International Civil Aviation Organization

Tenth Meeting of the Surveillance Implementation Coordination Group (SURICG/10)

Bangkok, Thailand, 21 - 23 April 2025

Agenda Item 8: Update on surveillance activities and explore potential cooperation opportunity

UPDATE ON NEW ZEALAND SURVEILLANCE STATUS

(Presented by New Zealand)

SUMMARY

This paper presents an update of previous yearly reports, providing information on New Zealand's Surveillance activities.

1. INTRODUCTION

1.1 This paper reflects the status of Air Traffic Management Surveillance activities in New Zealand in 2025

2. DISCUSSION

2.1 From Jan 1st, 2024, New Zealand's surveillance structure is based on ADS-B as the **PRIMARY** surveillance source. Further surveillance is provided from MSSRs, and a MLAT system, providing contingency cooperative surveillance back-up and PSRs providing a non-cooperative backup where required.

2.1.1 ADS-B as New Zealand's primary surveillance source is mandated in all controlled airspace within the NZZC FIR. Twenty-seven terrestrial sites provide country wide coverage of controlled airspace, and a significant amount of uncontrolled airspace.

- As of April 9th, 2025, Mode S transponders equipped 3305 New Zealand registered aircraft, of which 3212 or 97.18% are ADSB capable.
- ADSB equipped aircraft are made up of 0.75%, DO260, 0.12% DO260A and 99.1% DO260B systems.
- 2382 or 74% of the 3212 ADSB transponder types on New Zealand registered aircraft have been identified. Of these 43% are ADSB out only, 27% ADSB IN/OUT and 30% ADSB out with PING USB for ADSB IN. Most of the identified systems are in GA aircraft. The number of identified transponder units has declined since the NZ Government/NZCAA rebate scheme ceased and updating of transponder types is no longer provided.

2.1.1..1.The high uptake of ADSB-IN is seen as significant in improving safety especially for VFR GA traffic.

- 69 (up from 50) aircraft have Electronic Conspicuity (EC) devices with 8 of these having MODE S transponders as well. A further 6 EC devices are used by PART 102 approved Drone operators.

2.1.2 There are 3 MSSRs and 1 PSR, which are all 30 plus years old and at end of their operational life. Purchase of spares to keep these systems running remains extremely difficult. A decision on either replacing or removing the MSSRs is yet to be made.

2.1.3 The Wide Area Multilateration (WAM) system, used for approach and enroute in the lower South Island, and the Multilateration (MLAT) system used for surface movements at Auckland, are both 15 years old, and nearing end of life. Replacement systems are being considered. An ATS Surveillance OPS concept document is being developed to assist with the RFI/RFP process going forward.

2.1.4 All data from these surveillance systems is delivered via an IP based network.

2.2 New Zealand regulatory requirements require ADS-B surveillance is backed up by a non-GNSS contingency surveillance system covering the main trunk Jet routes between Auckland-Christchurch-Wellington-Auckland. Additionally, consideration should be given to use of PSR for those airports with what is termed as “dense complex airspace” (i.e., airspace with over 100,000 RPT movements a year).

2.3 Three combined MSSR/PSR3D at NZCH, NZAA and NZWN are being installed to cover the regulatory requirement mentioned in 2.2.

2.3.1 The first of the 3 MSSR/PSR3D’s was installed in NZCH in late 2023 and is due to become operational in the 2nd quarter of 2025 after a period of extensive operational testing.

- The existing PSR at NZCH was withdrawn from service in Jan 2024 to allow Surveillance Engineering to complete their commissioning process for the new radar.

- End to end testing to allow 3NM and 5NM surveillance separation for the MSSR within the ATMS is complete and awaiting sign-off to go live.

