International Civil Aviation Organization

THE SEVENTH MEETING OF THE ASIA/PACIFIC GBAS/SBAS IMPLEMENTATION TASK FORCE (GBAS/SBAS ITF/7)

(Bangkok, Thailand, 14-16 May 2025)

Agenda Item 4: Updates on GBAS/SBAS system and States' implementation status

SOUTHPAN PROGRAM UPDATE

(Presented by Australia)

SUMMARY

This paper presents a brief summary of the SouthPAN program, which will provide a SBAS aeronautical radio navigation service to Australia and New Zealand by 2028.

1. INTRODUCTION

1.1 The Southern Positioning Augmentation Network (SouthPAN) is a Satellite Based Augmentation System (SBAS) that is being developed by the Australian and New Zealand governments. When complete, it will support en-route, terminal, Non-Precision Approach (NPA), and Approach with Vertical Guidance (APV) flight operations across Australia and New Zealand. The service is currently broadcasting Early Open Services on the L1 and L5 navigation signals. More information on SouthPAN can be found at www.ga.gov.au/southpan and www.linz.govt.nz/southpan.

2. SOUTHPAN NAVIGATION SERVICES

2.1 SouthPAN commenced service delivery on 26 September 2022 and provides a number of Early Open Services including:

a) L1 SBAS Open Service (on the L1 navigation signal and as a Data Access Service), augmenting the L1 C/A GPS signal;

b) DFMC SBAS Open Service (on the L5 navigation signal and as a Data Access Service), augmenting the L1 C/A and L5 GPS signals, and the E1 and E5a Galileo signals; and

c) Precise Point Positioning (PPP) Via SouthPAN (PVS) (on the L5 navigation signal and as a Data Access Service), augmenting the L1 C/A and L5 GPS signals, and the E1 and E5a Galileo signals.

2.2 The L1 SBAS and DFMC SBAS Open Services are marked as not-for-use by aviation, through the use of Message Type 0. This prevents aircraft from using the SBAS navigation signals.

2.3 The L1 SBAS service will be available for use by aviation in 2028. There will be a limitation on the service north of approximately 20° South latitude due to ionospheric activity. The actual Service Volume will be maximised and determined during the design process.

2.4 There are currently no plans to certify the DFMC SBAS service for use by aviation. This may be the subject of a future government decision based on the availability and adoption of avionics by aircraft and airlines flying in Australia and New Zealand.

2.5 More detail on individual services can be found on the GA and LINZ websites, including the Service Definition Documents (SDD) for the Signals-in-Space and the Data Access Services. The SDDs describe the target levels of performance and how users can access the services.

2.6 The target Service Area is shown in Figure 1 below. SouthPAN will support Vertical Protection Levels of less than 35 metres within the green area.

2.7 Locations where LPV-200, LPV-250, and LNAV/VNAV (SBAS) instrument flight procedures are published will depend on a number of factors including runway lighting, approach lighting, traffic rates, aircraft types, and other extant navigation services.

