helicopter conducting an V.F.R. flight — at range speed; and

(iv) at the aircraft's estimated weight on arrival at the destination alternate or the destination aerodrome when no destination alternate is required (the ***relevant aerodrome***); and

(b) is usable fuel remaining in the fuel tanks on completion of the final landing at the relevant aerodrome.

FIR means a flight information region.

FL means flight level.

flight commencement means the moment an aircraft vacates its parking position whether pushed back or under its own power for the purpose of take-off (also known as the ***off-block time***).

flight forecast means a text-based forecast issued for a part of a flight for which a routine GAF is not prepared.

FM means from.

Note This is a BOM abbreviation.

forecast QNH means forecast altimeter setting from an authorised weather forecast.

ft means feet.

fuel emergency means the circumstance in which the fuel remaining when the usable fuel calculated to be available on landing at the nearest aerodrome where a safe landing can be made, is less than the final reserve fuel and, as a result, the aircraft requires immediate assistance.

GAF means graphical area forecast.

GNSS means the global navigation satellite system.

GNSS FDE means GNSS fault detection and exclusion.

G/P means glide path.

helideck means an aerodrome that is:

(a) located on a building, installation or equipment; and

(b) exclusively for the use of rotorcraft.

hPa means hectopascals.

HIAL means high intensity aerodrome lighting.

holding fuel means the amount of fuel an aircraft requires to fly for the period of time anticipated for holding (taking into account the operating conditions) calculated at the

holding fuel consumption rate established for the aircraft for the anticipated meteorological conditions, or ISA, as applicable.

Note See also the definition of ***established***.

HUD or ***head-up display*** means a display system that presents flight information into a pilot's forward external field of view.

IAF means initial approach fix.

IAL means instrument approach landing.

in the vicinity of a non-controlled aerodrome has the same meaning as in regulation 91.470.

Note For general guidance only: an aircraft is in the vicinity of a non-controlled aerodrome if it is:

(a) in uncontrolled airspace; and

(b) within 10 NM of the aerodrome; and

(c) at a height above the aerodrome that could result in conflict with aircraft traffic at the aerodrome.

IAS, or ***indicated airspeed***, means the speed of an aircraft as shown on its pitot static airspeed indicator, calibrated to reflect standard atmosphere adiabatic compressible flow at sea level uncorrected for airspeed system errors.

ICAO Annex, followed by a number**,** means the Annex of the given number, as contained in the Chicago Convention.

IFR means instrument flight rules.

ILS means instrument landing system.

IMC means instrument meteorological conditions.

immediately reportable matter has the same meaning as in the *Transport Safety Investigation Regulations 2003*.

infant has the same meaning as in the CASR Dictionary.

Note Infant means a person who has not turned 2.

ISA means international standard atmosphere.

isolated aerodrome, for a given aeroplane type, means a destination aerodrome for which there is no suitable destination alternate.

JRCC Australia means the Australian Joint Rescue Coordination Centre.

kts means knots.

landing decision point (or ***LDP***), for landing a rotorcraft, means the point, mentioned in the rotorcraft's flight manual, from which if an engine failure is recognised:

(a) a baulked landing may be initiated; or

(b) the landing may be safely continued.

landing distance available, for landing a rotorcraft, means the total of the following that are available for the rotorcraft to complete the landing from the height above the final approach and take-off area that is mentioned in the rotorcraft's flight manual:

(a) the length of the final approach and take-off area;

(b) the length of the area that is available and suitable for the rotorcraft to complete a landing on.

landing distance required, for landing a rotorcraft, means the horizontal distance required for the rotorcraft to land and come to a full stop from a point 50 ft above the landing aerodrome.

light sport aircraft has the same meaning as in the CASR Dictionary.

LOC means localised.

LSA is short for light sport aircraft.

LSALT means lowest safe altitude.

large aeroplane means an aeroplane with a MTOW more than 5 700 kg.

m, for a distance, means metres.

MDA means minimum descent attitude, and is a specified altitude, in a 2D instrument approach operation or circling approach operation, below which descent must not be made without the required visual reference for the operation.

MDH means minimum descent height, and is a specified height, in a 2D instrument approach operation or circling approach operation, below which descent must not be made without the required visual reference for the operation.

MEL means minimum equipment list.

METAR means a routine aviation weather report in aeronautical meteorological code.

minimum flight altitude, for a rotorcraft, has the same meaning as in regulation 91.390, 91.395, 91.400 or 91.403 of CASR, as the case requires.

minimum fuel means the fuel circumstance in which, having committed to land at a specific aerodrome, a pilot calculates that any change to the existing clearance to the aerodrome may result in landing with less than final reserve fuel.

MOS means Manual of Standards.

most critical point means the point along a route that is the last point at which an aircraft has sufficient fuel to proceed to the destination or initiate a diversion to an en-route alternate aerodrome.

MSA or ***minimum sector altitude***, means the lowest usable altitude that provides at least 300 m (or 1 000 ft) clearance above all objects within a sector of a circle of radius 46 km (or 25 NM) centred on a significant point.

MSL means mean sea level.

MTOW means maximum take-off weight.

MTOW HOGE means maximum take-off weight hover out of ground effect.

NAA means national aviation authority.

NAIPS, or National Aeronautical Information Processing System, is the multi-function, computerised, aeronautical information system, managed by AA, which:

(a) processes and stores meteorological and NOTAM information; and

(b) enables the provision of briefing products and services to pilots and ATC.

navigational tolerance means one of the following:

(a) for VOR or Localiser — a half scale deflection or more of the course deviation indicator;

(b) for NDB — + or - 5°or more from the specified bearing;

(c) for DME — + or – 2 NM or more from the required arc;

(d) area navigation system — the RNAV or RNP value for the route, track or procedure being flown;

visual navigation — more than 1NM from the cleared track.

NDB means non-directional beacon.

NOTAM is a notice to aviators issued by AA.

NVFR means the night visual flight rules.

NM means nautical miles.

NOTAM is a commonly used abbreviation for a notice to aviators.

NPA means non-precision approach.

NVD means night vision device.

NVG means night vision goggles.

NVIS means night vision imaging system.

OCA means an Oceanic control area.

OCTA means outside controlled airspace.

off-block time has the same meaning as ***flight commencement***.

PAL means a pilot activated lighting system.

PBN, or performance-based navigation, means area navigation based on performance requirements for aircraft operating along an ATS route:

(a) on an instrument approach procedure; or

(b) in designated airspace.

Note Performance requirements are expressed in navigation specifications (RNAV specification, and RNP specification) in terms of the accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular Class of airspace.

PBN flight has the same meaning as in section 27.02.

PIC means the pilot in command of an aircraft.

POB means people on board.

pre-flight briefing means a briefing of the PIC before a flight takes off which includes the following:

(a) a check of weather information relevant to the flight;

(b) a check to confirm that each aerodrome, air route and airway facility that the pilot plans to use for the flight will be available for use;

(c) a check and review of the following:

(i) all Head Office and FIR NOTAMs applicable to the en-route phase of the flight;

(ii) all location-specific NOTAMs for relevant aerodromes.

QNH is an atmospheric pressure adjusted to sea level and measured in hectopascals so that when QNH is set the altimeter will read elevation above mean sea level.

qualifying multi-engine aeroplane has the same meaning as in section 17.02.

qualifying multi-engine rotorcraft has the same meaning as in section 17.04.

quick donning mask means an oxygen mask that:

(a) is to be worn by a flight crew member; and

(b) within 5 seconds of being deployed for use, the member can, with 1 hand, place on his or her face, and secure and seal.

R, for a rotorcraft, means the largest radius of the rotorcraft's main rotor disc, as recorded in the rotorcraft's flight manual.

recognised authority means any of the following:

(a) the Civil Aviation Authority of the United Kingdom;

(b) the Federal Aviation Administration of the United States of America;

(c) EASA;

(c) the authority of another country that is responsible for the safety of air navigation and that CASA declares in writing is a recognised authority for the purposes of this MOS.

recognised country means any of the following:

(a) Canada;

(b) France;

(c) Germany;

(d) Netherlands;

(e) New Zealand;

(f) United Kingdom;

(g) United States of America.

rescue, for an operation, means an operation to retrieve a person in distress, provide for his or her initial medical or other needs, and deliver the person to a place of safety.

RNAV means a method of navigation which permits aircraft operations on any desired flight path within:

(a) the coverage of ground or space-based navigation aids; or

(b) the limits of the capability of self-contained navigation aids; or

Note Self-contained navigation aids are such aids on board an aircraft.

(c) a combination of paragraphs (a) and (b).

RNP is a statement of the navigation performance necessary for an aircraft operation within a defined airspace.

rotorcraft clearway, for an aerodrome, means an area of ground or water that is selected and prepared by the aerodrome operator as a suitable area over which a rotorcraft may accelerate and achieve a height mentioned in the rotorcraft's flight manual.

RVR means runway visual range, and is the range over which the pilot of an aircraft on the centre line of a runaway can see:

(a) the runway surface markings; or

(b) the lights delineating the runway or identifying its centreline.

RVSM means reduced vertical separation minimum, and is the reduction of vertical space between aircraft from 2 000 ft to 1 000 ft at flight levels from 29 000 ft to 41 000 ft, in order to increase airspace capacity and give access to more fuel-efficient flight levels.

SAR means search and rescue.

SARTIME, or ***search and rescue time,*** means the time nominated by a pilot for the initiation of a SAR action if not cancelled before its expiration using a nominated method.

Note The methods that may be nominated are online, telephone or radio.

SARWARCH means the time for a SAR alert, based on:

(a) full position reporting procedures; or

(b) scheduled reporting times (SKEDS); or

(c) SARTIME.

SCT, for cloud, means scattered.

SIGWX means significant weather.

search, for an operation, means an operation normally coordinated by a rescue coordination centre or sub-centre using available personnel and facilities to locate a person in distress.

small aeroplane means an aeroplane with a MTOW of not more than 5 700 kg.

SPECI means an aviation special weather report in aeronautical meteorological code.

special VFR has the same meaning as in section 2.01.

specified aircraft performance category has the same meaning as in section 2.02.

stage, for a flight of a rotorcraft, means any of the following:

(a) take-off;

(b) take-off and initial climb;

(c) en-route flight;

(d) approach and landing or baulked landing.

standard pressure region means the airspace above 10 000 ft where the sub-scale of a pressure altimeter is set to 1013.2 hPa.

standard visual signal has the same meaning as in Part 20.

step climb is an ATC procedure which allows 2 aircraft to perform a coordinated climb to a more fuel efficient level while maintaining safe separation.

suitable forced landing area means:

(a) an area of ground on which a rotorcraft could make a forced landing with a reasonable expectation that there would be no injuries to persons in the rotorcraft or on the ground; or

(b) an area of water

(i) into which a rotorcraft could ditch with a reasonable expectation, taking into account surface conditions, that there would be no injuries to persons in the rotorcraft or on the water; and

Note Surface conditions include, for example, wave height, wind and swell, and rocks and sandbanks only exposed at low tide.

(ii) in which there would be a reasonable expectation, taking into account the limitations of the rotorcraft's emergency flotation devices, that persons in the rotorcraft would survive for the time that it would take to be rescued; and

(iii) that, for a passenger transport operation, would be:

(A) adjacent to land; or

(B) adjacent to an offshore installation with search and rescue capabilities; or

(C) in a location, set out in the rotorcraft operator's exposition, that has search and rescue capabilities.

TAF means terminal area forecast.

take-off decision point (or TDP), for a rotorcraft taking off, means the point used in determining take-off performance from which, if a power unit failure is recognised at that point, either a rejected take-off may be made, or a take-off may safely be continued by the rotorcraft.

taxi fuel means the amount of fuel expected to be used before take-off, taking into account:

(a) local conditions at the departure aerodrome; and

(b) APU consumption (if applicable).

Note For rotorcraft operations requiring a take-off prior to taxi, such as a hover taxi from a confined helipad, taxi fuel would be the fuel expected to the consumed before the commencement of the actual departure.

the Regulations means CAR 1988 and CASR.

TIBA is short for traffic information broadcast by aircraft.

Note See section 25.15.

track has the same meaning as in the CASR Dictionary.

transition altitude means the altitude:

(a) at or below which the vertical position of an aircraft is referenced to an average mean sea level atmospheric pressure (QNH); and

(b) above which the vertical position of the aircraft is referenced to standard pressure (pressure altitude).

transition layer means the airspace between the transition altitude and the ***transition*** level.

transition level means the lowest flight level available for use above the transition altitude.

transition point, for a flight of a rotorcraft that begins in VMC but is not conducted wholly in VMC, means the point in the flight at which the rotorcraft stops flying in VMC and starts flying in IMC.

trip fuel means the amount of fuel required to enable an aircraft to fly from take-off, or the point of in-flight re-planning, until landing at the destination aerodrome taking into account the operating conditions including the following:

(a) fuel for take-off and climb from departure aerodrome elevation to initial cruising level or altitude, taking into account the expected departure routing;

(b) fuel for cruise from top of climb to top of descent, including any step climb or descent;

(c) fuel from top of descent to the point where the approach is initiated, taking into account the expected arrival procedure;

(d) fuel for executing an approach and landing at the destination aerodrome.

TSO means Technical Standard Order of the FAA.

TTF means trend type forecast.

unforeseen factors means factors that could have an influence on the fuel consumption to the destination aerodrome, including the following:

(a) deviation of the particular aircraft from the expected fuel consumption data for aircraft of that type;

(b) deviation from forecast meteorological conditions;

(c) extended delays and deviations from planned routings or cruising levels.

use NVIS means to use NVIS as the primary means of terrain avoidance for safe air navigation by means of visual surface reference external to the aircraft.

V_{AT}, or velocity at threshold, means the indicated airspeed at the threshold which is equal to the higher of the following in the landing configuration at the maximum certificated landing mass:

(a) stall speed V_{SO} multiplied by 1.3; or

(b) stall speed V_{S1G} multiplied by 1.23.

VFR means the visual flight rules as prescribed by this MOS.

VHF means very high frequency.

VMC criteria has the same meaning as in section 2.03.

$\boldsymbol{V_{min}}$, means the minimum operating speed.

$\boldsymbol{V_{S1G}}$ means the stalling speed, or the steady flight speed, obtained in the clean configuration at 1G.

$\boldsymbol{V_{SO}}$ means the stalling speed, or the steady flight speed, in the landing configuration.

$\boldsymbol{V_{yse}}$, for an aircraft, means the speed mentioned in the AFM for the best rate of climb with 1 engine inoperative.

VMC means visual meteorological conditions as prescribed by this MOS.

VOR means VHF omnidirectional radio range.

(7) In this MOS:

(a) ***operative***, for anything, has the same meaning as serviceable;

(b) ***inoperative***, for anything, has the same meaning as unserviceable.

(c) ***serviceable***, for anything, means that the thing is capable of functioning in all respects as intended by its manufacturer;

(d) ***unserviceable***, for anything, means that the thing is incapable of functioning in all respects as intended by its manufacturer;

Part 2 Prescriptions for certain definitions in the CASR Dictionary

Note Relevant definitions to which these provisions refer were inserted in the CASR Dictionary by the *Civil Aviation Legislation Amendment (Operations) Regulations 2017*.

2.01 Special VFR

(1) This section is for the definition of ***special VFR*** in the CASR Dictionary.

(2) For the definition of ***special VFR*** for an aircraft other than a balloon, the visual flight rules in subsection (3) are prescribed.

(3) To operate under the special VFR, the PIC must:

(a) be authorised by ATC; and

(b) not operate in Class E airspace; and

(c) conduct the flight clear of cloud; and

(d) only conduct the flight if visibility is at least:

(i) for an aeroplane — 1 600 m; and

(ii) for a rotorcraft — 800 m; and

(e) for a rotorcraft — ensure that the rotorcraft is operated at a speed that allows the PIC to see obstructions or other traffic in sufficient time to avoid a collision; and

(f) ensure that the flight is conducted in accordance with regulations 91.400 and 91.403 of CASR.

Note Regulations 91.400 and 91.403 of CASR deal with minimum operating heights.

2.02 Specified aircraft performance category

(1) This section is for the definition of ***specified aircraft performance category*** in the CASR Dictionary.

(2) For the definition of ***specified aircraft performance category***, the aircraft performance category for the aircraft's V_{AT} (as worked out in accordance with the AFM) is as specified in Table 2.02 (2), so that for an aircraft with an IAS mentioned in a row of column 2 of the Table, the aircraft performance category is that mentioned in the same row in column 1.

(3) The landing minima for an IFR aircraft at an aerodrome are determined by the aircraft performance category specified for the aircraft in Table 2.02 (2), based on V_{AT} (except for rotorcraft) as set out in the aerodrome's approved instrument approach procedure.

(4) For an aircraft with an IAS mentioned in a row of column 2 of Table 2.02 (2), the landing minima is that given in the instrument approach chart for an aircraft of the category mentioned in the same row in column 1.

(5) A rotorcraft operating on an instrument approach that does not have CAT H minima must be operated to the CAT A minima.

Table 2.02 (2)

Aircraft performance category (from lowest, A, to highest, E)	Indicated airspeed (IAS)
A	up to 90 kts IAS
B	from 91 kts to 120 kts IAS

Aircraft performance category (from lowest, A, to highest, E)	Indicated airspeed (IAS)
C	from 121 kts to 140 kts IAS
D	from 141 kts to 165 kts IAS
E	from 166 kts to 210 kts IAS
H	there is no calculated IAS

Note V_{AT} is the indicated airspeed (IAS) at the threshold which is equal to the stalling speed V_{SO} multiplied by 1.3, or the stalling speed V_{S1G} multiplied by 1.23. Both V_{SO} and V_{S1G} apply to aircraft in the landing configuration at the maximum certificated landing weight. If both V_{SO} and V_{S1G} are available for an aircraft, the higher resulting V_{AT} must be used.

(6) If aircraft handling speeds during an approach are in excess of those that would otherwise apply for the aircraft performance category mentioned in Table 2.02 (2), the performance category must be increased.

(7) For subsection (6) the increase in performance category must be such that during IAL procedures within the range of speeds, or at the maximum speed, for an approach or manoeuvre mentioned in a row of column 2, 3, 4 and 5 of Table 2.02 (7), the specified aircraft performance category must be that mentioned in the same row of column 1.

Table 2.02 (7)

Aircraft performance category (from lowest, A, to highest, E)	Range of speeds for initial and intermediate approach (kts)	Range of speeds for final approach (kts)	Max. speed for visual manoeuvring (circling) (kts)	Max. speed for missed approach (kts)
A	90–150	70–100	100	110
B	120–180	85–130	135	150
C	160–240	115–160	180	240
D	185–250	130–185	205	265
E	185–250	155–230	240	275
H	70–120	60–90	N/A	90

2.03 VMC criteria

(1) This section is for the definition of ***VMC criteria*** in the CASR Dictionary.

(2) For the definition of ***VMC criteria,*** for a class of aircraft (other than a balloon) and a Class of airspace (including flight visibility and distance from cloud), the prescribed criteria are as mentioned in this section.

(3) For Class A controlled airspace, there are no prescribed VMC criteria.

Note Only IFR flights are permitted in Class A airspace unless CASA approves otherwise — see subregulation 91.300 of CASR.

(4) For Class C, D, E and G airspace, the VMC criteria for aircraft are specified in Table 2.03 (4).

(5) For Table 2.03 (4), for a Class of airspace mentioned in a row of column 1, at a height mentioned in the same row (or sub-row) of column 2, the VMC criteria, in the form of:

(a) the flight visibility; and

(b) distance from cloud — horizontally and vertically; and

(c) any operational requirements;

are those mentioned in the same row (or sub-row) in columns 3, 4 and 5 respectively.

Table 2.03 (4) VMC criteria for controlled airspace and Class G non-controlled airspace

Class of airspace Column 1	Height Column 2	Flight visibility Column 3	Distance from cloud Column 4	Operational requirements Column 5
C or E	At or above 10 000 ft AMSL	8 km	1 500 m horizontal 1 000 ft vertical	
	Below 10 000 ft AMSL	5 000 m	1 500 m horizontal 1 000 ft vertical	
D	All heights	5 000 m	600 m horizontal 1 000 ft vertical above cloud 500 ft vertical below cloud	

(6) For rotorcraft in Class G airspace, the VMC criteria specified in Table 2.03 (4) are subject to the operational requirement exceptions specified in Table 2.03 (6).

(7) For Table 2.03 (6), for rotorcraft in Class G airspace, at a height, with flight visibility, and distance from cloud, as mentioned in the same row in columns 1, 2, 3, and 4 of the Table, the operational requirements are those mentioned in column 5 for the same row.

Table 2.03 (6) Exceptions for rotorcraft in Class G airspace

Type of aircraft Column 1	Height Column 2	Flight visibility Column 3	Distance from cloud — horizontal/ vertical Column 4	Operational requirement exceptions Column 5
Rotorcraft	(a) Below 700 ft over land.	800 m	Clear of cloud	This exception is applicable only if the rotorcraft is operated: (a) by day; and (b) at a speed that allows the PIC to see obstructions or other traffic in sufficient time to avoid a collision; and (c) if less than 10 NM from an aerodrome for which an instrument approach has been approved — in a way that ensures the flight: (i) complies with the requirements for reporting, broadcasting and maintaining a listening watch, as set out in Part 91 of CASR; and (ii) maintains a separation of at least 500 ft vertically from any aircraft that is: (A) less than 10 NM from the aerodrome; and (B) conducting an IFR operation.
Rotorcraft	(b) Below 700 ft over water without track guidance from a navigation system.	1500 m	1600 m horizontal and 500 ft vertical	If track guidance is provided by an approved navigation system, then the same requirements as for over land apply as in columns 3, 4 and 5 above.

Part 3 Journey logs for international flights

3.01 Journey log information at the beginning of an international flight

(1) For subregulation 91.127 (2), subsection (2) prescribes the information about an international flight that must be recorded in the journey log at the beginning of the flight.

(2) The information is the following:

(a) the aircraft registration mark and flight number (if any);

(b) the date of the flight;

(c) for each FCM assigned to the flight:

(i) the FCM's name; and

(ii) the duties assigned to him or her for the flight;

(d) for the flight:

(i) the place of departure; and

(ii) the time the flight begins;

(e) the amount of fuel added to the aircraft's fuel tanks before the flight begins (if any);

(f) the amount of fuel in the aircraft's fuel tanks when the flight begins.

3.02 Journey log information after an international flight ends

(1) For subregulation 91.127 (2), subsection (2) prescribes the information about an international flight that must be recorded in the journey log as soon as practicable after the flight ends.

(2) The information is the following:

(a) the place of arrival;

(b) the time the flight ends;

(c) the duration of the flight;

(d) the amount of fuel in the aircraft's fuel tanks when the flight ends;

(e) incidents and observations (if any) that may have been relevant in any way to the safety of the flight.

Part 4 Carriage of animals

4.01 Carriage of animals — requirements

For subregulation 91.200 (5), this Part prescribes the requirements relating to the carriage of animals on an aircraft for a flight.

RESERVED

Part 5 NVIS flights

5.01 Purpose

(1) For subregulation 91.305 (1), this Part prescribes the requirements relating to the conduct of an NVIS flight.

(2) It is a requirement that the operator of an aircraft must ensure that the pilot in command of the aircraft complies with the requirements of this Part.

5.02 NVIS flight requirements

(1) The pilot of an aircraft must not use NVIS unless he or she is qualified to use NVIS and has meet all recency requirements, in accordance with Part 61 of CASR.

Note To ***use NVIS*** means to use NVIS as the primary means of terrain avoidance for safe air navigation by means of visual surface reference external to the aircraft. See section 1.05.

(2) The pilot may only use NVIS in accordance with:

(a) the NVFR; or

(b) the IFR but only in VMC.

(3) The pilot may only use NVIS in an aircraft that is certified to operate:

(a) under the NVFR or IFR; and

(b) using NVIS.

Note These certifications appear on the type certificate or may be obtained through a special type certificate (STC) process with a flight manual supplement.

(4) The pilot may only use NVIS if the NVG and NVD equipment constituting the NVIS complies with all applicable requirements of Part 21 of CASR.

(5) The pilot of an aircraft must not use NVIS unless:

(a) the minimum crew, in accordance with the AFM, are on board the aircraft; and

(b) each crew member is qualified for the operation and has met all recency requirements, in accordance with Part 61 of CASR.

Part 6 Airspeed limits — all flights

6.01 Purpose

For subregulation 91.310 (1), this Part prescribes the airspeed limits for an aircraft flight.

6.02 Flight to be within airspeed limits

(1) Subject to this section, if an aircraft is flown:

(a) in the airspace mentioned in a row of column 1 in Table 6.02 (1); and

(b) under the flight rules mentioned in the same row in column 2;

the PIC must ensure that, unless required for the purposes of aviation safety, the aircraft is flown at not more than the maximum airspeed limits (if any) mentioned in the same row in column 3.

Table 6.02 (1) Airspeed limits

Item	Airspace classification Column 1	Flight rules Column 2	Maximum airspeed Column 3
1	Class A	IFR	No maximum
2	Class C	IFR	No maximum
3	Class C	VFR	(a) Below 10 000 feet above mean sea level — 250 knots; (b) in any other case — no maximum except that VFR flights must not to exceed subsonic speed. *Note* See regulation 91 .290 of CASR.
4	Class D	IFR or VFR	(a) At or below 2 500 feet above aerodrome elevation within 4 nautical miles of the primary aerodrome in that airspace — 200 knots; or (b) in any other case — 250 knots
5	Class E	IFR or VFR	(a) Below 10 000 feet above mean sea level — 250 knots; (b) in any other case — no maximum except that VFR flights must not to exceed subsonic speed. *Note* See regulation 91 .290 of CASR.
6	Class G	IFR or VFR	(a) Below 10 000 feet above mean sea level — 250 knots; (b) in any other case — no maximum except that VFR flights must not to exceed subsonic speeds. *Note* See regulation 91 .290 of CASR.

(2) Subsection (1) does not apply to a flight mentioned in item 2, 3, 4 or 5 of Table 6.02 (1) — if ATS has authorised the pilot to fly the aircraft:

(a) in the airspace classification mentioned in column 1 for the item; and

(b) subject to regulation 91.290 — at a speed greater than the speed mentioned in column 3 for the item.

(3) Subsection (1) does not apply to a flight mentioned in item 3, 4, 5 or 6 of Table 6.02 (1) — if the PIC holds an approval in writing issued by CASA to fly the aircraft:

(a) in the airspace classification mentioned in column 1 for the item; and

(b) subject to regulation 91.290 — at a speed greater than the speed mentioned in column 3 for the item.

Part 7 Flight preparation — flight planning (weather assessments)

7.01 Purpose

For subregulation 91.313 (1), this Part prescribes requirements relating to flight preparation and weather assessments.

7.02 Forecasts for flight planning

(1) Before commencing a flight, the PIC must study:

(a) the current authorised weather forecast and authorised weather report for:

(i) the route to be flown; and

(ii) any aerodromes to be used; and

(b) any other reasonably available weather information that is relevant to the intended operation.

(2) For paragraph (1) (a), for a flight to a destination with an authorised instrument approach procedure, the current authorised weather forecasts are as follows:

(a) aerodrome forecasts for the departure and destination aerodromes and the alternate aerodromes (if any);

(b) one of the following:

(i) for an operation at or below 10 000 feet AMSL — a GAF; and

(ii) for an operation above 10 000 feet AMSL — a SIGWX forecast.

(iii) for any operation — a flight forecast;

(c) a wind and temperature forecast.

(3) For paragraph (1) (a), for a flight to a destination without an authorised instrument approach procedure, the current authorised weather forecast must be at least a GAF.

(4) A forecast must cover the whole period of the flight for which it is to be used.

(5) For the destination and alternate aerodromes nominated in a flight plan, an aerodrome forecast must be valid for at least 30 minutes before, and 60 minutes after, the planned ETA.

(6) When a flight is delayed so that the meteorological and operational information does not cover the period of the flight, updates must be obtained, as necessary, to allow the flight to be concluded safely.

(7) If a pre-flight briefing is obtained more than 1 hour before the estimated commencement of a flight, the PIC must obtain an updated authorised weather forecast for the flight.

7.03 Flights unable to obtain an authorised weather forecast before departure

(1) Despite subsections 7.02 (1) and (7), an aircraft may commence a flight if:

(a) a current authorised weather forecast or an authorised weather report for the flight cannot be obtained; and

(b) the PIC reasonably considers that the weather conditions at the departure aerodrome will permit the aircraft to return and land safely at the departure aerodrome within 1 hour after take-off.

(2) The PIC of a flight mentioned in subsection (1) must return to the departure aerodrome if the authorised weather forecast required for the flight by subsection 7.02 (1) is not obtained within 30 minutes after take-off.

(3) If an aerodrome forecast required by paragraph 7.02 (2) (a), cannot be obtained or is provisional only, the flight may commence provided an alternate aerodrome:

(a) is nominated on the ATS flight plan or operational flight plan; and

(b) meets the requirements for alternate aerodromes under the provisions of the Regulations and this MOS that are applicable to the type of operation being conducted.

Part 8 Flight preparation — flight planning (alternate aerodromes)

8.01 Purpose

For subregulation 91.314 (1), this Part prescribes the requirements relating to flight preparation and alternate aerodromes.

8.02 Alternate aerodromes — flight planning — general

(1) The PIC may nominate an aerodrome as an alternate aerodrome only if:

(a) it is suitable as a destination for the flight; and

(b) it is not itself an aerodrome for which the aircraft would require an alternate aerodrome.

(2) For a particular destination aerodrome, if there is no current aerodrome authorised weather forecast or only a provisional forecast, the PIC must nominate an alternate aerodrome that has a current aerodrome authorised weather forecast.

8.03 Weather conditions — general

(1) The PIC of an aircraft must nominate an alternate aerodrome if arrival at the destination aerodrome is forecast to occur during, or in the 30 minutes before the forecast commencement of, any of the following weather conditions at the destination aerodrome:

(a) for cloud — more than SCT below the alternate minimum prescribed in section 8.08 or 8.09, as applicable;

(b) for visibility — either:

(i) less than the alternate minimum; or

(ii) equal to or greater than the alternate minimum, but the forecast comes with at least a 30% probability of fog, mist, dust or any other phenomenon restricting visibility below the alternate minimum;

(c) for wind — a crosswind or downwind component more than the maximum for the aircraft.

