General operating and flight rules
Part 91 of CASR

Date December 2021
Project number OS 99/08
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An Acceptable Means of Compliance (AMC) explains how one or more requirements of the Civil Aviation Safety Regulations 1998 (CASR) for the issue of a certificate, licence, approval or other authorisation, can be met by an individual or organisation applying to the Civil Aviation Safety Authority (CASA) for the authorisation.

AMC are non-binding advisory documents issued by CASA which may be used by persons and organisations to achieve compliance with CASR.

Applicants are not required to utilise an AMC to comply with a legislative requirement but if they do, CASA will issue the authorisation to which the AMC relates.

AMC do not articulate the only way compliance can be achieved. Individuals and operators may, on their own initiative, propose other ways of meeting the requirements of CASR; however, any such proposal will be subject to separate assessment by CASA to determine whether the proposed methods are likely to produce the required legislative outcome.

Guidance material (GM) is non-binding material issued by CASA which helps to illustrate the meaning of a requirement or specification in CASR. It provides explanations of the CASR and sometimes an amplification of the policy intention underpinning the applicable provision of CASR, rather than a means of complying with it. GM should be read in conjunction with the applicable provision of CASR and AMC. GM is identified by grey shaded text.
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This version of the AMC and GM document is approved by the Branch Manager, Flight Standards.

Note: Changes made in the current version are annotated with change bars.

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<td>v2.2</td>
<td>December 21</td>
<td>Added references to additional exemptions incorporated into EX81/21 by EX146/21. Added reference to the transitional approvals arising from CASA EX161/21. Added reference to the existing exemption relating to the conduct of aerial application operations under Part 137 of CASR which is CASA EX129/19.</td>
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<td>v2.1</td>
<td>November 21</td>
<td>Added information on air displays and aerobatics, and landing on wet runways guidance from CAAP 235-5 (the CAAP is being withdrawn on 2 December 2021).</td>
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<tr>
<td>v2.0</td>
<td>October 21</td>
<td>Addition of guidance material and editorial changes. Added references to exemptions and directions.</td>
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<td>v1.0</td>
<td>December 20</td>
<td>Initial AMC and GM.</td>
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# Reference material

## 1.1 Acronyms

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<td>Air Defence Identification Zone</td>
</tr>
<tr>
<td>AFM</td>
<td>aircraft flight manual</td>
</tr>
<tr>
<td>AGL</td>
<td>above ground level</td>
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<tr>
<td>AIP</td>
<td>Aeronautical Information Publication</td>
</tr>
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<td>AIRAC</td>
<td>Aeronautical Information Regulation and Control</td>
</tr>
<tr>
<td>AMC</td>
<td>acceptable means of compliance</td>
</tr>
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<td>AOD</td>
<td>alcohol and other drugs</td>
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<tr>
<td>APCH</td>
<td>Approach</td>
</tr>
<tr>
<td>APU</td>
<td>auxiliary power unit</td>
</tr>
<tr>
<td>AR</td>
<td>approval required</td>
</tr>
<tr>
<td>ASAO</td>
<td>approved self-administering organisation</td>
</tr>
<tr>
<td>ATC</td>
<td>air traffic control</td>
</tr>
<tr>
<td>ATS</td>
<td>air traffic services</td>
</tr>
<tr>
<td>ATSB</td>
<td>Australian Transport Safety Bureau</td>
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<tr>
<td>CAS</td>
<td>calibrated airspeed</td>
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<td>CASA</td>
<td>Civil Aviation Safety Authority</td>
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<td>CASR</td>
<td><em>Civil Aviation Safety Regulations 1998</em></td>
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<tr>
<td>CAT</td>
<td>category</td>
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<tr>
<td>CoFA</td>
<td>Certificate of Airworthiness</td>
</tr>
<tr>
<td>DAMP</td>
<td>drug and alcohol management plan</td>
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<tr>
<td>DME</td>
<td>distant measuring equipment</td>
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<tr>
<td>EC</td>
<td>electronic conspicuity</td>
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<tr>
<td>ERC</td>
<td>en-route chart</td>
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<tr>
<td>EVDS</td>
<td>electronic visual distress signals</td>
</tr>
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<td>GM</td>
<td>guidance material</td>
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<tr>
<td>GNSS</td>
<td>Global Navigation Satellite System</td>
</tr>
<tr>
<td>HLS</td>
<td>helicopter landing site</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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<td>---------</td>
<td>-----------------------------------------------------------------</td>
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<tr>
<td>ICAO</td>
<td>International Civil Aviation Organization</td>
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<td>IFR</td>
<td>instrument flight rules</td>
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<td>IRM</td>
<td>immediately reportable matter</td>
</tr>
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<td>IMC</td>
<td>instrument meteorological conditions</td>
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<tr>
<td>LPV</td>
<td>localiser performance with vertical navigation</td>
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<tr>
<td>LNAV</td>
<td>lateral navigation</td>
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<td>LSA</td>
<td>light sport aircraft</td>
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<td>LSALT</td>
<td>lowest safe altitude</td>
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<td>MEL</td>
<td>minimum equipment list</td>
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<td>MMEL</td>
<td>master minimum equipment list</td>
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<td>MOS</td>
<td>Manual of Standards</td>
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<td>MTOW</td>
<td>maximum take-off weight</td>
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<td>NM</td>
<td>nautical mile</td>
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<td>NOTAM</td>
<td>notice to airmen</td>
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<td>NOTOC</td>
<td>notification to the captain</td>
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<td>NVIS</td>
<td>night vision imaging system</td>
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<td>PAL</td>
<td>pilot activated lighting</td>
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<tr>
<td>PBN</td>
<td>performance-based navigation</td>
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<tr>
<td>PED</td>
<td>portable electronic device</td>
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<tr>
<td>PIC</td>
<td>pilot in command</td>
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<tr>
<td>PRM</td>
<td>precision runway monitor</td>
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<tr>
<td>RNP</td>
<td>required navigation performance</td>
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<tr>
<td>RRM</td>
<td>routinely reportable matter</td>
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<tr>
<td>RVSM</td>
<td>reduced vertical separation minimum</td>
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<td>RWY</td>
<td>runway</td>
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<td>SFP</td>
<td>special flight permit</td>
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<tr>
<td>SSAA</td>
<td>safety sensitive aviation activity</td>
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<tr>
<td>TODA</td>
<td>take-off distance available</td>
</tr>
<tr>
<td>TSO</td>
<td>Technical Standards Order</td>
</tr>
<tr>
<td>VFR</td>
<td>visual flight rules</td>
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<tr>
<td>VMC</td>
<td>visual meteorological conditions</td>
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1.2 Definitions

Terms that have specific meaning within this AMC and GM are defined in the table below. Where definitions from the civil aviation legislation have been reproduced for ease of reference, these are identified by 'grey shading'. Should there be a discrepancy between a definition given in this AMC and GM and the civil aviation legislation, the definition in the legislation prevails.

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<th>Definition</th>
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<td>Act</td>
<td>Civil Aviation Act 1988</td>
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<tr>
<td>aerial work</td>
<td>An external load operation, a dispensing operation or a task specialist operation.</td>
</tr>
<tr>
<td>air transport operation</td>
<td>1. An air transport operation is a passenger transport operation, a cargo transport operation or a medical transport operation, that:</td>
</tr>
<tr>
<td></td>
<td>a. is conducted for hire or reward; or</td>
</tr>
<tr>
<td></td>
<td>b. is prescribed by an instrument issued under regulation 201.025.</td>
</tr>
<tr>
<td>Australian aircraft</td>
<td>a. aircraft registered in Australia; and</td>
</tr>
<tr>
<td></td>
<td>b. aircraft in Australian territory, other than foreign registered aircraft and state aircraft.</td>
</tr>
<tr>
<td>Australian territory</td>
<td>a. the territory of Australia and of every external Territory;</td>
</tr>
<tr>
<td></td>
<td>b. the territorial sea of Australia and of every external Territory; and</td>
</tr>
<tr>
<td></td>
<td>c. the air space over any such territory or sea.</td>
</tr>
<tr>
<td>authorised aeronautical</td>
<td>Aeronautical maps, charts and other aeronautical information relevant to the route of the flight, and any probable diversionary route, that are published:</td>
</tr>
<tr>
<td>information</td>
<td>a. if paragraph (b) does not apply:</td>
</tr>
<tr>
<td></td>
<td>i. in the AIP; or</td>
</tr>
<tr>
<td></td>
<td>ii. by a data service provider; or</td>
</tr>
<tr>
<td></td>
<td>iii. in NOTAMs; or</td>
</tr>
<tr>
<td></td>
<td>b. for a flight in a foreign country:</td>
</tr>
<tr>
<td></td>
<td>i. in the document that in that country is equivalent to the AIP; or</td>
</tr>
<tr>
<td></td>
<td>ii. by an organisation approved to publish aeronautical information by the national aviation authority of that country.</td>
</tr>
<tr>
<td>authorised person</td>
<td>for a provision of CASR in which the expression occurs, a person who is appointed under regulation 201.001 to be an authorised person for the CASR or the provision</td>
</tr>
<tr>
<td>basic HLS</td>
<td>A place used for infrequent, opportune or short-term rotorcraft operations</td>
</tr>
<tr>
<td>cargo</td>
<td>Things other than persons carried, or to be carried, on an aircraft.</td>
</tr>
<tr>
<td>cargo transport operation</td>
<td>An operation of an aircraft that involves the carriage of cargo and crew only, but does not include the following:</td>
</tr>
<tr>
<td></td>
<td>a. an operation conducted for the carriage of the possessions of the operator or the pilot-in-command for the purpose of business or trade;</td>
</tr>
<tr>
<td></td>
<td>b. a medical transport operation.</td>
</tr>
<tr>
<td>carry-on baggage</td>
<td>Baggage or personal effects taken into, or to be taken into, the cabin of an aircraft, for carriage on the aircraft, by:</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>------------------------------</td>
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</tr>
<tr>
<td>a. person (including a crew member of the aircraft) travelling on the aircraft; or</td>
<td>a member of the personnel of the operator of the aircraft on behalf of a person mentioned in paragraph (a).</td>
</tr>
<tr>
<td>b. a member of the personnel of the operator of the aircraft on behalf of a person mentioned in paragraph (a).</td>
<td></td>
</tr>
<tr>
<td>fuelling</td>
<td>Includes refuelling and defuelling.</td>
</tr>
<tr>
<td>high seas</td>
<td>Refer to GM 91.015.</td>
</tr>
<tr>
<td>highly volatile fuel</td>
<td>Means:</td>
</tr>
<tr>
<td>a. aviation gasoline; or</td>
<td>a hydrocarbon mixture that spans the gasoline and kerosene boiling ranges; or</td>
</tr>
<tr>
<td>b. a hydrocarbon mixture that spans the gasoline and kerosene boiling ranges; or</td>
<td>a mixture of aviation gasoline and a hydrocarbon mixture mentioned in paragraph (b).</td>
</tr>
<tr>
<td>IFR pick-up</td>
<td>A pilot procedure whereby a flight operating to the IFR in Class G airspace changes to VFR upon entering Class E airspace whilst awaiting an airways clearance.</td>
</tr>
<tr>
<td>instrument approach procedure</td>
<td>A series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix or, where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en-route obstacle clearance criteria apply.</td>
</tr>
<tr>
<td>misfuelling</td>
<td>Delivering the incorrect type of fuel into an aircraft.</td>
</tr>
<tr>
<td>Part 103 aircraft</td>
<td>An aircraft that is not registered and is any of the following:</td>
</tr>
<tr>
<td>a. a powered parachute;</td>
<td>b. a gyroglider;</td>
</tr>
<tr>
<td>b. a gyroglider;</td>
<td>c. a hang glider or powered hang glider;</td>
</tr>
<tr>
<td>c. a hang glider or powered hang glider;</td>
<td>d. a paraglider or powered paraglider;</td>
</tr>
<tr>
<td>d. a paraglider or powered paraglider;</td>
<td>e. a rotocraft prescribed by the Part 103 Manual of Standards for the purposes of this definition;</td>
</tr>
<tr>
<td>e. a rotocraft prescribed by the Part 103 Manual of Standards for the purposes of this definition;</td>
<td>f. a weight-shift-controlled aeroplane prescribed by the Part 103 Manual of Standards for the purposes of this definition;</td>
</tr>
<tr>
<td>f. a weight-shift-controlled aeroplane prescribed by the Part 103 Manual of Standards for the purposes of this definition;</td>
<td>g. any other aeroplane prescribed by the Part 103 Manual of Standards for the purposes of this definition.</td>
</tr>
<tr>
<td>Part 131 aircraft</td>
<td>A manned free balloon or a hot air airship.</td>
</tr>
<tr>
<td>passenger transport operation</td>
<td>An operation of an aircraft that involves the carriage of passengers, whether or not cargo is also carried on the aircraft, but does not include the following:</td>
</tr>
<tr>
<td>a. an operation of an aircraft with a special certificate of airworthiness;</td>
<td>b. a cost-sharing flight;</td>
</tr>
<tr>
<td>b. a cost-sharing flight;</td>
<td>c. a medical transport operation.</td>
</tr>
<tr>
<td>portable electronic device</td>
<td>Lightweight, electrically-powered equipment including a mobile phone, music player, e-reader, tablet computer, laptop computer, portable video game console, or camera.</td>
</tr>
<tr>
<td>prescribed aircraft</td>
<td>Aircraft being used for a prescribed air service.</td>
</tr>
<tr>
<td>prescribed air service</td>
<td>Any of the following:</td>
</tr>
<tr>
<td>a. a regular public transport operation;</td>
<td></td>
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<tr>
<td>Term</td>
<td>Definition</td>
</tr>
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<td>-----------------------------------------------------------------------------</td>
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<tr>
<td>b.</td>
<td>an air service in which a jet is used;</td>
</tr>
<tr>
<td>c.</td>
<td>an air service in which an aircraft with a certified MTOW greater than</td>
</tr>
<tr>
<td></td>
<td>5,700 kg is used.</td>
</tr>
<tr>
<td>secondary HLS</td>
<td>A place suitable for use as an aerodrome for helicopter operations by day or</td>
</tr>
<tr>
<td></td>
<td>night that is not certified in accordance with Part 139.</td>
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### 1.3 References

#### Legislation


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<td>Division 3 (Weapons)</td>
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<td>Civil Aviation Act 1988</td>
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<td>Civil Aviation Regulations</td>
<td>Civil Aviation Regulations 1988</td>
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<td>Civil Aviation Safety Regulations</td>
<td>Civil Aviation Safety Regulations 1998</td>
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<tr>
<td>Crimes Act 1914</td>
<td>Sections 37C (use of force in making arrest) and 37D (persons to be</td>
</tr>
<tr>
<td></td>
<td>informed of ground of arrest)</td>
</tr>
<tr>
<td>Disability Discrimination Act</td>
<td>Disability Discrimination Act 1992</td>
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<td>Part 21 of CASR</td>
<td>Certification and airworthiness requirements for aircraft and parts</td>
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<td>Part 91 of CASR</td>
<td>General operating and flight rules</td>
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<tr>
<td>Part 91 MOS</td>
<td>Part 91 (General operating and flight rules) Manual of Standards 2020</td>
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<td>Part 92 of CASR</td>
<td>Consignment and carriage of dangerous goods by air</td>
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<td>Unmanned aircraft and rockets</td>
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<td>Radiocommunications Act 1992</td>
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<td>United Nations Convention on the Law of the Sea</td>
<td>Article 86 (definition of 'high seas')</td>
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<td>Part 91 of CASR - Supplementary Exemptions and Directions Instrument 2021</td>
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<td>Part 121 and 91 Part of CASR – Supplementary Exemptions and Directions Instrument 2021</td>
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<td>Part 133 and Part 91 of CASR – Supplementary Exemptions and Directions Instrument 2021</td>
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<td>Restricted Category Aircraft – Certification</td>
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<td>Primary Category Aircraft - Certification</td>
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| AC 91-25 | Fuel and oil safety |
| AC 91-27 | Non-precision approaches and approaches with vertical guidance  
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| AC 91-28 | Crew safety during turbulence |
| AC 91-29 | Guidelines for helicopters - suitable places to take off and land (under development) |
| AC 92A-01 | The consignment and carriage of dangerous goods on all aircraft in Australian territory and on Australian aircraft overseas: An overview of the legislative framework and procedures |
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| AC 133-01 | Performance class operations |
| AC 133-02 | Performance Class 2 with exposure operations |
| AC 133-03 | Performance Class 3 operations over populous areas  
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| CAAP 5.23-1 | Multi-engine operations and training |
| CAAP 37-1 | Minimum Equipment Lists (MEL) |
| CAAP 48-01 | Fatigue management for flight crew members |
| CAAP 92-2(2) | Guidelines for the establishment and operation of onshore Helicopter Landing Sites  
**Note:** Flight operations related information in this CAAP (although not yet deleted out of the CAAP) has been replaced by AC 91-29. |
### Document Title

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### Other material

International Civil Aviation Organization (ICAO) documents are available for purchase from [http://store1.icao.int/](http://store1.icao.int/)

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2 Subpart 91.A—Preliminary

There is a Part 11 direction in force in relation to crew members carrying out audits, checks, examinations etc. Operators and pilots are advised to review section 9 of CASA EX81/21.

GM 91.005 Application of Part 91—Australian aircraft in Australian territory

*Australian aircraft* is defined by the *Civil Aviation Act 1988* (the Act) as:

- aircraft registered in Australia
- aircraft in Australian territory, other than foreign registered aircraft and state aircraft.

Aircraft in Australian territory, other than foreign registered aircraft, refers to aircraft that are operated in Australia but are not registered with CASA. This group of aircraft are generally Part 103 aircraft and are registered with an applicable Approved Self-Administering Organisation (ASAO). Part 149 prescribes the rules for ASAOs.

GM 91.010 Application of Part 91—Australian aircraft in foreign countries

For an Australian aircraft operated in a foreign country, both Part 91 and the aviation laws of the foreign country apply. Where there is an inconsistency, the pilot in command (PIC) must comply with the relevant law of the foreign country.

GM 91.015 Application of Part 91—Australian aircraft over the high seas

Reserved.

GM 91.020 Application of Part 91—foreign registered aircraft

Reserved.

GM 91.025 Application of Part 91—foreign state aircraft

Reserved.

GM 91.030 Application of Part 91—aircraft to which Part 101, 103 or 131 applies

Reserved.

GM 91.035 Application of Part 91—certain provisions of this Part do not apply if provisions of Part 105, 121, 133, 135 or 138 apply

Reserved.

GM 91.040 Issue of Manual of Standards for Part 91

Refer to AC 1-01 - Understanding the legislative framework for guidance on the Australian legislative framework including explanation of the purpose of a Manual of Standards (MOS).

GM 91.045 Approvals by CASA for Part 91

This regulation authorises CASA to issue approvals under Part 91 where a provision of Part 91, or the Part 91 MOS, makes reference to a CASA approval. All approvals granted by CASA
under Part 91 are subject to the procedural requirements of Part 11. This requires CASA to have regard to the safety of air navigation.

It should be noted that the approvals required for certain flights of experimental certificate aircraft under regulations within Division 91.T.4, may be subject to the safety standard mentioned in subregulation 11.055 (1C) of CASR if the approval requires the issuance or re-issuance of an experimental certificate.

Forms and templates for approvals are available on the forms and templates page of the CASA website.

91.050 Approvals by authorised persons for Subpart 91.T

It should be noted that the approvals required for certain flights of experimental certificate aircraft under regulations within Division 91.T.4, may be subject to the safety standard mentioned in subregulation 11.055 (1C) of CASR if the approval requires the issuance or re-issuance of an experimental certificate.
3 Subpart 91.C—General

3.1 Division 91.C.1—General flight limitations

AMC 91.055 Aircraft not to be operated in a manner that creates a hazard

Use of radio (broadcasts and reports) under regulation 91.630 and chapter 26 of the Part 91 MOS.

In order to avoid operating an aircraft in a manner that creates a hazard to another aircraft, a person or property, it is an acceptable means of compliance when making radio broadcasts and reports if those broadcasts and reports are:

- made using the standard words and phrases that are used for radio communications and specified in the Australian AIP, or, for foreign jurisdictions, in accordance with the relevant radiotelephony guidance for that jurisdiction
- or
- if using the standard phraseology is not possible, made using words and phrases that directly communicate the relevant information, accompanied by some form of confirmation that the message was received by the intended recipient.

GM 91.055 Aircraft not to be operated in a manner that creates a hazard

This regulation is a very broad outcome-based requirement that is intended to encompass hazards created by the operation of an aircraft to another aircraft, person or property, where the specific element of the operation that led to the hazard is not specifically mentioned elsewhere in the ruleset.

However, an aircraft is not considered to be creating a hazard simply by flying over populous areas in the normal course of navigation, provided the aircraft adheres to the prescribed distances and altitudes outlined in regulation 91.265, as the potential for normal operational hazard is dealt with elsewhere in the ruleset by this provision. As another example, an aircraft conducting a flight test that is part of the activities authorised under an experimental certificate, would not be taken to be operating in a manner that creates a hazard provided the operation is conducted in accordance with the experimental certificate and the underpinning documentation or procedures.

This rule is also intended to create flexibility in enforcement actions, noting that section 20A of the Civil Aviation Act 1988 also states a person must not operate an aircraft being reckless regarding whether the manner of operation could endanger other persons or property, but criminal enforcement of a contravention of that provision is only through a prosecution, whereas CASA can issue an aviation infringement notice for a contravention of regulation 91.055, or a prosecution.

GM 91.060 Unauthorised travel or placing of cargo on aircraft

Reserved.
GM 91.085 NVIS flights
This regulation does not apply if regulation 133.265 or 138.350 applies to an operation.

The operational NVIS requirements are contained in Chapter 3 of the Part 91 MOS. Unique VMC for NVIS are contained in section 2.07 of the Part 91 MOS. NVIS equipment requirements are contained in Division 26.17 of the Part 91 MOS.

Refer to Multi-Part AC 91-13, 133-09 and 138-06 for guidance on NVIS.

GM 91.090 All flights—airspeed limits
There is an exemption in force in relation to this regulation and air displays. Pilots and operators are recommended to review section 20 of CASA EX81/21.

Airspeed limits for the conduct of instrument flight procedures are described in Chapter 4 of the Part 91 MOS and may also be stated in the Aeronautical Information Publication (AIP).

3.2 Division 91.C.2—Operational documents

This Division does not apply if regulation 133.030 or 138.210 applies to an operation.

GM 91.095 Compliance with flight manual etc.
There is a Part 11 direction in force in relation to this regulation. Pilots are advised to review section 5 of CASA EX81/21.

There is an exemption in force in relation to this regulation, which limits the requirement to comply with aircraft flight manual instructions to any requirements or limitations set out in the aircraft flight manual instructions that relate to the aircraft. It is recommended that pilots review section 21 of CASA EX81/21.

There is an exemption in force (CASA EX129/19) for the conduct of aerial application operations under Part 137 that relates to this regulation. The effect of regulation 137.020 means that regulation 137.190 overrides this regulation in limited ways. After this override occurs, relevant operators and persons can then utilise instrument CASA EX129/19 if they elect to do so.

Transitional regulation 202.416A, item 20 of the table (which can be found here - Civil Aviation Legislation Amendment (Flight Operations—Consequential Amendments and Transitional Provisions) Regulations 2021), contains a provision that deems an existing CAR 232 flight check approval to be an exemption, where necessary, from the requirements of this regulation. CASA recommends operators read this regulation to determine its applicability to their operation.

