



Australian Government

Civil Aviation Safety Authority

I, TERENCE LINDSAY FARQUHARSON, Acting Director of Aviation Safety, on behalf of CASA, make this instrument under regulation 207 of the *Civil Aviation Regulations 1988*.

[Signed T. Farquharson]

Terry Farquharson
Acting Director of Aviation Safety

16 August 2012

Civil Aviation Order 20.18 Amendment Instrument 2012 (No. 1)

1 Name of instrument

This instrument is the *Civil Aviation Order 20.18 Amendment Instrument 2012 (No. 1)*.

2 Commencement

This instrument commences on the day after registration.

3 Amendment of Civil Aviation Order 20.18

Schedule 1 amends Civil Aviation Order 20.18.

Schedule 1 Amendments

[1] Paragraphs 9B.8 and 9B.9

substitute

9B.8 On and after 12 December 2013, any aircraft that is operated at or above FL 290 must carry serviceable ADS-B transmitting equipment that complies with an approved equipment configuration by meeting the conditions for approval set out in Appendix XI.

9B.9 An aircraft:

- (a) that is first registered on or after 6 February 2014; and
- (b) that is operated under the I.F.R.;

must carry serviceable ADS-B transmitting equipment that complies with an approved equipment configuration by meeting the conditions for approval set out in Appendix XI.

9B.10 On and after 2 February 2017, an aircraft:

- (a) that is first registered before 6 February 2014; and
- (b) that is operated under the I.F.R.;

must carry serviceable ADS-B transmitting equipment that complies with an approved equipment configuration by meeting the conditions for approval set out in Appendix XI.

9B.11 On and after 4 February 2016, an aircraft that is operated under the I.F.R. in airspace:

- (a) that is Class A, B, C or E; and
- (b) that is within the arc of a circle that starts 500 NM true north from Perth aerodrome and finishes 500 NM true east from Perth aerodrome;

must carry serviceable ADS-B transmitting equipment that complies with an approved equipment configuration by meeting the conditions for approval set out in Appendix XI.

9B.12 Paragraphs 9B.8 to 9B.11 do not apply to an aircraft if:

- (a) the aircraft owner, operator or pilot has written authorisation from CASA, based on a safety case, for the operation of the aircraft without the ADS-B transmitting equipment; or
- (b) the equipment is unserviceable for a flight, and each of the following applies:
 - (i) the flight takes place within 3 days of the discovery of the unserviceability;
 - (ii) at least 1 of the following applies for the flight:
 - (A) flight with unserviceable equipment has been approved by CASA, in writing, subject to such conditions as CASA specifies;
 - (B) the unserviceability is a permissible unserviceability set out in the minimum equipment list for the aircraft and any applicable conditions under subregulation 37 (2) of the *Civil Aviation Regulations 1988* have been complied with;
 - (iii) ATC clears the flight before it commences despite the unserviceability.

[2] After subsection 9C

insert

9D Directions for mandatory GNSS equipment for I.F.R. flight

Note This subsection provides for minimum equipage for GNSS navigation. Some operations under RNP may require additional equipment under CAO 20.91.

Definitions

9D.1 In this subsection:

ADF equipment means automatic direction finding equipment.

CAO means Civil Aviation Order.

EASA means the European Aviation Safety Agency.

ETSO means European Technical Standard Order of EASA.

FAA means the Federal Aviation Administration of the United States of America.

GNSS means the Global Navigation Satellite System.

paragraph 9D.9 standards means the standard set out in paragraph 9D.9 for GNSS navigation equipment.

paragraph 9D.10 standards means the standard set out in paragraph 9D.10 for GNSS navigation equipment.

paragraph 9D.11 standards means the standard set out in paragraph 9.11 for GNSS navigation equipment.

paragraph 9D.12 standards means the standard set out in paragraph 9D.12 for ADF and VOR equipment.

recognised country means a country listed in the Table in Appendix 1 of CAO 100.16.

registered, for an aircraft, means entered on the Australian Civil Aircraft Register.

RNP means required navigation performance.

TSO means Technical Standard Order of the FAA.

VOR navigation receiver means very high frequency (VHF) omni-range navigation receiver.

9D.2 Subject to paragraph 9D.1, in this subsection words and phrases have the same meaning as in subsection 9B.

