IBAC Bulletin 16-01

Subject: Performance-based Navigation in Australian airspace - General guidance on the GNSS mandate, decommissioning of navigation aids and implementation of RNP 1 and RNP 2.

BACKGROUND

In early November 2015 IBAC initiated a dialogue with Air Services Australia on the above subject. The dialogue subsequently involved the Australian Civil Aviation Safety Authority (CASA).

The regulatory foundation upon which IBAC initiated the dialogue is: Civil Aviation Order 20.91 (Instructions and directions for performance-based navigation) Instrument 2014.

The objective of the dialogue was to clarify the impact of this mandate on foreign business aircraft operators including, but not limited, to operations in airspace over the high seas, operational approvals and flight planning requirements. IBAC also encouraged Air Services Australia and CASA to expeditiously promulgate relevant aeronautical information.

OUTCOME

The dialogue culminated in the email from CASA quoted below and the General Guidance document attached to this Bulletin.

CASA has requested that IBAC disseminate this information as widely as possible.

“The Australian Civil Aviation Safety Authority (CASA) is writing to inform you of recent changes to the rules relating to the implementation of Performance-based Navigation (PBN) in Australia under International Civil Aviation Organization (ICAO) Annex 11, paragraph 2.7. These changes apply to both Australian registered aircraft and foreign registered aircraft and international operators.
Australia has developed the framework to enable PBN through a range of regulatory measures which, when combined, provide for the necessary aircraft equipment, operational and airworthiness requirements to meet applicable ICAO PBN navigation specifications.

Key to the overall implementation of PBN is the application of high performance navigation capabilities that ensure highly accurate track keeping in all dimensions. This will be facilitated in Australian airspace by way of the carriage and use of suitable Global Navigation Satellite Systems (GNSS) equipment in all Instrument Flight Rules (IFR) aircraft as required by the Australian GNSS mandate.

These changes include the requirement that from **4 February 2016**, all aircraft operating under the IFR must be equipped with GNSS systems meeting (E)TSO C129, C145, C146 or C196a specifications, which enables compliance with RNP 1 terminal area and RNP 2 enroute operations. The RNP 1 and RNP 2 ICAO PBN specifications are applicable from **26 May 2016** for terminal area (SID & STARS) and continental enroute operations in Australia.

Under the new rules, foreign registered aircraft must have navigation authorisations equivalent to those for Australian registered aircraft.

To assist all foreign registered aircraft and international operators meet the new requirements, Australia has instigated transition arrangements available for a two year period. In order to facilitate RNP 1 and RNP 2 operations within Australian continental enroute and terminal airspace (SIDS and STARS), CASA has developed an Acceptable Means of Compliance (AMC). The AMC requirements are reflected in regulatory instrument CASA EX01/16, which is currently under development and should be available for information by mid-January 2016.

Operators intending to take advantage of the transition arrangements detailed in CASA EX01/16 should register their intent with CASA by completing the template form prior to the first operation on or after 26 May 2016.

To provide you with as much detail as possible, CASA has prepared the document attached to this email, providing general guidance on the GNSS mandate, the decommissioning of navigation aids, the implementation of RNP 1 and RNP 2 and the two-year transition arrangements for foreign operators."
ATTACHMENT: General guidance on the GNSS mandate, decommissioning of navigation aids, and implementation of RNP 1 and RNP 2

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Performance-based Navigation in Australian airspace

**General guidance on the GNSS mandate, decommissioning of navigation aids, and implementation of RNP 1 and RNP 2**

1) Implementation of Performance-based Navigation (PBN)\(^1\) is a State responsibility under ICAO Annex 11, paragraph 2.7. Australia has developed the framework to enable PBN through a range of regulatory measures which, when combined, provide for the necessary aircraft equipment, operational and airworthiness requirements to meet applicable ICAO PBN navigation specifications.

2) Key to the overall implementation of PBN is the application of high performance navigation capabilities that ensure highly accurate track keeping in all dimensions. This will be facilitated in Australian airspace by way of the carriage and use of suitable GNSS equipment in all IFR aircraft as required by the GNSS mandate.

3) Under Civil Aviation Order (CAO) 20.18\(^2\) from 4 February 2016 all aircraft operating under the IFR must be equipped with an (E)TSO C129, C145, C146 or C196a GNSS\(^3\) system. Amongst other things, because the RNP 1 and RNP 2 navigation specifications have been developed on the basis of these (E)TSOs, this “GNSS mandate” has the effect that all Australian registered IFR aircraft will be RNP 1 and RNP 2 capable.

4) For foreign aircraft, CAO 20.91\(^4\) clause 7.2 stipulates that foreign registered aircraft must have navigation authorisations equivalent to those for Australian registered aircraft. Additionally, and importantly, CAO 20.91 clause 8.1 requires Australian aircraft to operate in accordance with the particular ICAO PBN navigation specification in any airspace for which that PBN specification is required – this obliges Australian aircraft to comply with ICAO PBN requirements in foreign States.

