International Civil Aviation Organization

Thirteenth Meeting of The Performance Based Navigation Implementation Coordination Group (PBNICG/13)

(Bangkok, Thailand, 14-16 October 2026)

Agenda Item 3: States' PBN Implementation Progress and challenges/lessons learnt

UPDATE ON PBN IMPLEMENTATION IN AUSTRALIA

(Presented by Airservices Australia)

SUMMARY

This paper provides an update on navigation augmentation, Global Navigation Satellite System (GNSS) resilience and surveillance-based safety monitoring capabilities being implemented in Australia. Specifically, the paper outlines implementation progress associated with the Southern Positioning Augmentation Network (SouthPAN) Satellite Based Augmentation System (SBAS), provides a brief update on Ground Based Augmentation System (GBAS) operations, discusses recent operational experience associated with GNSS Radio Frequency Interference (RFI) events affecting aircraft arriving in Australia, and introduces Downlinked Barometric Pressure Setting Monitoring (DBPSM), an emerging surveillance-based safety monitoring capability planned for Australia's future air traffic management environment.

1. INTRODUCTION

1.1 Australia continues to support the implementation of navigation and surveillance technologies that improve operational efficiency, support Performance-Based Navigation (PBN) operations and enhance aviation safety.

1.2 Satellite navigation continues to be the primary means of navigation for the majority of aviation operations within Australia. GNSS has increased the importance of augmentation technologies capable of improving navigation accuracy, integrity and operational resilience. Additionally, increasing reports of RFI highlights an emerging risk to the technology.

1.3 Concurrent advances in surveillance and Air Traffic Management (ATM) system technology will enable the development of new safety monitoring functions that provide Air Traffic Controllers (ATCs) with increased awareness of aircraft operational status and potential hazards.

1.4 This paper provides updates on:

a) navigation augmentation activities including GBAS and SouthPAN SBAS;
b) increasing prevalence of GNSS RFI impacts being reported in Australian-administered airspace; and
c) the development of Downlinked Barometric Pressure Setting Monitoring (DBPSM) capabilities within Australia's future air traffic management system.

2. DISCUSSION

Navigation Augmentation Systems update

2.1 Australia continues to support navigation augmentation technologies intended to improve navigation performance, operational efficiency and aviation safety. These technologies include both GBAS and SBAS capabilities.

2.2 Australia continues to operate GBAS facilities at Sydney and Melbourne Airports supporting Category I GBAS Landing System (GLS) approaches. As previously reported to PBNICG/12, GBAS remains an established component of Australia's navigation infrastructure and supports precision approach operations for suitably equipped aircraft. Operational experience continues to be positive, with an increasing number of GLS-capable aircraft regularly operating into both airports. For many operators, GLS has become the preferred precision approach option where available, demonstrating industry confidence in the operational and efficiency benefits provided by GBAS. No significant operational changes have occurred since Australia's previous update to the group.

2.3 In parallel with GBAS operations, jointly, Australia and New Zealand continue to progress the Southern Positioning Augmentation Network (SouthPAN), a Satellite Based Augmentation System providing augmentation and integrity services across Australia, New Zealand and surrounding regions.

2.4 SouthPAN improves the performance of GNSS navigation through the provision of correction and integrity information broadcast via geostationary satellites. The service improves positioning accuracy, availability and continuity across a wide range of user communities, including establishing the foundation for future aviation applications supported by SBAS technology.

2.5 SouthPAN has the potential to support a range of applications including en-route navigation, terminal operations, non-precision approaches and approach procedures with vertical guidance. These capabilities are expected to be particularly beneficial at locations where conventional precision approach infrastructure may not be operationally feasible – particularly in remote areas.

2.6 Australia continues to work with aviation stakeholders, service providers and regulators to progress implementation of SBAS-enabled aviation services and associated regulatory requirements. The service is anticipated to become available for use by aviation from 2028.

2.7 There are operational and regulatory challenges associated with the future implementation of SouthPAN supported aviation services. One area under consideration is the ability to meet ICAO Annex 10 ‘Continuity of Service’ performance requirements across all parts of the SouthPAN service volume. Due to the geographical constraints associated with deploying GNSS Reference Stations in oceanic regions, there are likely to be technical limitations that reduce performance in some areas. Australia is currently evaluating a range of operational mitigations that may be able to meet the Annex 10 requirements, including a prohibition on the use of SouthPAN for alternate planning, a planned Instrument Flight Procedure Unavailability Notification system and continued reliance on Receiver Autonomous Integrity Monitoring (RAIM) capabilities. Additionally, the national Minimum Operational Network (MON) will continue to be leveraged to support navigation resilience during any type of GNSS disruption.