(2) Subsection (1) does not apply if the PIC is operating an aircraft under the VFR by day within 50 NM of the point of departure.

8.04 Weather conditions — rotorcraft — VMC alternate requirements

(1) The PIC of a rotorcraft must nominate an alternate aerodrome if:

(a) operating under the VFR; and

(b) operation of the rotorcraft in rotorcraft VMC is permissible at the destination aerodrome; and

(c) either of the following weather conditions is forecast at the destination:

(i) for cloud — more than SCT below a ceiling of 1 000 ft; or

(ii) for visibility — less than 3 000 m.

Note For permissible operation of a rotorcraft in rotorcraft VMC, see the visual meteorological conditions criteria (VMC criteria), and see regulation 91.280 of CASR.

8.05 Conditions when alternate is not required

(1) The PIC of an aircraft need not nominate an alternate aerodrome if:

(a) the weather conditions at the destination aerodrome are forecast to be as mentioned in a paragraph of section 8.03; and

(b) the weather conditions are expected to improve at a specific time; and

(c) the aircraft has sufficient fuel to allow it to hold for at least 30 minutes after the specific time.

(2) The PIC need not nominate an alternate aerodrome if:

(a) the weather conditions at the destination aerodrome are forecast to be above the values mentioned in each paragraph of section 8.03; and

(b) intermittent or temporary deteriorations in the weather below the values are forecast; and

(c) the aircraft has sufficient fuel to allow it to hold:

(i) for intermittent deteriorations (INTER) — for at least 30 minutes; and

(ii) for temporary deteriorations (TEMPO) — for at least 60 minutes.

8.06 Alternate or holding fuel requirements

(1) When a thunder storm or its associated severe turbulence, or at least a 30% probability of either a thunder storm or severe turbulence (***thunderstorm events***) is forecast at the destination aerodrome, the PIC must ensure that sufficient fuel is carried to permit the aircraft to:

(a) proceed to an alternate aerodrome; or

(b) hold for:

(i) 30 minutes when the forecast is endorsed INTER; or

(ii) 60 minutes when the forecast is endorsed TEMPO.

(2) If a forecast has multiple INTER or TEMPO deteriorations, and fuel for holding must be carried, the fuel must be that for the most limiting requirement.

(3) For section 8.05 and this section, the PIC must carry:

(a) the fuel required by subsection (1) or subsection (2), as the case may be, when the estimated time of arrival of the aircraft at its destination aerodrome or alternate falls within the period:

(i) beginning 30 minutes before the forecast time of commencement of the deterioration or thunderstorm event; and

(ii) ending 30 minutes after the forecast time of cessation of the deterioration or event; or

(b) sufficient fuel to hold for at least 30 minutes after the forecast time of cessation of the deteriorations or thunderstorm event.

(4) When TAFs for a destination aerodrome include a BOM FM or a BECMG, causing an operational requirement to be created or removed (an ***operational requirement***), the time for the operational change is as follows:

(a) when the weather following the FM or the BECMG is forecast to create an operational requirement — the operational requirement becomes effective 30 minutes before the start of the FM time, or 30 minutes before the start of the BECMG period;

(b) when the weather following the FM or BECMG is forecast to remove an operational requirement — the operational requirement is not removed until 30 minutes after the FM time, or 30 minutes after the end of the BECMG period stated in the forecast that removes the requirement.

8.07 Trend type forecasts (TTF)

(1) When there is a TTF for the destination aerodrome:

(a) the 30 minute buffer periods mentioned in subsections 8.06 (3) and (4) do not apply; and

(b) a flight to be completed within the time of validity of the TTF of the destination aerodrome may be planned wholly by reference to that TTF.

(2) The TTF for a destination aerodrome may have either 1 visibility or 2 visibilities included in the report. Operational requirements to carry holding fuel or plan for an alternate apply to the PIC if:

(a) the 1 visibility is less than the alternate minimum; or

(b) the higher of 2 visibilities is less than the alternate minimum.

(3) When a flight cannot use a TTF, the PIC may plan a flight on the current TAF until such time as the destination ETA falls within the validity period of a TTF.

8.08 IFR alternate minima

For an IFR flight, the alternate minima are as follows:

(a) for an aerodrome with an instrument approach procedure — the alternate minima is that published on the relevant approach chart;

(b) for an aerodrome without an instrument approach procedure — the alternate minima is:

(i) the LSALT for the final route segment, or the grid lowest safe altitude; and

(ii) an additional 500 ft; and

(iii) a visibility of 8 km.

(c) for an aerodrome with an instrument approach procedure where an aerodrome forecast is unavailable or is provisional, the PIC must make provision for a suitable alternate.

8.09 VFR alternate minima

The VFR alternate minima are as shown in Table 8.09.

Table 8.09

Aircraft	Operation	Alternate minima
Aeroplane	Day VFR or Night VFR	1.Cloud more than SCT below a ceiling of 1 500 ft; and 2.Visibility of less than 8 km
Rotorcraft	Day VFR	1.Cloud more than SCT below a ceiling of 1 500 ft; and 2.Visibility of less than 8 km
		If rotorcraft VMC is possible: 1.Cloud more than SCT below a ceiling of 1 000 ft; and 2.Visibility of less than 3 000 m. *Note* See section 8.04.
Rotorcraft	Night VFR	1.Cloud more than SCT below a ceiling of 1 500 ft; and 2.Visibility of less than 8 km

8.10 IFR Special alternate minima

(1) A PIC must use standard alternate minima during a period when:

(a) local BOM METAR/SPECI services are not available; or

(b) BOM forecasting services are not available; or

(c) ground equipment associated with the approach aid has been unserviceable for more than 7 days and continues to be unserviceable; or

(d) an aerodrome control service is not provided.

8.11 IFR Special alternate minima — equipment required

(1) *Airborne equipment*. Special alternate minima are available for operations by aircraft with dual ILS and VOR approach capability (that is, with duplicated LOC, G/P, Marker and VOR receivers. For this purpose, the requirement for dual marker receivers may be met by one marker receiver plus DME).

Note It is assumed that such aircraft will also have duplicated ADF systems when an NDB or Locator is used for the ILS.

(2) *Ground equipment*. For a location to be considered as suitable for special alternate minima, it must be served by ILS, LOC or straight-in VOR instrument approach procedures to at least 2 runway directions which are suitable for use by all aircraft likely to use the special low alternate minima.

(3) The instrument approach procedures may only utilise the same ground equipment for both runway directions if:

(a) the equipment meets the applicable requirements of:

(i) ICAO Annex 10, Volume 1, Attachment C, Table C2; or

(ii) ICAO Annex 10, Volume 1, Attachment F; and

(b) an alternative straight-in instrument approach procedure is available using a different aid.

Note It is recommended that instrument approach procedures utilise different VHF ground equipment as far as possible.

(4) *Other requirements*. Special alternate minima are:

(a) only available at controlled aerodromes; and

(b) not available during any period when ATS and BOM observation and forecasting services are not provided at the aerodrome concerned.

8.12 Alternate aerodromes — navigation requirements

(1) A flight which is planned to be conducted under the IFR on the last route segment to its destination must provide for a suitable alternate aerodrome, unless the destination is served by a published instrument approach and the aircraft is fitted with a navigation system capable of using the approach.

(2) Despite subsection (1), a flight may be planned under the IFR by day to a destination aerodrome which has no published instrument approach procedure without the requirement to provide for a suitable alternate aerodrome, provided that:

(a) not more than SCT cloud is forecast below the final route segment LSALT plus 500FT and forecast visibility at the destination aerodrome is not less than 8KM; and

(b) the aircraft can be navigated to the destination aerodrome in accordance with the IFR requirements.

(3) Where navigational capability is based on GNSS equipment certified to (E)TSO C-129, the requirement for navigation to an alternate aerodrome must be met by using ADF or VOR navigation.

Note (E)TSO C-129 may be obtained at

http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgTSO.nsf/MainFrame?OpenFrameSet

8.13 Runway lighting

(1) *Portable lighting*. If a flight is planned to land at night at an aerodrome with portable runway lighting, the PIC must make provision for an alternate aerodrome except when reliable arrangements have been made for a qualified and responsible person to attend to the runway lighting during the period from at least 30 minutes before the ETA, to completion of landing and taxiing.

(2) *Standby power*. If a flight is planned to land at night at an aerodrome with electric runway lighting, whether PAL or otherwise, but without standby power, the PIC must make provision for an alternate aerodrome except when:

(a) portable runway lights are available; and

(b) reliable arrangements have been made for a qualified and responsible person to:

(i) be in attendance at the aerodrome during the period from at least 30 minutes before the ETA, to completion of landing and taxiing; and

(ii) display the portable lights in the event of a failure of the primary lighting.

(3) *PAL*. If a flight at night is planned to land at a destination aerodrome with PAL and standby power, the PIC must make provision for an alternate aerodrome equipped with runway lighting, unless reliable arrangements have been made for a qualified and responsible person to be in attendance to manually switch on the aerodrome lighting;

(4) *Alternate aerodromes — PAL*. For an aircraft fitted with single VHF communication, the PIC may plan for an aerodrome equipped with PAL to be an alternate aerodrome only if:

(a) there is a responsible person in attendance to manually switch on the aerodrome lighting; and

(b) the aircraft has:

(i) HF communications; and

(ii) 30 minutes of holding fuel.

Note There is no requirement for a responsible person to be in attendance on the ground. The requirement for holding fuel will allow ground staff to be alerted in the event of a failure of the aircraft's VHF communication.

(5) Subsections (1) to (4) do not apply to a PIC who carries holding fuel for first light plus 10 minutes at the destination.

(6) If an alternate aerodrome is nominated because of a requirement under subsection (2) or (3), the alternate aerodrome is not required to have standby power or portable runway lighting.

(7) ***Qualified***, when mentioned for a responsible person in this section means a person who is instructed in, and is competent to display, the standard runway lighting with portable lights.

(8) *Partial runway lighting failure*. At a controlled aerodrome, if a lighting failure occurs on a runway and doubled spacing of runway edge lights results, the PIC of a flight at night must comply with the following requirements for an approach to land:

(a) in VMC — no restriction;

(b) in less than VMC — the prevailing visibility must be equal to, or greater than, 1.5 times the published minimum.

Note 1 At a controlled aerodrome, in the event of failure of 1 electrical circuit on a runway equipped with interleaved circuitry lighting, pilots will be notified of a doubled spacing of runway edge lights — from 60 m to 120 m spacing.

Note 2 The published minimum is that for the instrument approach procedure being used for the aircraft's arrival.

8.14 Determination of general alternate minima

In calculating the general alternate minima, the aircraft operator or the PIC must add to the circling minima appropriate to the aircraft category:

(a) 500 ft — as the tolerance for the forecast ceiling; and

(b) 4km — as the tolerance for the forecast visibility.

Note For the tolerance for the forecast ceiling and visibility, see section 8.03.

8.15 Alternate minima for IFR operations outside Australia

(1) For operations outside Australia, an aircraft operator or the PIC must use alternate minima criteria not less than the alternate minima criteria that apply in the foreign State where the aerodrome is located unless the State does not specify alternate minima criteria.

(2) For operations to foreign States that do not specify alternate minima criteria, the alternate minima criteria must be determined in accordance with subsection (3).

Note Outside Australia, the criteria which determine whether an alternate aerodrome must be selected for a flight, and the criteria that determine whether an aerodrome can be filed as an alternate, may differ. The former may be in regulations and the latter published on charts.

(3) For subsection (2), the PIC or the operator must add:

(a) to the circling minima — a forecasting tolerance of 500 feet and a visibility tolerance of 2 km; or

(b) to the minima of the second lowest independent approach procedure suitable for the operation and for which the aircraft is equipped — State forecast tolerances for ceiling and visibility.

(4) For subsection (3), if foreign State forecast tolerances cannot be determined, or if the availability or reliability of the approach aid is doubtful, a ceiling tolerance of 500 feet and a visibility tolerance of 2 km must be used.

(5) The procedures used by each navigation system must be independent of each other, except for ILS with approved precision approach procedures with minima less than CAT I. Minima lower than CAT I must not be considered in determining alternate criteria.

(6) If:

(a) the aerodrome has straight-in procedures to a runway that is not suitable for the operation; and

(b) circling is approved;

then the alternate minima must not be lower than the circling minima plus forecast tolerances.

(7) The approved alternate minima are whichever is the highest of the following:

(a) the values determined in accordance with subsections (1) to (4); or

(b) the values determined by the foreign State in which the aerodrome is located; or

(c) 400 ft ceiling and 1 600 m visibility if the values determined in accordance with paragraph (a) are based entirely on precision landing minima; or

(d) 800 ft ceiling and 3 000 m visibility if the values determined in accordance with paragraph (a) are not based solely on precision landing minima.

(8) The alternate minima must be assessed immediately before departure.

Note Alternate minima vary with the aerodrome, the aircraft and radio aid serviceability and, therefore, must be assessed immediately before departure.

(9) The PIC is responsible for assessing the alternate minima immediately before departure even if the operator has selected nominal values for a particular port.

(10) For subsection (9), if the operator has selected a nominal value for a particular port for a particular period, the operator must demonstrate that the value will satisfy the requirements of this MOS for scheduled or non-scheduled IFR operations outside Australia which may occur during the period of application of the values selected.

(11) For subsection (10), the demonstration must account for the 3 standard deviation wind values for both landing and crosswind components and may account for a downwind landing to the value allowed by the relevant aircraft's certification.

8.16 Night VFR flights

A flight permitted to operate under the VFR at night must provide an alternate aerodrome within 1 hour's flight time of the destination:

(a) unless:

(i) the destination is served by a ground-based radio navigation aid; and

(ii) the aircraft is fitted with the appropriate radio navigation system capable of using the aid; and

(iii) the PIC is qualified to use the aid; or

(b) unless:

(i) the aircraft is fitted with an approved GNSS receiver; and

(ii) the PIC is qualified to use the receiver.

Part 9 Flight preparation — fuel requirements

9.01 Purpose

For subregulation 91.320 (1), this Part prescribes requirements relating to fuel for aircraft.

9.02 Matters for determining fuel sufficiency

For paragraph 91.320 (1) (a), when determining whether an aircraft has sufficient usable fuel to complete a flight in safety, the following requirements must be complied with:

9.03 Usable fuel required for a flight

(1) This section is for paragraph 91.320 (1) (a) — matters that must be considered when determining whether an aircraft has sufficient usable fuel to complete a flight.

(2) In determining the quantity of usable fuel required to complete a flight in safety, the following matters must be considered:

(a) aircraft specific fuel consumption data in the form of:

(i) current aircraft specific fuel consumption data derived from a fuel consumption monitoring system (if available); or

(ii) fuel consumption data provided by the engine, or aircraft, manufacturer;

(b) operating conditions for the planned flight, including the following;

(i) anticipated weight of the aircraft;

(ii) relevant NOTAMS;

(iii) relevant meteorological reports and forecasts;

(iv) relevant ATS procedures, restrictions and anticipated delays;

(v) the effects of deferred maintenance items and configuration deviations;

(c) the potential for deviations from the planned flight because of unforeseen factors.

9.04 Amount of fuel to be carried

(1) This section is for paragraph 91.320 (1) (b) of CASR.

(2) For paragraph 91.320 (1) (b), the amounts of fuel that must be carried on board an aircraft for a flight must conform to the requirements set out in Table 9.04, so that for an aircraft in a kind of flight mentioned in an item of the Table, the final reserve fuel flight time, and the contingency fuel amount, must be as mentioned in columns 3 and 4 respectively for the item.

Table 9.04 Final reserve fuel and contingency fuel requirements

Item	Aircraft (by aircraft category) Column 1	Kind of flight (by flight rules) Column 2	Final reserve fuel flight time Column 3	Contingency fuel amount Column 4
1	Small aeroplane (piston engine or turboprop)	VFR	30 minutes	N/A
2	Small aeroplane (piston engine or turboprop)	Night VFR	45 minutes	N/A

Item	Aircraft (by aircraft category) Column 1	Kind of flight (by flight rules) Column 2	Final reserve fuel flight time Column 3	Contingency fuel amount Column 4
3	Small aeroplane (piston engine or turboprop)	IFR	45 minutes	N/A
4	Turbojet engine aeroplane or large turboprop aeroplane	IFR or VFR	30 minutes	5% of trip fuel
5	Large aeroplane (piston engine)	IFR or VFR	45 minutes	5% of trip fuel
6	Rotorcraft	VFR	20 minutes	N/A
7	Rotorcraft	Night VFR	30 minutes	N/A
8	Rotorcraft	IFR	30 minutes	N/A

Note Table 9.04 describes the required final reserve fuel and contingency fuel quantities by aircraft type and flight rules.

9.05 Amount of fuel that must be carried for a flight

(1) This section is for paragraph 91.320 (1) (b) of CASR.

(2) Before a flight commences, the PIC of an aircraft must ensure that:

(a) the quantity of fuel on board the aircraft is determined; and

(b) the quantity of usable fuel is recorded.

(3) The amount of usable fuel required to be on board an aircraft at the commencement of a flight must include the following:

(a) taxi fuel;

(b) trip fuel;

(c) contingency fuel (if applicable);

(d) alternate fuel (if required);

(e) final reserve fuel;

(f) holding fuel (if required);

(g) additional fuel (if applicable).

9.06 Procedures for fuel monitoring during a flight

(1) This section is for paragraph 91.320 (1) (c) of CASR — procedures for monitoring amounts of fuel during a flight.

(2) The PIC must ensure that fuel quantity checks are carried out at regular intervals throughout a flight, and that the usable fuel remaining is evaluated to:

(a) compare planned fuel consumption with actual fuel consumption; and

(b) determine that the usable fuel remaining is sufficient to complete the planned flight in accordance with subsection (3); and

(c) determine the expected usable fuel remaining on arrival at the destination aerodrome; and

(d) trigger in-flight re-planning of the flight if the usable fuel remaining is insufficient to complete the planned flight in accordance with subsection (3).

(3) The amount of usable fuel required to be on board to continue a flight must include the following:

(a) trip fuel;

(b) alternate fuel (if required);

(c) final reserve fuel;

(d) holding fuel (if required);

(e) additional fuel (if applicable).

(4) The amount of usable fuel required to be on board to continue a flight from the point of in-flight re-planning must include the following:

(a) trip fuel;

(b) contingency fuel (if applicable);

(c) alternate fuel (if required);

(d) final reserve fuel;

(e) holding fuel (if required);

(f) additional fuel (if applicable).

(5) The use of fuel after commencement of a flight, for purposes other than as planned during pre-flight planning, must be based on a re-analysis and, if applicable, an adjustment, of the planned flight.

9.07 Procedures if fuel reaches specified amounts

(1) This section is for paragraph 91.320 (1) (d) of CASR — procedures to be followed if fuel reaches specified amounts during a flight.

(2) If an in-flight fuel quantity check shows that usable fuel on arrival at the destination aerodrome would be less than:

(a) the required alternate fuel plus final reserve fuel — the PIC must:

(i) having taken into account the traffic and operational conditions likely to be prevailing on arrival — plan for a safe landing at the destination aerodrome, the destination alternate or another en-route alternate; and

(ii) proceed to whichever of those aerodromes will enable the PIC to perform a safe landing with not less than final reserve fuel remaining; or

(b) the final reserve fuel (where no alternate aerodrome is required) — the PIC must proceed to an en-route alternate aerodrome which will enable the PIC to perform a safe landing with not less than final reserve fuel remaining.

(3) The PIC of a radio-equipped aircraft must advise ATS of a "*Minimum fuel"* state if, having committed to land at a specific aerodrome, the pilot calculates that any change to the existing clearance to that aerodrome may result in landing with less than the final reserve fuel.

(4) If the calculated usable fuel predicted to be available upon landing at the nearest aerodrome where a safe landing can be made would be less than the final reserve fuel, the PIC of a radio-equipped aircraft must declare to the ATS a fuel emergency by broadcasting "MAYDAY, MAYDAY, MAYDAY FUEL".

Note The fuel emergency declaration is a distress message.

Part 10 Flight plans and notifications

10.01 Purpose

For subregulation 91.325 (1), this Part prescribes requirements relating to flight plans and notifications.

10.02 Flight notification requirements

(1) A flight notification in accordance with the AIP must be submitted to the ATS by a PIC for the following flights:

(a) an IFR flight;

(b) subject to subsection 10.03 (1), a VFR flight for which the PIC nominates a SARTIME;

(c) a flight in controlled airspace (but excluding VFR flight in Class E airspace).

(2) A PIC who uses a facsimile message to submit a flight notification with SARTIME must confirm its receipt with ATS.

(3) To minimise the risk of frequency congestion, a PIC who uses radio to submit a flight notification must transmit only the information required by ATS for the current flight stage.

(4) A PIC of an aircraft equipped only with VHF must not nominate IFR for any stage of the flight where the aircraft is beyond ATS VHF coverage.

(5) A flight notification mentioned in subsection (1) or (2) must not be acted upon unless it is accepted or confirmed by the ATS.

10.03 SARTIME flight notification requirements — VFR

(1) If a VFR flight is:

(a) an air transport flight; or

(b) a flight over water; or

(c) a flight in a designated remote area referred to in section 30.64 of this MOS; or

(d) a flight at night proceeding beyond 120NM from the aerodrome of departure;

then the PIC must:

(e) submit a flight notification with SARTIME to ATS; or

(f) leave an appropriate flight note with a responsible person.

Note For flight notes, see sections 10.08 and 10.10.

(2) The PIC for a VFR flight who is required, or chooses, to nominate a SARTIME must provide ATS with the following details for the flight:

(a) the aircraft radio call sign;

(b) the aircraft type;

(c) the departure point;

(d) the route to be flown;

(e) the destination;

(f) the POB;

(g) the SARTIME.

(3) If the details of a VFR flight with SARTIME are varied, the PIC must provide ATS with the following in the same way as a flight notification is given:

(a) the details of the variation;

(b) the position at which the variation is to occur;

(c) which flight rules will apply after the variation.

(4) Only 1 SARTIME may be current at any time.

10.04 Departure SARTIME

(1) When submitting a flight notification to ATS, the PIC may nominate a SARTIME for departure for the initial departure aerodrome only.

(2) When submitting a flight notification to ATS for an intermediate departure, SARTIME must be nominated:

(a) by telephone after landing; or

(b) as part of the arrival report for the intermediate departure aerodrome.

(3) The nomination of a SARTIME for departure does not affect any obligation on a PIC under Part 91 of CASR for the carriage of serviceable radio equipment and the making of broadcasts and reports.

(4) At an aerodrome where radio or ground communication cannot reasonably be assured, the PIC may extend the SARWATCH for the period of landing and subsequent take-off, by nominating SARTIME for departure at the time of arrival.

10.05 Guide to flight notification requirements

(1) Table 10.05 (1) is for guidance only to show the flight notification requirements under this Part for classes and types of operations when flying IFR or VFR.

(2) For Table 10.05 (1), for a flight category in a class and type of operation mentioned in a row of columns 1, 2 and 3, respectively, the flight notification requirement is that mentioned in column 4 of the same row.

Table 10.05 (1)

Flight category	Class of operation	Type of operation	Summary of flight notification options
IFR	All classes	All operations	Comprehensive flight notification to ATS
VFR	Air transport	All operations	SARTIME to ATS or flight note to a responsible person
VFR	Aerial work (AWK) and Part 91 of CASR	Particular operations, namely: 1. flights over water; or 2. flights in designated remote areas; or 3. flights at night proceeding beyond 120 NM from the aerodrome of departure	SARTIME to ATS or flight note to a responsible person
VFR	AWK and Part 91 of CASR	All other operations that are not particular operations	SARTIME to ATS or flight note to a responsible person are optional

10.06 Cancelling SARTIME —VFR flight

(1) If operating on a SARTIME, the PIC of a VFR flight must cancel the SARTIME:

(a) not later than the time nominated; and

(b) by using the words "CANCEL SARTIME".

(2) The PIC of a single VHF radio equipped aircraft must cancel SARTIME:

(a) after landing; or

(b) at or before changing to the CTAF.

(3) SARTIME for VFR flights may be cancelled; as follows:

(a) via telephone to CENSAR on 1800 814 931;

(b) if telephone facilities are not available — through use of ATS frequencies;

(c) otherwise — as approved in writing by CASA.

Note Paragraph 10.06 (3) (a) is the preferred method for cancelling SARTIME for VFR flights.

10.07 Cancelling SARWATCH or SARTIME for an IFR flight

When cancelling SARWATCH, a PIC must include the following:

(a) the aircraft radio call-sign;

(b) the place of arrival, or point from which SARWATCH services are no longer required;

(c) the words "CANCEL SARWATCH";

(d) when communicating with a unit other than that nominated — the name of the ATS unit to which the report is to be relayed.

10.08 Information to be included in a flight notification

For paragraph 10.03 (1) (f), a flight note must contain the following information:

(a) the aircraft radio call sign;

(b) the ETD for each departure point;

(c) the ETA for each landing point;

(d) the aircraft's fuelled airborne endurance;

(e) the pilot's name, and the telephone number at which he or she is contactable for the flight;

(f) the POB;

(g) the destination contact facility.

10.09 Requirement to notify numbers of POB

The PIC for an IFR flight must notify ATS, on first contact, of the number of POB the aircraft.

Note 1 CASA recommends that a PIC notify ATS of any subsequent changes to the POB.

Note 2 Detailed information on completing a flight notification form, and amendments that are to be notified, may be found in the AIP ENR.

10.10 Responsible persons for receipt of a flight note

(1) In this Part, a responsible person for the receipt of a flight note must meet the requirements mentioned in subsection (2).

(2) For subsection (1), the responsible person must:

(a) be over the age of 18 years; and

(b) have access to at least 2 serviceable and appropriate telephones; and

(c) satisfy the PIC that he or she:

(i) knows how to contact IRCC Australia; and

(ii) will immediately do so in the event that the PIC's flight is overdue.

Part 11 Flight preparation — matters to be checked before take-off

11.01 Purpose

For subregulation 91.335 (1), this Part prescribes the checks to be carried out before take-off.

11.02 Matters to be checked before take-off

(1) Before commencing a flight, the PIC of an aircraft must complete the following:

(a) the checks for a pre-flight briefing;

(b) if an RNP approach is planned at the intended destination or designated alternate — a prediction for GNSS integrity availability obtained from a ground-based source;

(c) if flight navigation is to be based on use of GNSS in Oceanic airspace — a prediction check for GNSS FDE availability for the intended route using the following parameters:

(i) the route or airspace RNP, where published; or

(ii) a centreline space of:

(A) 20NM for flight in CTA, and

(B) 50NM for flight in OCA;

(d) the checks mentioned in subsection (2).

(2) For paragraph (1) (d), the checks are as follows:

(a) a check to confirm that:

(i) all instruments, indicators, equipment and systems required to be fitted to, or carried on, the aircraft by or under the Regulations are available and functioning properly; and

(ii) emergency and survival equipment carried on the aircraft is readily accessible;

(b) a check to confirm that the aircraft's take-off, en-route and landing performance capabilities meet the performance requirements required by or under the Regulations for the circumstances and conditions expected during the flight;

(c) a check to confirm that sufficient fuel is on the aircraft to enable the PIC to comply with the Regulations;

(d) a visual check to confirm that the aircraft's fuel has not been contaminated by water or other foreign matter — unless the PIC reasonably believes it is not necessary to carry out this check.

(e) a check to confirm that:

(i) the flight crew, and cabin crew (if any), required for the flight by or under the Regulations are on duty for the flight; and

(ii) each crew member is fit to perform his or her duties;

(f) a check to confirm that the aircraft's weight and balance will remain within the aircraft's weight and balance limits throughout the flight;

(g) a check to confirm that:

(i) the aircraft's hatches, access ports, panels and tank caps are secured; and

(ii) the control locks, covers and similar ground safety devices have been removed;

(h) a check to confirm that carry-on baggage and catering equipment is securely stowed;

(i) if the aircraft is an Australian aircraft — a check to confirm that there is either:

(i) a certificate of release to service for the most recent maintenance carried out on the aircraft; or

(ii) a maintenance release for the aircraft;

(j) a check to confirm that the aircraft's flight controls have been tested and are functioning correctly;

(k) if the AFM instructions for the aircraft require a pre-flight inspection of the aircraft to be carried out — a check to confirm that the pre-flight inspection has been carried out;

(l) for each system fitted to the aircraft for measuring and displaying pressure altitude, a check of the system's accuracy in accordance with:

(i) the procedures mentioned in this Part; and

(ii) the QNH that has been set;

(m) if an amount of supplemental oxygen or protective breathing equipment is required by or under the Regulations to be carried on the aircraft for an FCM for the flight — the following checks (as the case requires):

(i) that the required amount of supplemental oxygen is available;

(ii) that the protective breathing equipment is serviceable;

(iii) that the oxygen mask is connected to the supply terminal;

(iv) that each communication system associated with the oxygen mask is connected to the aircraft's communication system;

(v) if the oxygen mask is adjustable — that the mask fits the FCM correctly.

11.03 Checking systems for measuring and displaying pressure altitude

(1) For paragraph 11.02 (2) (l), this section sets out the requirements for checking aircraft systems for measuring and displaying pressure altitude (***pressure altitude systems***).

(2) If:

(a) an aircraft is at a known elevation; and

(b) an accurate QNH is available;

then, before take-off, the PIC of the aircraft must check the accuracy of each of the aircraft's pressure altitude systems in accordance with this section.

Note For accurate QNH and site elevation, see section 11.04.

(3) The PIC must consider unserviceable any pressure altitude system with an error in excess of ± 75 ft.

(4) If 2 pressure altitude systems are required for the category of operation:

(a) 1 system (the ***first system***) must read the nominated elevation to within 60 ft; and

(b) if the other system (the ***second system***) has an error between 60 ft and 75 ft — the PIC may conduct a flight to the first point of landing where the accuracy of the second system can be rechecked; and

(c) if, on rechecking, the second system shows an error in excess of 60 ft — the PIC must consider the second system to be unserviceable for further IFR flight.

