

Australian Government

Civil Aviation SafetyAuthority

I, SHANE PATRICK CARMODY, Director of Aviation Safety, on behalf of CASA, make this instrument under regulation 179A of the *Civil Aviation Regulations 1988* and regulation 11.245 of the *Civil Aviation Safety Regulations 1998*.

[Signed S. Carmody]

Shane Carmody Director of Aviation Safety

31 October 2018

Civil Aviation Order 20.91 Amendment Instrument 2018 (No. 1)

1 Name

This instrument is Civil Aviation Order 20.91 Amendment Instrument 2018 (No. 1).

2 Commencement

This instrument commences on the day after it is registered.

3 Amendment of Civil Aviation Order 20.91

Schedules 1 and 2 amend *Civil Aviation Order 20.91 (Instructions and directions for performance-based navigation) Instrument 2014.*

Schedule 1 Amendments — general

[1] Paragraph 3.2

omit

the Civil Aviation Safety Regulations 1998 (CASR 1998) substitute CASR

[2] Paragraph 3.2, Note

omit

the Civil Aviation Regulations 1988 substitute CAR

[3] Subsection 4, after the heading

insert

Note In this Civil Aviation Order terms and expressions have the same meaning as they have in the *Civil Aviation Act 1988* and the regulations.

[4] Paragraph 4.1, Table

Omit each item for the following acronyms and abbreviations:

(a) AUSEP;

(b) ADC;

- (c) AFCS;
- (d) ATA;
- (e) BNN;
- (f) CA;
- (g) CAANZ;
- (h) CAS;
- (i) CAW;
- (j) CF;
- (k) CMM;
- (l) CRC;
- (m) DB;
- (n) DF;
- (o) DTK;
- (p) D TO;
- (q) EFIS;
- (r) EHSI;
- (s) ELA;
- (t) FA;
- (u) FAAOC;
- (v) FGS;
- (w) FTP;
- (x) GNSS FPA;
- (y) GPA;
- (z) HF;
- (za) HIL;
- (zb) HM;
- (zc) ICAW;
- (zd) IPC;
- (ze) LOI;
- (zf) LTP;
- (zg) MASPS;
- (zh) MCDU;
- (zi) MOC;
- (zj) ND.

[5] Paragraph 4.1, Table

insert

NM nautical mile

[6] Paragraph 4.1, Table

Omit each item for the following acronyms and abbreviations:

- (a) Ops Specs;
- (b) PDE;
- (c) PFD;
- (d) PFOV;
- (e) PT;
- (f) QFE;
- (g) RVSM;
- (h) SAE;
- (i) SATCOM;
- (j) SCNS;
- (k) SRM;
- (l) TF;
- (m) TOAC;
- (n) VA;
- (o) VDI;
- (p) VEB;
- (q) VM;
- (r) VTF;
- (s) WPT.

[7] Paragraph 4.2, definition of Self-contained navigation system *omit*

[8] Paragraph 9.1

substitute

- 9.1 Subject to compliance with paragraphs 9.2 and 9.3, an Australian aircraft is deemed to be approved for navigation in accordance with any of the following navigation specifications:
 - (a) RNAV 5;
 - (b) RNAV 1 and RNAV 2;
 - (c) RNP 2;
 - (d) RNP 1.

[9] Paragraph 9.3

substitute

- 9.3 The aircraft is approved for navigation during a flight in accordance with a navigation specification mentioned in paragraph 9.1 if the AFM or AFMS for the aircraft, as published at the time of the flight, states that the aircraft:
 - (a) is capable of the navigation specification; or
 - (b) has the GPS capability mentioned in an item of the Table that corresponds to the navigation specification.

Table

	GPS capability (Column 1)	Navigation specification (Column 2)
1	GPS RNAV EN ROUTE	RNAV 5; RNAV 2 or RNP 2
2	GPS RNAV TERMINAL	RNAV 1 or RNP 1

Note For example, for the purposes of subparagraph 9.3 (b), if the AFM or AFMS for an aircraft states that the aircraft is capable of GPS RNAV TERMINAL (a "GPS capability"), then the aircraft would be approved to navigate in accordance with RNAV 1 (the corresponding "navigation specification").