5) CAO 20.91 includes all of the navigation specifications for RNAV 5, RNAV 1 & 2, RNP 1, RNP 2, RNP APCH, RNP AR etc. Oceanic RNP 4 and RNP (RNAV) 10 navigation specifications are contained in CASR Subpart 91.U\(^5\). Further information on PBN navigation authorisations is contained in AC 91.U-01\(^6\) and airworthiness requirements in AC 91.U-04\(^7\).

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\(^1\) See ICAO Performance-based Navigation (PBN) Manual (Doc 9613)
\(^2\) Civil Aviation Order 20.18 (Aircraft equipment — basic operational requirements) Instrument 2014
\(^4\) Civil Aviation Order 20.91 (Instructions and directions for performance-based navigation) Instrument 2014
\(^5\) Civil Aviation Safety Regulation Subpart 91.U – Navigation Authorisations
\(^6\) Advisory Circular AC 91.U-01 - Navigation authorisations
\(^7\) Advisory Circular AC 91.U-04 Airworthiness requirements for performance based navigation
6) CAO 20.18 and CAO 20.91 also contain requirements for aircraft equipment, pilot qualifications and training, and continuing airworthiness.

IMPLEMENTATION of RNP 1 and RNP 2

7) Australia is actively transitioning to RNP 1 for terminal operations (SIDS & STARS) and RNP 2 for continental enroute operations.

Australian registered aircraft

8) The ICAO RNP 1 and RNP 2 navigation specifications have been developed on the basis of the FAA and European TSOs for GNSS systems. Hence, aircraft fitted with CAO 20.18 GNSS equipment (“boxes”) have the RNP 1 and RNP 2 capability already contained “in the box”. Therefore, Australian registered aircraft and Australian qualified pilots are automatically RNP 1 and RNP 2 compliant. Accordingly:

a) Australian pilots are automatically eligible to specify RNP 2 or RNP 1 on an IFR flight plan notification if:
   - the aircraft is fitted with radio navigation aids that meet the requirements of CAO 20.18 and these navigation aids will be used, and
   - the pilot is authorised to conduct a flight under the IFR using GNSS and competent in the use of the radio navigation aids according to CASR Part 61 requirements.

b) For Australian pilots, the RNP 1 and/or RNP 2 route specifications are met if:
   - the aircraft is fitted with radio navigation aids that meet the requirements of CAO 20.18 and these navigation aids are used, and
   - the pilot is authorised to conduct a flight under the IFR using GNSS and competent in the use of the radio navigation aids according to CASR Part 61 requirements; and
   - the pilot maintains the aircraft within as close as practicable to the route centreline, and certainly within:
     (i) 2NM of the centreline for RNP 2 operations and
     (ii) 1NM of the centreline for RNP 1 operations.

c) Route lowest safe altitudes (LSALT) depicted on ERC and TAC charts are valid for operations involving:
   - aircraft that are fitted with radio navigation aids that meet the requirements of CAO 20.18 and these navigation aids are being used, and
   - the pilot is maintaining the aircraft within as close as practicable to the route centreline, and certainly within 2NM of the route centreline.
Foreign registered aircraft and international operators

9) CASA and Australia’s ANSPs will facilitate the continued operation of International Operators that are unable to comply with RNP 1 and RNP 2 Navigational Specifications (Nav Spec) into Australian terminal and continental enroute airspace on RNP 1 procedures and RNP 2 routes. This may require special CASA assistance to both the International operator, and the applicable NAA, such that the NAA can issue a “No technical objection” for RNP operations, for that particular operator, in Australian continental and terminal airspace.

10) Australia expects that foreign operators will obtain RNP 1 and RNP 2 authorisations from State of Registry or State of Operator for flights in Australian terminal (SIDS and STARS) and continental enroute airspace on and after 26 May 2016. However, Australia recognises that RNP 2 in particular is a relatively new navigation specification and consequently many States have not yet established processes for including RNP 2 authorisation on their Operations Specifications (Ops Spec). Additionally, aircraft manufacturers may not have provided their customers with AFM, AFM Supplement or OEM service letters specifying the available PBN capability per airframe.

11) For these reasons Australia has instigated transition arrangements applicable to foreign registered aircraft and International operators for a two-year period. In order to facilitate RNP 1 and RNP 2 operations within Australian continental enroute and terminal airspace (SIDS and STARS) an Acceptable Means of Compliance (AMC) has been provided. The AMC requirements are reflected in regulatory instrument CASA EX01/16.

12) The AMC will allow RNAV 1 and RNAV 2 authorisations issued by the State of Registry or State of Operator, together with GNSS equipment complying with ICAO Doc 9613 (ICAO PBN Manual) and Ops Spec authorisations for RNAV 1 and RNAV 2 based on GNSS, to be accepted as equivalent to RNP 1 and RNP 2 authorisations for the purposes of operations within Australian continental enroute and terminal airspace (SIDS & STARS) for the duration of the transition arrangements. The AMC will take effect for flights on or after 26 May 2016. All flights operating in accordance with the AMC will be required to enter RMK/CASA RNP1&2 AMC in item 18 of the flight plan.