(5) If 1 pressure altitude system is required for the category of operation, but 2 are fitted:

(a) the PIC is permitted to conduct a flight if 1 system (the ***first system***) reads the nominated elevation to within 60 ft; and

(b) if the other system (the ***second system***) has an error in excess of 75 ft — the PIC must ensure that the second system is:

(i) placarded as unserviceable for IFR flight; and

(ii) reported in the aircraft's flight technical log or aircraft maintenance release (as applicable).

Note "Flight technical log" has the same meaning as in Part 42 of CASR; and "aircraft maintenance release" has the same meaning as in regulation 30 of CAR.

(6) If 1 pressure altitude system is required for the category of operation, and 1 is fitted:

(a) if the system has an error between 60 ft and 75 ft, the PIC is permitted to conduct a flight to the first point of landing where the accuracy of the system can be rechecked; and

(b) if, on rechecking, the system shows an error in excess of 60 ft, the PIC must consider the system to be unserviceable for further IFR flight.

11.04 Checking altimeters used for VFR flight

(1) Given an accurate QNH set, to be serviceable a pressure altitude system used for VFR flight must read site elevation to within:

(a) 100 ft; or

(b) at test sites above 3 300 ft — 110 ft.

(2) If an aircraft that is fitted with 2 pressure altitude systems continues to conduct a flight under the VFR with 1 system erroneously reading more than 100 ft (or 110ft as the case may be), then:

(a) the faulty system must be placarded as unserviceable; and

(b) the error noted in the aircraft's flight technical log or aircraft maintenance release (as applicable).

(3) For an aeroplane operation conducted under the VFR involving flight above FL200, the pressure altitude system used must be checked against the accuracy requirements for such system usage under the IFR.

11.05 Accurate QNH and site elevation

(1) In this Part, a QNH is to be considered accurate only if it is provided by 1 of the following:

(a) ATIS;

(b) an ATC tower;

(c) an automatic remote-reporting aerodrome sensor.

(2) Area or forecast QNH must not be used for checking the accuracy of a pressure altitude system.

(3) Site elevation must be derived from aerodrome survey data that is:

(a) authorised in writing:

(i) directly or indirectly by CASA; or

(ii) by an NAA; or

(b) supplied in writing by the relevant aerodrome operator.

Part 12 Flight rules — air traffic services

Division 12.1 Classes of airspace

12.01 Purpose

For paragraph 91.340 (1) (a), this Division prescribes requirements in relation to the use by an aircraft of classes of airspace.

12.02 Failure of radio communications required for ATS

(1) For a flight in any Class of airspace, if:

(a) a total or partial failure of the required radio communications equipment occurs before the flight commences; and

(b) repair facilities are available;

then repairs must be made before the flight proceeds.

(2) For subsection (1), if:

(a) repair facilities are not available; and

(b) flight to the nearest appropriate repair facility would involve flight in controlled airspace;

then the flight may proceed, provided that ATS:

(c) is advised of the radio failure; and

(d) gives a flight clearance.

Note Procedures to be adopted when total loss of radio occurs whilst in-flight and within Australian domestic airspace are contained in ERSA EMERG. For radio failure or no radio procedures at all non-controlled aerodromes refer to ERSA INTRO.

12.03 Failure of radio communications required for ATS — Oceanic airspace

(1) For a total failure of communication while in-flight within Australian administered Oceanic airspace, the PIC must:

(a) try to re-establish communication with ATC by any practicable means; and

(b) if unsuccessful —do the following:

(i) Squawk 7600;

(ii) if possible:

(A) using both the frequency in use; and

(B) frequency 121.5 MHz, or, as a back-up, the VHF inter-pilot air-to-air frequency 123.45 MHz;

broadcast the following at suitable intervals:

(C) the aircraft's identification;

(D) the aircraft's flight level;

(E) the aircraft's position (including the ATS route designator or the track code);

(F) the PIC's intentions;

(c) watch for conflicting traffic both visually and by reference to airborne collision avoidance systems or traffic displays (if equipped).

(d) turn on all aircraft exterior lights (commensurate with appropriate operating limitations);

(e) maintain the last assigned speed and level for a period of 60 minutes following the aircraft's failure to report its position over a compulsory reporting point (including ADS-C flights);

(f) after the 60 minutes mentioned in paragraph (e), adjust speed and altitude in accordance with the filed flight plan;

Note In an OCA, aircraft experiencing communication failure may also initiate strategic lateral offset procedures (SLOP) in accordance with ENR section 2.2, including an offset of up to 2NM right of track.

(g) on exiting OCA, conform to the relevant State procedures and regulations.

(2) A PIC who is not able to comply with the requirements of this section must proceed to the nearest suitable aerodrome and land.

(3) In the event of a failure of communications, ATC must maintain separation between the aircraft experiencing the communication failure and any other aircraft, based on the assumption that the aircraft experiencing the communication failure will operate in accordance with the procedures in section 12.03.

12.04 No radio communications — Class G airspace

(1) A non-radio aircraft may operate above 5 000 ft in Class G airspace to the minimum extent necessary for the safe conduct of the flight, provided that:

(a) the aircraft cruises at a VFR level; and

(b) the cruise is conducted in VMC; and

(c) as soon as practicable, the aircraft descends in VMC to below 5 000 ft to continue flight in VMC.

(2) A PIC who is not able to comply with subsection (1) must proceed to the nearest suitable aerodrome and land.

12.05 Flight level deviation reporting

(1) For an operation in the Australian FIR, the PIC must report all flight level deviations of 300 ft or more from the aircraft's assigned level, regardless of the cause of the deviation.

Note Thus, a report under subsection (1) must cover deviations caused by, for example, traffic alert and collision avoidance system (TCAS), turbulence and contingency events.

(2) For subsection (1), the report must use the following format:

1. Name of reporting agency.
2. Date and time of deviation.
3. Location of deviation (latitude/longitude) and indication of the area (for example, Australian South Pacific airspace; Australian Continental airspace; Australian Indian Ocean airspace.
4. Aircraft identification and type:
5. Flight level assigned.
6. Observed/Reported (indicate one) final flight level (including whether controller or pilot report).
7. Duration at flight level.
8. Cause of Deviation.
9. Other traffic.
10. Crew comments, (if provided).

11. Remarks (for example, if the event necessitated contingency action, indicate whether AIP contingency procedures were followed).

(3) For subsection (1), the report must be submitted in writing, as soon as possible after the occurrence of the deviation, to:

Australian Airspace Monitoring Agency (AAMA)

Safety & Assurance Group

Airservices Australia

GPO Box 367

CANBERRA ACT 2601

AUSTRALIA

Fax: +61 2 6268 5695

Email: aama@airservicesaustralia.com

(4) The PIC may also send a report to the relevant airline or operator using normal airline or operator reporting procedures.

Part 12

Division 12.2 Controlled aerodromes, control areas and control zones

12.06 Controlled aerodromes

(1) For paragraph 91.340 (1) (b), this section prescribes the requirements in relation to the use by an aircraft of a controlled aerodrome.

(2) The PIC of an aircraft taxiing on the manoeuvring area of a controlled aerodrome:

(a) must stop and hold at all lighted stop bars; and

(b) may only proceed beyond the stop bars when the stop bar lights are switched off.

12.07 Control areas — change of level

(1) For paragraph 91.340 (1) (c), this section prescribes requirements in relation to the use by an aircraft of a control area.

(2) The PIC of an aircraft must commence a change of level as soon as possible, but not later than one minute, after receiving the instruction to do so from ATS, unless that instruction specifies a later time or place.

(3) If:

(a) ATS requires that an aircraft must reach an assigned level by a specific time, distance or place; and

(b) the PIC of the aircraft doubts that the requirement can be met;

then he or she must advise ATS immediately.

(3) If ATS advise expectation of a level this does not authorise a pilot to climb or descend to the level without clearance.

(4) An expectation of a level requirement is not required to be read back.

(5) A requirement to report at a time or place given in the same clearance as a descent/climb instruction does not require the new level to be reached by the specified time or place.

(6) The PIC, receiving an instruction from ATS to change level, must report:

(a) when the aircraft has left a level at which level flight has been conducted in the course of climb, cruise or descent; and

(b) when the aircraft leaves a level for which ATS has requested a report.

(7) A PIC must comply with cruising level requirements in Table 13.02 (1) (a)-1 (***Table A***) or Table 13.02 (1) (a)-2 (***Table B***) as the case requires, unless it is not practicable to do so, and must report to ATS as requested by ATS, complying with any time limits specified by ATS for doing so.

12.08 Control areas — other matters

(1) For paragraph 91.340 (1) (c), this section prescribes requirements in relation to the use by an aircraft of a control area.

(2) If the PIC of an aircraft operating within the RVSM flight level band encounters any of the following:

(a) weather turbulence that affects aircraft capability to maintain CFL;

(b) wake turbulence;

(c) distracting aircraft system alerts;

then, before deviating from track or CFL the PIC must:

(d) notify ATC; and

(e) request and obtain a revised clearance.

(3) For flight in OCA, if a revised clearance under paragraph (1) (e) is not possible, the PIC may initiate a temporary lateral offset procedure with the intention of returning to the cleared route as soon as possible.

(4) For the temporary lateral offset procedure mentioned in subsection (3):

(a) the PIC must establish contact with other aircraft on the VHF inter-pilot air-to-air frequency 123.45MHz; and

(b) one or both aircraft must then initiate a temporary lateral offset not exceeding 2NM from the cleared route or track; and

(c) as soon as practicable thereafter, the PIC of the offsetting aircraft (the ***relevant PIC***) must notify ATC that temporary lateral offset action has been taken and the reason for doing so; and

(d) the relevant PIC must notify ATC when the aircraft is re-established on its assigned route or track.

12.09 Control zones

(1) For paragraph 91.340 (1) (d), this section prescribes the requirements in relation to the use by an aircraft of a control zone.

(2) Operations in a control zone must be conducted in accordance with each of the following that are for the specific airspace:

(a) the published procedures and requirements, as existing from time to time;

(b) the air traffic clearances.

Note The relevant procedures and requirements for operations in the specific airspace of a control zone are published in the AIP, including the DAH, the ERSA, NOTAMs and their associated maps and charts. These publications are available through the Airservices Australia website: www.airservicesaustralia.com

12.10 Controlled aerodromes, controlled areas and control zones

For this Division, controlled aerodromes, controlled areas and control zones are the volumes of airspace, as so described and determined by CASA in the *Determination of airspace and controlled aerodromes etc. instrument*, as in force from time to time.

Note Airspace details from the Determination are also published by Airservices Australia in the Designated Airspace Handbook and other publications, for example, Airservices Aeronautical Charts, NOTAMs and AIP Supplements (SUPs).

Part 12

Division 12.3 Prohibited, restricted and danger areas

12.11 Prohibited areas

(1) For paragraph 91.340 (1) (e), this section prescribes the requirements in relation to the use by an aircraft of a prohibited area.

(2) The PIC of an aircraft must not fly within or across the boundaries of a prohibited area in any circumstances.

12.12 Restricted areas

(1) For paragraph 91.340 (1) (f), this section prescribes the requirements in relation to the use by an aircraft of a restricted area.

(2) Flight within a restricted area is subject to the conditions prescribed by CASA in a determination (the ***CASA PRD determination*** made under the *Airspace Regulations 2007* (***AsR 2007***) and published in:

(a) the ERSA and DAH parts of the AIP; or

(b) a NOTAM.

(3) The PIC of an aircraft must not fly within or across an activated restricted area without the approval of the controlling authority prescribed for the area in the CASA PRD determination.

(4) Despite subsection (3), if the ATS is available within an activated restricted area, approval to fly within or across the area may be given by ATS if the PIC of an aircraft makes a request in the same manner as a request for clearance to enter controlled airspace.

Note ATC clearance is not automatic and subject to, for example, a declared emergency, may be withheld when activities, hazardous to the aircraft, are taking place and require priority.

(5) Provided that he or she has ATC clearance, the PIC of an aircraft may fly:

(a) from controlled airspace into an adjoining activated restricted area; or

(b) through an activated restricted area into adjoining controlled airspace; or

(c) through an activated restricted area within controlled airspace.

12.13 Danger areas

(1) For paragraph 91.340 (1) (g), this section prescribes the requirements in relation to the use by an aircraft of a danger area.

(2) The PIC of an aircraft may fly within or across a danger area without a specific approval provided:

(a) the area is not in controlled airspace; and

(b) before the flight, the PIC makes himself or herself aware of the specific activity which causes the area to be a danger area; and

(c) the PIC takes appropriate precautions against any safety risks that could arise from the flight.

(3) An aircraft without a radio (other than a glider) may operate above 5 000 ft within a danger area if the AIP or a NOTAM identifies the area as one:

(a) specifically for no-radio operations; or

(b) that permits no-radio operations.

Part 13 Cruising levels and minimum heights

13.01 Purpose

(1) For the definition in regulation 91.365 of ***specified IFR cruising level*** for a track, section 13.02 prescribes the cruising level for an aircraft in an IFR flight on the track.

(2) For the definition in regulation 91.365 of ***specified VFR cruising level*** for a track, section 13.04 prescribes the cruising level for an aircraft in an IFR flight on the track.

13.02 Specified IFR cruising level

(1) The cruising level is a cruising level for the aircraft's track selected for the location in accordance with the following:

(a) Table 13.02 (1) (a)-1 (***Table A***) for north of 80 South; and

(b) Table13.02 (1) (a)-2 (***Table B***) for south of 80 South;

including the effect of any asterisked matter.

(2) For Tables A and B, for area QNH barometric pressure mentioned in row 1 of column 1 of the Table, the cruising level:

(a) from 000º through East to 179 of the compass — is any of the altitude levels mentioned in column 2 of the same row, measured in feet (subject to subsection (1)); and

(b) from 180º through West to 359 of the compass ¯ is any of the altitude levels mentioned in column 3 of the same row, measured in feet (subject to subsection (1)).

(3) For Tables A and B, for a barometric pressure at or above 1013 hPa mentioned in row 2 of column 1 of the Table, the cruising level:

(a) from 000º through East to 179 of the compass ¯ is any of the altitude levels mentioned in column 2 of the same row, measured in flight levels (subject to subsection (1)); and

(b) from 180º through West to 359 of the compass ¯ is any of the altitude levels mentioned in column 3 of the same row, measured in flight levels (subject to subsection (1)).

Table A (Table 13.02 (1) (a)-1)

IFR for use by an aircraft north of 80o South

Altitude or level (barometric pressure in hPa)	**Cruising level for magnetic tracks (in ft – row 1) or flight level (FL, row 2))**	
	From 000º through East to 179º	**From 180º through West to 359º**
Cruising altitudes (ft) (area QNH)	3 000 5 000 7 000 9 000	2 000 4 000 6 000 8 000 10 000

Altitude or level (barometric pressure in hPa)	Cruising level for magnetic tracks (in ft – row 1) or flight level (FL, row 2))	
	From 000º through East to 179º	**From 180º through West to 359º**
Cruising flight levels (FL) (at or above 1013 hPa)	110*	120**
	130	140
	150	160
	170	180
	190	200
	210	220
	230	240
	250	260
	270	280
	290	300
	310	320
	330	340
	350	360
	370	380
	390	400
	410	430
	450	470
	490	510

* FL 110 is not available for cruising level flight when the area QNH is less than 1 013 hPa.

** FL 120 is not available for cruising level flight when the area QNH is less than 980 hPa.

Table B (Table 13.02 (1) (a)-2)

IFR for use by an aircraft south of 80o South

Altitude or level (barometric pressure in hPa)	Cruising level for true tracks (in ft – row 1) or flight level (FL, row 2))	
	From 000º through East to 179º	**From 180º through West to 359º**
Cruising altitudes (ft) (area QNH)	3 000	2 000
	5 000	4 000
	7 000	6 000
	9 000	8 000
		10 000

Altitude or level (barometric pressure in hPa)	Cruising level for true tracks (in ft – row 1) or flight level (FL, row 2))	
	From 000º through East to 179º	**From 180º through West to 359º**
Cruising flight levels (FL) (at or above 1013 hPa)	110*	120**
	130	140
	150	160
	170	180
	190	200
	210	220
	230	240
	250	260
	270	280
	290	300
	310	320
	330	340
	350	360
	370	380
	390	400
	410	430
	450	470
	490	510

* FL 110 is not available for cruising level flight when the area QNH is less than 1 013 hPa.

** FL 120 is not available for cruising level flight when the area QNH is less than 980 hPa.

13.03 IFR flights — OCTA

If an IFR flight operating outside controlled airspace is unable to comply with the relevant Table under section 13.02 while continuing with the operation, the PIC must:

(a) tell the appropriate ATS unit of the intended cruising level and any subsequent changes; and

(b) in the event of conflict with another aircraft that is complying with the relevant Table, stop continuing with the operation and:

(i) give way to that aircraft; or

(ii) assume a cruising level in accordance with the Table until the conflicting aircraft is past and clear.

13.04 Specified VFR cruising level

(1) The cruising level is as follows:

(a) if the aircraft is at a height above 3 000 ft AMSL — a cruising level for the aircraft's magnetic track selected for the location in accordance with:

(i) Table 13.05 (1) (a)-1 (***Table A***) for north of 80 South, including the effect of any asterisked matter; and

(ii) Table13.05 (1) (a)-2 (***Table B***) for south of 80 South, including the effect of any asterisked matter.

(b) if the aircraft is at or below 3 000 ft AMSL — as far as practicable, a cruising level for the aircraft's magnetic track selected for the location in accordance with:

(i) Table A for north of 80 South; and

(ii) Table B for south of 80 South;

including the effect of any asterisked matter.

(2) For Tables A and B, for area QNH barometric pressure mentioned in row 1 of column 1 of the Table, the cruising level:

(a) from 000° through East to 179 of the compass — is any of the altitude levels mentioned in column 2 of the same row, measured in feet (subject to subsection (1)); and

(b) from 180° through West to 359 of the compass ¯ is any of the altitude levels mentioned in column 3 of the same row, measured in feet (subject to subsection (1)).

(3) For Tables A and B, for a barometric pressure at or above 1013 hPa mentioned in row 2 of column 1 of the Table, the cruising level:

(a) from 000° through East to 179 of the compass ¯ is any of the altitude levels mentioned in column 2 of the same row, measured in flight levels (subject to subsection (1)); and

(b) from 180° through West to 359 of the compass ¯ is any of the altitude levels mentioned in column 3 of the same row, measured in flight levels (subject to subsection (1)).

Table A (Table 13.05 (1) (a)-1)

VFR for use by an aircraft north of 80o South

Altitude or level (barometric pressure in hPa)	**Cruising level for magnetic tracks (in ft – row 1) or flight level (FL, row 2))**	
	From 000° through East to 179°	**From 180° through West to 359°**
Cruising altitudes (ft) (area QNH)	1 500	2 500
	3 500	4 500
	5 500	6 500
	7 500	8 500
	9 500	
Cruising flight levels (at or above 1 013 hPa)	115*	125*
	135	145
	155	165
	175	185
	195	205

Altitude or level (barometric pressure in hPa)	Cruising level for magnetic tracks (in ft – row 1) or flight level (FL, row 2))	
	From 000º through East to 179º	**From 180º through West to 359º**
	215	225
	235	245
	255	265
	275	285

* FL 115 is not available for level flight when the area QNH is less than 997 hPa.

** FL 125 is not available for level flight when the area QNH is less than 963 hPa.

Note Pilots should be aware that VFR aircraft outside controlled airspace may be operating at random levels at or below 5 000 ft AMSL — see subsection 13.05 (1).

Table B (Table 13.05 (1) (a)-2)

VFR for use by an aircraft south of 80o South

Altitude or level (barometric pressure in hPa)	Cruising level for true tracks (in ft – row 1) or flight level (FL, row 2))	
	From 000º through East to 179º	**From 180º through West to 359º**
Cruising altitudes (ft) (area QNH)	1 500	2 500
	3 500	4 500
	5 500	6 500
	7 500	8 500
	9 500	
Cruising flight levels (at or above 1 013 hPa)	115*	125**
	135	145
	155	165
	175	185
	195	205
	215	225
	235	245
	255	265
	275	285
	300	320
	340	360
	380	400
	420	440
		480

* FL 115 is not available for level flight when the area QNH is less than 997 hPa.

** FL 125 is not available for level flight when the area QNH is less than 963 hPa.

Part 14 Altimeter requirements

14.01 Altimeter setting procedures

(1) For subregulation 91.387 (1), this Part prescribes the requirements relating to altimeter setting procedures to be used during prescribed stages of a flight of an aircraft.

(2) For subsection (1), any stage of a flight mentioned in a section of this Part is a prescribed stage of a flight.

14.02 Transition altitude, transition layer and transition level

(1) The transition altitude is 10 000 ft.

(2) The transition level is as set out in Table 14.02 (2), so that for an area QNH mentioned in a row of column 1, the transition level is that mentioned in the same row of column 2.

Table 14.02 (2)

Area QNH	Transition level
Equal to or greater than 1013.2 hPa	FL 110
At least 997 hPa but less than 1013.2 hPa	FL 115
At least 980 hPa but less than 997 hPa	FL 120
At least 963 hPa but less than 980 hPa	FL 125

Note The intention is to retain a minimum buffer of 1 000 ft above the transition altitude.

(3) A PIC must not cruise within the transition layer.

(4) For an operation below the transition altitude, the PIC must use the following altimeter setting:

(a) the current local QNH (either an accurate QNH as defined in section 6.05 or a forecast QNH) of a station along the route within 100 NM of the aircraft; or

(b) if the current local QNH is not known — the current area forecast QNH.

(5) For an operation at or above the transition altitude, the PIC must use an altimeter setting of 1013.2 hPa.

(6) On climb, the PIC must change between QNH and 1013.2 hPa on passing 10 000 feet.

(7) On descent, the PIC must change between 1013.2 hPa and the QNH on passing 10 000 ft.

14.03 Instrument approaches — QNH sources

(1) Before passing the IAF, the PIC must set one of the following:

(a) the actual aerodrome QNH from an approved source;

(b) the forecast aerodrome QNH;

(c) the actual area QNH from an approved source;

(d) the forecast area QNH.

(2) The PIC must not use an actual aerodrome QNH for an instrument approach more than 15 minutes after receiving it.

(3) If the forecast area QNH is used, the PIC must increase the minima for the instrument approach by 50 ft.

Part 15 RESERVED

Part 16 Minimum height for flights

16.01 Method of calculation of lowest altitude as minimum height for VFR flight at night

For paragraph 91.395 (2) (e), this section prescribes the method for calculating the lowest altitude for a route or route segment as the minimum height for a VFR flight at night.

RESERVED

16.02 Minimum height for flight over populous areas and public gatherings

(1) For subregulation 91.400 (4) (a), for flight over a populous area or a public gathering, this section prescribes take-off and landing circumstances for the purposes of paragraphs 91.400 (2) (b) and (3) (b).

Note For an aeroplane and a rotorcraft, paragraphs 91.400 (2) (b) and (3) (b), respectively, permit flight over a populous area or a public gathering below 1,000 ft above the highest feature or obstacle within a horizontal radius of 600 m or 300m, respectively, of the point on the ground or water immediately below the aircraft.

(2) For subsection (1), the circumstances are when the following requirements are complied with:

(a) for take-off in an aeroplane — the requirements in 28.02;

(b) for landing in an aeroplane — the requirements in 29.02;

(c) for take-off in a rotorcraft — the requirements in section 28.04 or 28.05, as applicable;

(d) for landing in a rotorcraft — the requirements in section 29.04 or 29.05, as applicable.

16.03 Minimum height for other areas

(1) For subregulation 91.403 (3) (a), for flight over an area other than a populous area or a public gathering, this section prescribes take-off and landing circumstances for the purposes of paragraphs 91.403 (2) (b).

(2) For subsection (1), the circumstances are when the following requirements are complied with:

(a) for take-off in an aeroplane — the requirements in 28.02;

(b) for landing in an aeroplane — the requirements in 29.02;

(c) for take-off in a rotorcraft — the requirements in 28.03;

(d) for landing in a rotorcraft — the requirements in section 29.03.

Part 17 IFR take-off and landing minima

17.01 Purpose

(1) For subregulation 91.420 (1), this Part prescribes:

(a) requirements (the ***take-off minima requirements***) relating to take-off minima for an aerodrome or helideck;

(b) requirements (the ***landing minima requirements***) relating to landing minima for an aerodrome or helideck;

(2) Subject to subsection (3), the requirements in this Part relating to take-off minima and landing minima for an aerodrome also apply when conducting a low visibility operation at the aerodrome.

(3) Requirements for low visibility take-off minima and landing minima in this Part are only applicable if the PIC or the operator of the aircraft holds the appropriate approval under CASR.

17.02 Take-off minima for certain multi-engine aeroplanes

(1) In this section, a ***qualifying multi-engine aeroplane*** is an aeroplane:

(a) that is:

(i) a multi-engine jet powered aeroplane with a MTOW more than 2 722 kg; or

(ii) a multi-engine turbo propeller powered aeroplane with a MTOW more than 5 700 kg:

(A) operated by 2 pilots; or

(B) operated by 1 pilot and fitted with serviceable auto feather; and

(b) for which, before commencing the take-off, PIC:

(i) has assessed relevant obstacles along the take-off and climb path in accordance with the AFM; and

(ii) determined that in the event of engine failure at any time after V_1, terrain clearance is assured.

(2) The take-off minima for a qualifying multi-engine aeroplane (**the aeroplane**) are:

(a) a ceiling of zero feet; and

(b) visibility of:

(i) 550 m:

(A) if the runway has illuminated edge lighting at spacing intervals not exceeding 60 m, and centreline lighting or centreline markings, all of which are supported by a secondary power supply with a switchover capability of 1 second or less; and

Note The PIC must be aware of the time interval between failure of the primary power supply and the complete restoration of power following switch-over to a secondary power supply.

(B) where the aerodrome is a non-controlled aerodrome, or a controlled aerodrome without ATS in operation — if the take-off is conducted by day and the aerodrome is one at which carriage of radio is mandatory; or

(ii) 800 m.

(3) For subsection (2), the PIC of the aeroplane must ensure, as far as practicable and based on the meteorological conditions at the time of take-off, that:

(a) if it became necessary to return to land at the departure aerodrome because of engine failure — the meteorological conditions would be:

(i) at, or above, instrument approach and landing minima for the aerodrome; or

(ii) such as to allow a visual approach; and

(b) if engine failure were to occur at any time after V_1, lift-off, or encountering non-visual conditions — terrain clearance would be assured until reaching either LSALT or departure aerodrome MSA; and

(c) if a return to the departure aerodrome were not possible — the aeroplane's performance and fuel availability would each be adequate to enable the aeroplane to proceed to a departure alternate, having regard to terrain, obstacles and route distance limitations.

17.03 Take-off minima for other aeroplanes

(1) The take-off minima mentioned in this section apply to an aeroplane (***the aeroplane***) that is NOT:

(a) a qualifying multi-engine aeroplane within the meaning of section 17.02; or

(b) approved to conduct low visibility take-offs.

(2) The take-off minima for the aeroplane are:

(a) a ceiling of 300 ft; and

(b) visibility of 2 000 m.

(3) For subsection (2), the PIC of a single engine IFR aeroplane must ensure that:

(a) terrain clearance is assured until reaching either en-route LSALT or departure aerodrome MSA; and

(b) if a return to the departure aerodrome is not possible — the aeroplane's performance and fuel availability would each be adequate to enable the aeroplane to proceed to a departure alternate having regard to terrain, obstacles and route distance limitations.

(4) For subsection (2), the PIC of a multi-engine aeroplane must ensure that, as far as practicable, and based on the meteorological conditions at the time of take-off:

(a) if it became necessary to return to land at the departure aerodrome because of engine failure — the meteorological conditions would be:

(i) at or above instrument approach and landing minima for the aerodrome; or

(ii) such as to allow a visual approach; and

(b) if engine failure were to occur at any time after V_1 lift-off (where V_1 is available for the aircraft), or if non-visual conditions are encountered — terrain clearance would be assured until the aircraft:

(i) reaches LSALT or departure aerodrome MSA; or

(ii) returns to the departure aerodrome to land.

17.04 Take-off minima for certain multi-engine rotorcraft

(1) In this section, a qualifying multi-engine rotorcraft means an IFR rotorcraft that:

(a) has a Category A performance supplement; and

(b) is operated to the Category A weights, limitations and procedures contained in the supplement.

(2) The take-off minima mentioned in this section apply to a ***qualifying multi-engine rotorcraft***) that is NOT approved to conduct low visibility take-offs.

(3) The minima are:

(a) clear of cloud until attaining the greater of V_{yse} or V_{min} IMC; and

(b) visibility of:

(i) 800 m; or

(ii) 550 m, but only if the relevant runway or FATO has:

(A) both illuminated edge lighting at spacing intervals not exceeding 60 m, and centreline lighting, supported by a secondary power supply with a switchover capability of 1 second or less and

(B) where the aerodrome is a non-controlled aerodrome, or a controlled aerodrome without ATS in operation — if the take-off is conducted by day and the aerodrome is one at which carriage of radio is mandatory.

(4) For subsection (2), after entering IMC the PIC must conduct the take-off:

(a) in accordance with published IFR departure procedures; or

(b) if there are no published IFR departure procedures — such that terrain clearance is assured.

(5) For subsection (2), the PIC must ensure that:

(a) in the event of engine failure at or after the transition point terrain clearance would be assured until reaching the LSALT or departure aerodrome MSA; and

(b) if it became necessary to return to land at the departure aerodrome because of engine failure — the meteorological conditions would be:

(i) at, or above, instrument approach and landing minima for the aerodrome; or

(ii) such as to allow a visual approach; and

(c) if a return to the departure aerodrome were not possible — the rotorcraft's performance and fuel availability would each be adequate to enable the rotorcraft to proceed to a departure alternate having regard to terrain, obstacles and route distance limitations.

17.05 Take-off minima for other rotorcraft

(1) The take-off minima mentioned in this section apply to an IFR rotorcraft that is NOT:

(a) a qualifying multi-engine rotorcraft within the meaning of section 17.04; or

(b) approved to conduct low visibility take-offs.

(2) The minima for the rotorcraft are:

(a) a ceiling of 500 ft; and

(b) visibility of 800 m.

(3) For subsection (2), after entering IMC, the PIC must conduct the take-off

(a) in accordance with published IFR departure procedures; or

(b) if there are no published procedures — such that terrain clearance is assured until reaching en-route LSALT or departure aerodrome MSA.