[10] Paragraph 9.4

omit

[11] Paragraph 10.1

substitute

- 10.1 Subject to compliance with paragraphs 10.2 and 10.3, an Australian aircraft is deemed to be approved for navigation in accordance with any of the following navigation specifications:
 - (a) RNAV 5;
 - (b) RNAV 1 and RNAV 2;
 - (c) RNP 2;
 - (d) RNP 1;
 - (e) RNP APCH-LNAV;
 - (f) RNP APCH-LNAV/VNAV;
 - (g) RNP APCH-LP or RNP APCH-LPV.

[12] Paragraphs 10.3 and 10.4

substitute

- 10.3 The aircraft is approved for navigation during a flight in accordance with a navigation specification mentioned in paragraph 10.1 if the AFM or AFMS for the aircraft, as published at the time of the flight, states that the aircraft:
 - (a) is capable of the navigation specification; or
 - (b) has the GPS capability mentioned in an item of the Table that corresponds to the navigation specification.

Table

	GPS capability (Column 1)	Navigation specification (Column 2)
1	GPS RNAV EN ROUTE	RNAV 5; RNAV 2 or RNP 2
2	GPS RNAV TERMINAL	RNAV 1 or RNP 1
3	GPS RNAV NON-PRECISION APPROACH	RNP APCH-LNAV
4	GPS RNAV LP	RNP APCH-LP
5	GPS RNAV LPV	RNP APCH-LPV

Note For example, for the purposes of subparagraph 10.3 (b), if the AFM or AFMS for an aircraft states that the aircraft is capable of GPS RNAV NON-PRECISION APPROACH (a "GPS capability"), then the aircraft would be approved to navigate in accordance with RNP APCH-LNAV (the corresponding "navigation specification").

10.4 If the AFM or an AFMS for an aircraft states that the aircraft is approved for Baro-VNAV and the aircraft meets the requirements in paragraph 10.3, then the aircraft is deemed to be approved for Baro-VNAV in conjunction with RNP APCH-LNAV/VNAV.

[13] Paragraph 10.6

omit

AFMS Supplement

substitute AFMS

[14] Paragraph 11.1

substitute

- 11.1 Subject to compliance with paragraphs 11.2 and 11.3, an Australian aircraft is deemed to be approved for navigation in accordance with any of the following navigation specifications:
 - (a) RNAV 5;
 - (b) RNAV 1 and RNAV 2;
 - (c) RNP 2;
 - (d) RNP 1;
 - (e) RNP APCH-LNAV;
 - (f) RNP APCH-LNAV/VNAV;
 - (g) RNP APCH-LP or RNP APCH-LPV.

[15] Paragraphs 11.3 and 11.4

substitute

- 11.3 The aircraft is approved for navigation during a flight in accordance with a navigation specification mentioned in paragraph 11.1 if the AFM or AFMS for the aircraft, as published at the time of the flight, states that the aircraft:
 - (a) is capable of the navigation specification; or
 - (b) has the GPS capability mentioned in an item in the Table that corresponds to the navigation specification.

Table

	GPS capability (Column 1)	Navigation specification (Column 2)
1	GPS RNAV EN ROUTE	RNAV 5; RNAV 2 or RNP 2
2	GPS RNAV TERMINAL	RNAV 1 or RNP 1
3	GPS RNAV NON-PRECISION APPROACH	RNP APCH-LNAV
4	GPS RNAV LP	RNP APCH-LP
5	GPS RNAV LPV	RNP APCH-LPV

Note For example, for the purposes of subparagraph 11.3 (b), if the AFM or AFMS for an aircraft states that the aircraft is capable of GPS RNAV NON-PRECISION APPROACH (a "GPS capability"), then the aircraft would be approved to navigate in accordance with RNP APCH-LNAV (the corresponding "navigation specification").

11.4 If the AFM or an AFMS for an aircraft states that the aircraft meets the requirements in subsection 11.3, then it is deemed to be approved for Baro-VNAV in conjunction with RNP APCH-LNAV/VNAV operations.