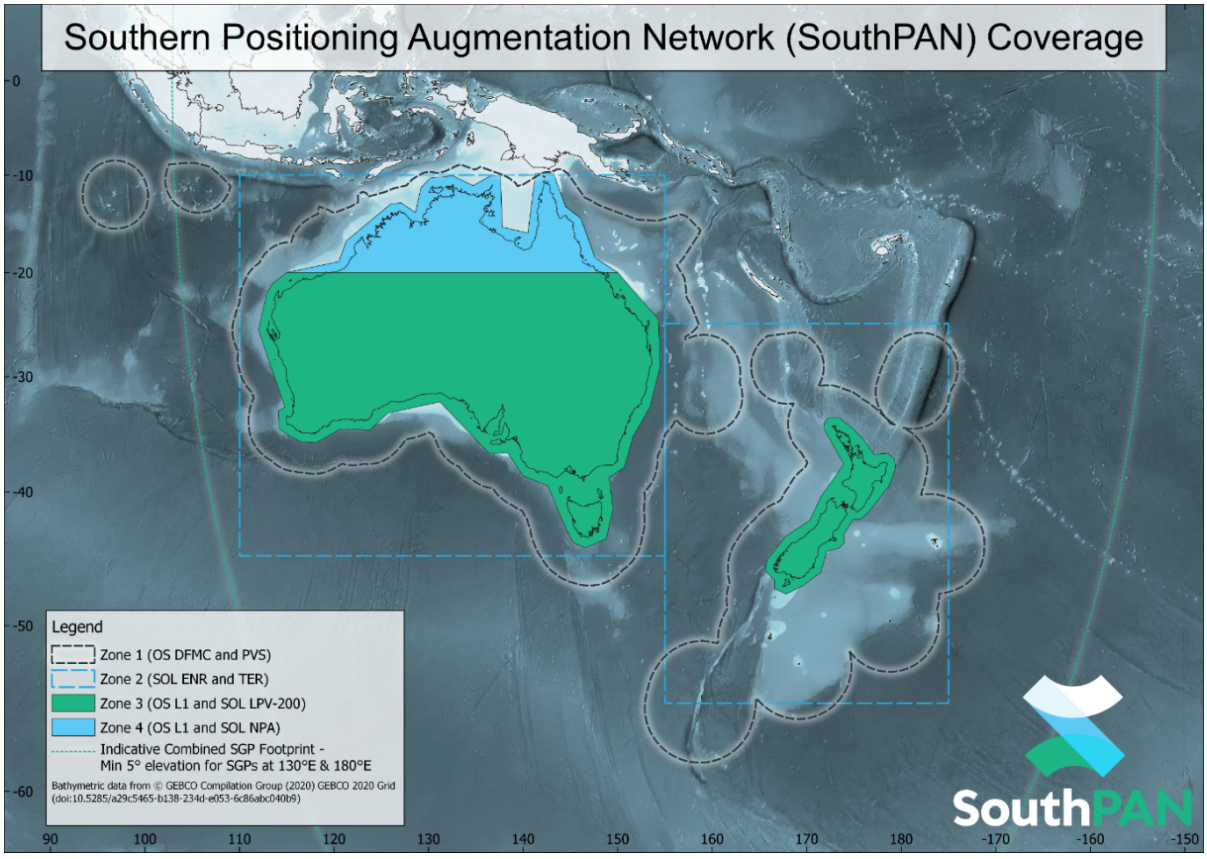

Figure 1 - SouthPAN Service Area

3. PROGRAM UPDATE

3.1 The high-level program schedule is included in Figure 2. The Critical Design Review was completed in April 2025. Software development has started, and the first GNSS Reference Station

Factory Acceptance Test is scheduled for May 2025. Site civil works and equipment installation will commence from June 2025.

3.2 The sites for the two Uplink & Processing Centres have been established and site civil works is largely complete. All four navigation Radio Frequency Uplinks have been constructed in pairs; near Armidale in New South Wales, Australia and near Invercargill in New Zealand. These sites are in a hot-standby configuration and maximise navigation signal availability from one satellite. A second satellite will be deployed closer to 2028 to meet the high availability requirements of ARNS.

3.3 Safety Computer and GNSS receiver procurements are complete. Early integration testing between system components and the prototype control segment has commenced.

3.4 A contract for the first new satellite (SouthPAN GEO Payload—SGP) was awarded to industry in May 2023 and will be located at 178° East. A procurement for SGP-02 is progressing well. The current satellite is Inmarsat 4F2 located at 143.5° East longitude, which replaced 4F1 as the active satellite on 20 November 2023. This change was coordinated with the PNT Spectrum Management Section of the USSF, in accordance with the PRN Code Assignment Process document.

3.5 SouthPAN uses the Service Provider ID of 8 as well as PRN codes 122 (assigned to Inmarsat 4F2) and 124 (assigned to Inmarsat 4F1).

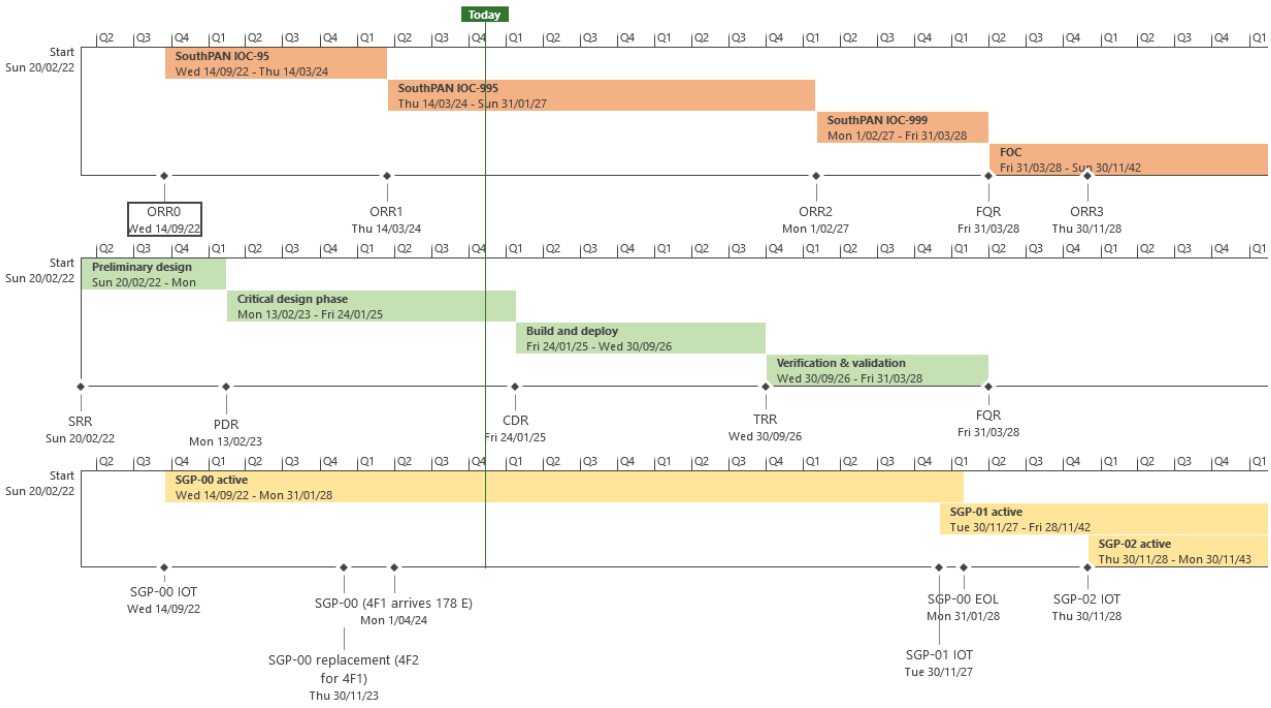

Figure 2 - SouthPAN Program Schedule

4. DISCUSSION

4.1 The meeting is invited to:

d) note the information contained in this paper; and

e) discuss any relevant matters as appropriate.

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