(4) For subsection (2), the PIC must ensure that:

(a) if it became necessary to return to land at the departure aerodrome because of engine failure, the meteorological conditions would be

(i) at, or above, instrument approach and landing minima for the aerodrome; or

(ii) such as to allow a visual approach; and

(b) if a return to the departure aerodrome were not possible — the rotorcraft's performance and fuel availability would each be adequate to enable the rotorcraft to proceed to a departure alternate having regard to terrain, obstacles and route distance limitations.

17.06 Landing minima for IFR aircraft

(1) For a precision 3D approach procedure and CAT I approach operations, the landing minima for an IFR aircraft are as follows:

(a) for an aerodrome with an approved instrument approach procedure, the higher of the following:

(i) the DA and runway visual range (RVR) or visibility specified in the instrument approach chart for carrying out the procedure;

(ii) relevant minima specified in the AFM;

(iii) where relevant, an adjusted RVR or visibility minimum mentioned in subsection (2);

(2) For a published CAT I approach, the visibility minima must be adjusted as follows:

(a) a minimum RVR or visibility of 1 500 m must be used if the approach lighting system normally available for the runway is unserviceable;

(b) a minimum RVR or visibility of 1 200m must be used if:

(i) the approach cannot be flown to at least the decision altitude (DA) using a flight director or approved HUD; or

(ii) the approach cannot be flown to at least the DA using a suitable autopilot coupled to the precision approach aid; or

(iii) the aircraft is not equipped with a serviceable failure warning system for the primary attitude and heading reference systems; or

(iv) high intensity runway edge lighting is not in operation; or

(v) the approach lighting system normally available beyond 210 m from the runway threshold is unserviceable;

(c) a minimum RVR or visibility of 800 m must be used if:

(i) RVR information in the threshold zone is not available; or

(ii) the approach lighting system normally available beyond 420 m from the runway threshold is unserviceable.

(3) A published ILS CAT II or CAT III minima may only be used by an aircraft operator who is an approval holder under regulation 91.045 for regulation 91.425.

(4) For a 2D approach procedure, the landing minima for an IFR aircraft for an aerodrome or point in space with an approved instrument approach procedure, are **the higher of the following**:

(i) the MDA and visibility minima specified in the instrument approach chart for carrying out the procedure;

(ii) relevant minima specified in the AFM;

(iii) where the approach lighting system normally available for the runway is unserviceable — the minima specified in the instrument approach chart plus 900 metres.

17.07 Approach ban

(1) This section applies to an aerodrome:

(a) that has ATC services in operation; and

(b) for which RVR reports are available for approach operations to a runway.

(2) Where the touchdown zone RVR is reported by ATC as continually less than the specified minima for the landing, the PIC must not fly below 1 000 ft above the aerodrome elevation.

(3) If, after passing 1 000 ft above the aerodrome elevation, the touchdown zone RVR is reported by ATC as falling below the specified minimum, an approach may be continued to the minima.

17.08 Operations below DA or MDA

(1) During an instrument approach procedure, a PIC may do one of the following only if section 17.10 applies:

(a) operate an aircraft at any aerodrome below the MDA;

(b) continue an instrument approach procedure below the DA or MDA.

17.09 Missed approach procedure

During an instrument approach procedure (***IAP***), the PIC must immediately execute the missed approach procedure for the IAP if:

(a) the following is the case:

(i) subsection 17.10 does not apply and the aircraft is being operated below MDA; and

(ii) either:

(A) the aircraft is flown outside the navigational tolerances for the approach being flown; or

(B) the navigational aid for the approach being flown becomes unreliable or unserviceable; or

Note examples of when a navigational aid for an approach becomes unreliable or unserviceable include a RAIM warning for a GNSS Approach, a red flag for a VOR approach, a loss of the ident for an NDB approach.

(b) the following is the case:

(i) subsection 17.10 does not apply; and

(ii) the aircraft has arrived at the missed approach point, (including a DA or DH where a DA or DH is specified and its use is required); or

(c) the following is the case:

(i) subsection 17.10 does not apply; and

(ii) the aircraft has passed the missed approach point, (including a DA or DH where a DA or DH is specified and its use is required) but has not touched down; or

(d) an identifiable part of the aerodrome is not distinctly visible to the PIC during a circling manoeuvre at or above MDA (unless the lack of distinct visibility is merely the result of normal aircraft manoeuvring during approach).

17.10 When a missed approach procedure is not required

This section applies if:

(a) an aircraft is continuously in a position from which a descent to a landing on the intended runway, or (for a rotorcraft) flight to a landing or hover on or over the intended FATO, can be made:
    (i) at a normal rate of descent; and
    (ii) using normal manoeuvres; and
    (iii) that allows touchdown to occur within the touchdown zone of the runway or TLOF of intended landing; and
(b) the flight visibility is not less than the RVR or the visibility required by the instrument approach procedure being used; and
(c) at least one of the following visual references for the intended runway or FATO is distinctly visible and identifiable to the pilot:
    (i) elements of the approach lighting system;
    (ii) the threshold;
    (iii) the threshold markings;
    (iv) the threshold lights;
    (v) the runway identification lights;
    (vi) the FATO itself;
    (vii) the visual approach slope indicator;
    (viii) the touchdown zone or touchdown zone markings;
    (ix) the touchdown zone lights;
    (x) the FATO or runway lights.

Part 18 Designated non-controlled aerodromes

18.01 Designated non-controlled aerodromes

For subparagraph 91.520 (1) (a) (iv), the following aerodromes are prescribed as designated non-controlled aerodromes:

RESERVED

Part 19 Safety when aeroplane operating on the ground

19.01 Safety when aeroplane operating on the ground

For subparagraph 91.545 (2) (a) (iii), the following kinds of persons are prescribed as persons who may start the engine of an aeroplane or cause the engine to be started:

RESERVED

Part 20 Signals, emergencies and hazards

20.01 Purpose

This Part prescribes visual signals and marks for the definition of ***standard visual signal*** in subregulation 91.700 (4).

Note Regulation 91.700 creates offences in relation to the use of standard visual signals.

20.02 Light signals to aircraft on an aerodrome or in flight

(1) The light signals to aircraft mentioned in an item of Table 20.02, are prescribed standard visual signals.

(2) For subsection (1), a light signal mentioned in an item of column 2 of the Table:

(a) for an aircraft in flight — has meaning mentioned for it in column 3 of the item; and

(b) for an aircraft on the ground at an aerodrome — has meaning mentioned for it in column 4 of the item.

Table 20.02: Light signals to aircraft on an aerodrome or in flight

Item	Light signal	Meaning — in flight	Meaning — on aerodrome
1	Steady green	Authorised to land if pilot satisfied no collision risk exists	Authorised to take-off if pilot satisfied no collision risk exists
2	Steady red	Give way to other aircraft and continue circling	Stop
3	Green flashes	Return for landing	Authorised to taxi if pilot satisfied no collision risk exists
4	Red flashes	Aerodrome unsafe - do not land	Taxi clear of landing area in use
5	White flashes	No significance	Return to starting point on aerodrome

Note A series of projectiles, each discharged at intervals of 10 seconds, showing, on bursting, red or green lights or stars may be used to indicate that an aircraft is in the vicinity of a restricted or prohibited area and that remedial action should be taken.

20.03 Ground marks for aircraft at aerodromes

(1) The ground marks for aircraft at aerodromes depicted in an item of Table 20.03, are prescribed standard visual marks.

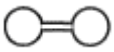
(2) For subsection (1), a ground mark depicted in an item of column 2 of the Table:

(a) when in the form mentioned in column 3 of the item; and

(b) when displayed at the location mentioned column 4 of the item;

has meaning mentioned for it in column 5 of the item.

Table 20.03: Ground marks for aircraft at aerodromes

Item	Ground mark	Description	Where mark is displayed at an aerodrome (display location)	Meaning of mark
1		Horizontal white dumb-bell	Adjacent to an aerodrome wind direction indicator.	1. Use only hard surface movement areas. 2. Where there are sealed and gravel manoeuvring areas use only the sealed surfaces. 3. Where there are constructed gravel and natural surface manoeuvring areas, use only the gravel surfaces. *Note* See also ERSA FAC for any local information relating to this particular ground mark.
2		White cross	1. Adjacent to an aerodrome wind direction indicator; or 2.On the manoeuvring area.	1. The aerodrome is completely unserviceable. 2.For an area marked by a cross or crosses with the limit delineated by markers — this area is unfit for use by aircraft.
3		White double cross	Adjacent to wind direction indicator.	Gliding operations are in progress.

20.04 Hand signals for marshalling aircraft at aerodromes

(1) When used in accordance with this section, the hand signals for a particular purpose, as depicted and described in the ***relevant source,*** are prescribed standard visual signals for ground personnel (***signallers***) marshalling aircraft at an aerodrome.

(2) For subsection (1), the ***relevant source*** is:

(a) *5.1 Marshaling Signals, From a signalman to an aircraft,* in Appendix 1 of ICAO Annex 2, Rules of the Air (excluding the Notes and 5.1.1); and

(b) *6. Standard Emergency Hand Signals*, in Appendix 1 of ICAO Annex 2, Rules of the Air (excluding the text of 6. and the Note).

Note For ICAO documents, see section 1.04.

(3) For subsection (1):

(a) each hand signal, excluding any marked with an asterisk (*) is for use with an aeroplane; and

(b) each hand signal, including any marked with an asterisk (*) are for use with a rotorcraft.

Note Signals marked with an asterisk (*) are designed for use with hovering rotorcraft.

(4) The hand signals must be used by the signaller, using lights or illumination if necessary, in a way that ensures the signals are visible to the pilot of the relevant aircraft.

Note For example, bare hands, gloved hands, bats, wands, or torches may be used, provided that the hand signal is visible to the pilot.

(5) The signaller must face the aircraft in the following a position:

(a) for an aeroplane — in front of the aircraft's port wing where the signaller can best be seen by the pilot;

(b) for a rotorcraft — where the signaller can best be seen by the pilot;

(c) for an emergency — as far as practicable, in front of the aircraft's port wing where the signaller, including the rescue and firefighting personnel, can best be seen by the pilot or cabin crew as the case requires.

(6) For a signaller facing an aircraft, the engines are numbered from right to left as viewed by the signaller so that the pilot's port outer engine is the signaller's No. 1 engine.

20.05 Interception of aircraft

(1) For paragraph 91.722 (1) (b), this Part prescribes the requirements that must be complied with by the PIC of an aircraft that is intercepted by another aircraft during flight.

(2) The PIC must comply with the applicable procedures for the PIC of an intercepted aircraft as set out in:

(a) ICAO Annex 2 – Appendix 1 – Signals - Section 2 - Signals for use in the event of interception; and

(b) ICAO Annex 2 – Appendix 2 - Interception of Civil Aircraft, Attachment A - Interception of Civil Aircraft.

Note For ICAO documents, see section 1.04.

Part 21 Safety of persons on aircraft

21.01 Purpose

For subregulation 91.753 (2), this Part prescribes circumstances that apply in relation to the carriage of a person for a flight.

21.02 Use of seats, berths, seat belts and safety harnesses

(1) Unless otherwise permitted under this Part or Part 22, during an aircraft manoeuvre a person must occupy an approved seat or berth:

(a) with an individual seat belt; and

(b) with the seatbelt adjusted to fit the person without slack.

(2) For subsection (1), the aircraft manoeuvres are any of the following:

(a) taxing;

(b) take-off;

(c) flight below 1 000 ft above terrain;

(d) landing;

(e) aerobatic manoeuvres.

(3) Only 1 person may occupy a seat or berth at any particular time, unless otherwise permitted under:

(a) Part 23 of this MOS; or

(b) the AFM, the aircraft type certificate or a supplemental type certificate approval; or

(c) the CASR.

21.03 Passenger seating in emergency exit rows

(1) A person may only be seated in an emergency exit seat or exit row if the PIC is satisfied that:

(a) the person is fully able and willing to assist those on the aircraft with access to the emergency exits in the event of an emergency; or

(b) the person's presence in the seat will not obstruct or hinder the escape of other persons from the aircraft in the event of an emergency.

21.04 Seating of passengers who require assistance

(1) If a person (a ***relevant person***) requiring assistance due to sickness or reduced mobility is carried on an aircraft, the operator and the PIC must each do the following:

(a) ensure that the relevant person has an approved seat or berth in accordance with subsection 21.02;

(b) take all reasonable precautions to prevent hazards to other persons on the aircraft arising from the relevant person's sickness or reduced mobility;

(c) ensure that procedures are in place, and are followed, to provide appropriate care to the relevant person;

(d) ensure that an individual briefing on emergency procedures is given to the relevant person in accordance with regulation 91.770.

Part 22 Passengers — safety briefings and instructions

22.01 Purpose

For paragraph 91.770 (1) (a), this Part prescribes the requirements for a passenger safety briefing and instructions before an aircraft takes off for a flight.

22.02 Passenger safety briefings and instructions

The passenger safety briefing and instructions must cover the following:

(a) the rules about smoking during the flight;

(b) the places on the aircraft where smoking is prohibited;

(c) the use and adjustment of seatbelts, shoulder harnesses, and infant and child restraint systems (if any);

(d) the requirement that seat backs must be in the upright position (or otherwise, if permitted by the AFM) during take-off and landing;

(e) any requirement that attachments to the seat (for example, tray tables and footrests) must be stowed, during taxiing, take-off and landing;

(f) if an infant or child is carried on the aircraft — how the infant or child must be restrained;

(g) where the emergency exits are and how to use them;

(h) the location of evacuation slides (if any) and how to use them;

(i) if emergency oxygen is carried for the flight — how and when to use the emergency oxygen;

(j) how and where to stow, or otherwise secure, carry-on baggage and personal effects, and the periods during the flight when these items must be stowed or secured;

(k) if the aircraft is fitted with escape path lighting — where the lighting is and how to use it;

(l) if survival equipment is carried, and it is intended that a passenger is to use the equipment — where the equipment is carried and how to use it;

(m) if life jackets or life rafts are carried — where the jackets or rafts are located and how to use them;

(n) the requirement that life jackets must not be inflated inside the aircraft;

(o) the limitations imposed on the use of portable electronic devices during different stages of the flight.

Part 23 Restraint of infants and children

23.01 Purpose

For paragraph 91.805 (1) (c), this Part prescribes the requirements for the restraint of an infant or a child when a direction is given to passengers under regulation 91.780 to fasten seatbelts or shoulder harnesses.

23.02 Infant and child seatbelts as restraints

(1) An infant is restrained if:

(a) the infant is carried in the arms or on the lap (the ***relevant position***), of an adult occupying a seat; and

(b) the adult's seatbelt is not fastened around the infant; and

(c) the infant is restrained in the relevant position by a device approved by CASA under Part 21 of CASR.

(2) A child is restrained if:

(a) the child:

(i) occupies a seat of his or her own; and

(ii) is restrained in the seat by the seat's seatbelt; or

(b) the child:

(i) occupies a seat with 1 other child who is not an infant; and

(ii) both children are seated side by side; and

(iii) the combined weight of both children is not more than 77 kg; and

(iv) the seatbelt is a lap belt which, when fastened, restrains both children in the seat.

23.03 Child restraint systems that are not seatbelts

(1) In this section:

approved child restraint system means a child restraint system that meets the requirements of 1 of the following:

(a) an automotive child restraint system;

(b) an aviation child restraint system.

Note To avoid doubt, an infant sling is not a child restraint system for this Part.

automotive child restraint system means a child restraint system that meets the requirements of 1 of the following:

(a) AS/NZS 1754:2013 Child restraint systems for use in motor vehicles;

(b) Federal Motor Vehicle Safety Standards (FMVSS) No. 213;

(c) Canadian Motor Vehicle Safety Standard (CMVSS) No. 213;

(d) European Safety Standard requirements of ECE Regulation 44.

aviation child restraint system means a child restraint system that is approved by CASA, or by the NAA of a recognised country.

shoulder harness includes a child restraint system.

(2) A child is restrained if:

(a) the child is restrained by an approved child restraint system; and

(b) the age, height and weight of the child using the system is within the range specified by the manufacturer of the system; and

(c) the system is:

(i) used according to the manufacturer's instructions; and

(ii) secured so as not to be a hazard to the child using the system or to any other person; and

(d) there is a suitable adult (the ***suitable person***) responsible for the child who is using the system.

(3) The suitable person must be:

(a) seated in the seat closest to the seat on which the child restraint system is installed; and

(b) competent to do the following:

(i) install the system on a seat; and

(ii) secure a child in the system; and

(iii) releasing a child from the system.

Part 24 Use of radio — qualifications

24.01 Purpose

For subparagraph 91.895 (1) (a) (iii), this Part prescribes certain radio frequencies published in authorised aeronautical information on which a person must not transmit unless authorised or qualified in accordance with paragraph 91.895 (1) (b).

24.02 Prescribed kinds of radio frequencies

RESERVED

Part 25 Use of radio — broadcast and reports

25.01 Purpose

For paragraph 91.900 (1) (b), this Part prescribes broadcasts and reports relating to a flight that the PIC of an aircraft must make during the flight.

25.02 Prescribed broadcasts and reports — general

Changed radio frequency

(1) The broadcasts and reports required under this Part must be made on the relevant published radio frequency unless ATS agrees to the use of a different frequency for special flight circumstances.

Note For example, descent from controlled to uncontrolled airspace, formation flights, search and rescue (SAR) operations, and police and security operations. The PIC may initiate a request the ATS to agree to a changed radio frequency for special flight circumstances.

Change in flight rules

(2) The PIC must report to the ATS a change in flight rules from VFR to IFR, or from IFR to VFR, as soon as the change occurs.

Position errors

(3) If a previously reported position estimate is more than 2 minutes in error, the PIC must:

(a) report the corrected position estimate to ATS; and

(b) if required for the class of airspace — broadcast a corrected position estimate.

ATS/FLIGHTWATCH

(4) If the PIC reports to ATS/FLIGHTWATCH on HF, he or she must also broadcast on the appropriate CTAF or area VHF.

Change to CTAF

(5) If the PIC of a flight that is inbound to a non-controlled aerodrome cannot monitor the ATS frequency, he or she must report “CHANGING TO [name of location] CTAF [frequency]”.

Parachute operations

(6) The PIC of an aircraft in a parachuting operation must broadcast his or her intentions in accordance with Part 105 of CASR.

Listening watch

(7) For the purpose of making required reports and broadcasts, the PIC of an aircraft in an operation below 5 000 ft in Class G airspace:

(a) must maintain a listening watch on the area VHF; and

(b) if necessary for the safety of the operation — must maintain a listening watch on frequencies other than the area VHF.

Note Examples of operations where the listening watch under paragraph (b) may be necessary include parachuting operations, agricultural operations, circuit training and local flights at non-controlled aerodromes.

(8) If the PIC of an IFR flight:

(a) is operating outside controlled airspace; and

(b) proposes to change radio frequency to communicate with a non-ATS station; and

(c) would, therefore, be unable to maintain a listening watch on the ATS frequency;

he or she must report changed SAR requirements to ATS before changing the radio frequency.

25.03 CTAF — prescribed broadcasts

(1) The PIC of an aircraft must make broadcasts on the CTAF in accordance with Table 25.03 (1) if:

(a) the pilot is operating at, or in the vicinity of, a non-controlled aerodrome (including a certified or military aerodrome when non-controlled); and

(b) the aircraft is equipped with a serviceable VHF radio; and

(c) the pilot is qualified to use the radio.

Note 1 For the definition of ***in the vicinity of a non-controlled aerodrome***, see section 1.06.

Note 2 For a pilot qualified to use the radio, see regulation 91.895 of CASR.

Note 3 For an aircraft that must be equipped with a serviceable VHF radio, see Part 29 of this MOS.

(2) For Table 25.03 (1), for an item in a row of the Table, the PIC in the situation mentioned for the item in column 2, must use the frequency mentioned for the item in column 3, to make the broadcast mentioned for the item in column 4.

(3) For this section, the broadcast information must include the following:

(a) the name of the aerodrome;

(b) the aircraft type;

(c) the aircraft call sign;

(d) the position of the aircraft and the intentions of the PIC.

Table 25.03 (1) Broadcasts — aircraft at, or in the vicinity of, a non-controlled aerodrome (including a certified or military aerodrome when non-controlled)

Item	Situation	Frequency	Broadcast/Report
1	When the PIC considers it reasonably necessary to broadcast to avoid the risk of a collision with another aircraft	CTAF	Broadcast

25.04 Controlled aerodromes and controlled airspace — prescribed reports

(1) The PIC of 1 of the following:

(a) an aircraft in Class A, C or D airspace; or

(b) an IFR aircraft in Class E airspace;

must:

(a) report to ATS in accordance with Table 25.04 (1); and

(b) report and broadcast in accordance with the other applicable provisions of this Part.

(2) For Table 25.04 (1), for an item in a row of the Table, the PIC in the situation mentioned for the item in column 2, must use the frequency mentioned for the item in column 3, and make the report mentioned for the item in column 43.

Table 25.04 (1) An aircraft in Class A, C or D airspace, or an IFR aircraft in Class E airspace

Item	Situation	Frequency	Report
1	Ready to Taxi	ATS	Report the situation
2	Airborne	ATS	Report the situation
3	Departure	ATS	Report the situation
4	Position report as per ATS, or route reporting requirements	ATS	Report the situation
5	Arrival	ATS	If cancelling SARWATCH — Report cancellation

25.05 IFR aircraft in Class G airspace — prescribed reports

(1) The PIC of a IFR aircraft in Class G airspace must:

(a) report to ATS in accordance with Table 25.05 (1); and

(b) report and broadcast in accordance with the other applicable provisions of this Part.

(2) For Table 25.05 (1), for an item in a row of the Table, the PIC in the situation mentioned for the item in column 2, must use the frequency mentioned for the item in column 3, to make the report mentioned for the item in column 4.

Table 25.05 (1) IFR aircraft in Class G airspace Note Subsection 1.7 applies.

Item	Situation	Frequency	Report
1	Taxiing	ATS	Report the situation
2	Departure	ATS	Report the situation
3	Reaching cruising level	ATS	Report the situation
4	Position report as per ATS, or route reporting requirements	ATS	Report the situation
5	Before changing level	ATS	Report the situation
6	Before changing frequency	ATS	Report the situation
7	Requiring clearance into controlled airspace	ATS	Report the situation
8	Before leaving controlled airspace on descent	ATS	Report the situation
9	Before changing to CTAF and not monitoring ATS frequency on second COM system	ATS	Report the situation
10	After landing	ATS	If cancelling SARWATCH at this time — Report the cancellation

25.06 VFR aircraft in Class E or G airspace — prescribed reports

(1) The PIC of a VFR aircraft in Class E or G airspace must:

(a) report to ATS in accordance with Table 25.06 (1); and

(b) report and broadcast in accordance with the other applicable provisions of this Part.

(2) For Table 25.06 (1), for an item in a row of the Table, the PIC in the situation mentioned for the item in column 2, must use the frequency mentioned for the item in column 3, to make the report mentioned for the item in column 4.

Table 25.06 (1) VFR aircraft in Classes E and G airspace

Item	Situation	Frequency	Report
1	Requiring clearance into controlled airspace	ATS	Report the situation
2	Before, and on completion of, over-water stage	ATS	Report in accordance with SAR reporting schedules if arranged before the over-water stage

25.07 IFR report and broadcast requirements — non-controlled aerodromes

(1) For the PIC of an IFR aircraft taxiing for take-off from a non-controlled aerodrome, the taxiing report to ATS must be on VHF or HF, and include the following information:

(a) the aircraft type;

(b) for an IFR flight other than a flight under Part 121 of CASR — the number of POB;

(c) that the flight is an IFR flight;

(d) the aircraft's current location;

(e) destination or departure quadrant or intentions;

(f) the runway to be used.

(2) For subsection (1), if the PIC is unable to establish contact with ATS, the flight may proceed on a broadcast basis, but only if:

(a) the PIC continues to make every effort to contact ATS before the aircraft leaves the vicinity of the aerodrome; and

(b) for an air transport operation or an aerial work operation:

(i) at the time of departure; and

(ii) until contact is made with ATS;

it is reasonably certain that:

(iii) the PIC has, and will have, radio contact with his or her operator, or with the operator's representative; and

(iv) the operator or representative has immediate access to a serviceable telephone with which to contact ATS; and

(c) a SARTIME for departure has been established with a maximum of 30 minutes from ETD (except for a flight under Part 121 of CASR).

(3) If an IFR aircraft is departing from an uncontrolled aerodrome, the PIC must report "IFR" when making first contact with ATS.

(4) The PIC (other than for a flight under Part 121 of CASR), may nominate a SARTIME for departure:

(a) as part of the arrival report; or

(b) by using the phrase SARTIME FOR DEPARTURE when submitting the flight notification.

25.08 IFR aircraft departure report

(1) Unless the ATS directs otherwise, the PIC of an IFR aircraft established on the departure track of any aerodrome and clear of any circuit traffic must make a departure report to ATS which includes the following information:

(a) the actual time of departure;

(b) the outbound track in degrees magnetic;

(c) the aircraft's intended cruising level;

(d) the estimated time of arrival at the first en-route reporting point.

(2) If the PIC transmits the departure report before intercepting the departure track, the report must include advice that the pilot is manoeuvring to intercept the track.

(3) If flight notification details are reported in flight, they must include the information mentioned in paragraphs 25.07 (1) (a) to (f), prefaced by the words "FLIGHT PLAN".

Note Flight notification details may be reported in flight in accordance with section 10.02 of this MOS.

25.09 Climb and cruise reporting and broadcast requirements — non-controlled airspace — VFR and IFR aircraft

(1) This section applies for the climb and cruise stages of a flight in non-controlled airspace.

(2) The PIC of a radio-equipped VFR aircraft must:

(a) listen out on the appropriate VHF frequency; and

(b) immediately broadcast an announcement if in potential conflict with another aircraft in his or her vicinity.

(3) If a PIC intercepts a broadcast apparently made under subsection (1); and

(a) the broadcast is from an aircraft in the PIC's vicinity; and

(b) the PIC considers that the aircraft is in potential conflict with his or her aircraft;

he or she must acknowledge the broadcast by transmitting his or her:

(c) call sign; and

(d) aircraft type, position, actual level and intentions.

(4) The PIC of an IFR flight must report any intention to amend route, deviate from track or change level in sufficient time for ATS to advise other aircraft traffic.

(5) If a PIC becomes aware that his or her position estimate for any point in an IFR flight differs from actual time by more than plus or minus 2 minutes, the pilot must advise ATS of the corrected position estimate.

(6) At the completion of a change of level, the PIC of an IFR flight must report to the ATS that he or she is maintaining the assigned level.

(7) After an en-route radio frequency change in an IFR flight:

(a) the PIC must report current flight level to the ATS; and

(b) if the aircraft is not at its planned cruising level — the PIC must report the level to which the aircraft is being climbed.

(8) If an IFR flight is in airspace where changes to flight level do not require ATS approval, the PIC must nevertheless report position and intention to ATS approximately 1 minute before making any change.

25.10 Position reports — IFR flights

(1) The PIC of an IFR flight must:

(a) alert ATS to a proposed position report using the word "POSITION"; and

(b) await the ATS instruction before making the report.

(2) The PIC of an IFR flight must, as far as possible, make position reports at the positions or times notified in the flight notification.

Note 1 For flight notification procedures refer to regulation 91.335 of CASR.

Note 2 If the PIC is holding due to weather, ATS will nominate scheduled reporting times which will normally be at 15 minute intervals.

(3) If the PIC of an IFR flight in an area flight nominates scheduled reporting times, he or she may limit the report to:

(a) the current flight level and position; or

(b) the current sector of the area.

Note Not being route flights, area flights do not usually lend themselves to particular geographic point reporting.

25.11 Change of levels — controlled airspace

(1) If the ATS instructs the PIC of an IFR flight in controlled airspace to change flight levels, then when the aircraft leaves a level the PIC must report:

(a) when he or she is at the changed level of the climb, the cruise or the descent; or

(b) when he or she is at a level for which ATS has requested a report.

(2) The PIC of a lower and a higher aircraft which are each instructed by the ATS to make a step climb, must report as follows:

(a) the pilot of the lower aircraft must report approaching each assigned level in the sequence;

(b) the pilot of the higher aircraft, on hearing the lower aircraft report each assigned level, must report his or her own last vacated level.

25.12 Descent from controlled airspace into uncontrolled airspace

(1) The PIC of an IFR flight from controlled airspace into Class G airspace must report the following to the ATS unit providing Flight Information Services in the airspace:

(a) the current position;

(b) the flight level;

(c) the PIC's intentions;

(d) the estimated time of arrival for the next position or destination.

(2) For subsection (1), the report to ATS must be made:

(a) before entering Class G airspace; and

(b) before any risk arises of compromising the aircraft's separation from any other aircraft operating near the base of controlled airspace.

(3) For subsection (1), if the report is made using HF radio frequency, a broadcast must be made on the appropriate area VHF radio frequency.

25.13 Arrival information — uncontrolled aerodromes

If the PIC of an IFR flight:

(a) is approaching a non-controlled aerodrome; and

(b) cannot monitor the ATS frequency;

then he or she must:

(c) broadcast on changing to the CTAF; and

(d) include the aerodrome location and frequency in the broadcast.

25.14 Mandatory broadcast procedures in controlled airspace when ATS is temporarily not available

(1) If ATS is temporarily unavailable for particular controlled airspace, the PIC of an IFR flight must use mandatory broadcast frequencies to:

(a) provide advisory traffic information to other aircraft; and

(b) arrange mutual separation.

Note Mandatory broadcast frequencies are notified by NOTAM.

(2) When arriving at, or departing from, an aerodrome where mandatory broadcast procedures apply under subsection (1), the PIC must:

(a) monitor the appropriate mandatory broadcast frequency; and

(b) make broadcasts in accordance with Table 25.14 (2).

(3) For Table 25.14 (2), for an item in a row of the Table, the PIC in the situation mentioned for the item in column 2, must use the phrase mentioned for the item in column 3, when making a broadcast on a mandatory broadcast frequency.