GNSS navigation for RPT operations and charter operations under the I.F.R.

9D.3 An aircraft:

- (a) that is first registered on or after 6 February 2014; and
- (b) that is engaged in RPT operations or charter operations under the I.F.R.;
must carry at least all of the serviceable equipment mentioned in 1 of the following subparagraphs:
- (c) at least 2 independent GNSS navigation equipments that meet paragraph 9D.9 standards;
- (d) at least:
 - (i) a single GNSS equipment that meets paragraph 9D.9 standards; and
 - (ii) an ADF or a VOR navigation receiver that meets paragraph 9D.12 standards;
- (e) a complete GNSS navigation installation that has been approved by CASA as capable of achieving RNP in accordance with CAO 20.91.

9D.4 An aircraft:

- (a) that is first registered before 6 February 2014; and
- (b) that is engaged in RPT operations or charter operations under the I.F.R.;

must carry at least all of the serviceable equipment mentioned in subparagraph 9D.3 (c), (d) or (e) if GNSS equipment is installed on the aircraft on or after 6 February 2014.

9D.5 On and after 4 February 2016, an aircraft:

- (a) that is first registered before 6 February 2014; and
 - (b) that is engaged in RPT operations or charter operations under the I.F.R.;
- must carry at least all of the serviceable equipment mentioned in 1 of the following subparagraphs:
- (c) at least 2 independent GNSS navigation equipments that meet paragraph 9D.9 standards;
 - (d) at least:
 - (i) a single GNSS equipment that meets paragraph 9D.10 standards; and
 - (ii) an ADF or a VOR navigation receiver that meets paragraph 9D.12 standards;
 - (e) a complete GNSS navigation installation that has been approved by CASA as capable of achieving RNP in accordance with CAO 20.91.

GNSS navigation for aerial work operations and private operations under the I.F.R.

9D.6 An aircraft:

- (a) that is first registered on or after 6 February 2014; and
- (b) that is engaged in aerial work operations or private operations under the I.F.R.;

must carry at least 1 serviceable GNSS navigation equipment that meets paragraph 9D.9 standards.

9D.7 An aircraft:

- (a) that is first registered before 6 February 2014; and
- (b) that is engaged in aerial work operations or private operations under the I.F.R.;

must carry at least 1 serviceable GNSS navigation equipment that meets paragraph 9D.9 standards, if GNSS equipment is installed on the aircraft on or after 6 February 2014.

9D.8 On and after 4 February 2016, an aircraft:

- (a) that is first registered before 6 February 2014; and
- (b) that is engaged in aerial work operations or private operations under the I.F.R.;

must carry at least all of the serviceable equipment mentioned in 1 of the following subparagraphs:

- (c) at least 1 serviceable GNSS navigation equipment that meets paragraph 9D.9 standards;

- (d) at least:
 - (i) a single GNSS equipment that meets paragraph 9D.11 standards; and
 - (ii) an ADF or a VOR navigation receiver that meets paragraph 9D.12 standards;
- (e) a complete GNSS navigation installation that has been approved by CASA as capable of achieving RNP in accordance with CAO 20.91.

Standards for GNSS navigation equipment, and ADF and VOR equipment

Paragraph 9D.9 standards

- 9D.9 For the paragraph 9D.9 standards, GNSS equipment must be of a type that is authorised by:
- (a) FAA, in accordance with 1 of the following TSOs, or a later version of the TSO as in force from time to time:
 - (i) TSO-C145, dated 15 May 1998;
 - (ii) TSO-C146, dated 6 October 1999;
 - (iii) TSO-C196, dated 21 September 2009; or
 - (b) EASA, in accordance with 1 of the following ETSOs, or a later version of the ETSO as in force from time to time:
 - (i) ETSO-C145, dated 24 October 2003;
 - (ii) ETSO-C146, dated 24 October 2003.

Paragraph 9D.10 standards

- 9D.10 For the paragraph 9D.10 standards, GNSS equipment must be of a type that is authorised by:
- (a) FAA, in accordance with 1 of the following TSOs, or a later version of the TSO as in force from time to time:
 - (i) TSO-C129, dated 10 December 1992;
 - (ii) TSO-C145, dated 15 May 1998;
 - (iii) TSO-C146, dated 6 October 1999;
 - (iv) TSO-C196, dated 21 September 2009; or

Note 1 GNSS equipment in accordance with TSO-C129 is unlikely to support ADS-B position source equipment requirements.