The PIC is required to ensure that the aircraft is operated in accordance with the aircraft flight manual instructions (defined term - see below) for the aircraft. This regulation does not provide CASA the ability to give any concession to a limitation or procedure that is set out in the flight manual.

1 At the time of publishing v2.1 of this AMC/GM, this AC had not yet been published.
The definition of aircraft flight manual instructions is:

*aircraft flight manual instructions*, for an aircraft, means the following documents and information provided by the aircraft’s manufacturer or issued in accordance with a Part 21 approval:

a. the aircraft’s flight manual;
b. checklists of normal, abnormal and emergency procedures for the aircraft;
c. any operating limitation, instructions, markings and placards relating to the aircraft.

The CASR dictionary also defines the meaning of an *aircraft flight manual* (AFM). Under this definition, a reference to a flight manual in the CASR includes the manual produced for the aircraft type certification or another document that contains the aircraft’s operating limitations and other information, including all amendments and supplements to the AFM or other documents, as applicable, required for safe operation of the aircraft.

For older aircraft, the AFM may be referred to as the pilot’s operating handbook (POH), owner’s handbook or owner’s manual.

Part 21 requires each aircraft to be provided with an aircraft flight manual (AFM), placards or other documents stating approved limitations within which the aircraft is considered airworthy (as defined by the appropriate airworthiness requirements), and additional instructions and information necessary for the safe operation of the aircraft.

Aircraft flight manuals are required, under aircraft type certification rules (e.g., FAR Parts 23, 25, 27 and 29 and equivalent EASA rules), to contain a differing mixture of mandatory requirements and non-mandatory (advisory) elements. The balance in a flight manual between the mandatory and advisory material is dependent on which type certification rule applies to the aircraft.

Section 2.3 of *[AC 21-34 Aircraft flight manuals](https://www.casa.gov.au/)* describes these different kinds of flight manual requirements as either “approved”, as in required to be approved by the national aviation authority (NAA) that provides the initial certification of a new aircraft type, or “unapproved”, as in advisory content from the manufacturer that is not required to be approved by the NAA.

The effect of this regulation, as modified by the forthcoming exemption mentioned earlier in this GM entry, is that compliance is only required in relation to the mandatory flight manual elements.

*AC 91-22 Aircraft checklists* contains information on aircraft checklists in the context of this regulation and similar regulations in Parts 121, 133, 135 and 138.

### 3.3 Division 91.C.3—Flight related documents

There are exemptions in force in relation to this Division for Part 121, 133 and 135 operators. Operators are advised to review section 15 of CASA EX83/21 (for Part 121 operators), section 10 of CASA EX84/21 (for Part 133 operators) and section 10 of CASA EX85/21 (for Part 135 operators).
This Division does not apply to Part 131 operations.

**GM 91.100 Electronic documents**

Reserved.

**GM 91.105 Carriage of documents**

There is a Part 11 direction in force in relation to this regulation and recreational aviation medical practitioner's certificates (RAMPC). Pilots are advised to review section 6 of CASA EX81/21.

There is a Part 11 direction in force in relation to this regulation and photographic identity documents. Pilots are advised to review section 7 of CASA EX81/21.

There is an exemption in force in relation to this regulation for pilots of aerial work certificate holders. Operators and pilots are advised to review section 10 of CASA EX86/21.

This regulation does not apply to Part 103 operations.

**GM 91.110 Carriage of documents for certain flights**

The aeronautical information carried should contain data appropriate to the applicable air traffic regulations, rules of the air, flight altitudes, area/route and nature of the operation. Due consideration should be given to carriage of textual and graphic representations of aeronautical data including appropriate information on the following:

- airspace structure
- significant points, navigation aids (navaids) and air traffic services (ATS) routes
- navigation and communication frequencies
- prohibited, restricted and danger areas
- sites of other relevant activities that may present a hazard to the flight
- topographical data, including terrain and obstacle data.

The authorised aeronautical information should be current and in accordance with the Aeronautical Information Regulation and Control (AIRAC) cycle. AIRAC effective dates are shown in the AIP.

This regulation does not apply to Part 103 operations.

**GM 91.115 Carriage of documents—flights that begin or end outside Australian territory**

For flights outside Australia where electronic documents are used to satisfy the Australian carriage of document requirements, it should be noted that electronic copies of the required documents might not satisfy the laws of the relevant foreign country.

This regulation does not apply to Part 103 operations.

**GM 91.120 Journey logs—flights that begin or end outside Australian territory**

The journey log requirements are contained in Chapter 5 of the Part 91 MOS.
3.4 Division 91.C.4—Reporting and recording defects and incidents etc.

Reserved.

3.5 Division 91.C.5—Search and rescue services and emergency and survival equipment

Reserved.

3.6 Division 91.C.6—Miscellaneous requirements for aircraft

GM 91.140 Operating an Australian aircraft outside Australia

An Australian aircraft flown over the high seas must comply with both Part 91 and Annex 2 to the Chicago Convention, Rules of the Air. Where there is inconsistency, the PIC must comply with the requirements of Annex 2.

Article 86 of the United Nations Convention on the Law of the Sea (Montego Bay, 10 December 1982) defines the term ‘high seas’ as all parts of the sea that are not included in the exclusive economic zone, in the territorial sea or in the internal waters of a State, or in the archipelagic waters of an archipelagic State. Territorial waters generally extend 12 nautical miles (NM) from the low water line except for some islands in the Torres Strait. Around those islands, territorial waters extend for 3 NM.

Where the entrance to coastal bays exceeds 24 NM in width, a low water line is created between two points in the bay. Internal waters are those inside this low water line.

Refer to the Geoscience Australia website for more information.

GM 91.145 Requirements to be met before Australian aircraft may fly

This regulation does not apply to Part 103 operations.

A registered aircraft is an aircraft registered under Part 47.

A special flight permit may be issued under regulation 21.200. It may be issued for one or more of the following purposes for an aircraft that may not, at the time, meet the applicable airworthiness requirements:

- flying the aircraft to a base where repairs, alterations, or maintenance are to be performed, or to a point of storage
- delivering or exporting the aircraft
- production flight testing of new production aircraft
- evacuating the aircraft from areas of impending danger
• conducting customer demonstration flights in new production aircraft that have satisfactorily completed production flight tests
• assisting in searching for, bringing aid to or rescuing persons in danger on a particular occasion
• assisting in dealing with a state of emergency
• operation of an aircraft at a weight in excess of its maximum certificated take-off weight for flight beyond the normal range over water, or over land areas where adequate landing facilities or appropriate fuel is not available. The excess weight that may be authorised under this paragraph is limited to the additional fuel, fuel-carrying facilities, and navigation equipment necessary for the flight.

GM 91.150 Operating aircraft with inoperative equipment—placarding
Reserved.

GM 91.155 Manipulating flight controls
Regulation 91.155 makes it an offence for a person to manipulate, or the PIC to permit, a person to manipulate the flight controls of an Australian aircraft, a foreign registered aircraft, a Part 103 aircraft or a Part 131 aircraft, if the person is not authorised to pilot the aircraft by the relevant legislation for piloting the aircraft.

With respect to Australian aircraft, regulation 91.155 has direct relevance to the requirements outlined in subsection 20AB (1) of the Act, and also to requirements under CASR Part 61 regarding who can ‘pilot’ an aircraft.

20AB Flying aircraft without licence etc.

(a) the person holds a civil aviation authorisation that is in force and authorises the person to perform that duty; or
(b) the person is authorised by or under the regulations to perform that duty without the civil aviation authorisation concerned.

There are multiple specifically referenced circumstances in Part 61 where paragraph 20AB(1)(b) of the Act applies rather than paragraph 20AB(1)(a). These are outlined in Subdivision 61.A.3.2 - Other circumstance in which flight crew duties may be performed without a licence, rating or endorsement.

Although the primary purpose of this subdivision is to allow for training, testing and checks of persons in an Australian aircraft before they hold the requisite Part 61 licence, rating or endorsement for the aircraft or the activity to be undertaken in the aircraft, there is an additional purpose contained in regulation 61.130.

Regulation 61.130 - Operation of a helicopter using the auto flight control system without a licence permits a person, such as an air crew member, to pilot a helicopter using an auto flight control system, in the circumstances where the person is approved to do so by the operator and the pilot in command. Auto flight control system (AFCS) is defined in Part 1 of the CASR Dictionary.
The circumstances where the requirements of regulation 61.130 would be required to avoid the offence under regulation 91.155 are:

- a situation where an air crew member controls the helicopter using the auto-hover trim control during auto-hover winching operations or
- where an air crew member enters data or changes modes of the AFCS under the supervision of the pilot in command whilst occupying a flight crew station as part of the minimum crew of the helicopter.

Note: Such operations can only be carried out by appropriately trained and competent air crew members with the approval of the operator and the pilot in command. Additionally, for the purposes of Parts 133 and 138, they would need to be conducted in accordance with the procedures for these operations outlined in the operator's exposition or operations manual.

### 3.7 Division 91.C.7—Firearms on aircraft

**GM 91.160 Possessing firearm on aircraft**

The Aviation Transport Security Act 2004 prescribes that firearms can only be carried by certain people on prescribed aircraft.

A prescribed aircraft is:

- a regular public transport operation
- an air service in which a jet is used
- an air service in which an aircraft with a certified maximum take-off weight (MTOW) greater than 5 700 kg is used.

Note: While the phrase ‘regular public transport’ is not part of CASR, it is used in the Aviation Transport Security Regulations to refer to a certain type of operation. Refer to the Aviation Transport Security Regulations 2005 for detail on the phrase.

The Aviation Transport Security Act 2004 and associated regulations prescribe requirements for carriage of firearms on prescribed aircraft, including people that are permitted to do so.

Part 91 prescribes requirements for carriage of firearms on an aircraft that is not a prescribed aircraft. CASA approval is not required to carry or possess a firearm on an aircraft that is not a prescribed aircraft. However, before doing so, a person must have the permission of the operator or the PIC.

A non-prescribed aircraft is one used in Part 91 operations, or propeller-powered aeroplanes, or rotorcraft, with an MTOW less than or equal to 5 700 kg used in non-scheduled air transport operations.

When providing permission for passengers to carry or possess firearms on board an aircraft, the PIC should consider the following:

- the person’s appropriate current Federal, State or Territory licence to possess the firearm
- the person should not perform any duty as a flight crew member while having a firearm in their possession
• the firearm should be unloaded at all times, unless discharge of the firearm is permitted by Part 138
• only the following types of firearms should be taken on the aircraft:
  – shotguns
  – semi-automatic shotguns
  – net guns
  – anaesthetising guns
  – rifles
  – semi-automatic rifles
  – handguns
  – other types of guns in secured cases.
• the PIC of the aircraft should not handle the firearm at any time during the flight
• applicable state and territory laws.

Note: Regulation 138.432 prescribes requirements for possessing and discharging firearms for aerial work operations.

Ammunition is classified as dangerous goods. The carriage of ammunition on board an aircraft conducting a Part 91 operation must therefore be in accordance with the requirements of regulation 92.175. The carriage of ammunition on board an aircraft conducting commercial operations (including Part 138 operations) must be in accordance with Subparts 92.B and 92.C.

GM 91.165 Discharging firearm on aircraft
The discharge of firearms on an aircraft is not permitted during Part 91 operations.
It may be permitted under certain circumstances during aerial work operations. Refer to regulation 138.432.

3.8 Division 91.C.8—Portable electronic devices

GM 91.170 Operation of portable electronic devices
Air transport operators should refer to regulations 121.350, 133.280 or 135.315, as applicable, for requirements relating to portable electronic devices in air transport operations.

A portable electronic device (PED) is any lightweight, electrically powered equipment. These devices are typically consumer electronic devices capable of communication, data processing and/or utility. Examples range from tablets, e-readers, and smart phones to electronic games. A portable electronic device might be transmitting or non-transmitting.

Many PEDs are not completely disconnected from the internal power source when switched off. The switching function may leave some remaining functionality, e.g., data storage, timer, clock, etc. These devices can be considered switched off when in the deactivated state. The same applies for devices having no transmitting capability and without further deactivation capability, e.g., wrist watches.
The PIC, when giving permission for the operation of a PED, should consider any limitation that may apply in the aircraft flight manual, supplementary aircraft manufacturer data or operational experience with the type of PED in question.

Considerations should include hazards associated with:

- PED in different aircraft zones
- PEDs used during various phases of flight
- PEDs used during turbulence
- improperly stowed PED
- impeded or slowed evacuations
- passenger non-compliance e.g., not deactivating transmitting functions, not switching off PEDs, or not stowing PEDs properly
- disruptive passengers
- battery fire.

Refer to AC 91-17 - Electronic flight bags for detailed guidance on electronic flight bags.

GM 91.175 Operation of portable electronic devices by crew members

Refer to AC 91-17 - Electronic flight bags for detailed guidance on electronic flight bags.

3.9 Division 91.C.9—Special flight operations

GM 91.180 Air displays in Australian territory

There is an exemption in force in relation to a number of regulations within Part 91 and air displays. Pilots and operators are recommended to review section 20 of CASA EX81/21.

Section 5 and schedule 1 of the CASA EX161/21 instrument collectively grant the approval required by this regulation to conduct an air display to the holders of approvals in force under the pre-2 December 2021 rules. It is recommended that persons conducting air displays with a display approval that had a state date prior to 2 December 2021 and an expiry date after 2 December 2021 review section 5 and schedule 1 of CASA EX161/21.

Air display is a defined term in the CASR Dictionary. A key phrase in this definition is the term public gathering which is also legally defined. These definitions state:

- air display means organised flying performed before a public gathering, including the following:
  - a contest;
  - an exhibition of aerobatic manoeuvres;
  - flying in formation;
  - other aircraft operations associated with the air display.

- public gathering means an assembly of people at a place on the basis of a general public invitation to attend at that place, whether or not a charge is made for attendance.

The intent of this regulation is to ensure that air displays are only conducted with the
approval of CASA. The air display event organiser, i.e. the person "conducting" the air display, is the person required to obtain and hold the approval.

This regulation requires an air display event organiser to hold an approval. Individual participants in the air display do not need to hold an approval under 91.180 (but if they are conducting aerobatics at the air display then an approval is required by regulation 91.185).

However, operators and pilots in command of aircraft participating in the air display are required to ensure that a CASA approval has been given for the air display event as a whole.

Refer to the CASA Air Display Administration and Procedures Manual for detailed guidance on air displays. The manual is available from the CASA website.

**GM 91.185 Conducting aerobatic manoeuvres**

This regulation is dependent on the legal definition of aerobatic manoeuvres in the CASR Dictionary. That definition states:

\[
\text{aerobatic manoeuvres}, \text{ for an aircraft, means manoeuvres of the aircraft that involve:} \\
- \text{bank angles that are greater than 60°; or} \\
- \text{pitch angles that are greater than 45°, or are otherwise abnormal to the aircraft type; or} \\
- \text{abrupt changes of speed, direction, angle of bank or angle of pitch.}
\]

This regulation is also dependent on the legal definitions of air display and public gathering which are also in the CASR Dictionary. See GM 91.180 for a copy of these definitions.

This regulation does not necessarily require aerobatic training events to obtain an approval. To require an approval, the aerobatic training would need to be taking place over a populous area, or at night, or as part of an air display. As the definition of air display is dependent on the definition of public gathering, some aerobatic training flights, if they were occurring at a trade day of an airshow before the public days, may require approval since the trade day would still be a public gathering.

Refer to CAAP 155-1 - Aerobatics for guidance on aerobatics.

**GM 91.190 Dropping things from aircraft**

There is an exemption in force in relation to this regulation and air displays. Pilots and operators are recommended to review section 20 of CASA EX81/21.

This regulation does not apply if regulation 105.090, 105.095 or 138.425 applies to an operation.

This regulation does not apply to Part 103 or Part 131 operations.

**GM 91.195 Picking up or setting down people or things during flight**

There is an exemption in force in relation to this regulation for a Part 133 operation that is a medical transport operation. Operators are advised to review section 18 of CASA EX84/21.

A person or a thing must not be picked up or set down during a flight unless the PIC holds an approval or is permitted to do so by the requirements for external load operations as prescribed by the following CASR Parts:
• Part 133 (Australian air transport operations—rotorcraft)
• Part 138 (Aerial work operations).

Regulation 133.295, and its subordinate requirements within Division 1 of Chapter 5 of the Part 133 MOS, constitute another provision of these Regulations for the purposes of paragraph 91.195 (2) (b), which effectively means that a PIC of an aircraft for a flight that is a Part 133 medical transport operation does not need to hold the approval under regulation 91.045 mentioned in paragraph 91.195 (2) (a) to pick up or set down a person or a thing during the medical transport operation. Also see GM 133.295 in the Part 133 AMC and GM document.

**GM 91.200 Persons not to be carried in certain parts of aircraft**

There is an exemption in force in relation to this regulation for a Part 133 operation that is a medical transport operation. Operators are advised to review section 19 of CASA EX84/21.

Regulation 138.410 provides that the Part 138 Manual of Standards (MOS) may prescribe additional requirements relating to flights of aircraft involving external load operations.

**GM 91.205 Flying in formation**

An exception to this regulation for gliders is contained in Chapter 6 of the Part 91 MOS.

An aircraft is flown in formation any time two or more aircraft are flown in close proximity to each other, and they operate as a single aircraft with regard to navigation, position reporting and control.

In addition, an aircraft is considered to be in formation during the period they are manoeuvring to achieve separation from each other in order to effect individual control and during join up or break away.

For determining close proximity to each other, attention should be paid to the type of aircraft in the formation and the speed of those aircraft.

For the requirements of a formation flying activity endorsement, see regulation 61.380.

While the regulation does not preclude flying in formation at night or in instrument meteorological conditions (IMC), if the PIC holds an approval, this activity is of a unique nature and would require considerable thought and risk mitigation before CASA would consider approving such activities.

**GM 91.210 Towing of things by aircraft**

This regulation permits a thing to be towed provided that the PIC holds an approval under regulation 91.045 or another provision of the regulations permits the thing to be towed.

The towing of a Part 103 aircraft by a Part 103 aircraft is a Part 103 activity. Refer to Part 103 for requirements relating to the conduct of Part 103 activities. Refer to regulation 103.130 for requirements related to towing of a Part 103 aircraft by an aircraft that is not a Part 103 aircraft.

The Part 138 MOS provides that a towing operation conducted in accordance with a 91.045 approval is not an aerial work external load operation for the purposes of Part 138.
It should be noted that such Part 91 approvals will only be issued for the conduct of an isolated and infrequent event, as the general policy intent is that a person intending to conduct enduring towing operations will need to comply with Part 138.

Refer to Part 138 for requirements relating to the conduct of an external load operation. An external load operation means carrying or towing a load outside an aircraft in flight and includes training for such an operation. An example of an external load operation is a banner towing operation by an aeroplane.
4 Subpart 91.D—Operational procedures

4.1 Division 91.D.1—Operational control

GM 91.215 Authority and responsibilities of pilot in command
Although not required by the regulation, the PIC will normally have to assume responsibilities before the flight begins and until after the flight ends to ensure the safety of the flight. This would normally be from the time that the PIC assumes responsibility for the aircraft and the passengers prior to a flight and is until the passengers are deplaned and escorted out of the operational area of the aerodrome or operating site and the PIC relinquishes responsibility for the aircraft at the end of a flight or series of flights.

GM 91.220 Actions and directions by operator or pilot-in-command
Reserved.

GM 91.225 Crew members—power of arrest
From subsection 3(1) of the Crimes Act 1914, constable means a member or special member of the Australian Federal Police, or a member of the police force or police service of a State or Territory.

From section 3ZC of the Crimes Act 1914, a person must not, in the course of arresting another person for an offence, use more force, or subject the other person to greater indignity, than is necessary and is reasonable to make the arrest or to prevent the escape of the other person after the arrest.

From section 3ZD of the Crimes Act 1914, a person who arrests another person for an offence must inform the person, at the time of the arrest, of the offence for which they are being arrested. It is sufficient if the person is informed of the substance of the offence, and it is not necessary that this be done in language of a precise or technical nature.

However, the informing of the offence is not necessary if the other person should, in the circumstances, know the substance of the offence for which they are being arrested; or the person’s actions make it impracticable for the person making the arrest to inform the person of the offence for which they are being arrested.

4.2 Division 91.D.2—Flight preparation

This Division does not apply to Part 131 operations.

GM 91.230 Flight preparation (weather assessments) requirements
The flight preparation (weather assessments) requirements are contained in Chapter 7 of the Part 91 MOS.

Educational information for each type of authorised weather forecast and authorised weather report is available from the knowledge centre on the Bureau of Meteorology website. Other
information available from the knowledge centre include publications on hazardous phenomena, regional hazards and airport hazards.

Authorised weather forecasts and authorised weather reports for Australia are available from the NAIPS Internet Service available through the Airservices Australia website.

**GM 91.235 Flight preparation (alternate aerodromes) requirements**

There is an exemption in force in relation to this regulation for Part 121 operators. Operators are advised to review section 16 of CASA EX83/21.

The flight preparation (alternate aerodromes) requirements are contained in Chapter 8 of the Part 91 MOS.

The components of flight preparation (alternate aerodromes) requirements are:

- relevant weather conditions and relevant instrument approach procedure(s)
- weather requirements
- navigation requirements
- aerodrome lighting requirements
- restrictions
- alternate minima.

Whether a pilot is able to conduct an instrument approach procedure will depend on the following:

- Part 61 authorisations
- aircraft equipment fitment
- availability of published instrument approach procedures
- any restrictions or conditions mentioned in NOTAMs applicable to the flight.

Alternate minima are used for flight planning purposes (both pre-flight and in-flight).

Operational requirements for visibility and minimum distances from cloud are prescribed as visual meteorological conditions (VMC) Criteria. Refer to regulation 91.280 for the requirement for the pilot of a visual flight rules (VFR) flight to comply with VMC Criteria.

Relevant weather conditions are summarised in

<table>
<thead>
<tr>
<th>Planning not based on TAF3 or ETA not within first three hours of validity of the TAF3</th>
<th>Planning based on TAF3 and ETA within first three hours of validity of the TAF3 and not after the end time (if any) specified for the TAF3 service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud</td>
<td>more than SCT below the alternate minimum</td>
</tr>
<tr>
<td>Visibility</td>
<td>either:</td>
</tr>
</tbody>
</table>
- less than the alternate minimum; or
- equal to or more than the alternate minimum but with a forecast of at least a 30% probability of fog, mist, dust or any other phenomenon restricting visibility below the alternate minimum (probabilities do not have to be considered)

<table>
<thead>
<tr>
<th>Wind</th>
<th>a headwind, crosswind or downwind component more than the maximum for the aircraft</th>
<th>a headwind, crosswind or downwind component more than the maximum for the aircraft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
<td>a thunderstorm or its associated severe turbulence, or at least a 30% probability of a thunderstorm or its associated severe turbulence</td>
<td>a thunderstorm or its associated severe turbulence (probabilities do not have to be considered)</td>
</tr>
</tbody>
</table>

Alternate aerodromes — weather requirements are summarised in Figure 1. Navigation requirements are summarised in Figure 2. Aerodrome lighting requirements are summarised in Figure 3.
### Table 1: Relevant weather conditions

<table>
<thead>
<tr>
<th></th>
<th>Planning not based on TAF3 or ETA not within first three hours of validity of the TAF3</th>
<th>Planning based on TAF3 and ETA within first three hours of validity of the TAF3 and not after the end time (if any) specified for the TAF3 service</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cloud</strong></td>
<td>more than SCT below the alternate minimum</td>
<td>more than SCT below the alternate minimum</td>
</tr>
<tr>
<td><strong>Visibility</strong></td>
<td>either:</td>
<td>less than the alternate minimum (probabilities do not have to be considered)</td>
</tr>
<tr>
<td></td>
<td>• less than the alternate minimum; or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• equal to or more than the alternate minimum but with a forecast of at least a 30% probability of fog, mist, dust or any other phenomenon restricting visibility below the alternate minimum</td>
<td></td>
</tr>
<tr>
<td><strong>Wind</strong></td>
<td>a headwind, crosswind or downwind component more than the maximum for the aircraft</td>
<td>a headwind, crosswind or downwind component more than the maximum for the aircraft</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>a thunderstorm or its associated severe turbulence, or at least a 30% probability of a thunderstorm or its associated severe turbulence</td>
<td>a thunderstorm or its associated severe turbulence (probabilities do not have to be considered)</td>
</tr>
</tbody>
</table>
Flight planning is not based on a TAF3, or the ETA is:
(i) outside the first 3 hours of the TAF3 validity period; or
(ii) outside the end time (if any) specified for the TAF3 service.