[16] Paragraph 13.1

omit

the Civil Aviation Regulations 1988 (CAR 1988)

substitute

CAR

[17] Paragraph 13.5

omit

PBN navigation authorisation from CASA must periodically check the PBN navigation database

substitute

navigation authorisation from CASA must periodically check the navigation database

[18] Paragraph 13.12

omit

flight days

substitute

Flight Days

[19] Appendix 6, subparagraph 1.3 (c) (i)

omit

and longitudinal

[20] Appendix 6, subparagraph 1.3 (c) (ii)

omit a MDA insert

an MDA

[21] Appendix 6, subclauses 7.6 to 7.7

substitute

- 7.6 A missed approach procedure must be conducted if:
 - (a) the navigation system display is flagged invalid; or
 - (b) there is a loss of integrity alert; or
 - (c) the integrity alerting function is not available before passing the FAF; or
 - (d) during a segment of a procedure, Cross-track Error/Deviation equals or is reasonably likely to equal the RNP for the segment of the procedure; or
 - (e) where NSE is available during a segment of a procedure, including NSE measured as Estimate of Position Uncertainty, NSE + FTE during the segment equals or exceeds the RNP specified for the segment; or
 - (f) if the aircraft is equipped with serviceable automated cross-track error alerting when a Cross-Track Error/Deviation alert is received.

Note 1 NSE and FTE are the largest tracking errors for RNP APCH. ICAO Doc 9613, *Performance-based Navigation (PBN) Manual*, notes "cross-track error/deviation" as a component of FTE. *Note 2* ICAO Doc 9613, *Performance-based Navigation (PBN) Manual*, Volume II, Part C, Chapter 5 – Section A, provides guidance on the use of RNP APCH procedures. Pilots are advised to track along procedure centre lines unless authorised to deviate by ATC or under emergency conditions. So far as practicable, the cross-track error/deviation for normal operations should be limited to 0.5 NM ($\frac{1}{2}$ x RNP) for the initial segment, the intermediate segment and a missed approach, and to 0.15 NM ($\frac{1}{2}$ x RNP) for the final approach segment. Brief deviations are acceptable during and immediately after turns where accurate cross-track information is not provided during the turn. The use of a flight director or autopilot is recommended. Flight crew procedures and training should emphasise observance of turn anticipation commands and management of rate of turn.

7.7 In subclause 7.6, *Estimate of Position Uncertainty*, or *EPU*, means a measure of NSE provided by the navigation system of an aircraft based on a defined scale in NM that displays the current performance of the navigation system in accurately estimating the aircraft position.

Note Different system manufacturers assign specific names for EPU, including "Horizontal Protection Limit" or "HPL", "Actual Navigation Performance" or "ANP" and "Estimate of Position Error" or "EPE".

[22] Appendix 6, subclauses 7.8 to 7.10

omit

[23] Appendix 7, subclause 8.14.2

omit subclause 19.1 insert

subclause 8.14.1

[24] Appendix 7, subclause 10.6

omit subclause 25.8

insert

subclauses 10.8 and 10.9

[25] Appendix 7, subclause 10.9

omit

RNP AR APCH DEP

insert RNP AR DEP

[26] Appendix 7, subclause 11.2

omit

the Civil Aviation Regulations 1988 (CAR 1988)

substitute CAR

[27] Appendix 7, subclauses 12.5 to 12.7

substitute

Initial data validation

- 12.5 Before flying an RNP AR procedure in a type of aircraft in I.M.C. from an initial approach fix for the procedure, the operator must validate the navigation data for the procedure and the aircraft type by:
 - (a) flying the entire procedure from the initial approach fix through the approach (including vertical angle), the missed approach and the approach transitions for the selected aerodrome and runway; and
 - (b) confirming that the depicted procedure on the map display is the same as depicted on the published procedure; and
 - (c) observing the flight path and confirming on the basis of the observation that the path does not have any lateral or vertical path disconnects with the procedure data, and is consistent with the published procedure; and
 - (d) verifying that the aircraft navigation, flight control, cockpit display and other systems function correctly, and that the procedure is flyable.
- 12.5A A validation of an RNP AR procedure for an aircraft type mentioned in subclause 12.5 must be conducted in:
 - (a) an aircraft of the type, being flown by day in V.M.C.; or

- (b) a level D flight simulation training device for the aircraft type.
- 12.5B A validation of an RNP AR procedure mentioned in subclause 12.5 that is conducted in an aircraft must not perform a non-normal operation unless:
 - (a) the flight is conducted as a private operation that does not carry a passenger, unless the passenger is a CASA officer who is on duty for the flight; or
 - (b) the non-normal operation is required for the safety of the flight.