13) Operators intending to take advantage of CASA EX01/16 should register their intent with CASA by completing the template form at: https://www.casa.gov.au/regulations-and-policy/standard-page/cns-atm-navigation prior to the first operation on or after 26 May 2016, providing all details called for by CASA EX01/16. Fleet operators are encouraged to identify all aircraft types expected to be operated in Australia under the AMC the first submission.

14) In Australia, Airservices Australia and the Royal Australian Air Force (Australia’s ANSPs) are responsible for the provision of air traffic services in accordance with ICAO Annex 11. Reliance is placed on accurate notification of navigation capabilities in the flight plan. ATC automated systems in Australia have the capability to highlight to controllers the

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8 General Exemption CASA EX01/16 - RNP 1 and RNP 2 Acceptable means of Compliance using GNSS based RNAV 1 and RNAV 2
navigation performance of each aircraft based on the flight plan notification; appropriate ATC separation standards and procedures are then applied.

15) Operations under other PBN navigation specifications (i.e. other than RNAV 1, RNAV 2, RNP 1 and RNP 2) will be permitted on a per flight basis but are subject to the Operating Standards requirements defined for those PBN specifications in CAO 20.91. In some cases, advance coordination may be necessary with Airservices. Such flights will not receive the benefits of an RNP 2 air traffic service but instead will receive a service commensurate with the navigation capability notified in the flight plan.

DECOMMISSIONING OF NAVIGATION AIDS

16) The GNSS mandate of 4 February 2016 will enable Airservices Australia to implement the Navigation Rationalisation Project (NRP) which will see the reduction in ground-based navigation capability by approximately 50% with the decommissioning of about 190 ground based aids. The remaining network of navigation aids will form the Backup Navigation Network (BNN).

17) The BNN will serve as a contingency network in the case of GNSS failure to enable aircraft to make a safe landing at an airport. However, because of the limited number and wide geographical spacing of remaining navaids, the BNN may not be capable of sustaining navigation services to flight planned destination. The decommissioning of ground based navigation aids will commence a few months after the February GNSS mandate, with the majority of navaids being decommissioned on or shortly after the 26 May 2016 AIRAC.

18) The navaids decommissioned under the NRP will be replaced, where necessary, by area navigation waypoints. The route amendments substituting waypoints for navaids will take effect from 26 May 2016, the first AIRAC chart publication date after the February GNSS mandate. Beyond the substitution of waypoints for navaids, no other significant route amendments will take place at this time.

SUMMARY

1. The RNP 1 and RNP 2 ICAO PBN navigation specifications are applicable from 26 May 2016 for terminal area (SID & STARS) and continental enroute operations, respectively, in Australia.

2. From 4 February 2016, all aircraft operating under the IFR must be equipped with GNSS systems meeting (E)TSO C129, C145, C146 or C196a specifications which enables compliance with RNP 1 terminal area and RNP 2 enroute operations.

3. For foreign registered aircraft, clause 7.2 of CAO 20.91 stipulates that foreign registered aircraft must have navigation authorisations equivalent to those for Australian registered aircraft. Foreign operators intending to enter Australian
continental enroute and terminal airspace on and after 26 May 2016 should obtain authorisations for RNP 1 and RNP 2 from State of Registry or State of Operator to assist the full implementation of RNP 1 and RNP 2 and enable operators to accrue benefits.

4. As soon as an authorisation for RNP 1 and/or RNP 2 has been issued by State of Registry or State of Operator, this should be notified in the flight plan immediately – no need to wait until May 2016.

5. In cases where foreign operators are administratively unable to obtain RNP 1 and/or RNP 2 authorisations from State of Registry or State of Operator because such States have not yet established processes for these authorisations, for a transition period of 2 years Australia will apply Acceptable Means of Compliance (AMC) arrangements as reflected in regulatory instrument CASA EX01/16.

6. On and after 26 May 2016 all flights operating in accordance with the AMC will be required to enter **RMK/CASA RNP1&2 AMC** in item 18 of the flight plan for each flight.

7. Operations under other PBN navigation specifications (Nav Specs) will be permitted on a flight by flight basis but are subject to the Operating Standards requirements defined for those PBN specifications in CAO 20.91.

8. Where necessary, ICAO 5 character waypoints will replace approximately 190 ground based navigation aids from 26 May 2016 when the navigation aids are decommissioned.

9. AIP, charts and the Designated Airspace Handbook (DAH) are being updated with effect from 26 May 2016 to reflect route amendments substituting waypoints for navigation aids, RNP 2 for continental enroute and RNP 1 for terminal operations (SIDS & STARS).

10. From 26 May 2016, route LSALT published in DAH and on Charts are only valid for RNP 2 operations. For other than RNP 2 operations use a pilot calculated route LSALT or default to grid LSALT.

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Safe skies for all