<table>
<thead>
<tr>
<th>ETA</th>
<th>Forecast relevant weather conditions</th>
<th>30 minutes</th>
<th>Part 91 MOS reference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>30 minutes</td>
<td>8.04(1)</td>
</tr>
</tbody>
</table>

BECMG | Forecast relevant weather conditions | 30 minutes | 8.04(1) and (8)       |

Nominate a destination alternate aerodrome, or
Carry holding fuel to reach end of period, or
Forecast endorsed with INTER:
Carry fuel to hold for 30 minutes, or
Forecast endorsed with TEMPO:
Carry fuel to hold for 60 minutes

Flight planning is based on a TAF3 and the ETA:
(i) is within the first 3 hours of the TAF3 validity; and
(ii) does not fall outside the end time (if any) specified for the TAF3 service.

<table>
<thead>
<tr>
<th>ETA</th>
<th>Forecast relevant weather conditions</th>
<th>Part 91 MOS reference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>8.04(1)</td>
</tr>
</tbody>
</table>

BECMG | Forecast relevant weather conditions | 8.04(1) and (8)       |

Nominate a destination alternate aerodrome, or
Carry holding fuel to reach end of period, or
Forecast endorsed with INTER:
Carry fuel to hold for 30 minutes, or
Forecast endorsed with TEMPO:
Carry fuel to hold for 60 minutes

All cases
If operating under the VFR by day within 50 NM of the departure aerodrome - a destination alternate need not be nominated

INTER
Ref: multiple change indicators of INTER or TEMPO, the most limiting requirement applies

Part 91 MOS reference
8.04(4)

Figure 1: Destination alternate aerodromes — weather
Figure 2: Destination alternate aerodromes — navigation
Figure 3: Destination alternate aerodromes — aerodrome lighting
When an alternate aerodrome is nominated for any reason, and navigation to an aerodrome will be achieved using only a Technical Standards Officer (TSO)-129 global navigation satellite system (GNSS), other navigation systems must be available.

An aerodrome must not be nominated as an alternate if it would require nomination of an alternate aerodrome.

4.3 Division 91.D.3—Flight notifications and pre-flight checks

This Division does not apply to Part 131 operations.

**GM 91.240 Flight notifications**

The flight notification requirements are contained in Chapter 9 of the Part 91 MOS.

Three types of flight notifications are used in Australia: International Civil Aviation Organization (ICAO) format flight plan, SARTIME notification, and flight note. Refer to the AIP for detailed guidance on procedures for submitting a flight notification.

**GM 91.245 Matters to be checked before take-off**

Chapter 10 of the Part 91 MOS sets out the matters to be checked before commencing a flight but does not distinguish between simple aircraft, complex aircraft, or types of operation. The PIC and operator should identify the requirements that are to be addressed and that are applicable to their operations.

When conducting checks of aircraft equipment, they should be completed in accordance with any criteria or limitations contained in the AFM or, where the AFM has no instruction for other equipment, in the manufacturer’s requirements or guidance for that equipment.

Before a solo flight in an aircraft fitted with dual controls, the PIC should ensure that any additional safety harness and any other articles or equipment which may foul the controls are safely secured. If the second control column is readily detachable and the AFM permits, consideration should be given to its removal.

Although the regulation does not require the use of a checklist, CASA recommends that the operator develop a flight checklist system that not only captures the relevant requirements of the MOS before take-off, but also the checks that are identified in the AFM for other phases of flight and that include, at least, the approach and landing.

Refer to [AC 91-22 - Aircraft checklists](#) for detailed guidance on aircraft checklist systems.
4.4 Division 91.D.4—Flight rules

4.4.1 Subdivision 91.D.4.1—General

GM 91.255 Air traffic services—prescribed requirements

This regulation does not apply to Part 131 operations.

The detailed requirements relating to this regulation are contained in Chapter 11 of the Part 91 MOS. The MOS covers the following broad topics:

- Transition altitude, transition layer and transition levels
- Availability of GNSS FDE in oceanic airspace
- Loss of GNSS integrity
- Use and supply of distance information
- ACAS resolution advisory
- RVSM airspace
- Flight in the NAT-HLA
- Performance-based communication and surveillance requirements
- Australian domestic airspace — inoperative radio requirements
- Mandatory broadcast area requirements
- Use of controlled aerodromes, control areas and control zones, including inoperative radio requirements for certain oceanic control areas
- Prohibited, restricted and danger areas.

Readback of air traffic control (ATC) clearances and instructions

The PIC of an aircraft is directly responsible for and is the final authority for the operation of that aircraft. Therefore, the pilot should obtain clarification of any clearance or instruction that is not understood.

Where possible, standard words and phrases should be used in all communication. Where this is not possible, plain English should be used and the correct receipt of the intended message confirmed.

A manoeuvring area is the part of the aerodrome to be used for take-off, landing and taxiing of aircraft, excluding aprons. Manoeuvring area maps for some controlled aerodromes are available from the CASA website.

Pilots are expected to maintain route centre lines during all operations unless instructed or cleared by ATS or under emergency conditions.

VFR climb/descend and VFR on top

VFR climb/descend and VFR on top are instrument flight rules (IFR) procedures. They provide IFR pilots with a way of departing an aerodrome into Class E airspace when an IFR clearance might be unavailable because of traffic or other ATC demands.
**IFR pick-up**

IFR pick-up provides the same option for the pilot of an IFR flight departing an aerodrome in *non-controlled airspace*. The flight will begin as a VFR flight and will change flight rules to become an IFR flight when an airways clearance is available.

Table 1 provides a comparison of the operations.

<table>
<thead>
<tr>
<th></th>
<th>VFR Climb/Descend</th>
<th>IFR Pick-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flight rules</td>
<td>IFR</td>
<td>VFR</td>
</tr>
<tr>
<td>VMC requirements</td>
<td>Must meet</td>
<td>Must meet</td>
</tr>
<tr>
<td>Cruising level</td>
<td>VFR levels</td>
<td>VFR levels</td>
</tr>
<tr>
<td>Traffic separation and obstacle clearance</td>
<td>Pilot responsibility</td>
<td>Pilot responsibility</td>
</tr>
<tr>
<td>Reporting requirements</td>
<td>IFR reporting requirements</td>
<td>VFR reporting requirements</td>
</tr>
<tr>
<td>Clearance required to change flight rules from VFR to IFR</td>
<td>Not applicable</td>
<td>Yes</td>
</tr>
<tr>
<td>Clearance required to change levels in Class E airspace?</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

**Reduced vertical separation minimum (RVSM)**

The global separation standards require 2 000 ft vertical separation between aircraft. In RVSM airspace, the vertical separation requirements are reduced to 1 000 ft.

ICAO provides that RVSM can be applied, under specified conditions, within designated portions of airspace based on regional air navigation agreements. In Australian airspace (at and north of 80° south), between FL290 and FL410 (inclusive) is designated as RVSM airspace. RVSM is not applied in Australian airspace south of 80° south.

**GM 91.257 Air traffic control clearances and instructions**

Reserved.

**GM 91.260 Unauthorised entry into prohibited or restricted areas**

Conditions relating to the declaration of a restricted area are shown in the AIP or notice to airmen (NOTAM) for an area. Refer to Section 13 of the Designated Airspace Handbook or NOTAMs. Conditions are also stated on aeronautical charts.

Prohibited and restricted areas, if declared for three (3) months or longer, are published in the AIP. For shorter periods, they are published in a NOTAM.
**GM 91.263 Air defence identification zone flights**

An Air Defence Identification Zone (ADIZ) is airspace of defined dimensions within which identification of all aircraft is required. Special requirements may be published relative to a particular ADIZ.

**GM 91.265 Minimum height rules—populous areas and public gatherings**

This regulation does not apply to Part 131 operations.

The take-off and landing circumstances for paragraph 91.265(4)(a) of CASR are include in section 12.01 of the Part 91 MOS.

**GM 91.267 Minimum height rules—other areas**

This regulation does not apply to Part 103 or Part 131 operations.

The take-off and landing circumstances for paragraph 91.267(3)(a) are include in section 12.01 of the Part 91 MOS.

When flying over an area that is not a populous area or a public gathering, the regulation provides for a minimum height of 500 ft above the highest obstacles within a horizontal radius of 300 m of a point immediately below the aircraft over ground or water.

Paragraph (3)(k) facilitates the ability to fly below 500 ft for training and the actual conduct of a reconnaissance before landing.

The need for a reconnaissance is normally the result of an extenuating circumstance and may be due to faulty navigation, planning oversights (running out of fuel or daylight) or encountering bad weather, most often caused by inadequate flight planning.

An actual reconnaissance and landing should only be carried out if the pilot becomes aware an alternative option, such as diverting or turning back, is no longer available. Once a decision is made, an inspection of any unprepared area should be carefully conducted.

Flying into an unfamiliar aerodrome or airstrip can bring with it many unknowns. Another reason to conduct inspection of a landing area may be due to the need to ensure the surface is suitable or to ensure animals are not on, or in, the immediate area of the intended landing runway.

**GM 91.270 Aircraft to be flown under VFR or IFR**

Part 103 aircraft must be flown under the VFR by day.

Part 131 aircraft must be flown under the VFR.

Other aircraft must be flown under either the VFR or the IFR.
4.4.2 Subdivision 91.D.4.2—Visual flight rules

This subdivision does not apply to Part 131 operations.

GM 91.273 VFR flights

The MOS content for this regulation is contained in Chapter 13 of the Part 91 MOS.

VMC criteria require the pilot of an aircraft operating under the VFR to operate in sight of the ground or water when operating below certain altitudes (refer to section 2.07 of the Part 91 MOS).

Navigation using any IFR method is permitted. While using those navigation methods, it is expected that the PIC will comply with any requirements that relate to the chosen navigation method. Refer to AMC 91.287 regarding CASA's acceptable means of compliance for older aircraft that do not specifically identify specific navigation specifications in the AFM, i.e., the AFM does not specifically state the RNAV or RNP certification of the aircraft.

An approved GNSS system may be used under the VFR for the following:

- to supplement use of topographical charts and other visual navigation techniques
- deriving distance information for en-route navigation and traffic separation
- in operations at night for:
  - position fixing and long-range navigation
  - operations on designated Performance Based Navigation (PBN) routes, including application of PBN-based lowest safe altitude (LSALT)
    or
  - deriving distance information for en-route navigation, traffic separation and ATS separation.

GM 91.275 Specified VFR cruising levels

Specified VFR cruising levels are defined in Division 2.5 of the Part 91 MOS.

GM 91.277 Minimum heights—VFR flights at night

Refer to GM 91.305 for guidance on lowest safe altitudes.

The MOS content mentioned in paragraph 91.277(2)(e) is not currently being used. A placeholder for any future content is contained in section 12.03 of the Part 91 MOS. Adding any new content would be subject to the consultation rules contained in Subpart 11.J.

GM 91.280 VFR flights—compliance with VMC criteria

VMC criteria are defined in Division 2.4 of the Part 91 MOS.

VMC criteria are defined for Class A airspace however approval is required to operate an aircraft under the VFR in Class A. Refer to regulation 91.285.

When it becomes evident that flight in VMC will not be practicable, the pilot of a VFR flight operating in controlled airspace should do the following:

- request an amended clearance enabling the flight to continue in VMC or to leave the controlled airspace
• if operating within a control zone by day, request clearance to operate as a special VFR flight
  or
• request clearance to operate in accordance with the instrument flight rules.

Clearance to operate under the special VFR is only available for operation in a control zone. Pilots wishing to operate under the special VFR should request clearance when in the control zone, or in a control area next to a control zone prior to entry into the zone. The ATC unit responsible for the control zone can issue a clearance to operate under the special VFR if an IFR flight will not be unduly delayed.

Pilots of VFR aircraft should be aware that clearance to operate under the special VFR will not always be available. They should consider alternate plans if weather conditions for departure from, or arrival at, a control zone are marginal.

**GM 91.283 VFR flights—aircraft not to exceed certain speeds**

Reserved.

**GM 91.285 VFR flights—flights in class A airspace**

Under the ICAO airspace classification, class A airspace is designed for the traffic management of IFR aircraft only. However, there are occasions when a VFR aircraft may need or wish to operate in class A airspace; therefore, the regulation allows for an approval in limited or certain circumstances.

### 4.4.3 Subdivision 91.D.4.3—Instrument flight rules

This subdivision does not apply to Part 131 operations.

**AMC 91.287 IFR flights**

**Introduction**

Subsection 14.01(2) of the Part 91 MOS specifies certain requirements for an aircraft to be ‘approved under a particular navigation specification’. Navigation specification is a defined term in the Part 91 MOS. That definition states:

*navigation specification* means a set of aircraft and aircrew requirements needed to support PBN operations within a defined airspace, being either:

- RNAV specification which is a navigation specification based on area navigation that does not include the requirement for on-board performance monitoring and alerting, and is designated by the prefix RNAV, for example, RNAV 5, RNAV 1; or
- RNP specification which is a navigation specification based on area navigation that includes the requirement for on-board performance monitoring and alerting, and is designated by the prefix RNP, for example, RNP 2, RNP APCH.

The AFMs of older aircraft may not specifically state the navigation capabilities of the aircraft using RNAV or RNP terminology. For example, the AFM may not state that the aircraft is certified to ‘RNP 2’.
AMC 1

As an acceptable means of compliance, for the purpose of subsection 14.01(2) (and subsection 13.02(4)) of the Part 91 MOS, a particular older terminology mentioned in a row of column 1 of Table 3 below is taken to be a reference to the navigation specification mentioned in column 2 of the same row of Table 3. For example, a mention of GPS RNAV TERMINAL is taken to be a mention of RNP 1 – whether mentioned in an AFM, or a document approved under Part 21 based on an airworthiness assessment before 2 December 2021, or a document approved in writing by a foreign NAA before 2 December 2021.

Note: Column 3 of Table 3 provides advisory information regarding the kinds of instrument approach minima available for use with the different specifications.

<table>
<thead>
<tr>
<th>GPS capability (column 1)</th>
<th>Navigation specification (column 2)</th>
<th>Minima available for use (column 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPS RNAV EN ROUTE</td>
<td>RNP 2</td>
<td>-</td>
</tr>
<tr>
<td>GPS RNAV TERMINAL</td>
<td>RNP 1</td>
<td>-</td>
</tr>
<tr>
<td>GPS RNAV NON-PRECISION APPROACH</td>
<td>RNP APCH</td>
<td>LNAV</td>
</tr>
<tr>
<td>Baro-VNAV</td>
<td>RNP APCH</td>
<td>LNAV/VNAV</td>
</tr>
<tr>
<td>GPS RNAV LP</td>
<td>RNP APCH</td>
<td>LP</td>
</tr>
<tr>
<td>GPS RNAV LPV</td>
<td>RNP APCH</td>
<td>LPV</td>
</tr>
</tbody>
</table>

AMC 2

As an acceptable means of compliance, for the purpose of subsection 14.01(2) (and subsection 13.02(4)) of the Part 91 MOS, the references listed below, which may be found in the AFM or other acceptable documents (see listing below in GM 91.287), are taken to be equivalent to the relevant specific navigation specification below where the correct navigation specification terminology (i.e., RNAV or RNP) is not used.

RNAV 1/RNAV 2

If a statement of compliance with any of the following specifications or standards is found in the acceptable documentation as listed above, the aircraft is eligible for RNAV 1/RNAV 2 operations:

- RNAV 1
- PRNAV
- US RNAV type A
- FAA AC 20-138 for the appropriate navigation specification
- FAA AC 90-100A
- JAA TEMPORARY GUIDANCE MATERIAL, LEAFLET NO. 10 Rev1 (TGL 10)
- FAA AC 90-100.

However, if position determination is exclusively computed based on VOR-DME, the aircraft is not eligible for RNAV 1/RNAV 2 operations.
RNAV 5

If a statement of compliance with any of the following specifications or standards is found in the acceptable documentation as listed above, the aircraft is eligible for RNAV 5 operations:

- B-RNAV
- RNAV 1
- RNP APCH
- RNP 4
- A-RNP
- AMC 20-4
- JAA TEMPORARY GUIDANCE MATERIAL, LEAFLET NO. 2 (TGL 2)
- JAA AMJ 20X2
- FAA AC 20-130A for en-route operations
- FAA AC 20-138 for en-route operations
- FAA AC 90-96.

RNP 1/RNP 2 continental

If a statement of compliance with any of the following specifications or standards is found in the acceptable documentation as listed above, the aircraft is eligible for RNP 1/RNP 2 continental operations:

- A-RNP
- FAA AC 20-138 for the appropriate navigation specification
- FAA AC 90-105.

Alternatively, if a statement of compliance with any of the following specifications or standards is found in the acceptable documentation as listed above and position determination is primarily based on GNSS, the aircraft is eligible for RNP 1/RNP 2 continental operations. However, in these cases, loss of GNSS implies loss of RNP 1/RNP 2 capability:

- JAA TEMPORARY GUIDANCE MATERIAL, LEAFLET NO. 10 (TGL 10) (any revision)
- FAA AC 90-100.

RNP APCH — LNAV minima

If a statement of compliance with any of the following specifications or standards is found in the acceptable documentation as listed above, the aircraft is eligible for RNP APCH — LNAV operations:

- A-RNP
- AMC 20-27
- AMC 20-28
- FAA AC 20-138 for the appropriate navigation specification
- FAA AC 90-105 for the appropriate navigation specification.

Alternatively, if a statement of compliance with RNP 0.3 GNSS approaches in accordance with any of the following specifications or standards is found in the acceptable documentation as listed above, the aircraft is eligible for RNP APCH — LNAV operations. Any limitation such as
'within the US National Airspace’ may be ignored since RNP APCH procedures are assumed to meet the same ICAO criteria around the world:

- JAA TEMPORARY GUIDANCE MATERIAL, LEAFLET NO. 3 (TGL 3)
- AMC 20-4
- FAA AC 20-130A

RNP APCH — LNAV/VNAV minima

If a statement of compliance with any of the following specifications or standards is found in the acceptable documentation as listed above, the aircraft is eligible for RNP APCH — LNAV/VNAV operation:

- A-RNP
- AMC 20-27 with Baro VNAV
- AMC 20-28
- FAA AC 20-138
- FAA AC 90-105 for the appropriate navigation specification.

Alternatively, if a statement of compliance with FAA AC 20-129 is found in the acceptable documentation as listed above, and the aircraft complies with the requirements and limitations of EASA SIB 2014-041, the aircraft is eligible for RNP APCH — LNAV/VNAV operations. Any limitation such as ‘within the US National Airspace’ may be ignored since RNP APCH procedures are assumed to meet the same ICAO criteria around the world.

RNP APCH — LPV minima

If a statement of compliance with any of the following specifications or standards is found in the acceptable documentation as listed above, the aircraft is eligible for RNP APCH — LPV operations:

- AMC 20-28
- FAA AC 20-138 for the appropriate navigation specification
- FAA AC 90-107.

For aircraft that have a TAWS Class A installed and do not provide Mode-5 protection on an LPV approach, the DH is limited to 250 ft.

RNAV 10

If a statement of compliance with any of the following specifications or standards is found in the acceptable documentation as listed above, the aircraft is eligible for RNAV 10 operations:

- RNP 10
- FAA AC 20-138 for the appropriate navigation specification
- AMC 20-12
- FAA Order 8400.12 (or later revision)
- FAA AC 90-105.
RNP 4

If a statement of compliance with any of the following specifications or standards is found in the acceptable documentation as listed above, the aircraft is eligible for RNP 4 operations:

- FAA AC 20-138B or later, for the appropriate navigation specification
- FAA Order 8400.33
- FAA AC 90-105 for the appropriate navigation specification.

RNP 2 oceanic

If a statement of compliance with FAA AC 90-105 for the appropriate navigation specification is found in the acceptable documentation as listed above, the aircraft is eligible for RNP 2 oceanic operations.

If the aircraft has been assessed eligible for RNP 4, the aircraft is eligible for RNP 2 oceanic.

RF in terminal operations (used in RNP 1 and in the initial segment of the RNP APCH)

If a statement of demonstrated capability to perform an RF leg, certified in accordance with any of the following specifications or standards, is found in the acceptable documentation as listed above, the aircraft is eligible for RF in terminal operations:

- AMC 20-26
- FAA AC 20-138B or later.

If there is a reference to RF and a reference to compliance with AC 90-105, then the aircraft is eligible for such operations.

Other considerations

In all cases, the limitations in the AFM need to be checked; in particular, the use of AP or FD which can be required to reduce the FTE primarily for RNP APCH, RNAV 1, and RNP 1.

Any limitation such as 'within the US National Airspace' may be ignored since RNP APCH procedures are assumed to meet the same ICAO criteria around the world.

GM 91.287 IFR flights

The MOS content for this regulation is contained in Chapter 14 of the Part 91 MOS.

Aircraft eligibility for PBN specifications not requiring specific approval

The navigation performance of the aircraft is usually stated in the AFM. Where such a reference cannot be found in the AFM, other information provided by the aircraft manufacturer as the type certificate (TC) holder, the supplemental type certificate (STC) holder or the design organisation having a privilege to approve minor changes may be considered. The following documents are considered acceptable sources of information:

- AFM, supplements thereto, and documents directly referenced in the AFM
- FCOM or similar document
- Service Bulletin or Service Letter issued by the TC holder or STC holder
- approved design data or data issued in support of a design change approval
• any other formal document issued by the TC or STC holders stating compliance with PBN specifications, AMC, Advisory Circulars (AC) or similar documents issued by the State of Design
• written evidence obtained from the State of Design.

Equipment qualification data alone is not sufficient to assess the PBN capabilities of the aircraft, since the latter depend on installation and integration.

As some PBN equipment and installations may have been certified prior to the publication of the ICAO PBN Manual and the adoption of its terminology for navigation specifications, it is not always possible to find a clear statement of aircraft PBN capability in the AFM. However, aircraft eligibility for certain PBN specifications can rely on the aircraft performance certified for PBN procedures and routes prior to the publication of the PBN Manual.