Note 2 If GNSS equipment in accordance with TSO-C129 is used, the requirement for navigation to an alternate aerodrome must be met by using ADF or VOR navigation.

- (b) EASA, in accordance with 1 of the following ETSOs, or a later version of the ETSO as in force from time to time:
 - (i) ETSO-C129a, dated 24 October 2003;
 - (ii) ETSO-C145, dated 24 October 2003;
 - (iii) ETSO-C146, dated 24 October 2003.

Paragraph 9D.11 standards

9D.11 For the paragraph 9D.11 standards, GNSS equipment must be of a type that is authorised by:

- (a) FAA, in accordance with TSO-C129, dated 10 December 1992, or a later version of the TSO as in force from time to time; or

Note 1 GNSS equipment in accordance with TSO-C129 is unlikely to support ADS-B position source equipment requirements.

Note 2 If GNSS equipment in accordance with TSO-C129 is used, the requirement for navigation to an alternate aerodrome must be met by using ADF or VOR navigation.

- (b) EASA, in accordance with ETSO-C129a, dated 24 October 2003, or a later version of the ETSO as in force from time to time.

Paragraph 9D.12 standards

9D.12 For the paragraph 9D.12 standards, ADF equipment and VOR navigation receivers must be of a type that is certified by 1 of the following:

- (a) FAA;
- (b) EASA;
- (c) NAA of a recognised country.

9E Carriage of Mode S transponder equipment

9E.1 This subsection applies to an aircraft engaged in private, aerial work, charter or RPT operations.

9E.2 Subject to paragraph 9E.3, an aircraft:

- (a) that is:
 - (i) first registered on or after 6 February 2014; or
 - (ii) modified by having its transponder installation replaced on or after 6 February 2014; and
- (b) that is operated:
 - (i) in Class A, B, C or E airspace; or
 - (ii) above 10 000 feet above mean sea level in Class G airspace;

must carry a serviceable Mode S transponder that meets the standards:

- (c) for Mode S transponder equipment — in subsection 9C; and
- (d) for ADS-B transmission — in a clause or clauses of Appendix XI as follows:
 - (i) clauses 2 and 5 of Part B; or
 - (ii) clause 7 of Part C; or
 - (iii) clause 8 of Part C.

Note The requirement is for aircraft to be fitted with a Mode S transponder with ADS-B OUT capability. That does not mean that ADS-B OUT transmission is also required under this paragraph. It means that, with the later connection of compatible GNSS position source equipment, ADS-B OUT can be transmitted as well as Mode S SSR responses.

- 9E.3 Paragraph 9E.2 does not apply to an aircraft:
- (a) operating in Class E airspace; or
 - (b) operating above 10 000 feet above mean sea level in Class G airspace;
- if the aircraft does not have:
- (c) an engine; or
 - (d) sufficient engine-driven electrical power generation capacity to power a Mode S transponder.

- 9E.4 On and after 4 February 2016, an aircraft operating at Brisbane, Sydney, Melbourne or Perth aerodrome must carry a serviceable Mode S transponder that meets the standards of:
- (a) subsection 9C; and
 - (b) the following clause or clauses of Appendix XI:
 - (i) clauses 2 and 5 of Part B; or
 - (ii) clause 7 of Part C; or
 - (iii) clause 8 of Part C.

Note 1 A Mode A/C transponder does not meet this requirement.

Note 2 ADS-B OUT transmission is not mandatory but the Mode S transponder must be ADS-B capable.

- 9E.5 Paragraphs 9E.2 and 9E.4 do not apply to an aircraft for a flight if the Mode S transponder equipment is unserviceable for the flight, and each of the following applies:
- (a) the flight takes place within 3 days of the discovery of the unserviceability;
 - (b) at least 1 of the following applies for the flight:
 - (i) flight with unserviceable equipment has been approved by CASA, in writing, subject to such conditions as CASA specifies;
 - (ii) the unserviceability is a permissible unserviceability set out in the minimum equipment list for the aircraft, and any applicable conditions under subregulation 37 (2) of the *Civil Aviation Regulations 1988* have been complied with;
 - (c) ATC clears the flight despite the unserviceability.
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