2.7 Together, GBAS and SouthPAN represent complementary augmentation capabilities that support Australia's long-term navigation strategy. While GBAS continues to provide precision approach capability at major international airports, SouthPAN has the potential to extend augmentation benefits more broadly across Australia, including to regional and remote locations where conventional precision approach infrastructure may not be available.

GNSS Radio Frequency Interference

2.8 Australia continues to monitor the increasing prevalence of GNSS Radio Frequency Interference (RFI) events, including both jamming and spoofing activity affecting international aviation operations.

2.9 While Australia has not experienced significant levels of operationally disruptive, unplanned GNSS jamming or spoofing within Australian-administered airspace, reports received via the operational safety reporting systems indicate that aircraft operating on routes through the Middle East have experienced GNSS interference resulting in degraded navigation capability. In some cases, these effects have persisted after aircraft departed the affected area and continued into Australian airspace. ATCs have reported operational impacts associated with degraded Required Navigation Performance (RNP) capability and therefore reduced ability to comply with RNP-based arrival procedures. Impacts on Automatic Dependent Surveillance-Broadcast (ADS-B) position reporting have also been reported.

2.10 In response to these developments, Airservices Australia has undertaken activities to increase operational awareness of GNSS interference impacts. ATCs have been reminded to consider the potential effect of GNSS RFI on aircraft navigation capability when receiving pilot reports of GNSS-related issues and to ensure relevant information is communicated to downstream controllers where necessary. Australia also maintains arrangements with the Australian Defence Force under a Memorandum of Understanding that provides for notification of planned GNSS interference activities, enabling operational assessment and stakeholder awareness where required. Additionally, Australia is actively contributing to international efforts to develop procedures around GNSS RFI response, via participation in expert panels at ICAO HQ and through APAC.

Downlinked Barometric Pressure Setting Monitoring (DBPSM)

2.11 Incorrect barometric pressure settings continue to be recognised internationally as a significant aviation safety hazard, with the potential to result in aircraft operating at altitudes different from those intended by flight crews or air traffic control. As discussed during the Secretariat presentation at PBNICG/12 on the May 2022 serious incident in Paris, these errors can reduce obstacle and terrain clearance margins, increase the risk of altitude deviations, and affect the safe conduct of instrument approach and departure operations.

2.12 The increasing availability of aircraft-derived data through Mode-S Enhanced Surveillance systems provides an opportunity to identify pressure setting errors before they result in operational consequences

2.13 As part of Australia's future Civil Military Air Traffic System (CMATS) development, a Downlinked Barometric Pressure Setting Monitoring (DBPSM) function is planned to provide

automated monitoring of aircraft barometric pressure settings. Subject to ongoing system development, integration activities and regulatory approvals, the capability is currently anticipated to be available as part of Australia's future ATM environment in 2030. The capability compares downlinked barometric pressure setting information received from suitably equipped aircraft against the expected pressure setting for the airspace in which the aircraft is operating.

2.14 The monitoring function utilises atmospheric pressure reference information associated with defined operational areas and continuously evaluates aircraft conformance against expected values. The reference pressure may be derived from meteorological sources associated with the operational environment. Where a discrepancy exceeds predefined tolerance limits, the system generates an alert to notify the responsible controller of a potential pressure setting error. The monitoring function is intended to operate automatically and continuously while eligible aircraft remain within designated surveillance coverage and defined airspace volumes.

2.15 The capability supports both arrival and departure operations through dedicated monitoring functions and may also be applied in other operational environments where surveillance coverage and local procedures permit.

2.16 The implementation of DBPSM represents an example of how aircraft-derived surveillance parameters can be leveraged to provide additional safety barriers beyond traditional controller observation and pilot procedures.

2.17 Expected operational benefits include:

a) improved detection of incorrect barometric pressure settings;
b) reduction in altitude deviations associated with incorrect QNH selection;
c) increased assurance for operations using barometric vertical guidance;
d) enhanced situational awareness for air traffic controllers; and
e) provision of an additional safety net to assist in the prevention of controlled flight into terrain and other altitude-related occurrences.

2.18 Australia considers DBPSM to be a promising example of the use of surveillance-derived aircraft data to enhance operational safety and is interested in understanding whether similar capabilities are being developed or utilised by other States and Air Navigation Service Providers.

3. ACTION REQUIRED BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper; and

b) discuss any relevant matters as appropriate.

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