Table 25.14 (2) Broadcasts under mandatory broadcast procedures

Item	Situation	Mandatory phrase and relevant information
1	Broadcasting intentions	ALL STATIONS [location] [appropriate information]
2	Taxiing at an aerodrome	[aircraft type] TAXIING [location] RUNWAY(number) FOR [destination, or departure quadrant or intention]
3	About to commence take-off	LINING UP or ROLLING [runway number] TURNING [left or right] TRACKING [quadrant] CLIMBING TO [level]
4	Departing	DEPARTED [location] TRACKING [degrees magnetic] CLIMBING TO [level)] FOR [destination]
5	When inbound — before crossing the boundary of the area in which mandatory broadcasts apply	[Aircraft type] [position reported as either the radial, the bearing or the quadrant from the aerodrome] [level] [intentions]

Item	Situation	Mandatory phrase and relevant information
6	Joining the circuit	[Aircraft type] JOINING [position in circuit] RUNWAY [number]

25.15 Traffic Information Broadcasts by Aircraft (TIBA)

(1) The PIC of an aircraft must maintain a listening watch and make traffic information broadcasts (***TIBA***s) in accordance with this section.

Note The airspace in which TIBAs may be required is usually identified by NOTAMs. These Notices are published by AA to assist pilots to recognise the relevant airspace. However, the actual airspace procedures are dictated by the following provisions.

When to make a TIBA

(2) A TIBA must be made as follows:

(a) either:

(i) 10 minutes before entering designated airspace; or

(ii) for an aircraft taking off from an aerodrome located within 10 minutes flying time of designated airspace — as soon as practicable after take-off;

(b) 10 minutes before crossing a mandatory reporting point indicated on the relevant chart for the airway or route (a ***mandatory reporting point***);

(c) 10 minutes before crossing or joining an ATS contingency route published in the AIP;

(d) at 20 minute intervals between distant mandatory reporting points;

(e) where possible — 2 to 5 minutes before a change in flight level;

(f) at the time of a change in flight level;

(g) at any other time the PIC considers it necessary to make a TIBA in the interests of aviation safety or the safety of persons or property on the ground.

TIBA frequencies

(3) The PIC must use the following frequencies for a TIBA:

(a) at or above FL 200 — 128.95 MHz; and

(b) subject to paragraph (c) — below FL 200 — 126.35 MHz; and

(c) below FL 200 in Class G airspace other than oceanic areas — the frequency of the relevant Flight Information Area (FIA).

Listening watch for TIBAs

(4) For this section, the PIC of an aircraft must:

(a) maintain a continuous listening watch on the relevant TIBA frequency; and.

(b) in particular — either:

(i) maintain a listening watch on the TIBA frequency from 10 minutes before entering designated airspace until leaving the designated airspace; or

(ii) for an aircraft taking off from an aerodrome located within 10 minutes flying time of designated airspace — maintain a listening watch from as soon as practicable after take-off.

VHF radios

(5) For this section, if:

(a) an aircraft is equipped with 2 serviceable VHF radios; and

(b) VHF is used for relevant air-ground communications with ATS;

then the PIC must ensure that:

(c) 1 VHF radio is tuned to the appropriate ATS frequency; and

(d) the other VHF radio is tuned to the TIBA frequency.

Changes of cruising levels

(6) If a change to an aircraft's cruising level is not mandated by the ATS but is otherwise required in the interests of aviation safety, then during the manoeuvre the PIC must display all available aircraft lighting that may improve the likelihood of visual detection of the aircraft.

(7) When a change of an aircraft's flight level is anticipated the PIC must:

(a) make a change of level report to ATS and

(b) when the new level is reached — report that the aircraft is maintaining the new level.

(8) Paragraphs (7) (a) and (b) apply even if an unanticipated change of flight level has already been initiated.

Position reporting

(9) At least 15 minutes before an aircraft leaves airspace in which TIBA procedures apply, the PIC must:

(a) make a position report on the next CTAF/FIA frequency; and

(b) either:

(i) request and obtain a clearance to leave the airspace; or

(ii) re-establish SARWATCH on the appropriate ATS frequency.

25.16 Use of aircraft call signs

(1) The PIC of an aircraft must use full radiotelephony call signs when first establishing any 2-way radio communication for a broadcast or report under this Part.

(2) For subsection (1), an aircraft radiotelephony call sign must be in 1 of the following forms:

(a) the characters must correspond to the registration marking of the aircraft;

(b) the telephony designator of the aircraft operator must be followed by:

(i) the last 3 characters of the registration of the aircraft; or

(ii) up to 4 digits.

Note Telephony designators are allocated by AA.

Part 26 Navigation

Division 26.1 VFR flights

26.01 VFR flight requirements

(1) For subsection 91.930 (1), this section prescribes requirements relating to the operation of an aircraft for VFR flight.

(2) The PIC must navigate the aircraft by:

(a) visual reference to the ground or water; or

(b) using any of the IFR methods described in section 26.02 except that if operating at or below 2 000 ft above ground or water, the PIC must be able to navigate by visual reference to the ground or water.

(3) When navigating by visual reference to the ground or water, at intervals not exceeding 30 minutes the PIC must positively fix the aircraft's position by visual reference to features marked on topographical charts.

(4) For subsection (3), when navigating by visual reference over the sea, visual reference features may include rocks, reefs and fixed man-made objects that are:

(a) marked on topographical charts appropriate for the flight; and

(b) readily identifiable from the air.

Part 26 Navigation

Division 26.2 IFR flights

26.02 IFR flight requirements

(1) For subsection 91.933 (1), this section prescribes requirements relating to the operation of an aircraft for IFR flight.

(2) The PIC must navigate the aircraft by:

(a) use of an approved area navigation system that meets the performance requirements of the intended airspace or route; or

(b) use of a radio navigation system, but only if:

(i) the route is one where, after making allowance for possible tracking errors of ±9° from the last positive fix, the aircraft will come within the rated coverage of a radio aid which can be used to fix the position of the aircraft; and

(ii) the maximum time interval between positive fixes does not exceed 2 hours; or

(c) visual reference to the ground or water, but only:

(i) by day; and

(ii) on route segments where suitable en route radio navigation aids are not available; and

(iii) if weather conditions permit flight in VMC; and

(iv) the VFR position fixing requirements mentioned in subsections 26.01 (3) and (4) are complied with.

Part 27 Performance-based navigation flights

27.01 Purpose

For subregulation 91.940 (1), this Part prescribes requirements relating to the operation of an aircraft for a performance-based navigation flight (a ***PBN flight***).

27.02 Definitions for this Part

In this Part (and in this MOS where relevant):

area navigation system means the computer hardware installed on an aircraft by its manufacturer, or under a supplementary type certificate, which enables the use of PBN navigation specifications for PBN flight.

AIRAC cycle, or ***Aeronautical Information Regulation and Control cycle***, is the system and frequency setting used by an approved provider to regularly update the aeronautical information in a navigation database for PBN flight.

approved provider means:

(a) a provider of aeronautical information for performance-based navigation, approved under Part 175 of CASR; or

(b) for a foreign aircraft — a provider of aeronautical information for performance-based navigation, approved by the NAA of the State of Registration or State of Operator, of the foreign aircraft.

current, for a navigation database used in PBN flight, means that the database is up to date in accordance with the AIRAC cycle.

LNAV means lateral navigation.

navigation specification means a set of aircraft and aircrew requirements needed to support a PBN flight within a defined airspace.

Note There are 2 kinds of navigation specification: an RNAV specification and an RNP specification. See the definition of ***PBN*** or ***performance-based navigation specification***.

PBN flight means an IFR flight using area navigation based on performance requirements for an aircraft to safely operate:

(a) along an ATS route; or

(b) under an instrument approach procedure; or

(c) in designated airspace.

PBN navigation database means the data from an approved provider loaded onto the computerised system installed in an aircraft for area navigation using performance-based navigation.

PBN navigation specification means 1 of the following:

(a) an RNAV specification which:

(i) is based on area navigation; and

(ii) does not include a requirement for on-board performance monitoring and alerting; and

(iii) is designated by the prefix RNAV;

Note Examples of an RNAV specification include RNAV 5 and RNAV 1.

(b) an RNP specification which:

(i) is based on area navigation; and

(ii) includes a requirement for on-board performance monitoring and alerting; and

(iii) is designated by the prefix RNP.

Note Examples of an RNP specification include RNP 4 and RNP APCH.

PBN or ***performance-based navigation*** means area navigation based on performance requirements for an aircraft in PBN flight.

RNP specification is a particular subset of ***PBN*** or ***performance-based navigation***.

RNAV specification is a particular subset of ***PBN*** or ***performance-based navigation***.

SBAS means satellite-based augmentation system.

valid, for a navigation database used in PBN flight, means that the database must be provided by an approved provider.

27.03 Operation of an aircraft for a PBN flight

The PIC of an aircraft may only conduct a PBN flight if:

(a) the flight is an IFR flight; and

(b) the flight is conducted under a PBN navigation specification; and

(c) the aircraft is approved for the particular PBN navigation specification under:

(i) the AFM; or

(ii) a document approved in writing by CASA as part of, or based on, an airworthiness assessment; or

(iii) for a foreign registered aircraft operating into or out of, and within, the Brisbane or Melbourne Flight Information Regions (***FIR***) — a document approved in writing by the NAA of the State of Registration or State of the Operator, of the foreign aircraft; and

(d) the operation is conducted in accordance with the requirements of this Part.

27.04 Use of PBN navigation specifications

For this Part, the PIC of an IFR flight of an aircraft that uses a particular PBN navigation specification must:

(a) conduct the flight in accordance with the particular PBN navigation specification; and

(b) operate the aircraft in accordance with the operating instructions for the area navigation system installed in the aircraft (the ***operating instructions***); and

(c) carry the operating instructions on board the aircraft in a place that is easily and immediately accessible to the pilot.

27.05 Operating instructions for the area navigation system

For section 27.04, the operating instructions must be:

(a) those provided by the manufacturer of the area navigation system installed in the aircraft; or

(b) contained in the AFM for the aircraft — but only if the instructions are a complete set that is not abridged or abbreviated in any way; or

Note AFM includes a Supplementary AFM — see Definitions in section 1.06.

(c) in a document that is:

(i) specified by the AFM as applicable although not actually contained in the AFM; and

(ii) easily accessible to the PIC of an aircraft; and

(iii) a complete set of instructions that is not abridged or abbreviated in any way; or

(d) approved in writing by CASA.

27.06 Navigation database requirements

(1) If particulars of way points and navigation aids, as published in authorised aeronautical information, are included in an aircraft's navigation database, they must be loaded in a form that cannot be modified by the aircraft operator or an FCM.

(2) A navigation database for PBN flight must be valid.

(3) The PIC of a PBN flight must:

(a) regularly check the PBN navigation database for database integrity; and

(b) if any discrepancy in the data is discovered:

(i) report the discrepancy as soon as practicable to the approved provider; and

(ii) cease operational use of the database until the discrepancy is resolved.

Note The *Transport Safety Investigation Regulations 2003* have the effect that any discrepancy in the PBN navigation database must be reported if it is likely to cause a hazardous condition from loss of separation between the aircraft and terrain or obstacles, or between the aircraft and other aircraft.

(5) If the PBN navigation database changes to the next AIRAC cycle during a PBN flight, the PIC must complete the flight using the unchanged database unless to do so will jeopardise the safety of the flight.

(6) Without affecting subsection (4) and (5), a PBN navigation database:

(a) that is not current at the start of a PBN flight; or

(b) that ceases to be current during a PBN flight;

may be used for navigation but only if:

(c) data used for navigation is verified before use from a current navigation data source; and

Note 1 A current navigation data source may be current maps, charts or other sources of navigation information of an approved provider; or a current electronic flight bag.

(d) the database is used for radio updating of a navigation system.

Note 2 Inertial systems (INS or IRS) may be used without radio updating provided that the conditions and limitations in the AFM for inertial only operations are complied with.

(7) Despite anything else in this section, an aircraft operated without a MEL must not be in PBN flight more than 72 hours after the PBN navigation data base has ceased to be current.

Note An aircraft that is operated with an MEL must operate in accordance with the instructions in the MEL.

(8) Flight plan data manually entered in a PBN navigation database must be checked for accuracy by 2 flight crew members.

Note This data entry is quite distinct from that referred to in subsection (1) and does not consist of published waypoints and navigation aids.

(9) In the case of a single-pilot operation, manually entered data in a navigation system must be checked against other aeronautical information>

Note Other aeronautical information includes, for example, current maps and charts carried in the aircraft, other sources of navigation information of an approved provider, or a current electronic flight bag.

27.07 Operating standards – flight planning – GNSS integrity availability

(1) Before the departure of a PBN flight planned to use RNP APCH for the intended destination or the designated alternate, the PIC must obtain a prediction for GNSS integrity availability from a ground-based source.

(2) For subsection (1), if a continuous loss of the GNSS integrity function for more than 5 minutes is predicted for any part of the RNP APCH operation, the PIC must revise the flight plan, for example, by delaying the departure time or planning a different route.

(3) The PIC must obtain a prediction for GNSS Fault Detection and Exclusion (***FDE***) availability for the intended route before the departure of a PBN flight that is planned to operate in oceanic airspace using GNSS.

, (4) For subsection (3), the PIC must plan so that the maximum FDE outage duration cannot exceed the following:

(a) 25 minutes — for an RNP-4 operation;

(b) 34 minutes — for an RNP-10 operation;

(c) 51 minutes — for a minimum navigation performance standards (***MNPS***) operation.

(5) Subsections (1) to (4) do not apply to the PIC of a PBN flight using an RNP PBN navigation specification that is approved under the AFM to achieve an LNAV accuracy of less than 0.3 NM using requisite GNSS satellites.

(6) The PIC of a PBN flight that is a continental en-route operation must report to ATC if a continuous loss of the GNSS integrity function occurs for more than 5 minutes during the flight.

Note A prediction for GNSS integrity availability is not required before departure.

(7) The PIC of a PBN flight that is navigating with SBAS receivers must regularly check for GNSS integrity availability in areas where the SBAS is not available.

27.08 Navigation errors

The PIC of an aircraft in a PBN flight must, before or during the flight, take immediate action to remedy any condition that causes, or is likely to cause, a navigation error in the course of the flight.

Note 1 The *Transport Safety Investigation Regulations 2003* have the effect that the following navigation errors or events during a PBN flight must be reported:

(a) a lateral or longitudinal navigational error that exceeds the required accuracy value of the relevant PBN navigation specification for more than a merely transient duration when the aircraft is turning; or

(b) an aircraft system failure that results in the aircraft losing the use of its area navigation system.

Note Loss of the RNP capability must be reported but the failure of 1 navigation system in a dual installation need not be reported since the capability to meet the navigation specification requirements has not been lost.

Part 28 Take-off weights

28.01 Circumstances for, and methods of, determining aircraft take-off weight

(1) For subregulation 91.1035 (2) of CASR, this Part prescribes:

(a) the circumstances in which a take-off weight for an aircraft for a flight must be determined under the subregulation; and

(b) methods for determining that weight.

(2) In this Part:

determined in accordance with this Part means determined:

(a) in accordance with the instructions set out in the relevant AFM; or

(b) using an equivalent methodology approved in writing by CASA.

Note An example of an equivalent methodology is the following, provided it is approved by CASA: an electronic load and trim system based on the data in the AFM and authorised for use by a weight control authority holder for the particular aircraft.

28.02 Take-off weight for aeroplanes

(1) Subject to this section, an aeroplane must not take off unless the take-off weight and performance capability of the aeroplane are:

(a) determined by the PIC before take-off; and

(b) such that the aeroplane may safely take-off without being a hazard to another aircraft, a person or property.

(2) For subsection (1):

(a) the take-off weight of the aeroplane must be determined in accordance with this Part; and

(b) the performance of the aeroplane at the take-off weight must be determined from 1 of the following:

(i) the AFM;

(ii) the manufacturer's data manual (if any);

(iii) other data approved for the purpose.

(3) For subsection (2), the following must be taken into account:

(a) the take-off distance available;

(b) the pressure altitude and temperature;

(c) the gradient of the runway in the direction of the take-off;

(d) the wind direction, velocity and characteristics;

(e) the take-off and en-route weather forecast;

(f) the obstacles in the vicinity of the take-off path;

(g) the obstacles en-route.

(4) The weight of the aeroplane at take-off must not exceed the weight limitations contained in or derived from:

(i) the AFM; or

(ii) the manufacturer's data manual (if any); or

(iii) other data approved for the purpose.

28.03 Take-off weight for rotorcraft — general

(1) Subject to this section, a rotorcraft must not take off unless the take-off weight and the performance capability of the rotorcraft are:

(a) determined by the PIC before take-off; and

(b) such that the rotorcraft may safely take-off without being a hazard to another aircraft, a person or property.

(2) For subsection (1):

(a) the take-off weight of the rotorcraft must be determined in accordance with this Part; and

(b) the performance of the rotorcraft at the take-off weight must be determined from 1 of the following:

(i) the AFM;

(ii) the manufacturer's data manual (if any);

(iii) other data approved for the purpose.

(3) For subsection (2), the following must be taken into account:

(a) the take-off distance available;

(b) the adequacy of the size of the departure and destination aerodromes and any alternates;

(c) the pressure altitude and temperature;

(d) the gradient of the take-off and initial climb stage of the flight;

(e) the climb flight path;

(f) either:

(i) the wind direction, velocity and characteristics — if known; or

(ii) zero wind — if the matters mentioned in subparagraph (i) are unknown;

(g) the take-off and en-route weather forecast;

(h) the obstacles in the vicinity of the take-off path;

(i) the obstacles en-route.

(4) The weight of the rotorcraft at take-off must not exceed the weight limitations contained in or derived from:

(i) the AFM; or

(ii) the manufacturer's data manual (if any); or

(iii) other data approved for the purpose.

28.04 Take-off weight for rotorcraft — Category A rotorcraft within populous areas

(1) This section applies to a rotorcraft:

(a) that is a Category A rotorcraft with a Category A performance supplement (the ***rotorcraft***); and

(b) that takes off from a place in a populous area that is 1 of the following (the ***relevant HLS***):

(i) a non-certified aerodrome (including a HLS); or

(ii) an aerodrome that is not used for the regular take-off or landing of aeroplanes.

(2) The PIC of the rotorcraft may take-off from the relevant HLS only if:

(a) the take-off weight allows compliance with the Category A procedure for take-off and initial departure at the relevant HLS; and

(b) either:

(i) the PIC can ensure that the rotorcraft, with one engine inoperative, will maintain an obstacle clear climb gradient until 1 000 feet above the take-off surface; or

(ii) a circumstance mentioned in subregulation 91.400 (1) applies.

Note 1 In the event of a critical engine failure, the Category A procedure allows for a rejected take off within take-off distance available. If the critical engine failure occurs after the TDP, the Category A procedure allows for flight clear of persons and property.

Note 2 ***Category A rotorcraft*** is defined in section 1.06.

28.05 Take-off weight for rotorcraft — Category B rotorcraft within populous areas

(1) This section applies to a rotorcraft that is:

(a) a Category B rotorcraft (the ***rotorcraft***); and

(b) takes off from a place in a populous area that is 1 of the following (the ***relevant HLS***):

(i) a non-certified aerodrome (including a HLS); or

(ii) an aerodrome that is not used for the regular take-off or landing of aeroplanes.

(2) The PIC of the rotorcraft may take-off from the relevant HLS only if:

(a) the rotorcraft's weight allows sufficient performance for the rotorcraft to:

(i) avoid obstacles during the take-off and initial climb stage of the flight; and

(ii) auto rotate or fly clear of persons or property in the event of a critical engine failure; and

(b) if the area is a confined area for the rotorcraft — the take-off weight allows hover-out-of-ground-effect performance for the take-off; and

(c) as far as practicable — the planned take-off profile minimises time within the avoid area of the HV curve.

Note For the ***avoid area of the HV curve***, see section 1.06.

Part 29 Landing weights

29.01 Circumstances for, and methods of, calculating aircraft landing weight

For subregulation 91.1040 (2), this Part prescribes:

(a) the circumstances in which a landing weight for an aircraft for a flight must be determined under the subregulation; and

(b) methods for determining that weight.

29.02 Landing weight for aeroplanes

(1) Subject to this section, an aeroplane must not land unless the landing weight and performance capability of the aeroplane are:

(a) determined by the PIC before landing; and

(b) such that the aeroplane may safely land without being a hazard to another aircraft, a person or property.

(2) For subsection (1):

(a) the landing weight of the aeroplane must be determined in accordance with this Part; and

(b) the performance of the aeroplane at the landing weight must be determined from 1 of the following:

(i) the AFM;

(ii) the manufacturer's data manual (if any);

(iii) other data approved for the purpose.

(3) For subsection (2), the following must be taken into account:

(a) the landing distance available;

(b) the pressure altitude and temperature;

(c) the gradient of the runway in the direction of the landing;

(d) the wind direction, velocity and characteristics;

(e) the landing weather forecast;

(f) the obstacles in the approach path.

(4) The weight of the aeroplane at landing must not exceed the weight limitations contained in or derived from:

(i) the AFM; or

(ii) the manufacturer's data manual (if any); or

(iii) other data approved for the purpose.

29.03 Landing weight for rotorcraft — general

(1) Subject to this section, a rotorcraft must not land unless the landing weight and the performance capability of the rotorcraft are:

(a) determined by the PIC before landing; and

(b) such that the rotorcraft may safely land without being a hazard to another aircraft, a person or property.

(2) For subsection (1):

(a) the landing weight of the rotorcraft must be determined in accordance with this Part; and

(b) the performance of the rotorcraft at the landing weight must be determined from 1 of the following:

(i) the AFM;

(ii) the manufacturer's data manual (if any);

(iii) other data approved for the purpose.

(3) For subsection (2), the following must be taken into account:

(a) the FATO distance available;

(b) the adequacy of the size of the destination aerodromes and any alternates;

(c) the pressure altitude and temperature;

(d) the gradient of the approach and any missed approach;

(e) either:

(i) the wind direction, velocity and characteristics — if known; or

(ii) zero wind — if the matters mentioned in subparagraph (i) are unknown;

(g) the en-route and destination weather forecast;

(h) the obstacles in the vicinity of the approach path;

(4) The weight of the rotorcraft at landing must not exceed the weight limitations contained in or derived from:

(i) the AFM; or

(ii) the manufacturer's data manual (if any.

29.04 Landing weight for rotorcraft — Category A rotorcraft within a populous area

(1) This section applies to a rotorcraft:

(a) that is a Category A rotorcraft with a Category A performance supplement; and

(b) that lands at a place in a populous area that is 1 of the following (a ***relevant HLS***):

(i) a non-certified aerodrome (including a HLS); or

(ii) an aerodrome that is not used for the regular take-off or landing of aeroplanes.

(2) The PIC of the rotorcraft may land at the relevant HLS only if:

(a) the landing weight allows compliance with the Category A procedure for landing and missed approach at the relevant HLS; and

(b) the PIC can ensure that the rotorcraft, with one engine inoperative, will maintain an obstacle clear approach gradient, including any missed approach.

Note 1 The Category A procedure allows, in the event of a critical engine failure at or after landing decision point (LDP), a continued approach clear of persons and property and a landing within the landing distance available at the HLS, to be made.

Note 2 ***Category A rotorcraft*** is defined in section 1.06.

29.05 Landing weight for rotorcraft — Category B rotorcraft within a populous area

(1) This section applies to a rotorcraft that:

(a) is a Category B rotorcraft (the ***rotorcraft***); and

(b) lands at a place in a populous area that is 1of the following (a ***relevant HLS***):

(i) a non-certified aerodrome (including a HLS); or

(ii) an aerodrome that is not used for the regular take-off or landing of aeroplanes.

(2) The PIC of the rotorcraft may land at the relevant HLS only if:

(a) the rotorcraft's weight allows sufficient performance for the rotorcraft to:

(i) avoid obstacles during the landing and any missed approach stage of the flight; and

(ii) auto rotate or fly clear of persons or property in the event of a critical engine failure; and

(b) if the area is a confined area for the rotorcraft — the landing weight allows hover-out-of-ground-effect performance for the landing; and

(c) the planned landing profile as far as practical minimises time within the avoid area of the HV curve; and

Note For the ***avoid area of the HV curve***, see section 1.06.

Part 30 Aircraft systems, including instruments, indicators and equipment

Division 30.1 Purpose, approvals, visibility, access and displays

30.01 Purpose

(1) This Part is a prescription for the purposes of subregulation 91.1150 in relation to the fitting and carriage of, and the requirements for, systems that must be fitted to or carried on an aircraft for a prescribed flight.

(2) For the purposes of subregulation 91.1150, any aircraft flight mentioned in this Part is a prescribed flight.

30.02 Meaning of *system* and *display*

(1) In this Part, unless the contrary intention appears, the word ***system*** is taken to include:

(a) an instrument, an indicator, or an item of equipment;

(b) any combination of one or more instruments, indicators or items of equipment;

(c) any combination of one or more instruments, indicators and items of equipment.

(2) In this Part, unless the contrary intention appears, each of the following is taken to be a system:

(a) an instrument, an indicator, or an item of equipment;

(b) any combination of one or more instruments, indicators or items of equipment;

(c) any combination of one or more instruments, indicators and items of equipment.

(3) In this Part, the meaning of the word ***display*** is taken to include the meaning of the word ***indicate***.

30.03 Approval of aircraft systems

(1) Before an Australian aircraft begins a flight, any system that is required to be fitted to or carried on the aircraft under this Part must have been approved by CASA under Part 21 of CASR.

(2) Subsection (1) does not apply to the following:

(a) an item of equipment used to display the time;

(b) an independent portable light, for example a flashlight or torch;

(c) a portable megaphone;

(d) a child restraint system;

(e) a sea anchor and other equipment for mooring;

(f) survival equipment, including signalling devices.

(3) Before a foreign registered aircraft begins a flight in Australian airspace, the systems fitted to or carried on the aircraft must have been approved by the NAA of the aircraft's State of Registry.

30.04 Visibility and accessibility of pilot-operated instruments, indicators, items equipment and systems

(1) This section applies in relation to systems that must be fitted to, or carried on, an aircraft for a flight, under this Part.

(2) Any system that is for a pilot's use in, or from, the cockpit must be visible to, and usable by, the pilot in his or her normal sitting position in a pilot's seat in the aircraft.

Part 30 Aircraft systems, including instruments, indicators and equipment

Division 30.2 Aeroplane specific requirements

30.05 Application

This Division applies to an aeroplane, subject to Division 30.4.

30.06 Aeroplane VFR flight by day

(1) An aeroplane for a VFR flight by day must not begin the flight unless it is fitted with 1 or more systems for measuring and displaying the following flight information for the aeroplane:

(a) indicated airspeed;

(b) pressure altitude;

(c) magnetic heading;

(d) time;

(e) Mach number — but only for an aeroplane with operating limitations expressed in terms of Mach number.

(2) For subsection (1), the system for measuring and displaying the flight information mentioned in column 1 of an item in Table 30.06 (2) must meet the requirements mentioned in column 2 of the same item.

Table 30.06 (2) System requirements — aeroplane VFR flight by day

Item	Flight information Column 1	Requirements Column 2
1	Pressure altitude	The system must: (a) have an adjustable datum scale calibrated in millibars or hectopascals; and (b) be calibrated in feet, except that, if a flight is conducted in a foreign country which measures flight levels or altitudes in metres, the system must be calibrated in metres, or fitted with a conversion placard or device.
2	Magnetic heading	The system must be: (a) a direct reading magnetic compass; or (b) a remote indicating compass and a standby direct reading magnetic compass.
3	Time	1. The system must display accurate time in hours, minutes, and seconds. 2. The system must be: (a) fitted to the aircraft and visible to the pilot from the pilot's normal sitting position; or

Item	Flight information Column 1	Requirements Column 2
		(b) worn by, or immediately accessible to, the pilot for the duration of the flight.

30.07 Aeroplane VFR flight by night

(1) Without affecting the requirements of section 30.06, an aeroplane for a VFR flight by night must not begin the flight unless it is fitted with a system for measuring and displaying the following flight information for the aeroplane:

(a) turn and slip;

(b) attitude;

(c) vertical speed;

(d) stabilised heading;

(e) whether the supply of power to gyroscopic instruments (if any) is adequate.

(2) For subsection (1), the system for measuring and displaying the flight information mentioned in column 1 of an item in Table 30.07 (2) must meet the requirements mentioned in column 2 of the same item.

Table 30.07 (2) System requirements — aeroplane VFR flight by night

Item	Flight information Column 1	Requirements Column 2
1	Indicated airspeed	1. The system must be capable of being connected to: (a) an alternate static system that: (i) is selectable by a pilot; and (ii) includes a selector that can open or block the aeroplane's static source and alternative static source at the same time; or (b) a balanced pair of flush static ports.
2	Pressure altitude	The system must be capable of being connected to: (a) an alternate static system that: (i) is selectable by a pilot; and (ii) includes a selector that can open or block the aeroplane's static source and alternative static source at the same time; or (b) a balanced pair of flush static ports.
3	Turn and slip	The system must display turn and slip information, except when a second independent attitude indicating system is fitted, in which case only the display of slip information is required.
4	Vertical speed	The system must be capable of being connected to:

Item	Flight information Column 1	Requirements Column 2
		(a) an alternate static system that: (i) is selectable by a pilot; and (ii) includes a selector that can open or block the aeroplane's static source and alternative static source at the same time; or (b) a balanced pair of flush static ports.
5	Stabilised heading	The system must indicate whether the power supply to the gyroscopic instruments is working satisfactorily. *Note* A gyro-magnetic type of remote indicating compass meets this requirement if it has a primary power supply and an alternate power supply.

30.08 Aeroplane IFR flight

(1) An aeroplane for an IFR flight must not begin the flight unless it is fitted with a system for measuring and displaying the following flight information for the aeroplane:

(a) indicated airspeed;

(b) pressure altitude;

(c) magnetic heading;

(d) time;

(e) Mach number — but only for an aeroplane with operating limitations expressed in terms of Mach number;

(f) turn and slip;

(g) attitude;

(h) vertical speed;

(i) stabilised heading;

(j) outside air temperature.

(k) whether the supply of power to gyroscopic instruments (if any) is adequate.

(2) For subsection (1), the system for measuring and displaying the flight information mentioned in column 1 of an item in Table 30.08 (2) must meet the requirements mentioned in column 2 of the same item.