*Precision runway monitor instrument approach operations*

For section 14.08 of the Part 91 MOS, training for precision runway monitor (PRM) instrument approach operations should be included in an air transport operator's training and checking system. Training for PRM operations for pilots other than those conducting air transport operations should be conducted by a Part 141 or Part 142 training provider. Training for PRM operations should include an assessment of the pilot's knowledge to ensure that the pilot understands and can apply PRM approach procedures (including the breakout procedures and phraseology) completely and correctly. An overview of PRM operations and a pilot training presentation is available from the Airservices Australia website.

**GM 91.290 Specified IFR cruising levels**

Specified IFR cruising levels are defined in Division 2.5 of the Part 91 MOS.

**GM 91.295 IFR flights at non-specified cruising levels—notifying Air Traffic Services**

Reserved.

**GM 91.300 IFR flights at non-specified cruising levels—avoiding collisions with aircraft conducting VFR flights**

Reserved.

**GM 91.305 Minimum heights—IFR flights**

There is an exemption in force in relation to this regulation relating to taking off from an aerodrome in IMC for which there are no authorised instrument departure procedures and no ATC. Pilots and operators are recommended to review section 19 of CASA EX81/21.

IFR flights must be flown at or above certain minimum heights unless certain circumstances apply (see the regulation for these circumstances).

The relevant minimum heights can be any of the following:

• the published, in the AIP (which includes the ERCs), lowest safe altitude for a particular route
• the published, in the AIP (which includes the ERCs), minimum sector altitude (MSA) associated with a particular aerodrome
• the published, in the AIP (which includes the ERCs), lowest safe altitude for a particular geographic area (commonly referred to as grid LSALT)
• a lowest safe altitude calculated by the pilot in accordance with certain specified methods.

The routine criteria applicable for a pilot calculated lowest safe altitude is contained in the Part 173 Manual of Standards through the effect of the legal definition of lowest safe altitude. It is also currently published in the AIP for easy reference. Additionally, “operators holding an AOC, aerial work certificate or Part 141 certificate” that have an exposition or operations manual can include in their exposition or operations manual alternative methods of calculating lowest safe altitude. The intent of this rule was to provide for limited circumstances which are sometimes encountered during flights outside Australia. This does not preclude the use of this provision over Australia, but operators could expect that CASA would carefully review any alternative methods of calculating lowest safe altitude and, if appropriate, use powers under the relevant CASR parts to direct operators to change their exposition or operations manual where the method in the operator’s manual did not result in an equivalent level of aviation safety compared to the routine criteria.

Published lowest safe altitudes for specific routes are published on AIP en-route charts. As per the CAUTION on these charts, these published lowest safe altitudes are only valid if the aircraft can navigate in accordance with the RNP 2 navigation specification. See Chapter 14 of the Part 91 MOS for the requirements to be met in relation to navigation specifications. When a flight is conducted off a published route, or the flight is conducted in an aircraft that is not compliant with the RNP 2 navigation specification, another kind of minimum height must be used.

While this regulation permits a flight to be below a minimum height when operating by day in VMC, it is recommended that pilots fly at or above a minimum height during the conduct of all IFR operations. Many aviation incidents and accidents can be attributed to pilots operating in unfamiliar circumstances, and the familiarity required to avoid such events is strongly enhanced by operating in a consistent manner.

An in-depth understanding of instrument flight procedure design can be gained by referring to Part 173. Additionally, the US FAA publish the Instrument Flying Handbook and Instrument Procedures Handbook, both of which contain valuable information.

**GM 91.307 IFR take-off and landing minima**

The MOS content for this regulation is contained in Chapter 15 of the Part 91 MOS.

*Take-off*

When outlining the necessary criteria that permits a qualifying multi-engine aeroplane or qualifying multi-engine rotorcraft to take-off in visibilities below 800 m down to a minimum of 550 m, sections 15.05 and 15.07 of the Part 91 MOS includes a requirement that the required runway lights must be “supported by a secondary power supply with a switchover capability of 1 second or less”. Operators and the PIC will need to ensure that this technical capability is both available and serviceable in order to conduct a take-off in these visibilities.
In particular, if the secondary power supply is provided by a generator and the 1 second or less time period can only occur when the backup generator is already running, the operator and PIC will need to confirm that this is actually the case prior to taking off in visibilities below 800 m.

Landing

Whether a pilot is able to conduct an instrument approach procedure will depend on the following:

- Part 61 authorisations
- aircraft equipment fitment
- availability of published instrument approach procedures
- any restrictions or conditions mentioned in NOTAMs applicable to the flight.

Instrument approach procedures are defined as the following:

*instrument approach procedure* means a series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix or, where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en-route obstacle clearance criteria apply.

To avoid any misinterpretation or doubt, GNSS arrivals and GNSS/DME arrivals are instrument approach procedures whereas Standard Arrival Routes (STARs) are not instrument approach procedures. The minimum height and missed approach requirements in regulation 91.307 (IFR take-off and landing minima) apply to the conduct of GNSS and GNSS/DME arrivals.

Instrument approach procedures are based on either ground-based navigation aids (VOR, NDB, ILS, DME) or on Performance Based Navigation (PBN).

Two types of PBN based approaches exist: RNP APCH and RNP AR APCH.

- RNP AR APCH procedures may be conducted only by operators or pilots who hold CASA approval and are not discussed in this section.
- RNP APCH procedures do not require operators or pilots to hold CASA approval.

Four types of minima might appear on the approach chart for an RNP APCH procedure. Pilots must select minima based on aircraft certification and the type of approach operation they are authorised to conduct (2D or 3D instrument approach operations). Aircraft certification is documented in the AFM or AFM supplement. Figure 4 shows the relationship between types of instrument approach procedures and available minima.

**Missed approach navigational tolerances**

Requirements and guidance published before Part 91 commenced on 2 December 2021 lacked consistency and clarity regarding the lateral deviation of an aircraft during an instrument approach before a missed approach needed to be executed.

Paragraph 15.11(1)(a) of the Part 91 MOS requires that the PIC must execute a missed approach if, during the final segment of an IAP, the aircraft is flown outside the *navigational...*
tolerance. Navigational tolerance is defined in the dictionary at the front of the MOS as follows:

*navigational tolerance* means 1 of the following:
- for PBN operations — the RNP value for the segment of the IAP being conducted
- for VOR or LOC-based operations — full-scale deflection of the course deviation indicator
- for NDB-based operations — + or - 5° from the specified bearing
- for DME-based operations — + or - 2 NM from the required arc
- for operations based on visual navigation — 1 NM from the cleared track.

These tolerances are not always the same as the licensing tolerances contained in the Part 61 MOS. This is because the licensing tolerances can be thought of as a *target level of safety performance* whereas the missed approach requirements represent the *minimum acceptable level of safety performance*. The definition of *navigational tolerance* has been developed in consideration of the design obstacle clearance tolerances for instrument approaches of different kinds.
Figure 4: Types of instrument approach procedure and minima
A navigation system might provide two types of vertical navigation—vertical guidance and/or advisory vertical guidance.

- Vertical guidance is based on controlled survey data that is coded into the instrument approach procedure when it is designed by a procedure designer. The availability of vertical guidance is typically enunciated by aircraft systems as 'LNAV/VNAV' or 'LPV'.
- Advisory vertical guidance is provided by some GNSS system manufacturers and is not subject to the same regulatory controls. The presence of advisory vertical guidance is typically enunciated by aircraft systems as 'LNAV+V' or 'LP+V'.

Advisory vertical guidance must not be used to conduct RNP APCH operations to LNAV/VNAV or LPV minima. LNAV/VNAV minima are only available to aircraft equipped with a Baro-VNAV or SBAS-capable receiver. Note that for the SBAS-capable receiver SBAS must actually be available in the airspace volume. SBAS is not yet available in Australia.

The format for instrument approach chart titles is currently subject to a global amendment and standardisation activity. In Australia, RNP APCH charts are historically titled RNAV(GNSS) RWY XX. Titles are progressively being amended to the format RNP APCH RWY XX. Additionally, the minima 'S-I GNSS' is progressively being replaced with 'LNAV'.

Refer to AC 91-27 - Non-precision approaches and approaches with vertical guidance for detailed guidance on instrument approach procedures.

**GM 91.310 Approach ban for IFR flights**

The MOS content for this regulation is contained in Chapter 16 of the Part 91 MOS.

The intent of an approach ban for IFR flights is to manage the risks associated with the conduct of a missed approach from a low altitude.

A consequence of an approach ban for IFR flights is more efficient traffic flow. Because of the lower landing minima associated with low-visibility operations, aircraft conducting those operations will not be unduly delayed by those that are not.

**GM 91.315 Taking off and landing in low visibility**

Low-visibility operations consist of 2 types:

- a low-visibility take-off (this is defined in the CASR Dictionary) which are take-offs with a runway visual range of less than 550 m
- a low-visibility approach (this is defined in the CASR Dictionary) which are instrument approach operations using landing minima that are less than the category (CAT) I minima (examples include operations using CAT II, CAT III, and special authorisation CAT I (SA CAT I) landing minima).

If an operator is required by the Regulations to have an exposition or operations manual, i.e., under Parts 119, 131, 138, 141 or 142, then the operator must have approval to conduct low-visibility operations.
If an operator is not required to have an operations manual or exposition, the PIC must have approval to conduct low-visibility operations. This is particularly relevant to Part 91 operations.

Refer to CAAP 257-EX-01 - Approval to conduct low visibility operations, until AC 91-11 - Approval to conduct low visibility operations is issued (anticipated February 2022), for guidance on applying for approval to conduct low-visibility operations.

**GM 91.320 Specified aircraft performance categories**

A specified aircraft performance category is determined in accordance with the definition shown in Division 2.2 of the Part 91 MOS.

The specified aircraft performance category is obtained by considering aircraft type, $V_{AT}$ and instrument approach handling speeds. Section 2.02 of the MOS is only intended to provide requirements for determining the category – operational matters such as maximum speeds are not shown.

The specified aircraft performance category is used to determine the following operational matters:

- instrument approach aircraft handling speeds
- instrument approach minima.

Requirements for both are stated in the AIP.

When operating in a specified aircraft performance category, the PIC must comply with obstacle clearance, instrument approach speed limits, circling area limits and landing minima for the category.

A reference to 'lower performance category' is determined by the hierarchy of specified aircraft performance categories whereby CAT E is the highest and CAT A is the lowest.

'Performance category A' should not be confused with a 'Category A rotorcraft'. Performance category A refers to a performance category for an aircraft that is determined using the aircraft handling speeds in accordance with Division 2.2 of the Part 91 MOS. A category A rotorcraft is a rotorcraft that meets certain certification standards. Refer to AC 133-01 - Performance class operations for information on category A rotorcraft.

### 4.4.4 Subdivision 91.D.4.4—Avoiding collisions in the air

**GM 91.325 Basic rule**

This regulation emphasises the responsibility of a flight crew member to maintain vigilance so far as weather conditions permit to see and avoid other aircraft.

Refer to AC 91-14 - Pilots’ responsibility for collision avoidance for guidance on the pilots’ responsibility for collision avoidance.

**GM 91.330 Right of way rules**

Reserved.
GM 91.335 Additional right of way rules
This regulation does not apply to Part 131 operations.

GM 91.340 Right of way rules for take-off and landing
Reserved.

4.4.5 Subdivision 91.D.4.5—Avoiding collisions on water

GM 91.345 Compliance with International Regulations

International Regulations means the International Regulations for Preventing Collisions at Sea, 1972. The regulations are part of the Convention on the International Regulations for Preventing Collisions at Sea.

**Note:** The Convention is in Australian Treaty Series 1980 No. 5 ([1980] ATS 5) and can be viewed in the Australian Treaties Library on the AustLII website.

GM 91.350 Giving way to vessels
Reserved.

GM 91.355 Giving way on water
This regulation does not apply to Part 131 operations.

4.4.6 Subdivision 91.D.4.6—Avoiding collisions at or in the vicinity of aerodromes

GM 91.360 Meaning of *in the vicinity of a non-controlled aerodrome*

Refer to AC 91-10 - Operations in the vicinity of non-controlled aerodromes for guidance on operations in the vicinity of non-controlled aerodromes.

Useful information is also found in the Australian Transport Safety Bureau (ATSB) publication ‘A pilot’s guide to staying safe in the vicinity of non-controlled aerodromes’.

GM 91.365 Taxiing or towing on movement area of aerodrome
This regulation does not apply to Part 131 operations.

The movement area is any part of an aerodrome used for take-off, landing and taxiing of aircraft including manoeuvring areas and aprons.

AMC 91.370 Take-off or landing at non-controlled aerodrome—all aircraft
An acceptable means of complying with this regulation is for the PIC to ensure that if another aircraft is taking off ahead from the same runway:

- the other aircraft has crossed the upwind end of the runway
  or
• the other aircraft has commenced a turn.

GM 91.370 Take-off or landing at non-controlled aerodrome—all aircraft
This regulation does not apply to Part 131 operations.
At an aerodrome where gliders or glider tugs are operating to a common circuit pattern from either a runway or parallel strip they are to be taken as one. Therefore, an aircraft must not take-off or land when another aircraft on the parallel strip or runway is taking off or landing. However, an aircraft may take-off or land if there is another aircraft taxiing or stationary on either the runway or parallel strip, provided it does not affect the ability to take-off or land safely.

GM 91.375 Operating on manoeuvring area, or in the vicinity, of non-controlled aerodrome—general requirements
There is an exemption in force in relation to this regulation and air displays. Pilots and operators are recommended to review section 20 of CASA EX81/21.
This regulation does not apply to Part 131 operations.
The manoeuvring area of an aerodrome is that part used for take-off, landing and taxiing of aircraft, excluding aprons.
Refer to AC 91-10 - Operations in the vicinity of non-controlled aerodromes for guidance on operations in the vicinity of non-controlled aerodromes.

GM 91.380 Operating on manoeuvring area, or in the vicinity, of non-controlled aerodrome—landing and taking off into the wind
This regulation does not apply to Part 131 operations.
Refer to AC 91-10 - Operations in the vicinity of non-controlled aerodromes for guidance on operations in the vicinity of non-controlled aerodromes.

GM 91.385 Operating on manoeuvring area, or in the vicinity, of non-controlled aerodrome—requirements that apply after joining the circuit pattern
This regulation does not apply to Part 131 operations.
Refer to AC 91-10 - Operations in the vicinity of non-controlled aerodromes for guidance on operations in the vicinity of non-controlled aerodromes.

GM 91.390 Operating on manoeuvring area, or in the vicinity, of non-controlled aerodrome—requirements related to maintaining the same track after take-off
There is an exemption in force in relation to this regulation and air displays. Pilots and operators are recommended to review section 20 of CASA EX81/21.
This regulation does not apply to Part 131 operations.
Refer to AC 91-10 - Operations in the vicinity of non-controlled aerodromes for guidance on operations in the vicinity of non-controlled aerodromes.
GM 91.395 Straight-in approaches at non-controlled aerodromes
This regulation does not apply to Part 131 operations.
Refer to AC 91-10 - Operations in the vicinity of non-controlled aerodromes for guidance on operations in the vicinity of non-controlled aerodromes.

GM 91.400 Communicating at certified, registered, military or designated non-controlled aerodromes
This regulation does not apply to Part 131 operations.
The MOS content mentioned in subparagraph 91.400(1)(a)(iv) is not currently being used. A placeholder for any future content is contained in Chapter 17 of the Part 91 MOS. Adding any new content would be subject to the consultation rules contained in Subpart 11.J.

Aircraft operating in the vicinity of a non-controlled aerodrome that is certified, military, or an aerodrome specifically mentioned in the Part 91 MOS, must be fitted with at least one VHF radio communication system (refer to regulation 91.810).

Despite the requirements, it is recognised that there are occasions when this is not possible. Therefore, an alleviation is provided with restrictions:

- all of the following must happen:
  - flight in VMC by day
  - flight in company with another aircraft where:
    o the other aircraft is carrying an operative radio
    o the pilot of the other aircraft is authorised to operate the radio
  or
- the radio fails in flight, or the flight is for the purpose of radio repairs:
  - the aircraft landing lights, anti-collision lights and transponder are all switched on
  - upon arrival, the aircraft joins either crosswind or down-wind leg of the circuit.

GM 91.405 Aircraft in aerodrome traffic at controlled aerodromes
There is an exemption in force in relation to this regulation and air displays. Pilots and operators are recommended to review section 20 of CASA EX81/21.

There is an exemption in force in relation to the mistaken regulatory requirement to maintain a continuous watch for visual instructions from ATC. Operators and pilots are advised to review section 12 of CASA EX81/21.

This regulation does not apply to Part 131 operations.
4.5 Division 91.D.5—Taking off, landing and ground operations

There is a direction in force in relation to the use of military aerodromes. Pilots and operators are recommended to review section 11 of CASA EX81/21.

AMC 91.410 Use of aerodromes

Notes:

1. This regulation is disappplied for Part 121 operations (see item 6 of the table in subregulation 91.035(1)) and therefore this AMC does not apply during the conduct of Part 121 operations. For the equivalent AMC for those operations, refer to AMC 121.205.

2. For the lighting requirements during NVIS operations – refer to Multi-Part AC 91-13, 133-09 and 138-06³.

Aerodrome lighting

This AMC applies to:

- subparagraph 91.410(2)(a)(iv), i.e. that the place an aircraft takes off from, or lands at, must be suitable for the landing and taking off of aircraft
- paragraph 91.410(2)(b), i.e. that the aircraft can land at, or take-off from, a place safely having regard to all the circumstances of the proposed landing or take-off (including the prevailing weather conditions).

Minimum lighting

When conducting operations at night, or by day when the visibility is not sufficient to safely taxi, take-off or land without runway, taxiway or obstacle lighting, it is an acceptable means of compliance with the regulatory provisions above if the PIC or operator ensures that the following minimum kinds of lighting are available:

- runway edge lighting
- threshold lighting
- illuminated wind direction indicator (not required if wind velocity information can be obtained from an authorised weather report)
- obstacle lighting (when specified in local procedures).

Lighting availability time periods

When conducting operations at night, or by day when the visibility is not sufficient to safely taxi, take-off or land without runway, taxiway or obstacle lighting, and PAL is not being used, it is an acceptable means of compliance with the regulatory provisions above if the PIC or operator ensures that arrangements have been made for the lighting to be operating during the following periods:

- departure: from at least 10 minutes before departure to at least 30 minutes after take-off
- arrival: from at least 30 minutes before ETA to the time landing and taxiing has been completed.

³ At the time of publication of this document, this AC is under development. Once published, it will be available from the CASA website.
A pilot or operator that has an arrangement with an external party for aerodrome lighting (whether ATC or the aerodrome operator) must notify any change in requirements. Confirmation must be obtained that requests for lighting will be satisfied.

Notes:
1. Aerodrome lighting at an aerodrome where a control tower is operating will be activated by ATC as necessary. Pilots requiring aerodrome lighting outside the ATC published hours should use PAL, if available, or make appropriate arrangements with ATC.
2. Aerodrome lighting at non-controlled aerodromes (including aerodromes where ATC has already ceased duty) should be arranged with the aerodrome operator, or by using PAL facilities, if available.
3. The AIP-ERSA identifies locations where selected runway lighting is routinely left switched on during hours of darkness.

Aerodrome pavement strength

This acceptable means of compliance applies to:

- subparagraph 91.410(2)(a)(iv), i.e., that the place an aircraft takes off from, or lands at, must be suitable for the landing and taking off of aircraft
- paragraph 91.410(2)(b), i.e., that the aircraft can land at, or take-off from, a place safely having regard to all the circumstances of the proposed landing or take-off (including the prevailing weather conditions).

In relation to the pavement strength of an aerodrome runway that has a man-made surface (i.e. concrete, bitumen etc), it is an acceptable means of compliance with the regulatory provisions above if the PIC or operator ensures that where the runway has a pavement classification number (PCN) – that the aircraft classification number (ACN) is not greater than the PCN unless the aerodrome operator has provided permission for the aircraft to use the runway.

In relation to the pavement strength of any aerodrome man-made surface (i.e., runway, taxiway, apron etc), it is an acceptable means of compliance with the regulatory provisions above if the PIC or operator ensures that where the surface has a maximum permissible tyre pressure – that the aircraft tyre pressure does not exceed the maximum permissible tyre pressure unless the aerodrome operator has provided permission for the aircraft to use the surface.

In relation to the pavement strength of any aerodrome man-made surface (i.e. runway, taxiway, apron etc), it is an acceptable means of compliance with the regulatory provisions above if the PIC or operator ensures that where the surface has a maximum permissible aircraft weight – that the aircraft gross weight does not exceed the maximum permissible aircraft weight unless the aerodrome operator has provided permission for the aircraft to use the surface.

Notes:
1. See AIP-ERSA for further information on the information published in the authorised aeronautical information for Australia about CAN/PCN, maximum tyre pressures and maximum weights for different aerodrome surfaces.
2. Some aerodrome operators may provide permanent concessions for certain aircraft. Sometimes these concessions are contained in the AIP-ERSA entry for that aerodrome, or the aerodrome operator may need to be contacted directly.
GM 91.410 Use of aerodromes

There is a direction in force in relation to the use of military aerodromes. This information is included in this GM section because, even though the direction does not specifically relate to this regulation, it relates to the general topic of aerodrome usage. Pilots and operators are recommended to review section 11 of CASA EX81/21.

This regulation does not apply if regulation 121.205 applies to an operation.

Section 3 of the Act defines the word ‘aerodrome’ as follows:

‘An aerodrome is an area of land or water (including any buildings, installations and equipment) the use of which as an aerodrome is authorised under the regulations, being such an area intended for use wholly or partly for the arrival, departure or movement of aircraft’.

This includes helicopter landing sites (HLS).

Subregulation 91.490(1) requires aircraft to be operated into and out of places which meet the following requirements. They must be:

- a certified aerodrome
- a defence aerodrome for which an arrangement under section 20 of the Act, for civilian use, is in force or
- a place that is suitable for the landing and taking-off of aircraft.

The places may only be used provided the aircraft can land at, or take-off from, the place safely having regard to all the circumstances of the proposed landing or take-off (including the prevailing weather conditions).

For the purposes of section 3 of the Act, subregulation 91.410(3) authorises a place that is suitable for the landing and taking-off of aircraft as an aerodrome, as this allows the flexibility of operations needed for Australian civil aviation operations, into places which are not a certified aerodrome or a defence aerodrome.

Unlike the places in the first two dot points, this means that an aeroplane landing area (ALA) or an HLS which may or may not be designed and constructed to a particular standard is authorised as an aerodrome for the purposes of the regulations, and may be used for take-off and landing by respective categories of aircraft, provided the operation can be conducted safely following an assessment of all circumstances of the operation.

When considering ‘…all the circumstances’ of the proposed landing or take-off, this will include all of the normal flight operational safety requirements for the aircraft operation and

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4 HELICOPTER LANDING SITE (HLS):
(a) an area of land or water, or an area on a structure on land, intended for use wholly or partly for the arrival or departure of helicopters
(b) a helideck
(c) a heliport.

5 91.410(2)(b).
Some aircraft must be hand-started by manipulating the propeller. The method will depend on the availability of adequate assistance. When determining the suitability of a person to manipulate a propeller, consideration should be given to the risks associated with such an activity.

When adequate assistance is not available and the PIC will manipulate the propeller, the aircraft must be suitably chocked, and no one may be on board the aircraft. The PIC should ensure the aircraft throttle and mixture controls are set in a manner that will ensure aircraft will not jump the chocks. Consideration should also be given to the risks associated with people or aircraft operating nearby and the aircraft positioned in a way that will mitigate risk of injury. Once the PIC is in the pilot seat, passengers may be permitted to board.