Note Requirements for the validation of RNP AR procedures in non-normal operations are not regulated by clause 12 of Appendix 7 to this Civil Aviation Order.

12.5C If the matters mentioned in paragraphs 12.5 (b), (c) and (d) are confirmed for the procedure and the aircraft type, the operator must retain a copy of validated navigation data in such form that is sufficient to enable comparison with updated data in accordance with subclause 12.6.

Data updates

- 12.6 Upon receipt of each navigation data update for an RNP AR procedure, and before using the updated navigation data in a type of aircraft, the operator must:
 - (a) compare the updated data to the procedure validated under subclauses 12.5 to 12.5C and identify and resolve any discrepancies between the updated data and the validated procedure; and
 - (b) if any change affects the approach path or aircraft performance requirements for the procedure confirm that the change is intended with the person with responsibility for maintenance of the procedure under Part 173 of CASR; and
 - (c) validate the amended procedure for the type of aircraft in accordance with subclauses 12.5 to 12.5C.

Aircraft modifications

- 12.7 Subject to subclause 12.8, if a system used in an aircraft type and required for an RNP AR procedure is modified (e.g. software change), the operator must validate the procedure for the aircraft type using the modified system in accordance with subclauses 12.5 to 12.5C, noting that flight control computers, FMS OPS and display software changes are particularly critical.
- 12.8 The operator is not required to validate a procedure using a modified system for an aircraft type if the manufacturer of the modified system states in writing that the modification has no effect on the navigation database or path computation for the use of the procedure in the aircraft type.

[28] Appendix 8, paragraph 5 (b)

omit

an Baro-VNAV

substitute

a Baro-VNAV

[29] Appendix 9, paragraph 9.2 (e)

omit

which waypoints are and which are flyover

substitute

which waypoints are fly-by and which are flyover

Schedule 2 Multiple amendments

[1] Amendment of listed provisions — CAR 1988

Omit "CAR 1988" (wherever occurring) and substitute "CAR" in the following provisions:

- (a) paragraph 13.2;
- (b) Appendix 7, subclause 11.3.

[2] Amendment of listed provisions — CASR 1998

Omit "CASR 1998" (wherever occurring) and substitute "CASR" in the following provisions:

- (a) paragraph 3.2;
- (b) paragraph 3.2, Note;
- (c) subparagraph 7.1 (h), Note 2.

[3] Amendment of listed provisions — AFMS Supplement

Omit "AFM Supplement" and substitute "AFMS" in the following provisions:

- (a) Appendix 1, subclause 2.2;
- (b) Appendix 2, paragraph 2 (a);
- (c) Appendix 5, paragraph 2 (a);
- (d) Appendix 6, paragraph 2 (a);
- (e) Appendix 6, paragraph 3.3 (a);
- (f) Appendix 7, paragraph 3 (a);
- (g) Appendix 9, paragraph 2 (a);
- (h) Appendix 9, subclause 3.1;
- (i) Appendix 10, paragraph 3 (a);
- (j) Appendix 11, paragraph 3 (a);
- (k) Appendix 13, subclause 6.1.2.

[4] Amendment of listed provisions — PBN navigation specification

Omit "PBN navigation specification" and substitute "navigation specification" in the following provisions:

- (a) subsection 5, the Note;
- (b) paragraph 6 (a);
- (c) subsection 7, the heading;
- (d) paragraph 7.1;
- (e) subparagraph 7.1 (h), Note 2;
- (f) subsection 8, the heading;
- (g) paragraph 8.1 (wherever occurring);
- (h) paragraph 8.2;
- (i) subparagraph 8.2 (a);
- (j) subparagraph 8.2 (c);
- (k) paragraph 8.3;
- (l) Appendix 9, subclause 1.12.