Table 30.08 (2) System requirements — aeroplane IFR flight

Item	Flight information Column 1	Requirements Column 2
1	Indicated airspeed	The system must be capable of being connected to: (a) an alternate static system that: (i) is selectable by a pilot; and

Item	Flight information Column 1	Requirements Column 2
		(ii) includes a selector that can open or block the aeroplane's static source and alternative static source at the same time; or (b) a balanced pair of flush static ports. 2. At least 1 airspeed indicating system must include a means of preventing malfunction due to condensation or icing.
2	Pressure altitude	1. The system must: (a) have an adjustable datum scale calibrated in millibars or hectopascals; and (b) be calibrated in feet, except that, if a flight is conducted in a foreign country which measures flight levels or altitudes in metres, the system must be calibrated in metres or fitted with a conversion placard or device. 2. The system must be capable of being connected to: (a) an alternate static system that: (i) is selectable by a pilot; and (ii) includes a selector that can open or block the aeroplane's static source and alternative static source at the same time; or (b) a balanced pair of flush static ports.
3	Magnetic heading	The system must be: (a) a direct reading magnetic compass; or (b) a remote indicating compass and a standby direct reading magnetic compass.
4	Time	1. The system must display accurate time in hours, minutes, and seconds. 2. The system must be: (a) fitted to the aircraft and visible to the pilot from his or her normal sitting position; or (b) worn by, or immediately accessible to, the pilot for the duration of the flight.
5	Turn and slip	1. The system must display turn and slip information, except where a second independent attitude indicating system is fitted, in which case only the display of slip information is required. 2. The system must have an alternate power supply in addition to its primary power supply:

Item	Flight information Column 1	Requirements Column 2
		(a) unless the system has a source of power independent of the power operating other gyroscopic instruments; or (b) the aircraft is fitted with a second attitude indicator system that has a source of power independent of the power operating other gyroscopic instruments.
6	Attitude	The system must have an alternate power supply in addition to its primary power supply: (a) unless the system has a source of power independent of the power operating the turn and slip system; or (b) the aircraft is fitted with a second attitude indicator system that has a source of power independent of the power operating other systems.
7	Vertical speed	The system must be capable of being connected to: (a) an alternate static system that: (i) is selectable by a pilot; and (ii) includes a selector that can open or block the aeroplane's static source and alternative static source at the same time; or (b) a balanced pair of flush static ports.
8	Stabilised heading	The system must have an alternate power supply in addition to its primary power supply: (a) unless the system has a source of power independent of the power operating the turn and slip system; or (b) the aircraft is fitted with a second attitude indicator system that has a source of power independent of the power operating other systems. *Note* A gyro-magnetic type of remote indicating compass meets this requirement if it has a primary power supply and an alternate power supply.

30.09 Aeroplane IFR flight — equipment to measure and record cosmic radiation

(1) An aeroplane for an IFR flight above FL 490 must be fitted with a system to measure and display the cosmic radiation received in the cabin.

(2) For subsection (1), the system must continuously measure and display:

(a) the dose rate of total cosmic radiation being received; and

(b) the cumulative dose of total cosmic radiation received during the flight.

(3) In this section:

total cosmic radiation means the sum total of:

(a) ionizing radiation of galactic and solar origin; and
(b) neutron radiation of galactic and solar origin.

Part 30 Aircraft systems, including instruments, indicators and equipment

Division 30.3 Rotorcraft specific requirements

30.10 Application

This Division applies to an aeroplane, subject to Division 30.4.

30.11 Rotorcraft VFR flight by day

(1) A rotorcraft for a VFR flight by day must not begin a flight unless it is fitted with 1 or more systems for measuring and displaying the following flight information for the rotorcraft:

(a) indicated airspeed;

(b) pressure altitude;

(c) magnetic heading;

(d) time.

(2) For subsection (1), the system for measuring and displaying the flight information mentioned in column 1 of an item in Table 30.11 (2), as required under subsection (1), must meet the requirements mentioned in column 2 of the same item.

Table 30.11 (2) System requirements — rotorcraft VFR flight by day

Item	Flight information Column 1	Requirements Column 2
1	Pressure altitude	The system must have an adjustable datum scale calibrated in millibars or hectopascals.
2	Magnetic heading	The system must be: (a) a direct reading magnetic compass; or (b) a remote indicating compass and a standby direct reading magnetic compass.
3	Time	1. The system must display accurate time in hours, minutes, and seconds. 2. The system must be: (a) fitted to the aircraft and visible to the pilot from his or her normal sitting position; or (b) worn by, or immediately accessible to, the pilot for the duration of the flight.

30.12 Rotorcraft VFR flight by night

(1) Without affecting the requirements of section 30.11, a rotorcraft for a VFR flight by night must not begin the flight unless it is fitted with a system for measuring and displaying the following flight information for the rotorcraft:

(a) turn and slip;

(b) attitude;

(c) vertical speed;

(d) stabilised heading;

(e) outside air temperature;

(f) whether the supply of power to gyroscopic instruments (if any) is adequate.

(2) A rotorcraft for a single pilot, VFR flight by night over land or water must not begin the flight if:

(a) the rotorcraft's attitude cannot be maintained by the use of visual external surface cues provided by lights on the ground or celestial illumination; and

(b) the rotorcraft is not fitted with an automatic pilot system or an automatic stabilisation system.

(3) For subsection (1), the system for measuring and displaying the flight information mentioned in column 1 of an item in Table 30.12 (3) must meet the requirements mentioned in column 2 of the same item.

Table 30.12 (3) System requirements— rotorcraft VFR flight by night

Item	Flight information Column 1	Requirements Column 2
1	Turn and slip	1. The system must display turn and slip information, except where a second independent attitude indicating system is fitted, in which case only the display of slip information is required. *Note* A second independent source of attitude information may be a standby attitude indicator, or a second attitude indicating system.
2	Attitude	The system must have a primary power supply and an alternate power supply.
3	Standby attitude	The system must have a primary power supply and an alternate power supply.
4	Vertical speed	If the rotorcraft is operated on to vessels or platforms at sea by night, the system must: (a) be an instantaneous vertical speed indicator (***IVSI***); or (b) meet performance requirements for acceleration sensitivity equivalent to an IVSI.
5	Stabilised heading	1. The system must have a primary power supply and an alternate power supply, unless the system has a source of power independent of the power operating the turn and slip system.

Item	Flight information Column 1	Requirements Column 2
		2. The system must have an alternate power supply in addition to its primary power supply, unless the system has a source of power independent of the power operating the turn and slip system. *Note* A gyro-magnetic type of remote indicating compass meets this requirement if it has a primary power supply and an alternate power supply.

30.13 Rotorcraft IFR flight

(1) A rotorcraft for an IFR flight must not begin a flight unless it is fitted with a system for measuring and displaying the following flight information for the rotorcraft:

(a) indicated airspeed;

(b) pressure altitude;

(c) magnetic heading;

(d) time;

(e) slip;

(f) attitude;

(g) standby attitude;

(h) vertical speed;

(i) stabilised heading;

(j) outside air temperature;

(k) whether the supply of power to gyroscopic instruments (if any) is adequate.

(2) A rotorcraft mentioned in subsection (1) must not begin a flight unless it is fitted with, or carries, an automatic pilot system or an automatic stabilisation system.

(3) A rotorcraft for an IFR flight for which 2 pilots are required by or under the Regulations or the rotorcraft's AFM must not begin a flight unless it is fitted with at least 1 additional system, independent of the corresponding system mentioned in subsection (1), for measuring and displaying the following flight information for the rotorcraft:

(a) indicated airspeed;

(b) pressure altitude;

(c) turn and slip;

(d) attitude;

(e) vertical speed.

(4) For subsections (1) and (3), the system for measuring and displaying the flight information mentioned in column 1 of an item in Table 30.13 (4) must meet the requirements mentioned in column 2 of the same item.

Table 30.13 (4) System requirements — rotorcraft IFR flight

Item	Flight information Column 1	Requirements Column 2
1	Indicated airspeed	The system must be capable of being connected to: (a) an alternate static system that: (i) is selectable by a pilot; and (ii) includes a selector that can open or block the rotorcraft's static source and alternative static source at the same time; or (b) a balanced pair of flush static ports. 2. At least 1 airspeed indicating system must include a means of preventing malfunction due to condensation or icing. 3. The system must operate independently of other indicated airspeed systems fitted to the rotorcraft.
2	Pressure altitude	1. The system must have an adjustable datum scale calibrated in millibars or hectopascals. 2. The system must be capable of being connected to: (a) an alternate static system that: (i) is selectable by a pilot; and (ii) includes a selector that can open or block the rotorcraft's static source and alternative static source at the same time; or (b) a balanced pair of flush static ports. 3. The system must operate independently of other indicated airspeed systems fitted to the rotorcraft.
3	Magnetic heading	The system must be: (a) a direct reading magnetic compass; or (b) a remote indicating compass and a standby direct reading magnetic compass.
4	Time	1. The system must display accurate time in hours, minutes, and seconds. 2. The system must be: (a) fitted to the aircraft and visible to the pilot from his or her normal sitting position; or (b) worn by, or immediately accessible to, the pilot for the duration of the flight.

Item	Flight information Column 1	Requirements Column 2
5	Turn and slip	The system must operate independently of other turn and slip systems fitted to the rotorcraft.
6	Attitude	1. The system must have a primary power supply and an alternate power supply. 2. The system must operate independently of other turn and slip systems fitted to the rotorcraft.
7	Standby attitude	The system must: (a) have a source of power independent of the electrical generating system; and (b) operate independently of other attitude systems; and (c) continue to operate without any action by the flight crew, for a period of 30 minutes following the failure of the electrical power generating system.
8	Vertical speed	1. The system must be capable of being connected to: (a) an alternate static system that: (i) is selectable by a pilot; and (ii) includes a selector that can open or block the rotorcraft's static source and alternative static source at the same time; or (b) a balanced pair of flush static ports. 2. The system must: (a) be an instantaneous vertical speed indicator (***IVSI***); or (b) meet performance requirements equivalent to an IVSI. 3. The system must operate independently of other turn and slip systems fitted to the rotorcraft.
8	Stabilised heading	The system must have a primary power supply and an alternate power supply. *Note* A gyro-magnetic type of remote indicating compass meets this requirement if it has a primary power supply and an alternate power supply.

Part 30 Aircraft systems, including instruments, indicators and equipment

Division 30.4 Experimental and other aircraft

30.14 Application — VFR flight requirements do not apply to certain light sport and experimental aircraft

(1) In this section:

relevant aircraft means 1 of the following:

(a) an aircraft for which a certificate of airworthiness as an LSA has been issued and is in force;

(b) an LSA for which an experimental certificate has been issued and is in force under paragraph 21.191 (k) of CASR;

(c) any other aircraft for which an experimental certificate has been issued and is in force under paragraph 21.191 (g), (h) or (j) of CASR.

(2) Sections 30.06 and 30.07 do not apply to a relevant aircraft if the aircraft is fitted with systems, approved in writing by CASA, which provide the pilot with the same flight and navigation information as would be provided through compliance with section 30.06 or 30.07, as the case may be.

30.15 Application — IFR flight requirements do not apply to certain experimental aircraft

(1) In this section:

relevant aircraft means an aeroplane for which an experimental certificate has been issued and is in force under paragraph 21.191 (g), (h) or (k) of CASR.

(2) Section 30.08 does not apply to a relevant aircraft if the aircraft is fitted with systems, approved in writing by CASA, which provide the pilot with the same flight and navigation information as would be provided through compliance with section 30.08.

30.16 Application — VFR flight requirements do not apply to certain experimental rotorcraft

(1) In this section:

relevant rotorcraft means a rotorcraft for which an experimental certificate has been issued and is in force under paragraph 21.191 (g) or (h) of CASR.

(2) Sections 30.11 and 30.12 do not apply to a relevant rotorcraft if the rotorcraft is fitted with systems, approved in writing by CASA, which provide the pilot with the same flight and navigation information as would be provided through compliance with sections 30.11 or 30.12, as the case may be.

30.17 Application — IFR flight requirements do not apply to certain experimental rotorcraft

(1) In this section:

relevant rotorcraft means an aircraft for which an experimental certificate has been issued and is in force under paragraph 21.191 (g), (h) or (k) of CASR.

(2) Section 30.13 does not apply to a relevant rotorcraft if the rotorcraft is fitted with a system, approved in writing by CASA, which provides the pilot with the same flight and navigation information as would be provided through compliance with section 30.13.

30.18 Application — VFR and IFR flight requirements do not apply to certain Australian registered aircraft

(1) In this section:

relevant aircraft means any Australian registered aircraft.

(2) Division 30.2 or Division 30.3 of this Part does not apply to a relevant aircraft if the aircraft is fitted with a system, approved in writing by CASA, which provides for the aircraft's intended operation a level of safety equivalent to that which would be achieved if Division 30.2 or Division 30.3 (as the case requires) applied.

(3) For subsection (2), CASA's consideration of safety equivalency must take into account whether the type certificating authority for the aircraft considers that the aircraft achieves, for its intended operation, a level of safety equivalent to that which would be achieved if Division 30.2 or 30.3 applied.

(4) For subsection (3), ***type certificating authority*** means such an authority of a recognised country.

30.19 Electronic flight information systems

(1) This section applies to an aircraft:

(a) to which section 30.14, 30.15, 30.16 or 30.17 applies; and

(b) which is fitted with one of the following systems:

(i) an electronic flight information system (an ***EFIS***);

(ii) an electronic display indicator (***EDI***);

(iii) another system of electronically displaying flight information.

(2) The system must be provided with:

(a) a battery-powered back-up; or

(b) a source of power independent of the aircraft's electrical system.

(3) The battery-powered back-up must:

(a) be fully charged before the flight begins; and

(b) have sufficient capacity to power the EFIS panel or other display for at least 90 minutes.

Part 30 Aircraft systems, including instruments, indicators and equipment

Division 30.5 Aircraft lighting system requirements

30.20 Aircraft lighting systems — VFR flight at night and IFR flight

(1) An aircraft for a VFR flight by night, or for an IFR flight, must be fitted with, or carry, the following lighting systems:

(a) cockpit lighting that meets the requirements mentioned in subsection (2);

(b) cabin lighting that enables each occupant of the aircraft to see and use:

(i) his or her seatbelt and oxygen facilities (if any); and

(ii) the normal and emergency exits;

(c) for each crew member — an independent portable light accessible to the crew member from his or her normal sitting position in a crew member's seat in the aircraft;

(d) if the aircraft type design requires the aircraft to have an anti-collision light system — the number of anti-collision lights required for the system by the type design;

(e) navigation lights;

(f) at least 1 landing light.

Note See Part 90 of CASR for requirements relating to emergency lighting.

(2) The lighting from a cockpit lighting system must:

(a) illuminate each system that may be used by the flight crew; and

(b) illuminate the documents that may be used by the flight crew, including checklists and flight documents; and

(c) be compatible with each instrument or item of equipment that may be used by a pilot; and

(d) be arranged in a way that:

(i) enables all placards and instrument markings to be read from each pilot's normal sitting position in a pilot's seat in the aircraft; and

(ii) each pilot's eyes are shielded from direct and reflected light; and

(e) be adjustable, so that the intensity of the lighting can be varied for the light conditions.

30.21 Anti-collision lights

(1) An aircraft for a flight must be fitted with an anti-collision light system comprised of the following;

(a) at least 1 red beacon light; or

(b) at least 2 white strobe lights; or

(c) a combination of all of the lights mentioned in paragraphs (a) and (b).

(2) For an anti-collision light system comprising red beacon lights only, the lights must be displayed as follows:

(a) for a turbine-engine aircraft — from immediately **before** the engines are started until the time the engines are shut down at the end of the flight; and

(b) for any other aircraft — from immediately **after** the engines are started until the time the engines are shut down at the end of the flight.

(3) For an anti-collision light system comprising white strobe lights only, the lights must be displayed as follows:

(a) for a turbine-engine aircraft — from immediately **before** the engines are started until the time the engines are shut down at the end of the flight; and

(b) for any other aircraft — from immediately **after** the engines are started until the time the engines are shut down at the end of the flight.

(4) For an anti-collision light system comprising a combination of red beacon lights and white strobe lights, the lights must be displayed as follows:

(a) for the red beacon lights — in accordance with the requirements in subsection (2); and

(b) for the white strobe lights, not in accordance with subsection (3) but in accordance with the following:

(i) if the aircraft, on its way to the runway from which it will take off, or on its way from the runway on which it has landed, crosses any other runway that is in use for take-offs or landings (an ***active runway***) — while the aircraft is crossing the active runway;

(ii) from the time the aircraft first enters the runway from which the aircraft will take off until the time the aircraft leaves the runway on which it has landed.

(5) Subsections (2), (3) and (4) do not apply if:

(a) the anti-collision light system was serviceable at the beginning of the flight but becomes unserviceable during the flight; or

(b) the PIC reasonably believes that, in the circumstances, reflection or glare from the anti-collision light system may cause a hazard to an aircraft.

30.22 Navigation lights

(1) An aircraft for a flight must be fitted with navigation lights.

(2) The navigation lights must be displayed at night or in poor visibility whether the aircraft is in the air or on the movement area of an aerodrome.

Part 30 Aircraft systems, including instruments, indicators and equipment

Division 30.6 Aircraft warning system requirements

30.23 Altitude alerting system and assigned altitude indicator – IFR flights

(1) The following aircraft must be fitted with an altitude alerting system if operating under the IFR:

(a) a piston engine aircraft, operating in controlled airspace above FL 150;

(a) an unpressurised turbine-engine aircraft, operating in controlled airspace above FL150;

(c) a pressurised turbine-engine aircraft operating in any controlled airspace.

(2) For subsection (1), the altitude alerting system must:

(a) include an assigned altitude indicator; and

(b) alert the flight crew if the aircraft approaches a preselected altitude; and

(c) alert the flight crew, including by a sound signal, if the aircraft deviates from a preselected altitude; and

(d) be readable and adjustable by each flight crew member from his or her normal sitting position in a pilot's seat in the aircraft.

(3) If an aircraft (a ***relevant aircraft***), other than an aircraft to which subsection (1) applies, is operating under the IFR in controlled airspace, the relevant aircraft must be fitted with an assigned altitude indicator that is readable and adjustable by each flight crew member from his or her normal sitting position in a pilot's seat in the aircraft.

(4) Subsection (3) does not apply if an altitude alerting system has been fitted to the aircraft.

30.24 Aeroplane airborne collision avoidance system— ACAS II

(1) In this section:

ACAS means an airborne collision avoidance system.

ACAS II is an ACAS which provides vertical resolution advisories (RAs) in addition to traffic advisories (TAs).

Note In practice, an ACAS II is implemented in the form of, and known as, a TCAS II

(2) An ACAS II must be fitted to:

(a) an aeroplane that:

(i) has an MTOW of more than 15 000 kg; or

(ii) has a maximum certificated passenger seating capacity of 31 or more; or

(b) an aeroplane that was first issued with a certificate of airworthiness on or after 1 January 2014, and that:

(i) has an MTOW of more than 5 700 kg but less than 15 000 kg; or

(ii) has a maximum certificated passenger seating capacity of at least 20 but not more than 30.

30.25 ACAS II requirements for use

(1) An ACAS II fitted to an aircraft under subsection 30.24 (2) must be activated at all times during flight.

Note There are no specific circumstances in which an ACAS is to be deactivated in flight.

(2) The PIC of a category of Australian aircraft must have been trained in the use of the ACAS II for the category.

(3) The PIC of a foreign registered aircraft flying in Australian airspace must have been authorised by the NAA of the aircraft's State of registration, to use the ACAS II.

Part 30 Aircraft systems, including instruments, indicators and equipment

Division 30.7 Flight recording equipment

30.26 Aeroplane flight data recorder

(1) One flight data recorder (***FDR***) must be fitted to the following:

(a) an aeroplane that:

(i) has an MTOW more than 5 700 kg but not more than 27 000 kg; and

(ii) was first issued with a certificate of airworthiness on or after 1 January 2005;

(b) an aeroplane that:

(i) has an MTOW more than 27 000 kg; and

(ii) was first issued with a certificate of airworthiness on or after 1 January 1989.

30.27 Aeroplane cockpit voice recorder

(1) One cockpit voice recorder (***CVR***) must be fitted to the following:

(a) a turbine-engine aeroplane that:

(i) has an MTOW more than 5 700 kg; and

(ii) was first issued with a certificate of airworthiness on or after 1 January 2016; and

(iii) is required by or under the Regulations or its AFM to be flown by more than one pilot;

(b) an aeroplane that:

(i) has an MTOW more than 27 000 kg; and

(ii) was first issued with a certificate of airworthiness on or after 1 January 1987 and before 1 January 2016.

30.28 Rotorcraft flight data recorder and cockpit voice recorder

(1) Either:

(a) 1 FDR and 1 CVR; or

(b) despite subsections 30.29 (2) and (3) — 1 combination FDR/CVR;

must be fitted to the following:

(c) a multi-engine rotorcraft that:

(i) has an MTOW more than 5 700 kg; and

(ii) was first issued with a certificate of airworthiness on or after 1 January 1965;

(d) a multi-engine rotorcraft that:

(i) has an MTOW more than 3 180 kg; and

(ii) is type certificated in the transport category; and

(iii) was first issued with a certificate of airworthiness on or after 1 January 2005.

30.29 Combination recorders — for aeroplane or rotorcraft

(1) In this section:

combination recorder (***combination FDR/CVR***) means a single system combining the capabilities and the functions of a FDR and a CVR.

(2) A requirement under sections 30.26, 30.27, or 30.28 that an aeroplane or a rotorcraft must be fitted with both 1 FDR and 1 CVR, may be met by the fitment of 2 combination recorders.

(3) A requirement under sections 30.26, 30.27, 30.28 that an aeroplane or a rotorcraft must be fitted with both 1 FDR and 1 CVR, may be met by the fitment of:

(a) 1 FDR and 1 combination recorder; or

(b) 1 CVR and 1 combination recorder.

30.30 Recorder technical requirements

(1) Each of the following:

(a) an FDR;

(b) a CVR;

(c) a combination FDR/CVR;

must comply with:

(d) for an aeroplane — Part II of ICAO Annex 6; or

(e) for a rotorcraft — Part III of ICAO Annex 6.

Note For ICAO documents see section 1.04.

(2) A FDR and a combination FDR/CVR must be fitted with an acoustic underwater locating device that:

(a) has its own power source; and

(b) remains active for 30 days after the device enters water, ice melt or snow.

30.31 Unserviceable flight recording equipment

(1) Subject to this section, each of the following recorders, fitted to an aircraft for this Division, must be serviceable at the beginning of a flight:

(a) the FDR;

(b) the CVR;

(c) the combination FDR/CVR .

(2) A recorder mentioned in subsection (1) may be unserviceable at the beginning of a flight if:

(a) the flight begins from a departure aerodrome with no facility for the recorder to be repaired or replaced; and

(b) the flight is not a flight test or a training flight; and

(c) if the aircraft is fitted with 1 CVR and no FDR — the unserviceable recorder has not been unserviceable for more than 21 days; and

(d) if the aircraft is fitted with 1 CVR and 1 FDR:

(i) the unserviceable recorder has not been unserviceable for more than 21 days; and

(ii) the other recorder is serviceable; and

(e) if the aircraft is fitted with 1 combination FDR/CVR — the unserviceable recorder must not have been unserviceable for more than 3 days; and

(f) if the aircraft is fitted with 2 combination FDR/CVR :

(i) the unserviceable recorder has not been unserviceable for more than 21 days; and

(ii) the other recorder is serviceable.

30.32 Continuous operation of flight recorders

(1) A FDR fitted to an aircraft under this Division must operate continuously from the time the aircraft begins moving under its own power, until the time the flight is terminated and the aircraft can no longer move under its own power.

(2) A CVR fitted to an aircraft under this Division must operate continuously during the period:

(a) beginning when the first pilot checklist commences before the engines are started for a flight; and

(b) ending when the final pilot checklist is completed at the end of the flight.

(3) The FDR and the CVR functionalities within a combination FDR/CVR fitted to an aircraft under this Division must operate continuously during the same periods as an FDR and a CVR is required to operate under subsections (1) and (2).

(4) If:

(a) there is no APU or other alternative power source for the aircraft; and

(b) it is reasonably necessary to preserve the aircraft's primary power source in order to start the aircraft's engines; and

(c) the flight data recorder is operated continuously during the period beginning just before the engines are started for take-off and ending when the final pilot checklist is completed at the end of the flight;

then, a cockpit voice recorder fitted to an aircraft under this Division must operate continuously during the period:

(d) beginning after the engines are started before for the flight; and

(e) ending when the final pilot checklist is completed at the end of the flight.

30.33 Flight data and combination recorders not to be operated during aircraft maintenance

(1) A FDR or combination recorder fitted to an aircraft under this Division must not be operated during maintenance of the aircraft or of an aeronautical product fitted to the aircraft, except if the maintenance is to the recorder or an aircraft engine.

(2) For subsection (1), an APU fitted to the aircraft is not an aircraft engine unless it is used to propel the aircraft.

30.34 Aeroplane data link recorder

RESERVED

30.35 Rotorcraft data link recorder

RESERVED

Part 30 Aircraft systems, including instruments, indicators and equipment

Division 30.8 In-flight communication systems

30.36 Intercommunications system — VFR flights

(1) This section applies to an aircraft (a ***relevant aircraft***):

(a) that is flown under the VFR, and:

(b) that is flown by at least 2 pilots, as required by or under the Regulations or the AFM; and

(c) whose cockpit noise levels at any stage of the flight prevent the pilots from communicating with each other in speech at the level of normal conversation.

(2) A relevant aircraft must be fitted with a serviceable intercommunication system which:

(a) includes a headset and microphone that are not of the hand-held type and

(b) is accessible to each pilot in his or her normal sitting position in a pilot's seat in the aircraft.

30.37 Intercommunications system — IFR flights

(1) This section applies to an aircraft (a ***relevant aircraft***) that is flown under the IFR.

(2) When a relevant aircraft begins a flight with 1 pilot as required by its AFM, it must be fitted with or carry:

(a) 2 headsets and microphones that are not of a hand-held type; or

(b) 1 headset and microphone that is not of a hand-held type, and 1 hand-held microphone with a loudspeaker.

(3) When a relevant aircraft requiring 2 pilots by or under the Regulations or the AFM begins a flight, it must be fitted with:

(a) 3 headsets; and 3 microphones that are not of a hand-held type; or

(b) 2 headsets and microphones that are not of a hand-held type, and 1 hand-held microphone with a loudspeaker.

30.38 Public address system

(1) This section applies to an aircraft (a ***relevant aircraft***) that has:

(a) a maximum operational passenger seating configuration of 20 or more; and

(b) at least 1 passenger on board for a flight.

(2) When a relevant aircraft begins a flight it must be fitted with a public address system to enable the PIC to address the passengers.

Part 30 Aircraft systems, including instruments, indicators and equipment

Division 30.9 Oxygen equipment and oxygen supplies

30.39 Supplemental oxygen

(1) An aircraft must carry supplemental oxygen in accordance with Table 30.39 (1).

(2) If a circumstance arises as described in column 1 of an item in Table 30.39 (1), then, for the period mentioned for the item in column 2, supplemental oxygen must be available for each person mentioned for the item in column 3.

Table 30.39 (1) Supplemental oxygen — amount required for a flight

Item	Circumstance Column 1	Period Column 2	Persons Column 3
1	If, for a continuous period of at least 30 minutes, the aircraft's cabin pressure altitude will be at least FL 125 but less than FL 140	While the cabin pressure altitude is at least FL 125 but less than FL 140	Each flight crew member
2	If the aircraft's cabin pressure altitude is at least FL 140 but less than FL 150	While the aircraft's cabin pressure altitude is at least FL 140 but less than FL 150	Each flight crew member
3	The aircraft's cabin pressure altitude is at least FL 150	While the aircraft's cabin pressure altitude at least FL 150	Each occupant of the aircraft
4	The aircraft is pressurised and the aircraft is flown above FL 250	10 minutes, in addition to any period of time required under items 1, 2 and 3 (as applicable).	Each occupant of the aircraft

30.40 Oxygen masks — pressurised aircraft above FL250

(1) This section applies for a flight of a pressurised aircraft that is flown above FL250 at any time during the flight.

(2) At least 1 pilot occupying a pilot seat must:

(a) be wearing a sealed oxygen mask (securely worn) that:

(i) is being supplied with supplemental oxygen; or

(ii) automatically supplies supplemental oxygen when the cabin pressure altitude is at or above FL140; or

(b) have access to a quick donning mask that is supplied with supplemental oxygen when the mask is donned.

Note A ***quick donning mask*** is defined in section 1.06.

30.41 Oxygen masks — pressurised aircraft above FL450

(1) This section applies for a flight of a pressurised aircraft that is flown above FL450 at any time during the flight.

(2) At least 1 pilot occupying a pilot seat must be wearing one of the following that is being supplied with supplemental oxygen.:

(a) a sealed oxygen mask (securely worn); or

(b) a quick donning mask.

30.42 Protective breathing equipment — pressurised aircraft

(1) When a pressurised aircraft begins a flight with at least 2 pilots as required by or under the Regulations or the AFM (a ***relevant aircraft***), it must be carrying protective breathing equipment for each pilot in accordance with this section.

(2) The protective breathing equipment must be able to supply oxygen continuously for at least 15 minutes.

(3) The protective breathing equipment for a pilot must be located at his or her pilot seat.

(4) A pilot's protective breathing equipment must not prevent, or be likely to prevent, the pilot from effectively using any crew intercommunication system fitted to the aircraft.

30.43 Portable protective breathing equipment — pressurised aircraft

(1) When a pressurised aircraft begins a flight with at least 2 pilots as required by or under the Regulations or the AFM, it must be carrying portable protective breathing equipment for each pilot in accordance with this section.

(2) The aircraft must carry the number of portable protective breathing equipment units that is equal to whichever of the following is the lesser:

(a) the number of hand-held fire extinguishers required to be carried on the flight under a Division of this Part; and

(b) the number of cabin crew members required for the flight under regulation 91.1465.

(3) The portable protective breathing equipment must be able to supply oxygen, or a mixture of oxygen and another suitable gas, continuously for at least 15 minutes.