When adequate assistance is available. The PIC will either be in a pilot seat (and the propeller being manipulated by another person) or will be manipulating the propeller (and a person who is competent to apply the brakes and control the engine in a pilot seat).

Determining that the person is competent is the responsibility of the PIC. They should provide instruction(s) or demonstration necessary to ensure the aircraft will remain stationary and/or the engine will be shut down. Ideally, an operator will provide a training course on the activities associated with hand-starting aircraft.
4.6 Division 91.D.6—Fuel requirements

GM 91.455 Fuel requirements
There is an exemption in force in relation to this regulation and air displays. Pilots and operators are recommended to review section 20 of CASA EX81/21.

There are exemptions in force in relation to this regulation for Part 121, 133 and 135 operators. Operators are advised to review section 17 of CASA EX83/21 (for Part 121 operators), section 11 of CASA EX84/21 (for Part 133 operators) and section 11 of CASA EX85/21 (for Part 135 operators).

This regulation does not apply if Division 121.D.6, 133.D.6 or 135.D.6 of CASR applies to an operation.

This regulation does not apply to Part 131 operations.

This regulation requires the PIC to comply with the fuel requirements in Chapter 19 of the Part 91 MOS.

Further guidance on operational fuel requirements can be found in AC 91-15 - Guidelines for aircraft fuel requirements.

Operators holding an AOC authorising aerial application operations or Part 142 activities, or operators holding an aerial work certificate or Part 141 certificate, that were using an operational variation prior to the commencement of Part 91 on 2 December 2021 under the auspices of section 8 of CASA 29/18 — Civil Aviation (Fuel Requirements) Instrument 2018, and that intend to continue using the same operational variation after 2 December 2021, do not need to submit any additional documentation to CASA. The operator is taken to have already submitted the required documentation to CASA required under subsection 19.07(5) of the Part 91 MOS.

GM 91.460 Oil requirements
Reserved.

AMC 91.465 Contaminated, degraded or inappropriate fuels

*Inspection and testing of fuel system after hot fuelling*

When hot fuelling an aircraft, it is an acceptable means of compliance with subregulation 91.465(1) if one of the following is complied with:
• the PIC inspects and tests the aircraft’s fuel system on completion of each hot fuelling sequence for the presence of water and other contaminants, degraded or inappropriate fuel
  or
• the aircraft has, for a continuous period of not more than 5 hours’ time in service, been engaged in operations during which hot fuelling has taken place and either of the following apply:
  – the fuel used by the aircraft is supplied by a person:
    o who has a fuel quality audit program; and
    o whose regular audit reports are checked by the operator
  or
  – in a case where the fuel used by the aircraft is supplied by a person who does not have a fuel quality audit program, the operator has a system for monitoring the quality of the fuel used by the aircraft.

Note: For specific rules related to hot fuelling during a Part 91 operation – see regulations 91.495, 91.500 and 91.505. For Part 138 operations, see regulation 138.300.

GM 91.465 Contaminated, degraded or inappropriate fuels

Where various types of fuel are available, there is a risk of fuelling with an incorrect type. If an incorrect fuel type was added to an aircraft fuel tank, such as Avtur instead of Avgas, the fuel system may contain enough of the correct fuel type to allow start up, taxi and take-off, only to have an engine fail catastrophically soon after. The risk of the wrong type of fuel being added can be mitigated by awareness of fuel properties and signage requirements, in addition to thorough fuel checking or sampling using physical protective measures shown in Table 3.

Table 3: Fuel characteristics and protective measures

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Avgas</th>
<th>Avtur (Jet A1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness of physical characteristics.</td>
<td>Familiar petrol scent and texture and is coloured red, blue or green depending on grade.</td>
<td>Distinctive odour similar to diesel, is oily to the touch and is clear or straw coloured.</td>
</tr>
<tr>
<td>Wing decals. Placed on wing adjacent to filler port stating type of fuel required.</td>
<td>Red.</td>
<td>Black.</td>
</tr>
<tr>
<td>Selective fuelling port.</td>
<td>Fitted to Avgas aircraft tanks to allow only the smaller nozzles of Avgas fuelling systems to fit.</td>
<td>Larger jet A1 nozzles unable to be inserted through selective fuelling port.</td>
</tr>
</tbody>
</table>

Most aircraft in Australia are certified to operate only on either Avgas or Jet A1. Despite this, certain aircraft are approved to use a substitute fuel. In such cases, the type of fuel
acceptable for use will be stated on the aircraft TC or STC. At all times, the details of any such approval must be adhered to. An example of such substitutions is recreational aircraft certified to operate on both petrol and Avgas.

Checking fuel for water and other contaminants is something pilots can never be too careful about. The nature of some fuelling operations means that the person fuelling the aircraft is often unaware of the quality of the fuel being loaded. Operations in remote areas often involve refuelling from drums which requires operators, pilots and fuel suppliers to assess the quality of the fuel being loaded. Care must therefore be taken in testing for the presence of water using a positive method such as water-detecting paste, water-detecting paper or other such devices. Where possible, fuel from a drum should be filtered through a chamois before loading.

Like misfuelling, contaminated or degraded fuel has the potential to result in engine failure, or even a partial power loss, soon after take-off. During flying training, pilots are continuously exposed to simulated engine failures and the actions required become second nature. Students are very rarely, if ever, exposed to situations where partial power loss is experienced. To highlight the importance of managing partial power losses, the ATSB has published an advisory document discussing the subject. Titled 'Avoidable Accidents No. 3 - Managing partial power loss after takeoff in single-engine aircraft', the booklet is available from the ATSB website.

GM 91.470 Fire hazards

All reasonable precautions against fire hazards should be taken. All equipment should be of sound design and be maintained in safe working condition. Give attention to sources of ignition, such as:

- persons smoking
- incandescent carbon or naked flame which could be emitted from the engine or associated equipment
- arcing between metallic parts of electrical circuits and components caused by:
  - operation of switch contacts
  - faulty cable terminals
  - breakdown of electrical insulation
  - moving contacts or rotary electrical equipment
  - accidental short circuiting or open circuiting.
- exposure of hot parts to combustible matter
- overheating of working parts to the ignition temperature of any oils, fuel or other combustible matter in the vicinity of the engines.

In the case of a fuel spillage measuring greater than two metres in diameter occurring, the fuelling overseer should:

- consider evacuation of the area. It is generally safer upwind and upslope of any fuel spillage
- notify the Aerodrome Rescue and Fire Fighting Service and comply with laid-down aerodrome procedures
• prevent the movement of persons or vehicles into the affected area and restrict all activities in the vicinity to reduce the risk of ignition
• avoid starting vehicle engines within six m of a spillage until the area is declared safe.

Good airmanship requires that a pilot constantly monitors the fuelling taking place and positively manage any hazards that exist, including those created by another person.

The containment of spilled fuel should be reported to the airport fire service and any instructions followed.

**GM 91.475 Fuelling aircraft—fire fighting equipment**

Reserved.

**GM 91.480 Fuelling aircraft—electrical bonding**

This regulation does not apply to Part 131 operations.

For clarity, bonded means that aircraft and the fuelling equipment have the same electrical potential. By ensuring the same electrical potential between the aircraft and the fuelling equipment, bonding prevents static discharges in aircraft fuel tanks and hoses.

The electrical charge (static) created during the fuelling and defueling processes is a hazard that must be managed. The primary risk created by the build-up of static is the ignition of fuel vapour, which can happen from a single spark. Creating an electrical bond between aircraft and fuelling equipment ensures a static charge cannot be created. An electrical bond should be created between the aircraft being fuelled and the fuelling equipment in use. A bond should also be created between the aircraft being fuelled and the fuel nozzle in use.

Mobile fuel tankers, in-ground refuel ports, fuel bowsers and hand pumps are equipped with a bonding cable which should be attached to an earthing point on the aircraft being fuelled. Additionally, a second bonding cable, connecting the fuelling nozzle to the aircraft, should also be connected to an earthing point on the aircraft for over-wing fuelling. Both cables must be attached before fuel caps are removed and must remain attached until fuelling is complete with caps replaced. Should a cable become loose, fuelling should be stopped until the cable has been replaced. This allows time for any static discharge to dissipate.

At no time should an aircraft be directly bonded to an in-ground refuel port.

When refuelling from drum stocks, similar electrical bonding is required.

Where possible, plastic funnels or pipes should not be used in a fuelling process due to the electrostatic charge created by the sloshing of fuel being carried. Metal containers and funnels should be used, and the equipment electrically bonded.

It should be noted that fuel hoses, including so-called ‘conductive’ hoses, are not considered suitable substitutes for dedicated clips and bonding wires.

Refer to [AC 91-25 - Fuel and oil safety](#) for detailed guidance on fuel and oil safety.

**GM 91.485 Equipment or electronic devices operating near aircraft**

The term ‘fuelling’ refers to both refuelling and defueling.
A critical fuelling point means any of the following:

- a fuel tank filling point on the aircraft
- a fuel tank vent outlet on the aircraft
- the ground fuelling equipment that is used to fuel the aircraft.

When an aircraft is being fuelled, a person must not operate equipment or an electronic device within 15 m of a critical fuelling point for the aircraft. A person must not fuel an aircraft if equipment or an electronic device is being operated within the same area. This includes the operation of equipment such as an internal combustion engine or any electrical switch, battery, generator, motor or other electrical apparatus. Subregulation 91.485 (3) provides exceptions to this requirement, including for equipment that is part of the aircraft’s fuelling equipment or that is designed for use during fuelling operations, e.g., mobile fuel tankers, in-ground refuel ports, fuel bowsers, hand pumps, drums and funnels.

The auxiliary power unit (APU) of the aircraft may be operated during fuelling if it is permitted by the AFM and is started before fuelling begins.

An ‘electronic device that is hazardous to the process of fuelling only because it is designed to produce radio emissions (within the meaning of the Radiocommunications Act 1992)’ typically refers to mobile telephones, radios and radar equipment. The responsibility lies with the PIC to determine whether a device is hazardous in these circumstances. The PIC and the operator should take reasonable steps to ensure that a person does not operate or perform maintenance work on the aircraft radar equipment during fuelling operations except where the fuel is kerosene, when operation or maintenance may be carried out provided the radar transmitter is de-activated.

Refer to AC 91-25 - Fuel and oil safety for more detailed guidance on the precautions to be taken during fuelling operations.

**GM 91.490 Fuelling turbine-engine aircraft—low-risk electronic devices**

Low-risk electronic device means:

- a digital mobile telephone
- a hand-held personal digital assistant
- an electronic device designed to transmit on a Wi-Fi network.

A person may only operate a low-risk electronic device inside the cabin of a turbine-engine aircraft being fuelled when they have been given permission by the PIC, and each cabin door within 3 m of a critical fuelling point is closed.

A person may operate a low-risk electronic device outside the cabin of a turbine-engine aircraft while it is being fuelled only if the device is operated more than 3 m from each critical fuelling point. A person may also operate a low-risk electronic device outside the cabin of a turbine-engine aircraft while it is being fuelled and the device is operated less than 3 m from any critical fuelling point if they are employed or engaged by the operator and have successfully completed appropriate training.
GM 91.495 Only turbine-engine aircraft to be hot fuelled

This regulation does not apply if regulation 138.300 applies to an operation.

For this regulation, an APU is not considered to be an engine. Therefore, fueling an aircraft with only the APU running is not considered hot fuelling.

GM 91.500 Hot fuelling aircraft—general

This regulation does not apply if regulation 138.300 applies to an operation.

Before authorising the hot fuelling of an aircraft, the operator or owner should be satisfied that the fuelling can be carried out safely, and should have regard to the:

- configuration of the aircraft and its engine or engines
- location of the components of the aircraft’s fuel system
- refuelling system(s) to be used and associated components
- aircraft’s flight manual or equivalent data
- location of the aircraft
- requirements of the aerodrome operator
- requirements of regulation 91.505.

Refer to AC 91-25 - Fuel and oil safety for more detailed guidance on the precautions to be taken during hot fuelling operations, and AMC 91.465 for an acceptable means of compliance for the inspection and testing of a fuel system after hot fuelling.

GM 91.505 Hot fuelling aircraft—procedures etc.

There is an exemption in force in relation to this regulation and the operation of turbine-powered aeroplanes for parachuting operations conducted under the auspices of a Part 105 ASAO. Pilots and operators are recommended to review section 22 of CASA EX81/21.

This regulation does not apply if regulation 138.300 applies to an operation.

During hot fuelling, and where possible, communication between the pilot and the person on the ground in charge of the fuelling system should be considered by means of:

- an electronic intercommunication system
- or
- visual contact and an agreed system of signals.

While hot fuelling is taking place, radio transmissions from the aeroplane should be restricted to the greatest extent practicable.

GM 91.510 Fuelling aircraft—persons on aircraft, boarding or disembarking

There are exemptions in force in relation to this regulation for Part 121, 133, 135 operators and aerial work certificate holders. Operators are advised to review section 18 of CASA EX83/21 (for Part 121 operators), section 12 of CASA EX84/21 (for Part 133 operators), section 12 of CASA EX85/21 (for Part 135 operators) and section 11 of CASA EX86/21 (for aerial work certificate holders).
This regulation does not apply if regulation 121.240, 133.195, 135.220 or 138.302 applies to an operation.

This regulation does not apply to Part 131 operations.

A highly volatile fuel easily evaporates when brought into contact with the air. In aviation, this generally refers to Avgas or Mogas fuel. Fuel that is ‘other than highly volatile’ generally refers to Avtur or kerosene (refer to section 1.2 for the definition of ‘highly volatile fuel’).

An aircraft operated under Part 91 must not be fuelled with a highly volatile fuel if anyone other than a crew member is on board, boarding or disembarking the aircraft.

An aircraft may be fuelled with fuel other than a highly volatile fuel with a person other than a crew member on board, boarding or disembarking only if the PIC or the operator is approved for such an operation.

Because air transport operators and aerial work operators must have fuelling procedures in their exposition or operations manual, the regulation does not apply to Part 121, 133 or 135 operations.

**GM 91.515 Fuelling aircraft if fuel vapour detected**

This regulation does not apply to Part 131 operations.

### 4.7 Division 91.D.7—Safety of persons on aircraft and cargo requirements

There is a Part 11 direction in force in relation to crew members carrying out audits, checks, examinations etc. Operators and pilots are advised to review section 9 of CASA EX81/21.

**GM 91.520 Crew members to be fit for duty**

Most preventable accidents have human error as a common factor. External factors such as aircraft design, meteorological conditions and airworthiness issues are often involved. However, the ability to manage such factors and make effective decisions greatly improves when pilots are in good health, well rested and free of other health concerns or impairments.

Performance impairment arises from a number of sources. Family and work worries are common and can be a major source of stress and distraction and are often difficult to discuss or resolve in a busy and pressured work environment. Lifestyle factors such as rest, exercise, a balanced diet and responsible alcohol consumption all play an important role in supporting ‘fitness’. Medical problems and the respective treatment are often a concern for pilots and controllers, and they may be associated with incapacitation risks, irrespective of whether the individual feels well or not.

Fatigue is the factor most commonly associated with fitness for duty which can be induced by a wide variety of factors. Indirect factors include stress, which can be induced by pressures from significant life events or pending flight reviews. Direct factors affecting fatigue include aircraft ergonomics, noise and vibration. Regardless of its cause, because fatigue has such a
Impairment may be due to the influence of psychoactive substances including recreational drugs, alcohol, and medication. It has been shown that alcohol can produce a measurable impairment up to 48 hours after drinking. Medication, both over the counter and prescribed, has the potential to affect performance and side effects should be checked before performing aviation-related activities.

Consideration must be given to the effects of deep-water diving and blood donation, and the necessity to allow for a recovery period between these activities and returning to flying. A suitable minimum length of time to allow recovery from diving activities is 24 hours.

Guidance on the use of medication, recommended minimum stand-down times for several medical procedures (such as blood donation) and related matters are available on the CASA website.

In addition to in-flight incidents that result from impairment, some errors may occur during pre-flight activities and they may contribute to incidents in the same way that errors during flight may. Misreading of weather forecasts, errors in fuel planning and misfuelling are among the plethora of mistakes that can go unnoticed and have grave consequences.

Accident statistics suggest that pilots should be conducting pre-flight checklists on themselves as well as their aircraft. The commonly used 'I'M SAFE' mnemonic addresses the most common factors that can cause pilot impairment, and is detailed in Table 5.

### Table 4: I'M SAFE mnemonic for pilot impairment self-assessment

<table>
<thead>
<tr>
<th>Letter</th>
<th>Word</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Illness</td>
<td>Do I have any symptoms?</td>
</tr>
<tr>
<td>M</td>
<td>Medication</td>
<td>Have I been taking any prescription or over-the-counter medication?</td>
</tr>
<tr>
<td>S</td>
<td>Stress</td>
<td>Am I under psychological pressure? Do I have money, health, or family problems?</td>
</tr>
<tr>
<td>A</td>
<td>Alcohol</td>
<td>Have I been drinking within eight (8) hours? Within 24 hours?</td>
</tr>
<tr>
<td>F</td>
<td>Fatigue</td>
<td>Am I adequately rested?</td>
</tr>
<tr>
<td>E</td>
<td>Eating</td>
<td>Have I eaten enough proper food to sustain me for the flight? Do I have extra packed?</td>
</tr>
</tbody>
</table>

Ultimately, being fit for duty is a responsibility that rests with an individual. Sound and honest judgement is required to be satisfied that performance will not be impaired in a way that affects the ability to conduct safe operations. Illness, prescriptive medication, stress, fatigue, alcohol consumption, fatigue, eating and hydration may affect the ability to be fit for duty and to do your job safely.

Part 99 requires certain aviation organisations to implement a drug and alcohol management plan (DAMP). The DAMP provides a framework for organisations to assess and manage the
risks of alcohol and other drug (AOD) use in the workplace and applies to all employees who are performing, or are available to perform, a safety-sensitive aviation activity (SSAA). The term SSAA includes a broad range of aviation-related activities, such as piloting and maintaining aircraft, providing air traffic control services and acting as a baggage handler. Part 99 also provides for CASA to undertake random AOD testing of all individuals involved in SSAA. In addition to SSAA employees of DAMP organisations, this covers SSAA individuals employed by aviation organisations that are not required to have a DAMP, as well as SSAA individuals operating in a private capacity.

In addition to Part 99, subparagraph 91.520(2)(b)(i) requires that a crew member must not consume any alcohol in the eight hours before flight. Part 99 also requires the permitted level of alcohol to be less than 0.02 grams of alcohol in 210 litres of breath.

**GM 91.525 Offensive or disorderly behaviour on aircraft**

The intent of the regulation is to prevent incidents involving unruly passengers onboard the aircraft that endangers the safety of the aircraft or any person on board.

Behaviour considered offensive or disorderly would include:

- physical assault or threat to commit assault against a crew member
- verbal intimidation or threat against a crew member that interferes with the performance of their duties
- refusal to follow a lawful instruction given on behalf of the PIC
- assault, intimidation or threat, whether physical or verbal, against another person
- intentionally causing damage to, or destruction of, property
- consuming alcoholic beverages or drugs resulting in intoxication
- smoking on board
- tampering with a smoke detector or any other safety-related device on board the aircraft
- operating a portable electronic device when prohibited.

Operator procedures should address the following:

- the types of incidents personnel may be exposed to and possible consequences
- providing operational personnel with the means and knowledge necessary to respond appropriately
- techniques for diffusing a situation and preventing it from escalating to where a passenger is assessed as offensive or disorderly
- preventative measures to avoid passengers becoming offensive or disorderly e.g., restricting alcohol consumption due to its greater effect on people at high altitudes
- identifying passengers exhibiting signs of a potential problem before boarding e.g., aggressive, loud, unruly behaviour during check-in or in the departure area
- clarity on when and under what conditions a passenger may be refused boarding or deplaned for actions displayed on board the aircraft
- providing notification to all relevant personnel regarding a decision to refuse boarding or deplaning a passenger due to offensive or disorderly behaviour
distribution of procedures to all relevant operational personnel to ensure awareness and consistency in managing incidents.

**GM 91.530 When smoking not permitted**

This regulation does not apply to Part 131 operations.

Section 37 of the *Air Navigation Regulation 2016* prohibits smoking on board an aircraft when carrying passengers in Australian territory as part of an air transport service. Also, on an Australian international flight (other than cargo only flight), smoking is prohibited at all times.

In other operations, smoking is prohibited during take-off, during landing, and at other times at the discretion of the PIC. A person smoking onboard an aircraft during a critical stage of flight could be distracting and affect the safety of the aircraft. Sound judgement should be exercised when directing passengers not to smoke.

To advise passengers of smoking restrictions that apply, the PIC may make use of both verbal and non-verbal communication. Visible communication may be in the form of permanent or temporary signs such as illuminated 'no smoking' signs.

**GM 91.535 Crew safety during turbulence**

This regulation does not apply to Part 131 operations.

This regulation requires procedures for crew members (other than flight crew) to be in place before the flight begins that protect the crew members during times of turbulence during the flight. AOC or certificate holders would detail such procedures in their exposition or operations manual.

For a Part 91 operation that is conducted without an exposition or operations manual and where a crew member is carried, the PIC, to satisfy the requirement, would be expected to brief the crew member before the flight begins.

**GM 91.540 Means of passenger communication**

This regulation does not apply to Part 131 operations.

**GM 91.545 Seating for persons on aircraft**

This regulation does not apply to Part 103 or Part 131 operations.

The MOS content for this regulation is contained in Division 20.1 of the Part 91 MOS.

**GM 91.550 Seating for flight crew members**

This regulation does not apply to Part 103 or Part 131 operations.

**GM 91.555 Seating for crew members other than flight crew members**

There is an exemption in force in relation to this regulation for a Part 135 operation or a Subpart 121.Z operation that is a medical transport operation. Operators are advised to review section 17 of CASA EX85/21.
This regulation does not apply if regulation 138.375 applies to an operation. Regulation 138.375 addresses the wearing of seatbelts and other restraining devices in aerial work operations.

This regulation does not apply to Part 131 operations.

A crew member (other than a flight crew member) must, during take-off, landing or any other time the PIC directs, occupy their crew station and wear any provided seatbelt or shoulder harness and ensure that it is securely fastened.

If the PIC gives a direction during turbulence, then a crew member may instead occupy a seat other than a crew member’s seat (this could be a passenger seat) provided they wear a securely fastened seatbelt or shoulder harness at that seat.

Operators are reminded that the crew stations assigned for the use of cabin crew members must meet the standards prescribed by regulation 90.125. For Part 121 operations, operators are also required to ensure that the cabin crew member crew stations meet the requirements of regulation 121.380.

Refer to the Part 133 MOS and Part 135 MOS for more information on wearing a safety harness or restraint strap during medical transport operations.

**GM 91.560 Restraint of infants and children**

This regulation does not apply to Part 103 or Part 131 operations.

The MOS content for this regulation is contained in Division 20.2 of the Part 91 MOS.

Refer to [AC 91-18 - Restraint of infants and children](#) for guidance on the restraint of infants and children.

**GM 91.565 Passengers—safety briefings and instructions**

There are exemptions in force in relation to this regulation for Part 121, 133, 135 operators and aerial work certificate holders. Operators are advised to review section 19 of CASA EX83/21 (for Part 121 operators), section 13 of CASA EX84/21 (for Part 133 operators), section 13 of CASA EX85/21 (for Part 135 operators) and section 12 of CASA EX86/21 (for aerial work certificate holders).