(4) Portable protective breathing equipment units must be located as follows:

(a) 1 unit must be located in, or as close as practicable to, the cockpit;

(b) the remaining units (if any) must be located adjacent to:

(i) hand-held fire extinguishers; or

(ii) cabin crew member seats.

30.44 First aid oxygen equipment — pressurised aircraft

(1) This section applies to a pressurised aircraft that:

(a) begins a flight with at least 2 pilots as required by or under the Regulations or the AFM; and

(b) is flown above FL250 at any stage during the flight; and

(c) carries a passenger on the flight.

(2) When the aircraft begins the flight, it must carry, for use in first aid, such a volume of undiluted oxygen as will provide an average oxygen gas flow rate, calculated assuming dry oxygen gas at standard temperature and pressure, of 3 litres per minute per person, for:

(a) whichever of the following is the greater:

(i) 2% of the number of passengers carried on the flight;

(ii) one passenger; and

(b) the flight period during which the aircraft's cabin altitude exceeds 8 000 ft but does not exceed FL150.

(2) When the aircraft begins the flight, it must carry:

(a) at least 2 oxygen masks suitable for use in dispensing oxygen for first aid; and

(b) equipment for dispensing oxygen that:

(i) is capable of generating a flow rate, calculated assuming dry oxygen gas at standard temperature and pressure, of at least 4 litres per minute per person; and

(ii) has a means of reducing the flow to not less than 2 litres per minute per person at any altitude.

Part 30 Aircraft systems, including instruments, indicators and equipment

Division 30.10 Emergency locator transmitters

30.45 Purpose

This Division sets out the requirements for the fitment and carriage of emergency locator transmitters (***ELT***).

30.46 ELT — basic requirements

(1) In this Division, an ELT is a transmitter that meets the following requirements:

(a) if the transmitter is activated, the transmitter must transmit simultaneously on 121.5 MHz and 406 MHz.

(b) if the transmitter is fitted to, or carried on, an Australian aircraft — the transmitter must be registered with the AMSA and with no other authority;

(c) if the transmitter is fitted to, or carried on, a foreign registered aircraft — the transmitter must be registered with the authority of the aircraft's State of registry that is responsible for search and rescue services, and not with the Australian Maritime Safety Authority;

de) the transmitter must, for identification purposes, be coded in accordance with the requirements for the transmitter in Appendix 1 to Chapter 5 of Part II, Voice Communications, in Volume III of ICAO Annex 10, Aeronautical Telecommunications;

(e) if the transmitter is fitted with a lithium-sulphur dioxide battery — the battery must be authorised by the FAA or EASA in accordance with (E)TSO-C142a.

30.47 Approved automatic ELT

(1) In this Division:

approved automatic ELT is an ELT in accordance with section 30.46 that meets the requirements mentioned in subsection (2).

(2) For subsection (1), the ELT:

(a) must be automatically activated on impact; and

(b) must be one of the following types:

(i) a type authorised by the FAA or EASA in accordance with (E)TSO-C126;

(ii) a type authorised by EASA in accordance with:

(A) ETSO-2C91a for operation on 121.5 MHz; and

(B) ETSO-2C126 for operation on 406 MHz;

(iii) a type, approved in writing by CASA as having a level of performance equivalent to a type of transmitter mentioned in subparagraph (i) or (ii).

30.48 Approved survival ELT

(1) In this Division:

approved survival ELT is an ELT in accordance with section 30.46 that meets the requirements mentioned in subsection (2).

(2) For subsection (1), the ELT must be:

(a) removable from the aircraft; and

(b) 1 of the following types:

(i) an emergency position-indicating radio beacon of a type that meets the requirements of AS/NZS 4280.1:2003;

(ii) a personal locator beacon of a type that meets the requirements of AS/NZS 4280.2:2003;

(iii) a type authorised by the FAA or EASA in accordance with (E)TSO-C126;

(iv) a type authorised by EASA in accordance with:

(A) ETSO-2C91a for operation on 121.5 MHz; and

(B) ETSO-2C126 for operation on 406 MHz;

(v) a type approved in writing by CASA as having a level of performance equivalent to a type mentioned in subparagraph (i), (ii), (iii) or (iv).

30.49 ELT must be fitted or carried

(1) When an aircraft begins a flight it must:

(a) be fitted with an approved automatic ELT; or

(b) carry an approved survival ELT.

(2) This section does not apply to:

(a) a single engine aircraft; or

(b) a new aircraft being manufactured, flight tested or delivered by the manufacturer; or

(c) an aircraft flown no more than 50 NM from its place of departure.

30.50 ELT — single-engine aircraft flown over water

(1) This section applies to a single-engine aircraft that is flown further over water than the distance from which, with the engine inoperative, the aircraft could reach a safe forced landing area.

(2) When the aircraft begins the flight, it must carry an approved survival ELT.

(3) This section does not apply to:

(a) a single seat aircraft; or

(b) a new aircraft being manufactured, flight tested or delivered by the manufacturer; or

(c) an aircraft fitted with a radio, or otherwise capable of continuous communication with a person on the ground during the aircraft's flight.

30.51 Aircraft flown with unserviceable ELT

(1) An aircraft may begin a flight with an unserviceable approved automatic ELT or an unserviceable approved survival ELT, if the flight is for the purpose of taking the aircraft to a place for the maintenance or repair of the transmitter.

(2) An aircraft may begin a flight without an approved automatic ELT or an approved survival ELT if:

(a) the transmitter has been temporarily removed from the aircraft for maintenance; and

(b) an entry has been made in the aircraft's flight technical log, stating:

(i) the transmitter's make, model and serial number; and

(ii) the date on which the transmitter was removed from the aircraft; and

(iii) the reason for the removal of the transmitter; and

(c) a placard stating “Emergency locator transmitter not installed or carried” has been placed in the aircraft in a position where it can be seen by the PIC; and

(d) a period of no more than 90 days has passed since the emergency locator transmitter was removed.

(3) If an unserviceable approved automatic ELT has been removed from an aircraft, the aircraft is not required to carry an approved survival ELT during the period that the unserviceable ELT is permitted to be unserviceable under this section.

(4) If an unserviceable approved survival ELT has been removed from an aircraft, the aircraft is not required to be fitted with an approved automatic ELT during the period that the unserviceable ELT is permitted to be unserviceable under this section.

Division 30.11 Emergency equipment — fire extinguishers

30.52 Hand-held fire extinguishers — aeroplanes above 5 700 kg MTOW

(1) This section applies to an aeroplane with a MTOW above 5 700 kg.

(2) The aeroplane must carry at least the following numbers of hand-held fire extinguishers:

(a) 1 in the cockpit;

(b) 1 in each galley;

(c) 1 at the entry of each cargo compartment and of each baggage compartment, being a compartment that:

(i) is accessible in flight; and

(ii) is not fitted with a fixed fire and smoke detection and extinguishing system;

(d) for an aircraft with the passenger seating capacity mentioned in an item of column 1 of Table 30.52 (2) (d) — the number mentioned in column 2 for the same item, in the passenger compartment;

Table 30.52 (2) (d) Requirements for number of hand-held fire extinguishers

Passenger Seating Capacity	Number of extinguishers
7-30	1
31-60	2
61-200	3
201-300	4
301-400	5
401-500	6
501-600	7
601 or more	8

(e) despite paragraph (d) —for an aircraft with a passenger seating capacity of not more than 9, in which the flight crew and the passengers occupy the same compartment —1, readily available to the PIC;

(f) despite paragraph (d) —for an aircraft with a passenger seating capacity of more than 9, in which the flight crew and the passengers occupy the same compartment:

(i) 1, readily available to the PIC; and

(ii) 1, readily available to the passengers.

30.53 Hand-held fire extinguishers — rotorcraft

(1) This section applies to a rotorcraft in the air transport category.

(2) The rotorcraft must carry at least the following numbers of hand-held fire extinguishers:

(a) 1 in the cockpit;

(b) 1 in the passenger compartment — for an aircraft with the passenger seating capacity of 7 or more;

(c) despite paragraph (b) — for a rotorcraft with a passenger seating capacity of not more than 9, in which the flight crew and the passengers occupy the same compartment —1, readily available to the PIC;

(d) despite paragraph (b) —for a rotorcraft with a passenger seating capacity of more than 9, in which the flight crew and the passengers occupy the same compartment:

(i) 1, readily available to the PIC; and

(ii) 1, readily available to the passengers.

Part 30 Aircraft systems, including instruments, indicators and equipment

Division 30.12 Equipment for flights over water — sea anchors and sound signals

30.54 Sea anchors etc. and sound signals — seaplanes and amphibians

(1) This section applies to a flight of an aircraft if:

(a) the aircraft is a seaplane or an amphibian; and

(b) the flight involves take-off from, or landing on, water.

(2) When the aircraft begins the flight, it must carry the following:

(a) a sea anchor;

(b) other equipment for mooring.

(3) If the flight is conducted on or over water to which the International Regulations apply, the aircraft must carry equipment for making the sound signals required by the International Regulations for the flight.

Note The expression “International Regulations” is defined in the CASR Dictionary.

Part 30 Aircraft systems, including instruments, indicators and equipment

Division 30.13 Survival equipment for flights over water — life jackets

30.55 Definition of an approved life jacket

(1) In this Division:

approved life jacket means a life jacket that:

(a) is approved by CASA under Part 21 of CASR; and

(b) is equipped with a whistle (except in the case of a lifejacket for an infant, which may or may not have a whistle).

30.56 Lifejackets for flights over water

(1) This section applies to an aircraft flight:

(a) if the aircraft is a seaplane or an amphibian; or

(b) for a single-engine aircraft that is not a seaplane or an amphibian — if during the flight the aircraft is flown further over water than the distance from which, with the engine inoperative, the aircraft could reach a safe forced landing area; or

(c) for a multi-engine aircraft that is not a seaplane or an amphibian — if during the flight the aircraft is flown more than 50 NM from a safe forced landing area.

(2) When the aircraft begins the flight it must carry the following:

(a) for each infant on board — an approved life jacket or other flotation device; and

(b) for each other person on board — an approved life jacket.

(3) This section does not apply if:

(a) the aircraft is flown over water for the purpose of climbing after take-off from, or descending to land at, an aerodrome; and

(b) the aircraft is flown in accordance with a navigational procedure that is normal for the climb or descent at the aerodrome.

30.57 Stowage of life jackets

(1) This section applies to an aircraft that is required to carry an approved lifejacket or a flotation device under this Division.

(2) When the aircraft begins the flight, then, unless the lifejacket or other flotation device is being worn:

(a) each infant's life jacket or flotation device must be stowed where, in the event of an emergency evacuation, it is readily accessible by an adult responsible for the infant; and

(b) each other person's life jacket must be stowed where it is readily accessible from the person's seat in the event of an emergency evacuation.

30.58 Wearing life jackets — aircraft generally

(1) A person (other than an infant) on board a single-engine aircraft must wear an approved life jacket if the flight is over water that is further than the distance from which, with the engine inoperative, the aircraft could reach land.

(2) A person (other than an infant) on board a rotorcraft must wear a life jacket with a whistle if the flight is over water to or from a helideck.

(3) This section does not apply if:

(a) for any aircraft:

(i) the aircraft is flown over water for the purpose of climbing after take-off from, or descending to land at, an aerodrome; and

(ii) the aircraft is flown in accordance with a navigational procedure that is normal for the climb or descent at the aerodrome; or

(b) for any aeroplane — the aeroplane is being flown higher than 2 000 ft above the water.

(4) For subsections (1) and (2), a person may be taken to be wearing a life jacket if it is secured to the person in a way that allows the person to quickly and easily put it on in an emergency.

30.59 Wearing life jackets — rotorcraft —special provision

(1) This section applies to a flight of a rotorcraft if:

(a) the rotorcraft takes off from, or lands at, an aerodrome in a populous area; and

(b) an area of water is the only reasonably available forced landing area for the ***relevant period***.

(2) During the relevant period, each person on the rotorcraft (other than an infant, if any) must wear an approved life jacket.

(3) For paragraph (1)(b), the ***relevant period*** is:

(a) for a take-off —the period after take-off until the rotorcraft reaches the minimum height at or above which the rotorcraft is required to be flown under regulation 91.400; or

(b) for a landing — the period after the rotorcraft descends below the minimum height at or above which the rotorcraft is required to be flown under regulation 91.400, until actually landing.

Part 30 Aircraft systems, including instruments, indicators and equipment

Division 30.14 Survival equipment for flights over water — life rafts

30.60 Life rafts for flights over water

(1) When an aircraft begins a flight to which this section applies, it must carry sufficient life rafts to provide a place on a life raft for each person on the aircraft.

(2) This section applies to an aircraft flight if during the flight the aircraft is flown further over water than the following distances:

(a) for a jet-driven multi-engine aeroplane with a MTOW of more than 2 722 kg — whichever is the shorter of the following:

(i) the distance the aeroplane would fly in 2 hours at its normal cruising speed in still air;

(ii) 400 nautical miles;

(b) for a turbine-engine propeller-driven aeroplane with a MTOW of more than 5 700 kg — whichever is the shorter of the following:

(i) the distance the aeroplane would fly in 2 hours at its normal cruising speed in still air;

(ii) 400 nautical miles;

(c) for any other aircraft — whichever is the shorter of the following:

(i) the distance the aircraft would fly in 30 minutes at its normal cruising speed in still air;

(ii) 100 nautical miles.

(4) For subsection (1), when working out the number of life rafts to be carried on an aircraft:

(a) the capacity of a life raft is the rated capacity specified by the manufacturer for the life raft; and

(b) the number of infants on board the aircraft need not be taken into account.

(5) Any overload capacity of a life raft is not to be taken into account in determining its capacity for the purposes of paragraph (4) (a).

30.61 Stowage of life rafts

(1) This section applies to an aircraft that is required to carry a life raft under this Division.

(2) The life raft must be stowed and secured so that it can be readily deployed if the aircraft has to ditch.

(3) If a life raft is stowed in a compartment or container, the compartment or container must be conspicuously marked as containing the life raft.

Part 30 Aircraft systems, including instruments, indicators and equipment

Division 30.15 Survival equipment for flight over water or in remote areas

30.62 Definitions

In this Division:

Central Australia remote area has the meaning given in section 30.64.

r***emote area*** means one of the following:

(a) Central Australia remote area;

(b) Snowy Mountains remote area;

(c) Tasmania remote area.

Snowy Mountains remote area has the meaning given in section 30.64.

Tasmania remote area has the meaning given in section 30.64.

Note The actual definitions are located in section 30.64, adjacent to supporting maps.

30.63 Over water and remote area survival equipment

(1) This section applies to the flight of an aircraft:

(a) in or through a remote area; or

(b) if the aircraft is required to carry a life raft under Division 30.14 of this MOS.

(2) When the aircraft begins the flight, it must carry the following:

(a) survival equipment that is appropriate for survival in the area (the ***remote area***) in or through which the flight will be conducted; and

(b) if the flight is of a kind mentioned in paragraph (1)(b) — pyrotechnic signalling devices such that the distress signals set out in Appendix 1 to ICAO Annex 2, *Rules of the Air*, can be made if required.

(3) Subsection (2) does not apply to a flight of a kind mentioned in paragraph (1) (b) if:

(a) throughout the flight, the PIC is able to maintain continuous radio contact with:

(i) the ATS; or

(ii) the aircraft operator, or his or her representative; or

(b) the aircraft's position is continuously monitored on the ground though an automatic continuous tracking system fitted to the aircraft.

30.64 Meaning of remote area

(1) ***Central Australia remote area*** means the area of Australia, illustrated by the shading in Figure 30.64 CA RA, that:

(a) is enclosed within the boundary of the following lines: a line from Kalgoorlie to Leigh Creek, to Bourke, to Mt Isa, to Townsville, to Cairns, then following the coast north to Cape Horn, then along the coastline of the Gulf of Carpentaria and on to Darwin, then following the coastline to Talgarno, then to Wiluna, to Laverton, and back to Kalgoorlie; and

(b) includes Australian administered islands adjacent to the remote area between Cairns and Talgarno; and

(c) excludes the area within a 50 NM radius of Darwin; and

(d) excludes the flight corridors within sight of, and not more than 5 nautical miles from the following:

(i) the Stuart highway between Alice Springs and Darwin;

(ii) the Barkly highway between Tenant Creek and Mt Isa;

(iii) the Bruce Highway between Townsville and Cairns

Snowy Mountains remote area means the area of Australia, illustrated by the shading in Figure 30.64 SM RA, that is enclosed within the boundary of the following lines: a line from Mt Franklin to Tharwa, to Berridale, to Delegate, to Mt Baw Baw, to Jamieson, to Khancoban, and back to Mt Franklin.

Tasmania remote area means the area of Australia, illustrated by the shading in Figure 30.64 TAS RA, that is enclosed within the boundary of the following lines: a line from West Point to Black Bluff, to 15 NM beyond Cape Bruny, then back to West Point at a distance of 15 NM miles off the coastline (disregarding bays and inlets).

(2) For subsection (1):

(a) subject to paragraph (b), a line, other than a coastline, is taken to be a straight line; and

(b) a line to or from a named town is taken to come no closer than 5NM from the town centre on the side of the town adjacent to the remote area.

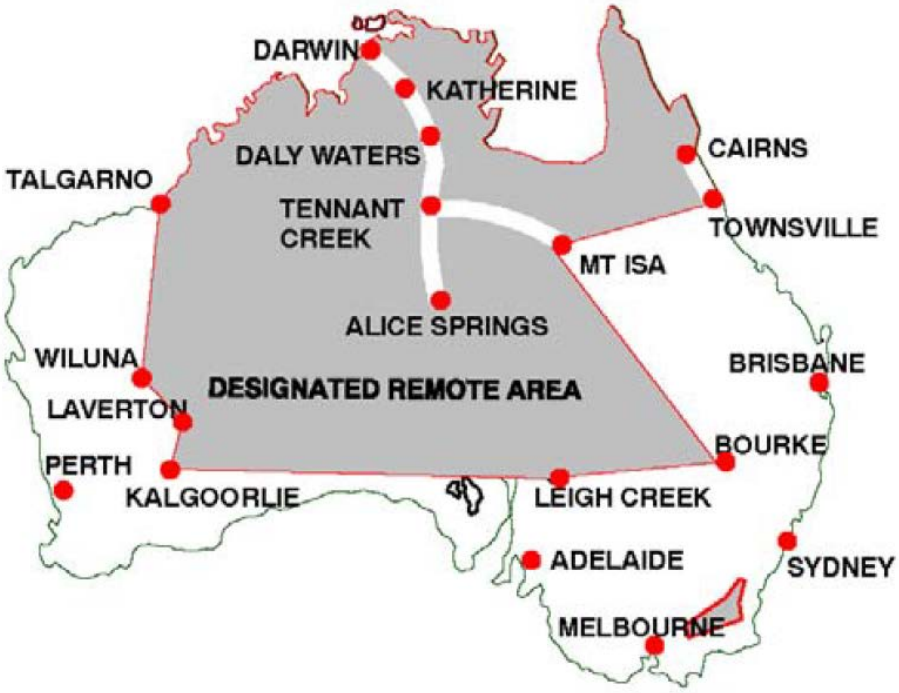


Figure 30.64 CA RA Central Australia remote area

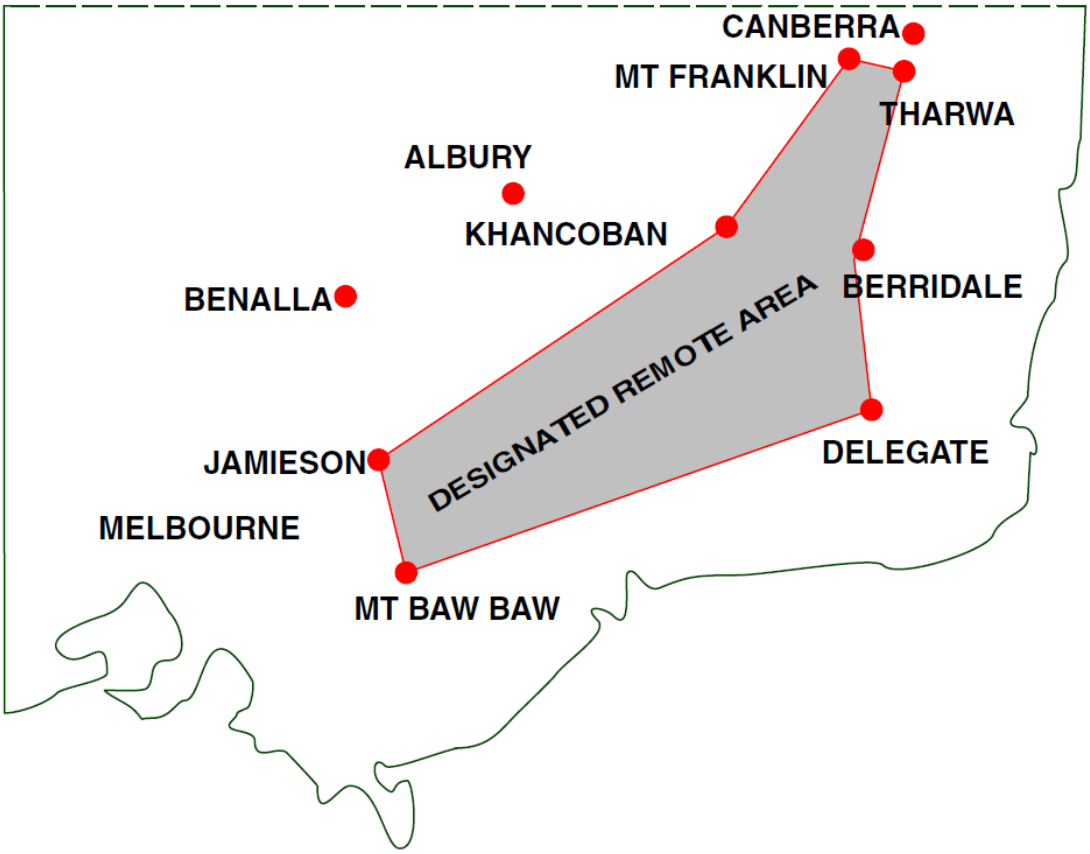


Figure 30.64 SM RA Snowy Mountains remote area

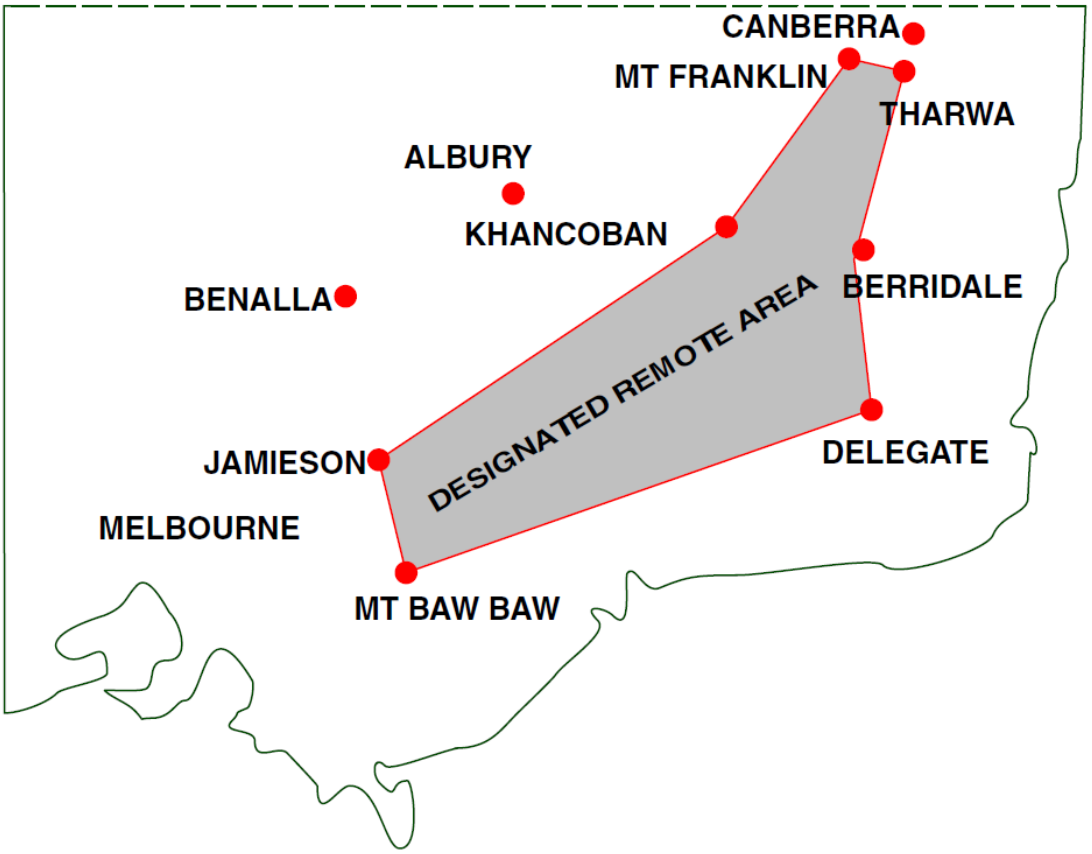


Figure 30.64 TAS RA Tasmania remote area

Part 30 Aircraft systems, including instruments, indicators and equipment

Division 30.16 Navigation systems — GNSS

30.65 Carriage of GNSS — IFR aircraft

(1) In this Division:

approved GNSS area navigation system, or ***approved GNSS***, means:

(a) a GNSS system that is authorised in accordance with 1 of the following:

(i) (E)TSO-C129;

(ii) (E)TSO-C145;

(iii) (E)TSO-C146;

(iv) (E) TSO-C196a;

(b) a multi-sensor navigation system that:

(i) includes GNSS and inertial integration; and

(ii) is approved in writing by CASA as providing a level of performance equivalent to a GNSS system mentioned in paragraph (a).

(2) An approved GNSS must be:

(a) approved by CASA under Part 21 of CASR; and

(b) serviceable at the beginning of the flight.

(3) An aircraft for a flight under the IFR must be fitted with an approved GNSS.

Note An approved GNSS authorised in accordance with (E)TSO-C129 is unlikely to satisfy the GNSS position source requirements for ADS-B surveillance.

30.66 Use of GNSS

(1) An aircraft must use a serviceable approved GNSS as a navigation system for any of the following:

(a) an approved RNAV instrument approach procedure, including the related missed approach procedure;

(b) an RNAV standard instrument departure (***SID***) or an RNAV standard instrument arrival (***STAR***).

(2) An aircraft may use a serviceable approved GNSS as an RNAV system for any of the following:

(a) an oceanic, remote area or domestic en route phase of flight that is not an IFR flight;

(b) a VFR operation.

30.67 Use of suitable area navigation systems on conventional routes and procedures

(1) This section applies for the flight of an aircraft, if:

(a) a means is required for operating on, or transitioning to, conventional routes and procedures (other than RNAV or RNP); and

(b) the AFM authorises navigation to RNP 2 (en-route), RNP 1 or RNP AR (terminal and approach); and

(c) other applicable requirements of this Division are complied with.

(2) Approved GNSS may be used:

(a) as a substitute means of navigation if:

(i) a conventional navigation aid is not available; or

(ii) the aircraft is not equipped with an ADF, VOR or DME; or

(iii) the installed ADF, VOR or DME is inoperative; or

(b) as an alternative means of navigation if:

(i) a conventional navigation aid is serviceable; and

(ii) the aircraft is equipped with serviceable equipment that is compatible with the conventional navigation aids.

(2) For subsections (1) and (2), approved GNSS may be used as a substitute for, or alternative to, the following conventional navigation aids:

(a) VOR;

(b) DME;

(c) VOR/DME;

(d) NDB;

(e) Outer Marker;

(f) Middle Marker.

(3) For subsections (1) and (2), before using approved GNSS as a substitute or alternative to the conventional navigation aids for 1 of the following:

(a) terminal operations (***SID*** or ***STAR***); or

(b) approach operations phases of flight;

the PIC must verify that:

(c) the intended waypoints or procedures can be loaded from the navigation database by name; and

(d) pilot manually-entered latitude and longitude waypoints are not used; and

(e) the navigation system will fly the procedure as published in authorised aeronautical information; and

(f) RAIM or other approved integrity monitoring is available.

30.68 Restrictions on use of GNSS

(1) For the flight of an aircraft, approved GNSS must not be used for the following:

(a) navigation using procedures that are advised by NOTAM as not authorised for use;

Note For example, the PIC may not use approved GNSS to navigate on a procedure that is based on a recently decommissioned navigation aid.

(b) lateral navigation on LOC based courses (including LOC back-course guidance) without reference to raw LOC data.

30.69 Procedures for using approved GNSS for certain phases of flight

(1) The PIC of an en route aircraft may use approved GNSS with data that has been manually entered into a database, only if the data entries:

(a) for an operation with at least 2 pilots — have been cross-checked for accuracy by at least 2 flight crew members; or

(b) for a single pilot operation — have been checked independently against other aeronautical information.

Note For example, other aeronautical information may be contained in authorised aeronautical information for the flight required under paragraph 91.120 (3) (a) of CASR.

(2) The PIC of an en route aircraft must ensure that GNSS-derived position and tracking information obtained from manually entered data or supplied data is checked:

(a) at, or before, each reporting point published in the AIP or designated by ATS; and

(b) at, or before, each en route waypoint; and

(c) at hourly intervals during area navigation; and

(d) after the insertion of new data relating to the flight, such as a new flight plan or alteration of an existing flight plan.

(3) The PIC may use GNSS as a navigation aid for an oceanic or remote area phase of flight only if an appropriate en route prediction analysis conducted before the flight ensures that GNSS availability will provide a useable service.

30.70 RNAV(GNSS) approach procedures

(1) If the PIC is conducting an approach using RNAV(GNSS), he or she:

(a) may only carry out a GNSS non-precision approach by using a current approved database with a GNSS non-precision approach procedure for the destination; and

(b) if carrying out a non-precision approach procedure or missed approach procedure — must not use a GNSS with data that has been manually entered.

(2) Subject to subclause (3), if the PIC is carrying out a RNAV(GNSS) non-precision approach procedure that has passed the initial approach fix but has not arrived at the final approach fix, he or she must carry out a missed approach procedure if there is:

(a) a RAIM warning or other reason to doubt the validity of GNSS-derived information; or

(b) RAIM loss.

(3) If a RAIM warning or RAIM loss ends before the PIC commences a missed approach procedure, he or she may execute the missed approach using GPS-derived information.

(4) If there is reason to doubt the validity of GNSS derived arrival information, the PIC must adopt procedures appropriate to loss of GNSS as a navigation aid.

(5) The PIC of an aircraft may use approved GNSS as a navigation aid for descent below the relevant ***LSALT*** or minimum sector altitude (***MSA***) in accordance with this section.

30.71 Use of GNSS in VFR operations

(1) GNSS may be used under the VFR for the following:

(a) to supplement map reading and other visual navigation techniques;

(b) in operations at night — for:

(i) position fixing and long-range navigation; or

(ii) operations on designated PBN routes, including application of PBN-based LSALT;

(iii) deriving distance information for en route navigation, traffic separation and ATS separation;

(iv) meeting the night VFR requirements for radio navigation systems and alternate aerodrome requirements in this MOS.

Note ATS may apply PBN-based separation standards to aircraft meeting the requirements for night VFR PBN.

(2) If GNSS is used for night VFR PBN applications, the flight crew must be appropriately qualified for the night VFR PBN application.

30.72 Operating without RAIM on domestic en route phase of flight

(1) If there is RAIM loss or loss of integrity on a domestic en route phase of a flight while using GNSS, the PIC must:

(a) monitor the aircraft's track by reference to the other navigation aids with which the aircraft is equipped; or

(b) carry out procedures for the loss of navigation equipment, as set out in one of the following:

(i) the operator's operations manual;

(ii) the AFM;

(iii) the GNSS manufacturer's instructions;

(iv) the RAIM loss or loss of integrity procedures published by CASA for this section.

(2) If the PIC on a domestic en route phase of flight is using GNSS within a control area, he or she must advise ATS if:

(a) there is RAIM loss or loss of integrity for more than 5 minutes; or

(b) RAIM or data integrity is not available when ATS requests the provision of GNSS-derived information; or

(c) RAIM or data integrity is not available when ATS grants a clearance, or imposes a requirement, based on GNSS-derived information; or

(d) the GNSS receiver is in dead reckoning mode, or experiences loss of its navigation function, for more than 1 minute; or

(e) the indicated displacement of the aircraft from the centre line of its track is found to exceed 2 NM.

(3) If:

(a) valid position information is lost, with the GNSS receiver being placed in 2-dimensional or dead reckoning mode; or

(b) there is RAIM loss for more than 5 minutes;

then the PIC must use another means of navigation until RAIM is restored and the aircraft is re-established on track.

(4) If RAIM has been lost for more than 5 minutes, the PIC:

(a) must not use GNSS-derived information or supply it to ATS; and

(b) after RAIM is restored — must notify ATS before using or supplying RAIM information.

(5) After RAIM or data integrity is restored, the PIC must notify ATS of the restoration before GNSS-derived information is used.

(6) When advising ATS that RAIM has been lost for more than 5 minutes or of its subsequent restoration, the PIC must use the expression “RAIM failure” or “RAIM restored”.

(7) If GNSS-derived information is supplied to ATS when RAIM has been unavailable for less than 5 minutes, the PIC must conclude the report with the expression “Negative RAIM”.

30.73 Use and supply of GNSS-derived distance information

(1) This section applies if the PIC of an aircraft is using approved GNSS.

(2) If ATS asks for distance information without specifying the source of the information, the PIC may provide GNSS-derived distance information.

(3) If ATS asks for a DME distance, the PIC may provide GNSS-derived distance information if a DME distance is not available.

(4) When supplying GNSS-derived distance information to ATS, the PIC must include the source and the point of reference.

Note Here are examples of source and the point of reference: *“115 GNSS ML VOR”, “80 GNSS CTM NDB”, “267 GNSS BEEZA”*.

(5) The PIC may only supply GNSS-derived distance information by reference to waypoints, navigation aids and other relevant data from a current approved database.

30.74 GNSS arrivals, and DME or GNSS arrivals

(1) The PIC of an aircraft may use approved GNSS in a GNSS arrival, or a DME or GNSS arrival only if:

(a) the coordinates of the destination VOR or NDB to which the procedure relates are obtained from a current approved database; and

(b) RAIM or data integrity is available at the time of descending below the applicable LSALT or MSA.

(2) During a DME or GNSS arrival, the PIC must:

(a) use the destination VOR or NDB to provide the primary track guidance; and

(b) if there is a significant disparity between the track guidance provided by the destination VOR or NDB and the GNSS track indication — discontinue the arrival procedure.

(3) The PIC must immediately conduct a missed approach if, at any time during the approach:

(a) there is doubt as to the validity of the GNSS information (for example, RAIM warning); or

(b) GNSS integrity is lost (for example, RAIM not available).

(4) For the purposes of paragraph (2) (b), a significant disparity is:

(a) for an NDB — a divergence of more than 6.9°; and

(b) for a VOR — a divergence of more than 5.2°.

(5) The PIC of an aircraft may use approved GNSS as a navigation aid for descent below the relevant ***LSALT*** or minimum sector altitude (***MSA***) in accordance with this section.

30.75 Use of GNSS instead of DME

(1) Approved GNSS may be used instead of DME for instrument approaches for which DME is required, but only if:

(a) the substituted DME reference position can be selected from the database; and

(b) the reference position used is annotated on the approach chart.

(2) The PIC of an aircraft may use approved GNSS as a navigation aid for descent below the relevant ***LSALT*** or minimum sector altitude (***MSA***) in accordance with this section.

Part 30 Aircraft systems, including instruments, indicators and equipment

Division 30.17 Aircraft computers

30.76 Purpose

This Division applies to a flight of an aircraft if it is fitted with a computerised navigation system whose database may be used by a pilot for a flight.

30.77 Computerised navigation systems — databases

(1) The data in the computerised navigation system's database must be:

(a) current for the flight; and

(b) in a form that ensures the navigational information within the database cannot be changed by the operator or a pilot; and

(c) for an Australian registered aircraft — supplied by a data service provider authorised for that purpose under Part 175 of CASR.

(2) Updating of the computerised navigation system's database must be carried out in accordance with the instructions issued by the manufacturer of the system.

(3) Without affecting subsection (2), the database may be updated by a pilot for a flight only if the pilot is:

(a) qualified under Part 61 of CASR to fly the aircraft using the system; and

(b) authorised in writing by the aircraft operator to update the system.

30.78 Computerised navigation systems — requirements

(1) This section applies if the computerised navigation system is used for one of the following flights:

(a) an IFR flight;

(b) a VFR flight by night.

(2) For subsection (1):

(a) the system must be operated in accordance with instructions issued by the manufacturer of the system; and

(b) any data that is manually entered into the system must be checked against published navigational data.

30.79 Computerised navigation systems — additional requirements for 2 pilot operations

(1) This section applies if:

(a) the computerised navigation system is used for an IFR flight, or a VFR flight by night; and

(b) the aircraft is flown by 2 pilots as required by or under the Regulations or the AFM.

(2) Any data that is manually entered into the system by one of the pilots must be checked against published navigational data by the other pilot.

Part 30 Aircraft systems, including instruments, indicators and equipment

Division 30.18 Radio communications equipment

30.80 Aircraft to be fitted with radio communication equipment

(1) An aircraft for a flight for which radio communication is required in accordance with Table 30.80 (1), must, as a minimum, be fitted with a radio communication system that is capable of continuous communication on all frequencies necessary to meet reporting, broadcast and listening watch requirements.

(2) For subsection (1), an aircraft in an operation mentioned in column 1 of an item in Table 30.80 (1), in the class of airspace mentioned in column 2 of the item, must be fitted with radio communication systems that meet the requirements mentioned in column 3 of the item.

(3) The radio communication system must be as follows:

(a) approved by the CASA under Part 21 of CASR; and

(b) serviceable at the beginning of the flight.

Table 30.80 (1) Radio communication systems — requirements

Item	Operation Column 1	Class of airspace Column 2	Requirements Column 3
1	IFR	Any Class (Class A, B, C, D, E, and G)	1. At least 1 VHF radio communication system is required. 2. At least 1 radio communication system fitted to the aircraft must be capable of continuous communication with ATS for the duration of a flight. 3. A HF radio communication system fitted to the aircraft must only be used for communication with ATS when beyond the range of VHF communication.
2	NVFR	Any Class (Classes A, B, C, D, E, and G)	At least 1 VHF radio communication system is required.
3	VFR	Classes A, B, C, D and E	At least 1 VHF radio communication system is required.
4	VFR	Class G — from 5 000 ft and above	At least 1 VHF radio communication system is required.

Item	Operation Column 1	Class of airspace Column 2	Requirements Column 3
5	VFR	Class G — at aerodromes where the carriage and use of radio is required under by or under the Regulations.	At least 1 VHF radio communication system is required. *Note* Regulation 91.520 of CASR requires the carriage of radio in the vicinity of certain non-controlled aerodromes.

30.81 Radio communications systems – light sport and experimental aircraft

(1) In this section:

relevant aircraft means any of the following:

(a) an aircraft for which a certificate of airworthiness as an LSA has been issued and is in force;

(b) an LSA for which an experimental certificate has been issued and is in force under paragraph 21.191 (k) of CASR;

(c) any other aircraft for which an experimental certificate has been issued and is in force under paragraph 21.191 (g), (h) or (j) of CASR.

(2) Paragraph 30.80 (3) (a) does not apply to a relevant aircraft if the aircraft is fitted with a system, approved in writing by CASA, which provides the pilot with the same radio communication capability as would be provided through compliance with section 30.80 (3) (a).

Part 30 Aircraft systems, including instruments, indicators and equipment

Division 30.19 Transponders and surveillance equipment

30.82 Definitions

In this Division:

ADS-B means automatic dependent surveillance – broadcast.

ADS-B OUT means the capability of an aircraft or vehicle to periodically broadcast position and other information for surveillance purposes.

aircraft address means the unique 24 bit binary code available for assignment to an aircraft for the purposes of air-ground communications, navigation and surveillance.

approved GNSS position source means a GNSS position source that is:

(a) authorised by the FAA or EASA in accordance with one of the following:

(i) (E)TSO-C145a;

(ii) (E)TSO-C146a;

(iii) (E)TSO-C196a; or

(b) an alternate GNSS position source meeting the requirements mentioned in section 30.86; or

(c) another system, approved in writing by CASA as having a level of performance equivalent to performance in accordance with paragraph (a) or (b).

approved Mode A/C transponder means a Mode A or Mode C transponder authorised:

(a) by the CASA or the NAA of a recognised country in accordance with (E)TSO-C74a; or

(b) by CASA in accordance with ATSO-1C74c.

approved Mode S transponder means a Mode S transponder that is:

(a) authorised by CASA or the NAA of a recognised country

(b) in accordance with:

(i) (E)TSO-C112; and

(ii) (E)TSO-C166b; or

(c) another system, approved in writing by CASA as having a level of performance equivalent to a system mentioned in paragraph (a).

Note CASA Advisory Circular 21-46 provides guidelines on Mode S transponder equipment.

approved Mode S transponder with ADS-B OUT means an equipment configuration capable of ADS-B out operation on the ground and in flight, and that is one of the following:

(a) an approved Mode S transponder connected to an approved GNSS position source;

(b) an alternate ADS-B OUT equipment configuration meeting the requirements mentioned in section 30.87;

(c) another system approved in writing by CASA as having a level of performance equivalent to a system mentioned in paragraphs (a) or (b).

approved transponder means an approved Mode A/C transponder or an approved Mode S transponder.

ASAO means approved self-administering aviation organisation.

assigned aircraft address means an aircraft address that is assigned to an aircraft by:

(a) when the aircraft is registered on the Australian Civil Aircraft Register — CASA; or

(b) when the aircraft is placed on the ASAO's aircraft register — the relevant ASAO for the aircraft;

(c) when the aircraft is a foreign registered aircraft — the relevant NAA.

DAPs means Mode S EHS downlink aircraft parameters.

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.

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, of EASA.

FDE means Fault Detection and Exclusion, a feature of a GNSS receiver that excludes faulty satellites from position computation.

HPL means the Horizontal Protection Level of the GNSS position of an aircraft as an output of the GNSS receiver or system.

Mode A is a transponder function that transmits a 4-digit octal identification code for an aircraft's identity when interrogated by an SSR.

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 identification code for an aircraft's pressure altitude when interrogated by an SSR.

Mode S is a transponder function that uses a unique aircraft address to selectively call individual aircraft. It supports advanced surveillance using Mode S EHS, Mode S ELS, or Mode S ES capabilities.

Mode S EHS means Mode S enhanced surveillance, which is a data transmission capability of a Mode S transponder.

Mode S ELS means Mode S elementary surveillance, which is a data transmission capability of a Mode S transponder.

Mode S ES means Mode S extended squitter, which is a data transmission capability of a Mode S transponder used to transmit ADS-B OUT information.

NACp means Navigation Accuracy Category – Position as specified in 2.4.3.2.7.2.7 of RTCA/DO-260B.

NIC means Navigation Integrity Category as specified in paragraph 2.2.3.2.7.2.6 of RTCA/DO-260A.

NUCp means Navigation Uncertainty Category – Position as specified in paragraph 2.2.8.1.5 of RTCA/DO-260.

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 Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services – Broadcast (TIS-B)*, dated 2 December 2009.

surveillance radar means radar equipment used by ATC to determine the position of an aircraft.

secondary surveillance radar (SSR) means a surveillance radar system that is used to interrogate aircraft equipped with transponders.

SIL means Source Integrity Level as specified in paragraph 2.2.3.2.7.2.9 of RTCA/DO-260B.

transponder means an aircraft's secondary surveillance radar (SSR) transponder.

30.83 Carriage of transponders and surveillance equipment

(1) An aircraft for a flight for which a transponder is required under this section must be fitted with an approved transponder that meets the requirements relevant to the intended operation and class of airspace.

(2) An approved transponder must be:

(a) approved by CASA under Part 21 of CASR; and

(b) serviceable at the beginning of the flight.

(3) For subsection (1), an aircraft in an operation mentioned in column 1 of an item in Table 30.83 (3), in the class of airspace mentioned in column 2 of the item, must be fitted with surveillance equipment meeting the requirements mentioned in column 3 of the item.

Table 30.83 (3) Surveillance equipment — requirements

Item	Operation Column 1	Class of airspace Column 2	Requirements Column 3
1	IFR	Any (Class A, B, C, D, E and G)	At least 1 approved Mode S transponder with ADS-B OUT.
2	Any (IFR or VFR)	Class C — at certain aerodromes	For an aircraft operating at one of the following aerodromes: (a) Brisbane (YBBN); (b) Sydney (YSSY); (c) Melbourne (YMML); (d) Perth (YPPH); — at least 1 approved Mode S transponder. *Note* An approved Mode S transponder fitted to an aircraft is required to be ADS-B capable, but ADS-B

Item	Operation Column 1	Class of airspace Column 2	Requirements Column 3
			transmission is not required for VFR flight.
3	VFR	Class A, B, C, or E	(a) For an aircraft first issued with a certificate of airworthiness on or after 6 February 2014, or modified by having its transponder replaced on or after 6 February 2014 — at least 1 approved Mode S transponder; or (b) for any other aircraft — at least 1 approved transponder. *Note* An approved Mode S transponder fitted to an aircraft is required to be ADS-B capable, but ADS-B transmission is not required for VFR flight.
4	VFR	Class G — from 10 000 ft and above	(a) For an aircraft first issued with a certificate of airworthiness on or after 6 February 2014, or modified by having its transponder replaced on or after 6 February 2014 — at least 1 approved Mode S transponder; or (b) for any other aircraft — at least 1 approved transponder. *Note* An approved Mode S transponder fitted to an aircraft is required to be ADS-B capable, but ADS-B transmission is not required for VFR flight.
5	VFR	Class A — from FL 290 and above	(a) For an aircraft first issued with a certificate of airworthiness on or after 6 February 2014, or modified by having its transponder replaced on or after 6 February 2014 — at least 1

Item	Operation Column 1	Class of airspace Column 2	Requirements Column 3
			approved Mode S transponder with ADS-B OUT; or (b) for any other aircraft — at least 1 approved transponder.

30.84 Operation of transponders — general requirements

(1) Subject to this section, if an approved transponder is fitted to an aircraft for a flight it must be operated at all times.

(3) An aircraft is not required to operate a transponder if ATC issues an instruction that the transponder is not to be operated.

(4) An aircraft for a flight in formation with other aircraft is not required to operate a transponder if a serviceable approved transponder is operated by another aircraft in the formation.

(5) If an aircraft is fitted with more than 1 approved transponder, only 1 transponder is to be operated at any time.

(6) If an approved transponder is fitted to an aircraft for a flight, the Mode A code must be set:

(a) to the transponder code assigned by ATC for the flight; or

(b) if no transponder code is so assigned — to the relevant standard code in Table 30.84 (6).

(7) For paragraph (6) (b), for a situation mentioned in column 1 of an item in Table 30.84 (6), the Mode A code is the number mentioned in column 2 for the same item.

(8) If an approved transponder capable of reporting pressure altitude is fitted to an aircraft for a flight, it must be operated with altitude reporting enabled.

(9) Pressure altitude information reported by an approved transponder must be determined by a barometric encoder of a type authorised by CASA or the NAA of a recognised country in accordance with (E)TSO-C88.

Table 30.84 (6) Transponders — Mode A standard codes

Item	Situation Column 1	Mode A Code Column 2
1	(a) Flights in Class A, C or D airspace. (b) IFR flights in Class E airspace.	3000
2	IFR flights in Class G airspace.	2000
3	VFR flights in Class E or Class G airspace	1200
4	Flights in Class G over water at a distance greater than 15 NM from shore.	4000
5	Flights engaged in coastal surveillance.	7615
6	Ground testing by aircraft maintenance staff	2100

Item	Situation Column 1	Mode A Code Column 2
7	Unlawful interference	7500
8	Loss of radio communication	7600
9	In flight emergency (unless otherwise instructed by ATC).	7700

30.85 Mode S transponders – specific requirements

(1) An approved Mode S transponder fitted to an aircraft for a flight must be configured in accordance with the following:

(a) the assigned aircraft address must be entered into the equipment; and

(b) as far as practicable for the equipment — with 1 of the following forms of aircraft flight identification entered into the equipment:

(i) if a flight notification is filed with ATC for the flight — the aircraft identification mentioned on the flight notification;

(ii) if no flight notification is filed with ATC for the flight — the aircraft registration mark or ASAO identifier as applicable.

(2) An approved Mode S transponder with ADS-B OUT fitted to an aircraft for a flight must be configured in accordance with the following:

(a) the assigned aircraft address must be entered into the equipment; and

(b) with 1 of the following forms of aircraft flight identification entered into the equipment:

(i) if a flight notification is filed with ATC for the flight — the aircraft identification mentioned on the flight notification;

(ii) if no flight notification is filed with ATC for the flight — the aircraft registration mark or ASAO identifier as applicable.

(3) An approved Mode S transponder must transmit each of the following when interrogated on the manoeuvring area of an aerodrome or in flight:

(a) the assigned aircraft address;

(b) the Mode A code;

(c) the Mode C code;

(d) subject to subsection (4) — the aircraft flight identification.

(4) Transmission of the aircraft flight identification by an approved Mode S transponder is optional for an aircraft that was first issued with a certificate of airworthiness before 9 February 2012 (an ***older aircraft***). However, an older aircraft that is equipped to transmit, may transmit its aircraft flight identification.

(5) If the approved Mode S transponder 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 ICAO Annex 10.

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.

(6) If an approved Mode S transponder is fitted to an aircraft first issued with a certificate of airworthiness 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 transponder'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 ICAO Annex 10.

Note Paragraph 3.1.2.10.4.2.1 is recommendatory only.

(7) Subject to subsection (8), an aircraft must not fly in Australian territory if it is fitted with Mode S transponder equipment other than an approved Mode S transponder with ADS-B OUT, 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.

(8) Subsection (7) does not apply to an aircraft if it is undertaking an ADS-B test flight in V.M.C. in airspace below FL290.

30.86 Alternate GNSS position source for ADS-B OUT — requirements

(1) For an aircraft manufactured on or after 8 December 2016, an alternate GNSS position source is acceptable if the source:

(a) is certified by the NAA of a recognised country for use in IFR flight; and

(b) has included in its specification and operation the following:

(i) FDE, computed in accordance with the definition at paragraph 1.7.3 of RTCA/DO-229D;

(ii) the output function HPL, computed in accordance with the definition at paragraph 1.7.2 of RTCA/DO-229D;

(iii) 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.

(2) For an aircraft manufactured before 8 December 2016, an alternate GNSS position source is acceptable if it meets the requirements of subsection (1), other than subparagraph (1) (b) (iii) which is optional.

30.87 Alternate ADS-B OUT equipment configuration — requirements

(1) An alternate ADS-B OUT equipment configuration is acceptable if:

(a) it has been certified by the NAA of a recognised country, during type certification, as meeting the standards of EASA AMC 20-24 or EASA CS-ACNS; and

(b) the AFM or flight manual supplement attests to the certification; and

(c) the GNSS system meets the performance requirements mentioned in 30.86 (1).

(2) An alternate ADS-B OUT equipment configuration is acceptable if:

(a) it has been certified by EASA, during type certification, as meeting the standards of EASA AMC 20-24; and

(b) the AFM attests to the certification; and

(c) the GNSS system meets the performance requirements mentioned in 30.86 (2).

(3) For an aircraft first issued with a certificate of airworthiness on or after 8 December 2016, an equipment configuration is acceptable if:

(a) it has been certified by FAA, during type certification, as meeting the equipment standards of 14 CFR 91.227; and

(b) the AFM attests to the certification; and

(c) the GNSS system meets the performance requirements mentioned in 30.86 (1).

(4) For an aircraft first issued with a certificate of airworthiness before 8 December 2016, an equipment configuration is acceptable if:

(a) it has been certified by FAA, during type certification, as meeting the equipment standards of 14 CFR 91.227; and

(b) the AFM attests to the certification; and

(c) the GNSS system meets the performance requirements mentioned in subsection 30.86 (2).

30.88 Transponders and surveillance equipment – light sport and experimental aircraft

(1) In this section:

relevant aircraft means any of the following:

(a) an aircraft for which a certificate of airworthiness as an LSA has been issued and is in force;

(b) an LSA for which an experimental certificate has been issued and is in force under paragraph 21.191 (k) of CASR;

(c) any other aircraft for which an experimental certificate has been issued and is in force under paragraph 21.191 (g), (h) or (j) of CASR.

(2) Paragraph 30.83 (2) (a) does not apply to a relevant aircraft if the aircraft is fitted with a system, approved in writing by CASA, which provides the pilot and ATC with the same transponder and surveillance capability as would be provided through compliance with paragraph 30.83 (2) (a).

Part 31 Experimental aircraft

31.01 Experimental aircraft — operating requirements

(1) For subparagraph 91.1560 (2) (i) (iii), this section prescribes the requirements for a placard that must be displayed inside an experimental aircraft carrying a passenger.

(2) The placard must be displayed in full view of all passengers and contain the following text (including the specific aircraft information as required):

WARNING

PERSONS FLY IN THIS AIRCRAFT AT THEIR OWN RISK.

THIS AIRCRAFT IS NOT OPERATED TO THE SAME SAFETY STANDARDS AS A NORMAL COMMERCIAL PASSENGER FLIGHT.

CASA DOES NOT SET AIRWORTHINESS STANDARDS FOR EXPERIMENTAL AIRCRAFT.

31.02 Experimental aircraft — operating requirements — populous areas

For subparagraph 91.1560 (3), this section prescribes the requirements relating to conducting operations over populous areas.

RESERVED

31.03 Experimental aircraft — operating requirements — approvals

For subparagraph 91.1560 (4), this section prescribes the requirements relating to conducting operations over public gatherings.

RESERVED

Part 32 Light Sport Aircraft

32.01 Light sport aircraft —operating requirements

(1) For paragraph 91.1605 (2)(c), this section prescribes the requirements for a placard that must be displayed inside a light sport aircraft carrying a passenger.

(2) The placard must be displayed in full view of all passengers and contain the following text (including the specific aircraft information as required):

WARNING

THIS AIRCRAFT WAS MANUFACTURED IN ACCORDANCE WITH LIGHT SPORT AIRCRAFT AIRWORTHINESS STANDARDS AND DOES NOT CONFORM TO STANDARD CATEGORY AIRWORTHINESS REQUIREMENTS.

Part 33 Minimum equipment list

33.01 Contents of minimum equipment list

For subregulation 91.1685(1) this Part prescribes the requirements relating to a minimum equipment list for an aircraft.

33.02 Definitions

(1) In this Part:

category A rectification interval means a rectification interval other than 3 days, 10 days or 120 days.

category B rectification interval means a rectification interval that is 3 days.

category C rectification interval means a rectification interval that is 10 consecutive days.

category D rectification interval means a rectification interval that is 120 consecutive days.

day in relation to a rectification interval for an inoperative item of equipment means the calendar day starting after 12 midnight on the day of discovery of the inoperative item.

day of discovery in relation to an inoperative item of equipment for an aircraft, means the day that information about the inoperative state of the item is recorded in the flight technical log for the aircraft.

equipment means instruments, indicators, items of equipment and systems.

extendable rectification interval means:

(a) a category B rectification interval; or

(b) a category C rectification interval.

item means an item of equipment as defined in this section.

MEL is short for minimum equipment list.

MMEL is short for master MEL.

UTC means Coordinated Universal Time as determined by the International Bureau of Weights and Measures.

Note The Coordinated Universal Time is located at http://www.bipm.org.

(2) A reference in this Part to days (plural) means consecutive days.

33.03 Contents of a MEL

(1) A MEL for an aircraft must include the following:

(a) the name of the operator of the aircraft, including any operating or trading name;

(b) the aircraft type, model, registration mark and serial number;

(c) a list of the items in the aircraft, one or more of which may be inoperative for a flight of the aircraft;

(d) identification of the MMEL on which the MEL is based;

(e) definitions of any unique terms used in the minimum equipment list;

(f) guidance for the use and application of the minimum equipment list;

(g) a statement of whether rectification intervals will be calculated according to the local legal time or UTC.

(2) If the operator intends to extend the rectification interval of an inoperative item in accordance with regulation 91.1700, the procedures the operator will use to extend the rectification interval must be set out in the MEL.

(3) For subsection (2), the procedures must include the following:

(a) who, on behalf of the operator, may extend the rectification interval;

(b) how the operator ensures compliance with the requirements of subregulation 91.1700 (1).

(4) For each item referred to in paragraph 33.03 (1) (c), the MEL must do the following:

(a) describe the item;

(b) specify whether the rectification interval for the item is a category A, B, C or D rectification interval;

(c) set out the conditions or limitations (if any) that must be complied with if the aircraft is to conduct a flight with the item inoperative;

(d) if the aircraft is required to comply with an operational procedure for the conduct a flight with the item inoperative:

(i) set out the operational procedure; or

(ii) if the procedure is in another document — include a reference to the procedures and the document;

(e) if the aircraft requires maintenance to conduct a flight with the item inoperative:

(i) set out the maintenance data; or

(ii) if the maintenance data is in another document — include a reference to the data and the document.

33.04 Compliance with the MMEL

(1) A MEL for an aircraft must be based on the MMEL for the aircraft type.

(2) Subject to subsection 33.05 (2), the MEL for a flight with an inoperative item must not be less operationally restrictive than the MMEL in the same circumstances.

Examples:

1. *If the MMEL for an aircraft specifies a rectification interval for an inoperative item, a MEL for the aircraft must not specify a rectification interval for the item that is less restrictive than the interval specified in the MMEL.*
2. *If the MMEL for an aircraft specifies conditions or limitations that must be complied with if the aircraft is to conduct a flight with an inoperative item, the MEL for the aircraft must include conditions or limitations for the item that are at least as restrictive as the conditions or limitations in the MMEL.*

33.05 Compliance with the Regulations

(1) A MEL must not permit the operation of an aircraft for a flight with an inoperative item if the flight would be in contravention of the Regulations.

(2) If the Regulations permit operation of an aircraft with an inoperative item, the MEL may permit the operation with the inoperative item in accordance with the Regulations even if the MEL is less restrictive than the MMEL.

Examples:

1. *If a provision of the Regulations permits an aircraft to operate for a period with an inoperative item and the period is less restrictive than the rectification interval for the item specified in the MMEL for the aircraft — the rectification interval for the item in the MEL may be based on the period mentioned in the provision.*
2. *If a provision of the Regulations permits an aircraft to operate for a flight with an inoperative item subject to conditions or limitations and the conditions or limitations in the provision are less restrictive than the conditions or limitations in the MMEL for the aircraft — the conditions or limitations specified in the MEL for the item must be at least as restrictive as the conditions or limitations specified in the provision.*

33.06 Compliance with the AFM

A MEL for an aircraft must not permit the operation of the aircraft for a flight, with an inoperative item in contravention of any of the conditions, limitations or emergency procedures specified in the AFM.

33.07 If the MMEL does not specify rectification intervals

If the MMEL for an aircraft type does not specify a rectification interval for an inoperative item, the rectification interval for the item in a MEL for an aircraft of the type must clearly reflect the significance of the item for the safe operation of the aircraft.

33.08 Effects of repairs or modifications made to the aircraft

If:

(a) a repair or modification is made to an aircraft; and

(b) the approval for the repair or modification places a new condition or limitation on the operation of the aircraft for flight with an inoperative item;

then, the conditions or limitations specified in the MEL for the inoperative item must be at least as restrictive as the conditions or limitations specified in the approval for the repair or modification.

33.09 Extension of rectification interval

(1) An extendable rectification interval prescribed by this Part is prescribed for the purposes of paragraph 91.1700 (1) (b).

(2) For subregulation 91.1700 (2), this section prescribes the period by which an original extendable rectification interval may be extended.

Note Category B and Category C rectification intervals are the extendable rectification intervals.

(3) An original Category B rectification interval may be extended up to a maximum of 3 days.

(4) An original Category C rectification interval may be extended up to a maximum of 10 days.

(5) A reference in this section to an original rectification interval (however expressed) is a reference to the relevant rectification interval before any extension of it under this section.

Note The intended effect of subregulation 33.09 (5) is that a rectification interval that has been extended once may not be further extended.