This regulation does not apply if regulation 121.285, 133.240 or 135.280 applies to an operation.

This regulation does not apply to Part 131 operations.

The MOS content for this regulation is contained in Division 20.3 of the Part 91 MOS.

Refer to [AC 91-19 - Passenger safety information](#) for guidance on safety briefings and instructions.

**GM 91.570 Passengers—safety directions by pilot in command**

This regulation does not apply if regulation 105.105 applies to an operation.

This regulation does not apply to Part 103 or Part 131 operations.
AMC 91.590 Restraint and stowage of carry-on baggage

Restraint and stowage of small portable electronic devices

This acceptable means of compliance applies to subparagraph 91.590(1)(b)(ii), i.e. the words “otherwise safely restrained”, solely in relation to the restraint and stowage of small portable electronic devices. Paragraph 91.590(1)(a) specifies the circumstances during a flight when this stowage and restraint rule apply, and these circumstances are when:

- the aircraft is taking off or landing
  or
- the PIC has directed that carry-on baggage be securely stowed.

A small portable electronic device is a portable electronic device that forms part of a person’s carry-on baggage. These 3 terms are defined as follows:

From the CASR Dictionary:
- a person (including a crew member of the aircraft) travelling on the aircraft, or
- a member of the personnel of the operator of the aircraft on behalf of a person mentioned in paragraph (a).

For the purposes of this AMC:

It is an acceptable means of compliance with the requirements of subparagraph 91.590(1)(b)(ii), in relation to the restraint and stowage of small portable electronic devices, if the PIC ensures that small portable electronic devices are carried by a person during the circumstances mentioned in paragraph 91.590(1)(a).

Operators holding an AOC, Part 141 certificate or aerial work certificate can also incorporate the contents of this AMC into their operations manual or exposition.
GM 91.590 Restraint and stowage of carry-on baggage

There is an exemption in force in relation to this regulation for Part 121 operators. Operators are advised to review section 20 of CASA EX83/21.

This regulation does not apply if regulation 121.265 applies to an operation.

This regulation does not apply to Part 103 or Part 131 operations.

Carry-on baggage means baggage or personal effects taken into, or to be taken into, the cabin of an aircraft, for carriage on the aircraft, by:

- a person (including a crew member of the aircraft) travelling on the aircraft
- a member of the personnel of the operator of the aircraft on behalf of a person mentioned in paragraph (a).

Carry-on baggage is a subset of the general definition of cargo and therefore the requirements of regulation 91.600 also apply. For example, paragraph 91.600(2)(c) requires cargo (other than passenger service equipment or galley equipment in an aisle on a temporary basis while in use) to not obstruct an aisle and paragraph 91.600(2)(d) requires cargo to not obstruct, or restrict access to, an emergency exit unless the operator or PIC holds an approval under regulation 91.045.

Stowage procedures

Procedures established by the operator to ensure that carry-on baggage and cargo are adequately and securely stowed should consider the following:

- each item carried in a cabin should be stowed only in a location that can restrain it
- under-seat stowage should not be used unless the seat is equipped with a restraint bar and the baggage is of such size that it may adequately be restrained by this equipment
- items should not be stowed in lavatories or against bulkheads that are incapable of restraining articles against movement forwards, sideways or upwards unless the bulkheads carry a placard specifying the greatest mass that may be placed there
- baggage and cargo placed in lockers should not be of such size that they prevent latched doors from being closed securely
- baggage and cargo should not be placed where they can impede access to emergency equipment
- checks should be made before take-off and landing, whenever the seat belt sign is illuminated, or it is otherwise so ordered, to ensure that baggage is stowed where it cannot impede evacuation from the aircraft or cause injury by falling (or other movement), as may be appropriate to the phase of flight.

Dangerous goods in carry-on baggage

Small amounts of dangerous goods (such as portable electronic devices, powerbanks, toiletry items, alcohol etc.) for personal use by passengers or crew are permitted in carry-on baggage. Requirements for the carriage of dangerous goods as carry-on baggage are
prescribed by regulation 92.030 (Compliance with Technical Instructions—passengers and crew).

Refer to AC 92A-01, and the dangerous goods section of the CASA website for detailed guidance on the carriage of dangerous goods.

**GM 91.595 Restraint and stowage of certain aircraft equipment**

There is an exemption in force in relation to this regulation for Part 121 operators. Operators are advised to review section 20 of CASA EX83/21.

This regulation does not apply if regulation 121.265 applies to an operation.

This regulation does not apply to Part 103 or Part 131 operations.

**GM 91.600 Carriage of cargo—general**

This regulation does not apply to Part 103 operations.

**GM 91.605 Carriage of cargo—cargo compartments**

This regulation does not apply to Part 103 or Part 131 operations.

**GM 91.610 Carriage of cargo—unoccupied seats**

This regulation does not apply to Part 103 or Part 131 operations.

If any modifications are made to an aircraft to enable the carriage of cargo on a seat (such as removing flight controls), applicable airworthiness requirements must be adhered to.

**GM 91.615 Carriage of cargo—loading instructions**

This regulation does not apply to Part 103 or Part 131 operations.

**GM 91.620 Carriage of animals**

There is an exemption in force in relation to this regulation. The exemption provides for an operator that is an Australian air transport AOC holder or an aerial work certificate holder to give permission for the carriage of an animal in place of the pilot in command. Operators and pilots are advised to review section 14 of CASA EX81/21.

The MOS content mentioned in subregulation 91.620(5) is not currently being used. A placeholder for any future content is contained in Division 20.4 of the Part 91 MOS. Adding any new content would be subject to the consultation rules contained in Subpart 11.J.

This regulation includes all animals and is not limited to only assistance animals.

The regulation places the responsibility on the PIC and the operator for ensuring the safety of the flight when an animal is carried on an aircraft. It applies to a small private aircraft through to an air transport aircraft, and each circumstance will require different considerations. It also allows the PIC or the operator discretion as to whether to carry an animal.

In general, carrying an animal is no different to carrying cargo. They must not block, impede access to, or escape through, an emergency exit. A large animal should be secured at all times so as not to damage or affect the balance of the aircraft in flight. As a minimum, a
small or medium-sized animal carried in the cabin would normally need to be restrained during take-off and landing and in turbulence.

When giving permission, consideration should be given to:

- the type of animal
- how it is being carried, contained and/or restrained
- its reaction to noise and being out of its natural environment
- nuisance to other passengers
- distraction to flight crew
- how excrement or fluids will be contained.

An AOC holder’s exposition should provide instructions for carrying animals, including any limitations or requirements the operator expects personnel to observe and respect.

Animals carried during flight generally fall into two categories

- animals such as livestock, horses, domestic pets and snakes
- assistance animals in the company of a person with a disability.

Rather than requiring CASA approval for the carriage of animals, this regulation allows the operator and PIC to decide whether an animal can be carried without risking the safety of an aircraft, passengers and cargo on board. Before permitting an animal on board a flight it is recommended that the operator and PIC of the aircraft consider the following:

- Containerisation: Where possible, animals should be carried in individual containers, secured in accordance with regulations pertaining to the carriage of cargo. Containers provide a form of restraint and a means to ensure the containment of excreta.
- Escape: The size and nature of some animals means that their escape from a container or handlers could place the safety of the aircraft in jeopardy.
- Co-location with sensitive cargo: Like humans, animals are sensitive to toxic and infectious substances. Furthermore, they could pose a threat to the cleanliness of food intended for human consumption.
- Adverse reaction to aircraft: Aircraft noise and vibration may cause distress to an animal. Whenever possible, animals should be restrained, muzzled or located in such a way that any reaction to such conditions does not pose a threat to the safety of the aircraft.
- Consideration of passengers on board: Passengers with allergies to, or a phobia of, animals should be considered when deciding on the carriage of animals.
- Carriage of associated dangerous goods: The carriage of live fish and other aquatic animals as cargo may require a separate permission from CASA if cylinders of compressed air or oxygen are required. Part 92 regulates the carriage of dangerous goods, and AC 92-5 - Use of compressed oxygen: Carriage and consignment of live aquatic animals for transport by air discusses the use of compressed oxygen or air in support of the consignment and carriage of live aquatic animals by air.
**Assistance animals**

Refer to [AC 91-03 - Carriage of assistance animals](#) for detailed guidance on the carriage of assistance animals on aircraft.

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**4.8 Division 91.D.8—Instruments, indicators, equipment and systems**

**GM 91.625 Use of radio—qualifications**

The MOS content for this regulation is contained in Division 21.1 of the Part 91 MOS.

Part 61 prescribes flight crew licensing requirements.

Part 64 prescribes authorisations for non-licensed personnel. It sets out requirements that persons other than holders of flight crew licences must satisfy to:

- transmit on a radio frequency of a kind used for the purpose of ensuring the safety of air navigation
- taxi an aeroplane.

Part 65 prescribes air traffic services licensing requirements.

A radio frequency of a kind used for the purpose of ensuring the safety of air navigation, as determined by the Australian Communications and Media Authority, is a radio frequency that is used for air traffic control, aerodrome radio information, private company radio at an airport or airfield, and other airport or aerodrome services.

**GM 91.630 Use of radio—broadcasts and reports**

There is an exemption in force in relation to this regulation and air displays. Pilots and operators are recommended to review section 20 of CASA EX81/21.

This regulation does not apply to Part 131 operations.

The MOS content for this regulation is contained in Division 21.2 of the Part 91 MOS.

See AMC 91.055 for information relating to avoiding the creation of an aviation safety hazard by using appropriate radio phraseology.

To avoid radio congestion, it is recommended that pilots should:

- plan the content of the message before transmitting
- listen out before transmitting to avoid interference with other transmissions.

**Common traffic advisory frequency (CTAF) – prescribed reports**

Refer to [AC 91-10 - Operations in the vicinity of non-controlled aerodromes](#) for detailed guidance on operations in the vicinity of non-controlled aerodromes.
Controlled aerodromes and controlled airspace – prescribed reports

A variety of reports are prescribed for operation in controlled airspace and at controlled aerodromes. Where a difference exists between a requirement of this regulation and an ATC instruction, the ATC instruction must be followed.

The ATS frequency to report on is particular to the type of operation and ATS service provided. Airborne and departure reports should be made on the relevant Centre, Approach or Departures frequency. For operation at Class D aerodromes, pilots will have to determine whether an approach control service is in operation.

GM 91.635 Communication monitoring in controlled airspaces

There is an exemption in force in relation to this regulation to permit a pilot occupying a pilot seat to monitor the primary communications medium in place of the pilot in command. Pilots are advised to review section 15 of CASA EX81/21.

There is an exemption in force in relation to this regulation and air displays. Pilots and operators are recommended to review section 20 of CASA EX81/21.

GM 91.640 Use of radio outside controlled airspaces—listening watch of radio transmissions

There is an exemption in force in relation to this regulation and air displays. Pilots and operators are recommended to review section 20 of CASA EX81/21.

This regulation requires that for an aircraft equipped with a radio and where the PIC is qualified to use it, the PIC (or another pilot occupying a pilot seat) must monitor radio transmissions continuously when flying outside controlled airspace.

Pilots should be aware of the possibility of gliders and manned free balloons operating without a radio or without maintaining listening watch on frequencies other than those used by ATS. Gliders and balloons operating with a radio will maintain listening watch on the frequencies shown in Table 5.

Table 5: Listening watch requirements of gliders and manned free balloons

<table>
<thead>
<tr>
<th>Area of operation</th>
<th>Listening watch and broadcast requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controlled airspace.</td>
<td>Relevant ATC frequency.</td>
</tr>
<tr>
<td>Class G airspace above 5 000 ft AMSL.</td>
<td>Relevant Area frequency or Glider-specific frequency (122.5, 122.7 or 122.9 MHz).</td>
</tr>
<tr>
<td>Class G airspace below 5 000 ft AMSL.</td>
<td>126.7 MHz.</td>
</tr>
<tr>
<td>In the vicinity of non-controlled aerodromes.</td>
<td>Relevant CTAF or 126.7MHz.</td>
</tr>
</tbody>
</table>

GM 91.645 Availability of instructions for flight data and combination recorders

Reserved.
GM 91.650 Flight recorders—preserving recordings of immediately reportable matters

The list of immediately reportable matters is defined in Section 2.3 of the Transport Safety Investigation Regulations 2003. Refer to the AIP for further details.

Following an immediately reportable matter, the ATSB might provide instructions to the operator of an aircraft regarding the preservation of recorders and/or recordings.

Instructions might include any of the following:

- that recorders and/or recordings do not have to be preserved
- that recorders and/or recordings are to be preserved for a certain period.

When no instructions are received, the operator of an aircraft must preserve the recorders and recordings for 72 hours from the time of the report being made. This requirement does not apply if the recordings or recorders are not preserved, and the operator took reasonable steps in the circumstances to preserve them.

GM 91.655 RVSM airspace

Refer to AC 91-20 Reduced vertical separation minima\textsuperscript{12} for guidance on obtaining approval to operate in RVSM airspace.

Before departing on a flight that will enter RVSM airspace, the PIC should check the following are fitted to the aircraft and operational:

- 2 independent primary altimetry systems
- a Mode C-capable SSR transponder
- an altitude alert system
- an autopilot with height lock.

If the aircraft is not fitted with this equipment, or it is unserviceable, an aircraft may still be operated in RVSM airspace. However, ATC must be advised the aircraft is being operated ‘Negative RVSM’.

GM 91.660 Performance-based navigation

Section 5 and schedule 1 of the CASA EX161/21 instrument collectively grant the approval required by this regulation and its subordinate MOS content to conduct RNP-AR approaches to the holders of approvals in force under the pre-2 December 2021 rules. It is recommended that holders of these kinds of pre-2 December 2021 approvals review section 5 and schedule 1 of CASA EX161/21.

The MOS content for this regulation is contained in Chapter 22 of the Part 91 MOS.

Refer to AC 91-05 - Performance-based navigation for detailed guidance on PBN theory and approvals.

\textsuperscript{12} At the time of publication of this AMC and GM document, this AC is under development. Once published, it will be available from the CASA website.
4.9 Division 91.D.9—Miscellaneous

Reserved.

4.10 Division 91.D.10—Signals, emergencies and hazards

GM 91.670 Standard visual signals

Standard visual signals are defined, and details of marshalling signals are referenced in Chapter 2 of the Part 91 MOS.

Details of marshalling signals are shown in Plain English Guide for new flight operations regulations.

Marshalling signals are designed for use by the marshaller (with hands illuminated as necessary to facilitate observation by the pilot) facing the aircraft in a position:

- for fixed-wing aircraft, on the left side of the aircraft, where best seen by the pilot
- for rotorcraft, where the marshaller can best be seen by the pilot.

The meaning of the relevant signals remains the same if bats, illuminated wands or torchlights are held.

The aircraft engines are numbered, for the marshaller facing the aircraft, from right to left (i.e., No. 1 engine being the port outer engine).

References to wands may also be understood as daylight-fluorescent table-tennis bats or gloves (daytime only).

The marshaller should check that the area within which an aircraft is to be guided is clear of objects which the aircraft might otherwise strike. The design of many aircraft is such that the path of the wing tips, engines and other extremities cannot always be monitored visually from the flight deck while the aircraft is being manoeuvred on the ground.

GM 91.675 Pilot in command to report hazards to air navigation

When reporting the existence of a hazard to air navigation under this regulation, it is recommended that the reports include any detail which may be pertinent to the safety of other aircraft.

Potential weather-related hazards to air navigation might include:

- wind shear
- severe turbulence
- severe icing
- severe mountain wave
- thunderstorms, with or without hail, that are obscured, embedded, widespread or in squall lines
- heavy dust storm or heavy sandstorm
- volcanic ash cloud
- unusual and/or increasing volcanic activity or a volcanic eruption.
GM 91.680 Pilot in command to report emergencies

In the event of an emergency, the PIC should be aware of the phrase ‘aviate, navigate, communicate’. The priorities in order of importance are to maintain (or regain) control of the aircraft, navigate clear of obstacles and communicate with ATS or other stations.

If the aircraft is carrying dangerous goods, the PIC must also advise ATS of the nature and state of any dangerous goods carried as cargo on the aircraft. Wherever possible, this information should include the information as provided on the notification to the captain (NOTOC). When it is not considered possible to include all the information (e.g., in a critical emergency), those parts thought most relevant in the circumstances or a summary of the quantities and class or division of dangerous goods in each cargo compartment should be given. Further information regarding the NOTOC and requirements for dangerous goods emergency response are contained in regulation 92.025 and AC 92A-01 - The consignment and carriage of dangerous goods on all aircraft in Australian territory and on Australian aircraft overseas: An overview of the legislative framework and procedures.

GM 91.685 Multi-engine aircraft—pilot in command to land at nearest suitable aerodrome if emergency occurs

When considering the suitability of an aerodrome for a landing in the event of an engine failure or a precautionary shut down, the PIC should consider the following:

- nature of the malfunctioning and the possible mechanical difficulties which may be encountered if the flight is continued
- the nature and extent of any city, town or populous area over which the aircraft is likely to fly
- availability of the inoperative engine to be used
- altitude, aircraft weight, and usable fuel at the time of engine stoppage
- distance to be flown coupled with the performance availability should another engine fail
- relative characteristics of aerodromes available for landing
- weather conditions en-route and at possible landing points
- air traffic congestion
- type of terrain, including whether the flight is likely to be over water
- familiarity of the pilot with the aerodrome to be used.

Also refer to the kit Safety behaviours: human factors for pilots for educational material on decision making. The kit is available from the CASA website.

GM 91.690 Pilot in command to report contraventions relating to emergencies

Incident, accident and emergency reporting is a valuable tool in maintaining aviation safety. Effective reporting allows organisations, such as CASA and the ATSB, to notice trends occurring within the aviation sector. Only where trends are observed can mitigating actions be identified and implemented.

Under the Transport Safety Investigation Act 2003, reports of accidents and incidents are defined by the AIP as either Immediately Reportable Matter (IRM) or Routinely Reportable
Matter (RRM). The definition and reporting requirements of an IRM or RRM are contained in the AIP. In addition to reporting of IRM and RRM, a report must be made to CASA whenever a CASR is contravened during the management of an emergency situation.

For regulation 91.690, the PIC must give notice of a contravention of the regulations that occurred during a flight to deal with an emergency that threatened the safety of the aircraft. The PIC is not excused from reporting such a contravention on the grounds that giving the notice or information might tend to incriminate or expose them to a penalty. However, except where the report contains false or misleading statements, information or documents, the information provided cannot be used as evidence in criminal proceedings.

GM 91.695 Interception of aircraft
The MOS content for this regulation is contained in Chapter 23 of the Part 91 MOS. The procedures to be followed during an aircraft interception are shown in Annex 2 to the Chicago Convention, Rules of the Air. The procedures are replicated in the AIP.

GM 91.700 Aviation distress signals
Reserved.

GM 91.705 Flight in icing conditions—adherence of frost, ice or snow
Reserved.

GM 91.710 Flight in icing conditions—requirements for flight
Reserved.

4.11 Division 91.D.11—Causing or simulating failures etc.

4.11.1 Subdivision 91.D.11.1—Causing or simulating instrument failure etc.

GM 91.715 Causing or simulating failure of flight instruments
Reserved.

GM 91.720 Simulating IMC flying
This regulation does not apply to Part 103 operations.

GM 91.725 Training flight limitations etc.
There is a Part 11 direction in force in relation to this regulation and permitted persons that are conducting audits. Pilots are advised to review section 8 of CASA EX81/21.

There is a Part 11 direction in force in relation to the training of flight crew members for an aircraft class rating, type rating, or foreign equivalent, to be granted under a law of a foreign country. Operators and pilots are advised to review section 10 of CASA EX81/21.
There are 2 exemptions in force in relation to this regulation. Operators and pilots are advised to review sections 16 and 17 of CASA EX81/21.

This regulation does not apply to Part 103 operations.

For this regulation, a permitted person in relation to an aircraft means:

- a crew member of the aircraft
- a person authorised by the operator of the aircraft to conduct an audit of the operation involved, or to supervise it
  or
- an authorised officer carrying out an examination, inspection or test of the work of the aircraft’s crew under these regulations.

A person is a crew member of an aircraft if the person is carried on the aircraft and is:

- a person:
  - who is authorised by the operator of the aircraft to carry out a specified function during flight time relating to the operation, maintenance, use or safety of the aircraft, the safety of the aircraft’s passengers or the care or security of any cargo which may affect the safety of the aircraft or its occupants
  - who has been trained to carry out that function.
  or
- a person who is on board the aircraft for the purpose of:
  - giving or receiving instruction in a function mentioned in subparagraph (a)(i)
  or
  - being tested for a qualification associated with a function mentioned in subparagraph (a)(i)
  or

a person authorised by CASA under these Regulations, or by the operator, to carry out an audit, check, examination, inspection or test of a person mentioned in paragraph (a) or (b). Table 6 sets out the number of permitted persons that may be carried on a given type of training flight.

**Table 6: Number of permitted persons on training flights**

<table>
<thead>
<tr>
<th>Type of training flight</th>
<th>Permitted Persons that may be carried during training flights</th>
</tr>
</thead>
<tbody>
<tr>
<td>For a flight crew member who does not hold a class rating or type rating for the aircraft.</td>
<td>Maximum of four permitted persons.</td>
</tr>
<tr>
<td>For the simulation (other than verbally) of an emergency or abnormal situation that may affect the handling characteristics of the aircraft.</td>
<td>Maximum of three permitted persons.</td>
</tr>
<tr>
<td>Below 500 ft above ground level (AGL) (other than training for take-off and landing).</td>
<td>No limit to number of permitted persons.</td>
</tr>
<tr>
<td>For a low-level rating, an aerial application rating.</td>
<td>Maximum of three permitted persons.</td>
</tr>
</tbody>
</table>
an aerobatic endorsement or a spinning endorsement (or training for an equivalent qualification under a law of a foreign country).

The PIC is not permitted to test the aircraft or any of its instruments, indicators, items of equipment or systems if a person, other than a permitted person or a member of the aircraft’s maintenance personnel (who is required, as part of their duties, to be on the aircraft) is on board the aircraft.

Note: These restrictions do not include testing the aircraft during checks associated with the normal operation of the aircraft.

4.11.2 Subdivision 91.D.11.2—Causing or simulating engine failure etc. for aeroplanes

GM 91.730 Aeroplane flights in IMC or at night—engine not to be shut down
Reserved.

GM 91.735 Single-engine aeroplane—VFR flights by day—engine not to be shut down
Reserved.

GM 91.740 Single-engine aeroplane—simulating engine failure in IMC or at night
Reserved.

GM 91.745 Multi-engine aeroplane—simulating engine failure—general

Section 5 and schedule 1 of the CASA EX161/21 instrument collectively grant the approval required by this regulation to conduct certain simulated engine failures to the holders of certain approvals in force under the pre-2 December 2021 rules. It is recommended that affected persons review section 5 and schedule 1 of CASA EX161/21.

Refer to CAAP 5.23-1 - Multi-engine aeroplane operations and training for detailed guidance.

GM 91.750 Multi-engine aeroplane—simulating engine failures in IMC or at night

Regulation 91.750 describes the requirements that must be met by the PIC of a multi-engine aeroplane if they intend to simulate the failure of one of its engines in instrument meteorological conditions (IMC) or at night.

The requirements cover the following topics:

- the necessary qualifications and authority of the PIC to carry out the simulation
- that the flight itself must be for pilot training, checking or testing
- that only flight crew members are to be carried on the flight
- briefing and supervision of the operation
- the permissible minimum heights and locations (different conditions apply for IMC, or at night in VMC).

The PIC needs to closely consider the permissible minimum height and location
requirements in their pre-flight planning, risk assessment and flight management requirements for the flight, and in the construction of the associated flight profile.

The flight profile will need to be designed to meet the requirements of the training, check or test objectives for the flight and remain compliant with regulation 91.750.

The reference in the regulation to circling areas as defined in the authorised aeronautical information is stated in the AIP Book as meaning:

- a prescribed IFR circling area for the aerodrome associated with an authorised instrument approach procedure, or
- if there is no prescribed IFR circling area of this kind for the aerodrome – within 3 NM of the aerodrome reference point, but only for an aeroplane with MTOW ≤ 5 700 kg.

It is recommended that appropriate risk assessment and hazard mitigation processes be applied when conducting these operations. These processes are recommended to include, but are not limited to, the following:

- the PIC having a full understanding of the aeroplane handling characteristics during and after simulating an engine failure
- the PIC having a full understanding of the aeroplane performance during and after simulating an engine failure
- the addition of appropriate safety buffers to airspeeds, altitudes, rates of descent, acceptable minimum climb profiles, minimum descent altitudes and setting maximum rate of attitude and heading change criteria
- the establishment of stabilised approach and go around criteria for the operation
- ensuring all failures are pre-briefed and closely monitored throughout
- the establishment of conservative take-over criteria
- the PIC having a full knowledge of the terrain over which the intended operation will be carried out, including knowledge of man-made obstacles such as buildings and towers and temporary obstacles such as cranes which may be notified via NOTAM
- establishment by the operator of appropriate exposition and operations manual procedures for the planning of such flights, the risk assessment and management processes and their conduct as air exercises.

Some flight manuals or POHs may include simulated engine failure in-flight procedures that are not stated as being mandatory. However, PICs and operators are strongly encouraged to fully understand the effect of not deciding to follow any manufacturer recommended procedures.

Where simulated engine failure in-flight procedures are mandatory in a flight manual, the most conservative requirements of either the regulations or the flight manual must be followed.
4.11.3 Subdivision 91.D.11.3—Causing or simulating engine failure etc. for rotorcraft

GM 91.755 Single-engine rotorcraft—engine not to be shut down
Reserved.

GM 91.760 Single-engine rotorcraft—engine failure not to be simulated and autorotation of main rotor system not to be initiated in IMC
Reserved.

GM 91.765 Single-engine rotorcraft—simulating engine failure or initiating autorotation of main rotor system at night
Reserved.

GM 91.770 Multi-engine rotorcraft—engine not to be shut down at certain altitudes in IMC or at night
Reserved.

GM 91.775 Multi-engine rotorcraft—simulating engine failure in IMC or at night

There is an exemption in force in relation to this regulation. Operators and pilots are advised to review section 18 of CASA EX81/21.

Regulation 91.775 describes the requirements that must be met by the PIC of a multi-engine rotorcraft if they intend to simulate the failure of one of its engines in instrument meteorological conditions (IMC) or at night.

The requirements cover the following topics:

- the necessary qualifications and authority of the PIC to carry out the simulation
- that the flight itself must be for pilot training, checking or testing
- that only flight crew members are to be carried on the flight
- briefing and supervision of the operation
- the permissible minimum heights and locations (different conditions apply for IMC, or at night in VMC).

The PIC needs to closely consider the permissible minimum height and location requirements in their pre-flight planning, risk assessment and flight management requirements for the flight and in the construction of the associated flight profile.

The flight profile will need to be designed to meet the requirements of the training, check or test objectives for the flight and remain compliant with regulation 91.775.

The reference in the regulation to circling areas as defined in the authorised aeronautical information is stated in the AIP Book as meaning:

- a prescribed IFR circling area for the aerodrome associated with an authorised instrument approach procedure, or
• if there is no prescribed IFR circling area of this kind for the aerodrome – within 3 NM of the aerodrome reference point, but only for an aeroplane with MTOW ≤ 5 700 kg.

It is recommended that appropriate risk assessment and hazard mitigation processes be applied when conducting these operations. These processes are recommended to include, but are not limited to, the following:

• the PIC having a full understanding of any simulated engine failure flight manual instructions and training selector switch (if any) requirements
• the PIC having a full understanding of rotorcraft's handling characteristics during and after simulating an engine failure
• the PIC having a full understanding of the rotorcraft’s performance during and after simulating an engine failure
• the addition of appropriate safety buffers to airspeeds, altitudes, rates of descent, acceptable minimum climb profiles, minimum descent altitudes and setting maximum rate of attitude and heading change criteria
• the establishment of stabilised approach and go around criteria for the operation
• the establishment of conservative take-over criteria
• the PIC having a full knowledge of the terrain over which the intended operation will be carried out, including knowledge of man-made obstacles such as buildings and towers and temporary obstacles such as cranes which may be notified via NOTAM, or via the operator’s HLS register temporary obstacle reporting system
• establishment by the operator of appropriate exposition and operations manual procedures for the planning of such flights, the risk assessment and management processes and their conduct as air exercises.

Some flight manuals or POHs may include simulated engine failure in-flight procedures that are not stated as being mandatory. However, PICs and operators are strongly encouraged to fully understand the effect of not deciding to follow any manufacturer recommended procedures.

Where simulated engine failure in-flight procedures are mandatory in a flight manual, the most conservative requirements of either the regulations or the flight manual must be followed.
4.12 Division 91.D.12—Psychoactive substances

<table>
<thead>
<tr>
<th>GM 91.780 Passengers—alcohol</th>
</tr>
</thead>
<tbody>
<tr>
<td>This regulation does not apply to Part 103 operations.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GM 91.785 Crew—provision of alcohol</th>
</tr>
</thead>
<tbody>
<tr>
<td>This regulation does not apply to Part 103 operations.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GM 91.790 Prohibiting person affected by psychoactive substances from boarding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserved.</td>
</tr>
</tbody>
</table>
5 Subpart 91.F—Performance

There are exemptions in force in relation to this Subpart for Part 121, 133, 135 operators and aerial work certificate holders. Operators are advised to review section 21 of CASA EX83/21 (for Part 121 operators), section 14 of CASA EX84/21 (for Part 133 operators), section 14 of CASA EX85/21 (for Part 135 operators) and section 13 of CASA EX86/21 (for aerial work certificate holders).

This Subpart does not apply if Subpart 121.F, 133.F, 135.F or 138.F applies to an operation.

This Subpart does not apply to Part 131 operations.

AMC 91.795 Take-off performance

Clearing obstacles by a safe margin (sections 24.02 and 24.03 of the Part 91 MOS)

For a multi-engine aeroplane with an MTOW < 5,700 kg, or any multi-engine rotorcraft, that is conducting a take-off as an IFR aircraft when day VMC cannot be maintained until the minimum height required by regulation 91.305, it is an acceptable means of compliance with the requirement to clear obstacles by a safe margin from section 24.02 or 24.03 of the Part 91 MOS if one of the following is met:

- the requirements of an authorised instrument departure procedure can be achieved, with the aircraft engine-out climb gradient under ambient conditions specified in the manufacturer’s data being at least 0.3% greater than the gradient specified in the procedure with the loss of the most critical engine (or either engine if for a rotorcraft there is no critical engine)

or

- all of the following:
  - the aircraft engine-out climb gradient under ambient conditions specified in the manufacturer’s data is at least 0.3% greater than the obstacle free gradient for the runway length required
  - either:
    - published obstacle free gradients are only used if such gradients are surveyed to at least a distance of 7,500 m from end of take-off distance available (TODA)
    - or
    - an operator-established obstacle free gradient is used only if: the gradient (having a 150 m baseline at the end of TODA), 12.5% splays, and at least 7,500 m distance) is established not more than 30° from runway heading
      - the procedures involve not more than 15° of bank to track within the splay.

For a multi-engine aeroplane with an MTOW ≥ 5,700 kg conducting a take-off as an IFR aircraft where day VMC cannot be maintained until the minimum height required by regulation 91.305, it is an acceptable means of compliance with the requirement to clear obstacles by a safe margin from section 24.02 of the Part 91 MOS if the requirements of sections 9.03, 9.04, 9.05 and 9.06 of the Part 121 MOS are met.
For a multi-engine rotorcraft conducting a take-off as an IFR aircraft where day VMC cannot be maintained until the minimum height required by regulation 91.305, it is an acceptable means of compliance with the requirement to clear obstacles by a safe margin from section 24.03 of the Part 91 MOS if the requirements of sections 10.33 and 10.34 in combination, or 10.37 and 10.38 in combination, of the Part 133 MOS are met.

For a single-engine aeroplane or rotorcraft conducting a take-off as an IFR aircraft where day VMC cannot be maintained until the minimum height required by regulation 91.305, it is an acceptable means of compliance with the requirement to clear obstacles by a safe margin from section 24.02 or 24.03 of the Part 91 MOS if terrain and obstacles are cleared by:

- the use of an authorised instrument departure procedure, with the aircraft climb gradient under ambient conditions specified in the manufacturer’s data being at least 0.3% greater than the gradient specified in the procedure
- a minimum of 50 ft vertically within a lateral distance of:
  - 45 m plus 0.10 D (where D is the horizontal distance the aircraft will travel from the end of the take-off distance available)
  - to a maximum of:
    - 600 m;
    - if the portion of the flight from the departure end of the runway to the lowest safe altitude for the route can be conducted with a navigation specification of RNP 0.2 or better—a maximum of 300 m.

**GM 91.795 Take-off performance**

The take-off performance requirements are contained in Chapter 24 of the Part 91 MOS.

The performance information presented in an AFM is often based on measured flight test data corrected to ICAO standard day conditions and analytically expanded for the various parameters of weight, altitude, temperature etc.

The performance charts are often unfactored and do not make any allowance for varying degrees of pilot proficiency or mechanical deterioration of the aircraft. Effects of conditions not considered on the charts should be evaluated by the pilot, such as the effect of soft or grass runway surface on take-off performance.

In addition to the AFM providing figures for determining the take-off distance required, the PIC should take into consideration obstacles that may be limiting or that may infringe the intended flight path. Consideration should also be given to obstacles that may infringe any flight path intended for use during abnormal situations.

See [AC 91-02 – Guidelines for aeroplanes with MTOW not exceeding 5 700 kg - suitable places to take off and land](https://example.com), for recommended safety factors to be used during the take-off and landing of aeroplanes.

The following ACs address air transport operations in rotorcraft, however the content will be useful for pilots of rotorcraft in Part 91 operations:
• **AC 133-01 - Performance class operations**
• **AC 133-02 - Performance Class 2 with exposure operations.**

**GM 91.800 Landing performance**

The landing performance requirements are contained in Chapter 25 of the Part 91 MOS.

The performance information presented in an AFM is often based on measured flight test data corrected to ICAO standard day conditions and analytically expanded for the various parameters of weight, altitude, temperature etc.

Effects of conditions not considered on the charts should be evaluated by the PIC, such as the effect of soft or grass runway surface on landing performance.

The performance charts are often unfactored and do not make any allowance for varying degrees of pilot proficiency or mechanical deterioration of the aircraft.

In addition to the AFM providing figures for determining the landing distance required, the PIC should take into consideration obstacles that may be limiting or that may infringe the intended flight path of a missed approach. Consideration should also be given to obstacles that may infringe any flight path intended for use during abnormal situations.

See **AC 91-02 – Guidelines for aeroplanes with MTOW not exceeding 5 700 kg - suitable places to take off and land**, for recommended safety factors to be used during the take-off and landing of aeroplanes.

The following ACs address air transport operations in rotorcraft, however the content may be useful for pilots of rotorcraft in Part 91 operations:

• **AC 133-01 - Performance class operations**
• **AC 133-02 - Performance Class 2 with exposure operations.**

**Actual landing distance**

In response to recommendations of the FAA’s Take-off and landing performance assessment aviation rule making committee (TALPA ARC), the manufacturers of some jet-engine aeroplanes now supply actual landing distance information to help pilots make more accurate in-flight assessments of the landing distance required in unusual situations. Actual landing distance information takes into account; reported meteorological and runway surface conditions, runway slope, aircraft configuration, planned approach speed, thrust reversers and any other deceleration devices planned to be used for the landing. The FAA’s [Safety Alert For Operators (SAFO 19001)](https://www.faa.gov/air_traffic/air_traffic规章safetyalertforoperators/) contains useful information about the recommendations of the TALPA ARC.

Actual landing distance information is intended to show landing performance that can realistically be achieved by flight crews in commercial operations. This is distinct from landing performance demonstrated by test pilots during flight tests for aircraft type certification. The safety factor applicable to in-flight actual landing distance information is 1.15. The safety factor applied to aircraft type certification for pre-flight planning landing distance is 1.67.

Pilots of jet-engine aeroplanes that do not have actual landing distance information should continue to make in-flight assessment of landing distance required using the manufacturers landing distance information with an applicable safety factor.
Two major manufacturers (Boeing and Airbus) have introduced a new reference for in-flight landing distance performance, catering for both normal and abnormal system operations. The new distances are referred to by Airbus as Operational Landing Distances (OLD) and In-flight Landing Distance (IFLD) whereas Boeing incorporates the actual landing distance in the Performance In-flight section of the Quick Reference Handbook. Both manufacturers have included this data in their respective performance applications. The actual landing distances are a realistic representation of operationally achievable landing performance. The representation of this information is generally “unfactored” unless otherwise stated. The CAO 20.7.1B amendment facilitates the adoption of manufacturers’ performance applications along with the application of the 1.15 safety factor. The FAA and EASA have adopted the in-flight landing distance factoring as policy, along with ICAO.

_Landing in very wet conditions_

Operators and flight crews should be aware that landing distance factors – whether based on type certification testing or actual landing distance data provided by OEMs separately – may not provide adequate stopping distance in very wet but not yet contaminated runway surface conditions.

Issues that contribute to such incidents include runway conditions such as texture (polished or rubber contaminated surfaces), drainage, puddling in wheel tracks and active precipitation. For un-grooved runways, wheel braking may be degraded when the runway is very wet. Research conducted by the FAA has indicated that 30 to 40 percent of additional stopping distance may be required in certain cases where the runway is very wet, but not yet classified as contaminated.

In order to manage some of the risks associated in operating to very wet runways, it is recommended that operators consider the landing safety factor of 1.15 (which is the difference between 1.67 and 1.92 for type certification data and the value mentioned in the actual landing distance data) to be a minimum value.

If moderate or heavy precipitation is expected at the time of landing, operators and flight crews should consider assuming a braking action of medium or fair, or increasing the landing safety factor used during in-flight landing performance calculations. The FAA’s [Safety Alert For Operators (SAFO 19003)](https://www.faa.gov/safety/safety_alerts/safos/detail/safotable_19003/) contains useful information about the recommendations on landing safety factors.
6 Subpart 91.J—Weight and balance

There is an exemption in force in relation to this topic for the conduct of aerial application operations under Part 137. The effect of regulation 137.020 means that regulation 137.190 overrides regulation 91.805. After this override occurs, relevant operators and persons can then utilise instrument CASA EX129/19 if they elect to do so.

There are exemptions in force in relation to this Subpart for Part 121, 133, 135 operators and aerial work certificate holders. Operators are advised to review section 22 of CASA EX83/21 (for Part 121 operators), section 15 of CASA EX84/21 (for Part 133 operators), section 15 of CASA EX85/21 (for Part 135 operators) and section 14 of CASA EX86/21 (for aerial work certificate holders).

This Subpart does not apply if Subpart 121.J, 133.J, 135.J or 138.J applies to an operation.

This Subpart does not apply to Part 131 operations.

GM 91.805 Loading of aircraft

Because the probability of overloading in a small aircraft is high if standard weights are used, the use of standard weights in aircraft with less than seven seats is not recommended by CASA. Load calculations for these aircraft should be made using actual weights arrived at by weighing all occupants and baggage, including cabin baggage. Operators and pilots conducting Part 91 operations in larger aircraft should refer to Multi-Part AC 121-05, AC 133-04 and AC 135-08 - Passenger, crew and baggage weights.

All cargo transported on an aircraft should be weighed and secured to avoid movement in flight. In addition, cargo carried for the purpose of being dropped from the aircraft must be secured for take-off and until the point of the drop. The PIC must ensure the dropping of the item(s) will not result in the aircraft centre of gravity moving to the extent that it exceeds aircraft limits.

Operators may have alternative methods of weight and balance calculation, e.g., EFB applications. CAO 100.7 requires that such applications must be validated by a weight control authority. As at 1 October 2021, CAO 100.7 is planned to remain in effect beyond 2 December 2021.
7 Subpart 91.K—Equipment

There are exemptions in force in relation to this Subpart for Part 121, 133 and 135 operators. Operators are advised to review section 23 of CASA EX83/21 (for Part 121 operators), section 16 of CASA EX84/21 (for Part 133 operators) and section 16 of CASA EX85/21 (for Part 135 operators).

This Subpart does not apply if Subpart 121.K, 133.K or 135.K applies to an operation.

This Subpart does not apply to Part 103 or Part 131 operations.

AMC 91.810 Requirements relating to equipment

Introduction – radiocommunication system requirements

Paragraph 26.18(1)(a) of the Part 91 MOS requires an aircraft to be fitted with radiocommunication systems capable of collectively communicating on the frequencies necessary to meet the reporting, broadcast and listening watch requirements under regulations 91.630, 91.635, 91.640 and 91.675, from any point on the route of the flight, including in the event of any diversions.

Radiocommunication systems – HF (section 26.18 of the Part 91 MOS)

If an HF radio is fitted to an aircraft to comply with paragraph 26.18(1)(a) of the Part 91 MOS—generally this would be in geographical areas where a VHF radio cannot ensure the required communications—then the radio must, in order to be fitted as an acceptable means of compliance:

- take into account the expected radio propagation conditions during the period of operation
- be capable of delivering a peak envelope power to the antenna transmission line of at least 100 watts and not greater than 400 watts under standard conditions.

Radiocommunication systems – SATCOM (section 26.18 of the Part 91 MOS)

Where 2-way communications cannot be maintained using a VHF radio in the event of emergency and/or abnormal operations en-route, it is an acceptable means of compliance to use SATCOM telephone that is fitted to the aircraft in accordance with Part 21, instead of an HF radio, provided that all of the following conditions are met:

- routes are selected so that the anticipated period beyond VHF coverage, in the event of emergency and/or abnormal operation, does not exceed 30 minutes
- appropriate checks have been incorporated into the pre-flight check list and form part of the company’s operating procedures
- the system is equipped with an external antenna and operated via a common VHF headset/microphone
- SATCOM telephone transmissions will be recorded by the Cockpit Voice Recorder
- the system is inter-operable with existing NAV systems
- power can be removed from the system
- defect reports will be issued and dispatched as for other COM systems
- the system has been incorporated in the MEL if there is one for the aircraft.
Note: SATCOM telephone contact procedures are described in AIP ERSA. Additionally, to facilitate ATC initiated calls to the aircraft during contingencies, it is recommended that the phone number of the aircraft be included in Field 18 of the flight plan. Any pre-flight radio check of the SATCOM telephone should not be made to ATS to avoid congesting ATS phone lines.

Section 26.21 of the Part 91 Manual of Standards – independent portable lights

The information in this section outlines acceptable means of compliance regarding what constitutes “an independent portable light” for a flight crew member as required by paragraph 26.21(1)(c) of the Part 91 MOS.

For the purposes of the previously mentioned MOS paragraph, a torch carried onboard by the flight crew member is considered to constitute “an independent portable light” provided that the flight crew member has confirmed on the day of the flight that the torch:

- is serviceable; and
- has sufficient light output to properly illuminate any control, switch or display within the cockpit that the flight crew member would be required to view, manipulate or action during normal, abnormal or emergency situations.

Division 26.11 of the Part 91 Manual of Standards – oxygen equipment and oxygen supplies

Note: This acceptable means of compliance continues the previous standards specified in subsection 3 of 108.26 prior to 2 December 2021 when this CAO was repealed.

It is an acceptable means of compliance if a gaseous oxygen system complies with one of the following specifications:

- C.I.G. Gas Code 420 or 430
- RAAF Specification G172
- U.K. Ministry of Defence DEF STAN 68-2 1/1

It is an acceptable means of compliance if oxygen produced through chemical means in an oxygen system complies with one of the following specifications:

- U.S. Military Specification MIL-E-83252
- Scott Engineering Report 1024.

Sections 26.43 and 26.44 of the Part 91 Manual of Standards – supplemental oxygen and oxygen mask requirements

Note: This acceptable means of compliance continues previous standards specified in paragraph 8.2 of CAO 20.4 and subsections 5 and 6, and Appendix II, of 108.26 prior to 2 December 2021 when these CAOs were repealed.

The information in this section outlines acceptable means of compliance regarding the means of calculating the supplemental oxygen supply and the dispensing units for supplemental oxygen, including the minimum mass flow requirements, in relation to the requirements of sections 26.43 and 26.44 of the Part 91 Manual of Standards. None of these requirements override a higher requirement imposed by a design standard (however described) related to the type certification, or supplemental type certification, of the aircraft.
In determining the amount of oxygen required to be carried, the amount is to be determined on the basis that:

- a cabin pressurisation failure will occur at a point on the planned flight route which is most critical from the standpoint of oxygen need; and
- after the failure, the aircraft will descend in accordance with the emergency procedures specified in the aircraft’s flight manual (without exceeding its normal operating limitations) to a flight altitude or a Flight Level, as the case may be, that will allow the safe termination of the flight.

Dispensing units must meet the following requirements:

- An individual dispensing unit must be installed for each occupant for whom supplemental oxygen is to be supplied.
- A unit must be equipped with a suitable means to retain the unit in position on the face.
- A unit:
  - must not, while using the unit, adversely affect a person’s ability to use the crew intercommunications equipment or radiocommunication equipment required to be fitted to the aircraft by the civil aviation legislation; or
  - must provide alternative communication equipment that can achieve equivalent outcomes that the person can use while using the unit.
- The units provided in an aircraft operating at or below flight level 180 must include at least 1 unit designed to cover the nose and mouth for every 15 units provided.
- Every unit provided in an aircraft operating above flight level 180 must be designed to cover the nose and mouth.
- Every unit installed in an unpressurised aircraft must have all of the following information clearly visible on it:
  - a notice prohibiting smoking while the unit is used
  - an illustration showing how to put the unit on
  - a notice describing the dangers of flying with any kind of nasal obstruction or congestion.
- For flight crew members or assisting crew members, they must be provided with oxygen demand equipment with the oxygen dispensing unit connected to an oxygen supply terminal which is immediately available to each of these crew members when seated at their crew station.

The following minimum mass flow requirements must be met:

- One of the following:
  - if continuous flow equipment is installed for the use by flight crew members – the minimum mass flow of supplemental oxygen available for each crew member must not be less than the flow required to maintain, during inspiration, a mean tracheal oxygen partial pressure of 149 mm Hg when breathing 15 litres per minute, body temperature and pressure saturated (BTPS) and with a maximum tidal volume of 700 cc with a constant time interval between respirations; or
  - if continuous flow equipment is installed for the use by flight crew members – the flow rates and mask efficiencies in Figure 5 below may be used instead of the above flow rates; or
− a nasal cannula manufactured under the name “Oxymizer” may be used subject to the following conditions:
  o the minimum flow of supplemental oxygen available for each flight crew member at various cabin pressure altitudes must not be less than 0.3 litre per minute at 10 000 feet altitude, increasing by 0.1 litre per minute for every 2 000 feet up to 18 000 feet altitude; and
  o the aircraft must not operate above 18 000 feet altitude.

• If demand equipment is installed for use by flight crew members, the minimum mass flow of supplemental oxygen available for each flight crew member must not be less than the flow required to maintain, during inspiration, a mean tracheal oxygen partial pressure of 122 mm Hg, up to and including a cabin pressure altitude of 35 000 feet and 95 per cent oxygen between cabin pressure altitudes of 35 000 feet and 40 000 feet, when breathing 20 litres per minute BTPS. In addition, there must be means to allow the crew to use undiluted oxygen at their discretion.

• For passengers or cabin crew members using masks, the minimum mass flow of supplemental oxygen available for each person at various cabin pressure altitudes must not be less than the flow required to maintain, during inspiration and while using the oxygen equipment provided, the following mean tracheal oxygen partial pressures:
  − at cabin pressure altitudes above 10 000 feet up to and including 18 500 feet, a mean tracheal oxygen partial pressure of 100 mm Hg when breathing 15 litres per minute, BTPS, and with a tidal volume of 700 cc with a constant time interval between respirations;
  − at cabin pressure altitudes above 18 500 feet up to and including 40 000 feet, a mean tracheal oxygen partial pressure of 83.8 mm Hg when breathing 30 litres per minute, BTPS, and with a tidal volume of 1100 cc with a constant time interval between respirations. The flow rates and mask efficiencies specified in Figure 5 below may be used at cabin pressure altitudes up to 25 000 feet instead of the above flow rates.

• For passengers or cabin crew members using nasal cannulas manufactured under the name “Oxymizer”, the minimum flow of supplemental oxygen available for each person at various cabin pressure altitudes must not be less than 0.3 litre per minute at 10 000 feet altitude, increasing by 0.1 litre per minute for every 2 000 feet up to 18 000 feet altitude.
Sections 26.45 and 26.46 of the Part 91 Manual of Standards – protective breathing equipment

Note: This acceptable means of compliance continues previous standards specified in subsection 10 of CAO 20.4 and subsection 7 of 108.26 prior to 2 December 2021 when these CAOs were repealed.

The information in this section outlines acceptable means of compliance related to the protective breathing equipment required by sections 26.45 and 26.46 of the Part 91 Manual of Standards (the MOS).

The portable protective breathing equipment required by paragraphs 26.46(3)(b) and (3)(c) of the MOS must comply with (E)TSO-C116 (or any later version).

Except for the portable protective breathing equipment required by paragraph 26.46(3)(a) of the MOS which may, in relation to the 15 minute supply requirement of paragraph 26.46(2)(c) of the MOS, comply with (E)TSO-C116 (or any later version), the 15 minute supply requirement of paragraphs 26.45(2)(c) and 26.46(2)(c) must be calculated in reference to a pressure altitude 0 feet with a respiratory minute volume of 30 litres per minute, body temperature and pressure dry (BTPD) with the acceptable means of compliance being:

- If a demand oxygen system is used, a supply of 300 litres of free oxygen at 20°C and 760 mm Hg pressure is considered to be of 15 minute duration at the prescribed altitude and minute volume.
- If a continuous flow protective breathing system is used (including a mask with a standard rebreather bag) a flow rate of 60 litres per minute at 8 000 feet (45 litres per minute at sea level) and a supply of 600 litres of free oxygen at 20°C and 760 mm Hg pressure is considered to be of 15 minute duration at the prescribed altitude and minute volume.
GM 91.810 Requirements relating to equipment

The MOS content for this regulation is contained in Chapter 26 of the Part 91 MOS.

**ADS-B**

Refer to [AC 91-23 - ADS-B for enhancing situational awareness](#) for information on ADS-B and electronic conspicuity (EC) devices for operations under the VFR.

**Helicopter automatic pilot and automatic stabilisation systems**

Because of variation in the characteristics of helicopter automatic pilot and automatic stabilisation systems approved by a certifying authority, it is not possible to prescribe specifications for this equipment. Accordingly, each application for approval to conduct IFR category operations will be individually assessed on the basis of the specific helicopter type and its associated automatic pilot or autostabilisation equipment and the proposed operating environment.

**Carbon monoxide detectors / warning devices**

Crew and passengers in piston engine aircraft have the potential for carbon monoxide (CO) poisoning from cracked exhaust units and unserviceable heat exchange assemblies. This situation can be further exacerbated by unsealed penetration through the firewall and can go unnoticed through the fitment of inadequate or inappropriate CO detection units. The fitment of placards designed to change colour when exposed to CO may not necessarily provide adequate warning to the pilot and passengers of the elevated levels of CO within the cabin. More modern devices which include audible and improved visual warnings are more suited to detect and warn cabin occupants of the elevated levels of CO.

While audible/visual CO detectors are not mandated, they are available and they more effectively communicate the presence of CO.

It is strongly recommended that pilots wear personal CO detectors. As not all aircraft are required to have CO detectors fitted, small electronic personal devices are readily available at affordable prices. These devices allow for continual monitoring of CO levels with audible and visual warnings when escalated CO levels are detected. Examples of small electronic personal devices are shown in Figure 5.

![Figure 5: Examples of small electronic personal CO detector devices.](image)

**Figure 6: Electronic CO detector devices available for personal use.**

Aircraft certified and hard-wired products are also available that can be installed by approved maintenance repair organisations. Reliance on only the visual CO indicator placard, that
changes colour in the presence of CO, is considered suboptimal. If the aircraft is only fitted with the placard type CO indicator, the operator should ensure the placard is placed in the field of view of the pilot, is regularly checked to ensure that the placard is not time-expired and that the indicator is not faded from ultraviolet exposure or contamination.

Survival equipment - signalling

In determining whether Electronic Visual Distress Signals (EVDS) meet the requirements of paragraph 26.62(2)(b) of the Part 91 Manual of Standards, it is recommended that the operator consider whether:

- using the EVDS would constitute an offence under section 24 of the Civil Aviation Act 1988
- the EVDS meets all relevant safety standards including the requirements within Australian Standard AS 2092-2004 and the International Maritime Organization (IMO) Life Saving Appliance Code
- the light emitted by the EVDS would be recognised and effect an appropriate response in a distress situation, noting that lights of this kind are not internationally approved distress signals
- the use of EVDS is restricted by State and Territory legislation (Australian States and Territories restrict the types of lasers, including laser pointers and other laser signalling devices that can be lawfully used).

Supplemental oxygen for cabin crew

Supplemental oxygen is provided for cabin crew to help ensure they retain consciousness during an emergency descent following a loss of pressurisation, therefore enabling them to provide assistance to passengers (such as the application of first aid oxygen once a safe level is reached and the aeroplane stabilises after the emergency). Operator procedures should consider the different hazards cabin crew are exposed to during an emergency and how different cabin crew actions should be prioritised. Examples of the kinds of actions requiring prioritisation might be securing themselves and other movable items in their immediate vicinity, providing directions to passengers and when to access supplemental oxygen.

Note: It is not envisaged that cabin crew will always be able to provide assistance to passengers during emergency descent procedures which may be required in the event of loss of pressurisation.

Section 26.53 and 26.54 of the Part 91 Manual of Standards – Hand-held fire extinguishers

The MOS requires that “at least” a certain number of extinguishers be fitted.

In determining whether additional extinguishers are required, beyond the absolute regulatory minimum, it is recommended that operators consider the following matters:

- the size of the passenger compartment
- the location of any cargo or baggage compartments
- whether each extinguisher is located and installed to be readily accessible for use by crew and/or passengers
- whether the location is clearly evident to persons who may be required to use it
• whether the extinguisher is located in an environment, and mounted in an attitude, that complies with the manufacturer’s recommendations
• whether an extinguisher is mounted in a position which might lead to accidental discharge or restrict access to other equipment
• whether additional hand-held fire extinguishers may be required for the protection of other compartments accessible to the flight crew in flight.

Note: These considerations may result in a number of hand-held fire extinguishers greater than the minimum required.

Unless a specific location is required by section 26.53 or 26.54 of the Part 91 MOS, hand-held fire extinguishers are not necessarily exclusive to particular locations. If the location of a cargo/baggage or passenger compartment coincides with each other, and have common agent applicability, the various requirements may be considered common.

Where only one hand-held fire extinguisher is carried in the passenger compartment, it is recommended that this extinguisher be located near a crew member’s station. Where two or more hand-held fire extinguishers are carried in the passenger compartment it is recommended that the additional extinguishers are distributed throughout the cabin as evenly as is practicable.

In relation to the types of fire extinguishers carried, it is recommended that:
• where 2 or more extinguishers are required in the passenger compartment, at least 2 contain Halon 1211 (BCF) or a CASA accepted equivalent
• extinguishers located in the pilot compartment are suitable for fighting both flammable fluid and electrical fires
• dry chemical or water-based extinguishers are not used in the pilot compartment or any compartment not separated by a partition from the pilot compartment
• water based extinguishers are not located in the passenger compartment of aircraft which do not carry a cabin crew member.

Additional information is contained in the following Airworthiness bulletin: AWB Airframes 26 - Fire Protection for further information on fire protection.
8 Subpart 91.P—Cabin crew

There are exemptions in force in relation to this Subpart for Part 121 and 133 operators. Operators are advised to review section 24 of CASA EX83/21 (for Part 121 operators) and section 17 of CASA EX84/21 (for Part 133 operators).

This Subpart does not apply if Subpart 121.P, 133.P or 135.P applies to an operation.

This Subpart does not apply to Part 131 operations.

GM 91.820 Cabin crew—when required
Reserved.

GM 91.825 Cabin crew—number
Reserved.

GM 91.830 Cabin crew—knowledge of emergency and safety equipment and procedures
Reserved.
9  **Subpart 91.T—Operations under certain special certificates of airworthiness and special flight permits**

9.1  **Division 91.T.1—Preliminary**

GM 91.835 Aircraft with more than one certificate of airworthiness—application of Subpart 91.T

Refer to [AC 21-1 - Aircraft Airworthiness Certification Categories and Designations Explained](#) for detailed information on aircraft airworthiness certification and operational classifications.

9.2  **Division 91.T.2—Restricted category aircraft—operating requirements**

GM 91.840 Restricted category aircraft—general operating requirements

Restricted category applies to aircraft that carry out certain special purpose operations. Aircraft types which may be eligible for issue of a special CofA in the restricted category include:

- those designed and type certificated specifically as restricted category e.g., specialist water bombers, agricultural aircraft
- ex-military aircraft of:
  - the Australian Defence Force
  - an armed force of Canada, the USA or the UK
- aircraft which may have been in a standard category but have been modified for special purpose operations noting that, under certain conditions, such aircraft can be transferred from restricted to a standard CofA category, and back.

**Note:** Standard airworthiness categories are Transport, Normal, Utility, Acrobatic, Commuter, Manned free balloons, Special class (e.g., airships).

GM 91.845 Restricted category aircraft—kinds of operations permitted

A *special purpose operation* mentioned in paragraph 91.845(1)(a) is one of the following:

- agricultural operations (e.g., spraying, dusting, seeding, and livestock and feral animal control)
- forest and wildlife conservation
- firefighting
- aerial surveying or scientific research (e.g., photography, mapping, and oil and mineral exploration)
- patrolling (e.g., pipelines, power lines, and canals)
- weather control and atmospheric research (e.g., cloud seeding)
• aerial advertising (e.g., skywriting, banner towing, airborne signs and public address systems)
• glider towing
• target towing
• target designation
• any other operation similar to any of these operations.

Source: regulation 21.025 of CASR

Refer to AC 21.6 - Restricted category aircraft - certification for detailed information.

9.3 Division 91.T.3—Provisionally certificated aircraft—operating requirements

GM 91.850 Provisionally certificated aircraft—operating requirements
Reserved.

GM 91.855 Provisionally certificated aircraft—kinds of operations permitted
Reserved.

GM 91.860 Provisionally certificated aircraft—operation for type certification or supplemental type certification
Reserved.

GM 91.865 Provisionally certificated aircraft—requirements for the carriage of people
Reserved.

GM 91.870 Provisionally certificated aircraft—additional requirements for operators
Reserved.

9.4 Division 91.T.4—Experimental aircraft—operating requirements

GM 91.875 Experimental aircraft—operating requirements
The MOS content for subparagraph 91.875(2)(i)((iii) is contained in section 27.01 of the Part 91 MOS.

Other information contained in this document related to experimental aircraft can be found in GM 91.045, 91.050 and 91.055.

Experimental aircraft are not type-certificated. 'Experimental' is a designation and not a category. It is also important to note that an experimental certificate does not attest to an aircraft being fully airworthy.
The experimental certificate system allows any person or commercial concern to construct an aircraft of any size and seating capacity, and with any number and type of engines. Experimental certificates can be issued for one or more of a number of specific recognised purposes.

Regulation 21.191 allows an experimental certificate to be issued for one or more of the following purposes:

- research and development
- showing compliance with regulations
- training the applicant’s flight crew
- exhibition
- air racing
- market surveys
- operating an amateur-built aircraft
- operating a kit-built aircraft
- private operations of prototype aircraft previously certificated under paragraph 21.191 (a), (b) or (d)
- operating a light sport aircraft that:
  - has been assembled from a kit in relation to which the applicant can give the information, statement and documents required by paragraph 21.193(e)
  - has been assembled in accordance with the kit manufacturer’s instructions for assembling the aircraft
  - is of the same make and model as a production aircraft covered by regulation 21.186 that has been issued with a special certificate of airworthiness (CofA)
- operating any other light sport aircraft covered by regulation 21.186 for which a special CofA for light sport aircraft, or another document of similar effect under a law of a Contracting State, has been issued.

If the issuance of the approval mentioned in this regulation requires the issuance or re-issuance of an experimental certificate, then the approval is likely to be subject to the safety standard mentioned in subregulation 11.055 (1C).

Refer to [AC 21-10 - Experimental certificates](#) for detailed guidance.

**GM 91.880 Experimental aircraft—kinds of operations permitted**

Operations may be conducted under an experimental certificate for a range of reasons. Generally, this regulation requires the experimental certificate operation to occur for either the purposes listed in Part 21 or the additional supporting purposes listed under this Part 91 regulation.

Additional information relating to experimental certificates can be found in [AC 21-10 - Experimental certificates](#).
GM 91.885 Experimental aircraft—maximum number of persons to be carried

If the issuance of the approval mentioned in this regulation requires the issuance or re-issuance of an experimental certificate, then the approval is likely to be subject to the safety standard mentioned in subregulation 11.055 (1C).

9.5 Division 91.T.5—Primary category aircraft and intermediate category aircraft—operating requirements

GM 91.890 Primary category aircraft and intermediate category aircraft—operating requirements

Aircraft certified in the primary category are of simple design and intended for pleasure and personal use only. Regulation 21.024 provides that an aircraft can be certified in the primary category if the aircraft:

- is:
  - unpowered
  - an aeroplane powered by a single, naturally aspirated engine with a stall speed of 61 knots
  - a rotorcraft powered by a single, naturally aspirated engine with a 29.3 kgm\(^2\) main rotor disc loading limitation (under sea level standard day conditions)
- has a maximum take-off weight of not more than 1 225kg or, if the aircraft is a seaplane, a maximum take-off weight of not more than 1 530 kg
- has a maximum seating capacity of no more than four (4) persons, including the pilot
- has an unpressurised cabin.

Refer to AC 21-7 - Primary category aircraft - certification for detailed guidance.

Regulation 21.026 allows an aircraft to be certified in the intermediate category if the aircraft:

- is an aeroplane with a stall speed of 61 knots
- is a rotorcraft with a 29.3 kgm\(^2\) main rotor disc loading limitation (under sea level standard day conditions)
- has a maximum take-off weight of not more than 1 750 kg
- has a maximum seating capacity of 4 persons, including the pilot
- has an unpressurised cabin.
9.6 Division 91.T.6—Light sport aircraft—operating requirements

GM 91.895 Light sport aircraft—operators

A light sport aircraft (LSA) is a small, simple-to-operate, low performance aircraft. With regard to the requirements of CASR, a light sport aircraft is an aircraft, other than a helicopter, that complies with the following criteria:

- maximum take-off weight of not more than 600 kg, or 650 kg for an aircraft intended for operation on water, or 560 kg for a lighter-than-air aircraft
- maximum stalling speed in the landing configuration \( V_{S0} \) of not more than 45 kts Calibrated Airspeed (CAS) at the aircraft’s maximum certificated take-off weight and most critical centre of gravity
- maximum seating capacity of no more than two persons, including the pilot
- if powered, a single, non-turbine engine fitted with a propeller
- non-pressurised cabin
- for an aircraft operating over land, a fixed landing gear
- for an aircraft intended for operation on water, a fixed or repositionable landing gear
- for a glider, a fixed or retractable landing gear
- for a glider, a maximum never exceed speed \( V_{NE} \) of 135 knots CAS.

The types of aircraft that may satisfy these criteria are:

- fixed-wing aircraft
- powered parachutes
- weight shift aircraft
- gliders
- balloons
- airships
- gyroplanes.

Refer to AC 21-41 - Light Sport Aircraft Certificate of Airworthiness and AC 21-42 - Light sport aircraft manufacturers' requirements for detailed guidance.

GM 91.900 Light sport aircraft—pilots

The MOS content for paragraph 91.900(2)(c) is contained in section 27.02 of the Part 91 MOS.
9.7 Division 91.T.7—Special flight permits—operating requirements

GM 91.905 Flights under special flight permits

The purposes for which a Special Flight Permit (SFP) may be issued are:

- flying the aircraft to a base where repairs, alterations or maintenance is to be performed, or to a point of storage
- delivering or exporting the aircraft
- production flight testing of a new production aircraft
- evacuating the aircraft from areas of impending danger
- conducting customer demonstration flights of a new production aircraft, which has satisfactorily completed production flight tests
- assisting in searching for, bringing aid to, or rescuing persons in danger on a particular occasion
- assisting with a state of emergency
- operating the aircraft above its certificated MTOW.

Flight tests for the purpose of completion of a maintenance action or assessment flights as detailed in the aircraft maintenance manual may be conducted by entering the requirement on the aircraft flight and technical log. No SFP is issued for this purpose.

Refer to AC 21-09 - Special flight permits for details on the circumstances in which an SFP may be required, the process for applying for a special flight permit and other information.

9.8 Division 91.T.8—Miscellaneous

GM 91.910 Application of Division 91.T.8

A special CofA is issued to an aircraft that does not meet the requirements of an applicable comprehensive and detailed airworthiness code as required for standard category aircraft.

A special CofA may be issued in the following categories:

- primary
- intermediate
- restricted
- limited
- amateur built (accepted under an amateur built aircraft acceptance).

Refer to AC 21.1 - Aircraft airworthiness certification categories and designations explained for detailed guidance.

GM 91.915 Aircraft with special certificates of airworthiness—maintenance release etc.

This regulation does not apply to Part 103 operations.
GM 91.920 Aircraft with special certificates of airworthiness—flight tests to be conducted in certain areas

Airworthiness flight tests are controlled by Part 21 and occur for a range of circumstances. For example, an aircraft may need a formal flight test under an experimental certificate to show compliance with the applicable airworthiness standards for a TC, STC or other modification to be approved.

Refer to AC 21-47 – Flight test safety for additional information relating to flight tests.
10 Subpart 91.Y—Minimum equipment lists

10.1 Division 91.Y.1—Preliminary

GM 91.925 Definitions

Reserved.

GM 91.930 Requirements for minimum equipment lists

The MOS content for this regulation is contained in Chapter 28 of the Part 91 MOS (except for section 28.09 which encompass the MOS content for paragraph 91.945(5)(b)).

A MEL is a document that allows for the operation of an individual aircraft by a specific operator under specified conditions, with item(s) of equipment inoperative at the time of dispatch for an intended flight.

An MEL consists of an approved list of the specific inoperative equipment for a particular aircraft, not an aircraft make and model. Its use is described in the associated procedures contained in an operator’s maintenance control manual and/or operations manual, or other appropriately documented procedures (for class B aircraft).

An MEL is derived from the master minimum equipment list (MMEL) and is normally not less restrictive than the corresponding MMEL, except where regulatory requirements permit. An operator’s MEL must consider the aircraft configuration, type of operation and operating environment.

An approved MEL for an aircraft is a non-transferable document. If an aircraft moves from one operator to another, the new operator cannot automatically use the previously approved MEL.

Irrespective of the provisions of the MEL, the PIC may require a defect to be rectified after considering operational implications, multiple unserviceability’s, and additional failures during continued operation with inoperative systems or components.

The requirement to have an MEL is defined according to the type of operations conducted. Refer to the regulations below for requirements:

- 121.060 Operator to have minimum equipment list for certain flights (air transport operations - larger aeroplanes)
- 133.035 Operator to have minimum equipment list for certain flights (air transport operations - rotorcraft)
- 135.045 Operator to have minimum equipment list for certain flights (air transport operations - smaller aeroplanes.)

The regulations above prescribe the requirement for an operator to have an MEL in some circumstances. Subpart 91.Y prescribes the technical requirements of a MEL.

The conduct of Part 91 operations does not necessitate the use of a MEL. However, due to the associated safety benefits, operators may choose to apply to CASA seeking approval for an MEL.
Refer to CAAP 37-1 - Minimum Equipment Lists (MEL) for detailed guidance.

10.2 Division 91.Y.2—Approval of minimum equipment lists

GM 91.935 Approval of minimum equipment lists
Section 5 and schedule 1 of the CASA EX161/21 instrument collectively grant the approval required by this regulation for a MEL to the holders of an approved MEL that was in force under the pre-2 December 2021 rules. It is recommended that affected persons review section 5 and schedule 1 of CASA EX161/21.

10.3 Division 91.Y.3—Variations of minimum equipment lists

GM 91.940 Approval of variations
Reserved.

10.4 Division 91.Y.4—Extensions of rectification intervals

GM 91.945 Approval of extensions of rectification intervals
The MOS content for paragraph 91.945(5)(b) is contained in section 28.09 of the Part 91 MOS.
Refer to CAAP 37-1 - Minimum Equipment Lists (MEL) for detailed guidance.

GM 91.950 Effect of approval
Reserved.

GM 91.955 CASA to be notified of extensions approved by a continuing airworthiness management organisation
Reserved.

10.5 Division 91.Y.5—Other

GM 91.960 Operation of aircraft with multiple inoperative items not permitted in certain circumstances
Refer to CAAP 37-1 - Minimum Equipment Lists (MEL) for detailed guidance on minimum equipment lists.
11 Subpart 91.Z—Foreign aircraft

GM 91.965 Foreign registered aircraft—Chicago Convention
Reserved.

GM 91.970 Foreign registered aircraft—special flight authorisations
Reserved.

GM 91.975 Foreign state aircraft—approval to fly in Australian territory
Reserved.

GM 91.980 Foreign registered aircraft—major defect—CASA direction
Reserved.

GM 91.985 Foreign registered aircraft—CASA to notify Contracting State of direction
Reserved.

GM 91.990 Foreign registered aircraft—CASA may revoke direction
Reserved.

GM 91.995 Foreign registered aircraft—when direction or revocation takes effect
Reserved.