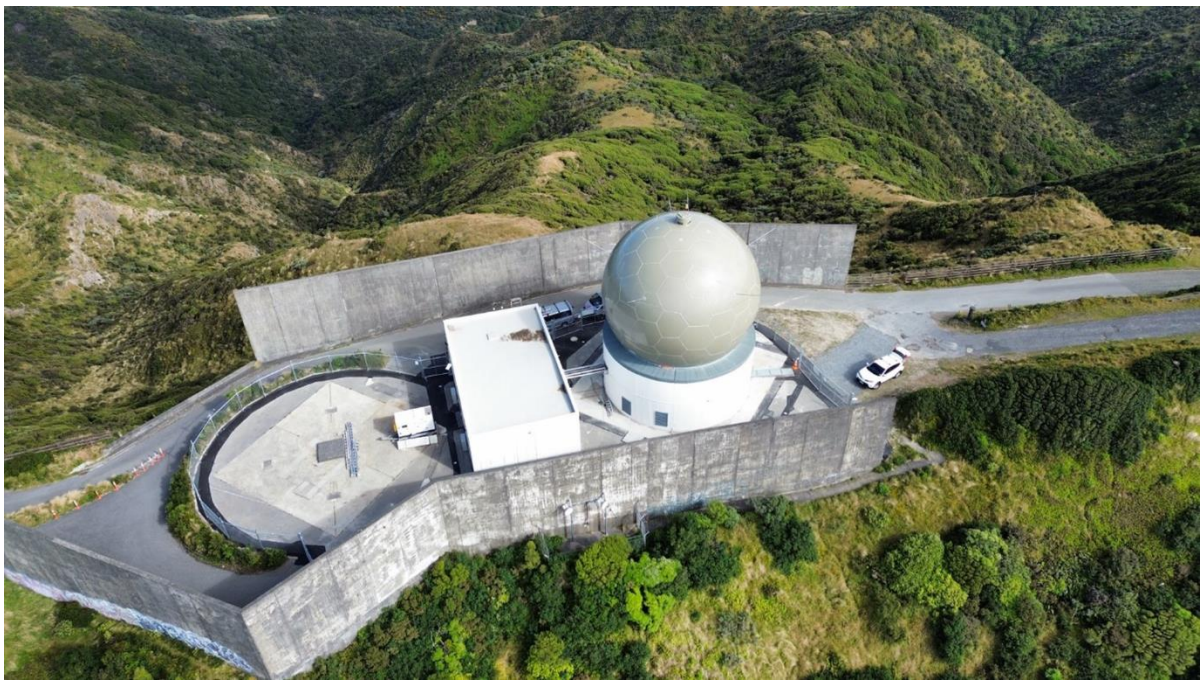
- End-to-end testing of the PSR is still ongoing, with the aim to commence operations of the PSR3D for Situational Awareness only.

2.3.1..1. This introduction of the PSR will assist with:
2.3.1..1.1. Identification of non-transponder equipped aircraft within controlled airspace, and,
2.3.1..1.2. Aid with identifying aircraft which have suffered a transponder system failure.

New MSSR/PSSR in front of the old PSR

2.3.2 For the remaining two contingency sites:

- The old SSR/PSR at Wellington (Hawkins Hill) has been removed and a new MSSR/PSR3D installed. The radar is currently undergoing optimization testing prior to final acceptance testing occurring.

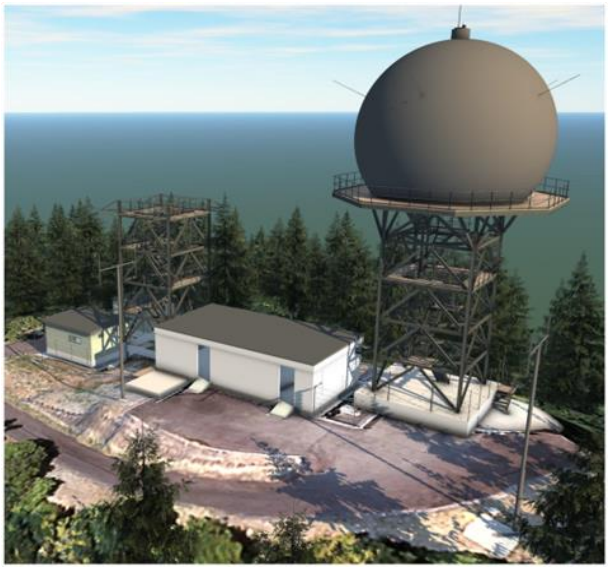


Hawkins Hill with new radar and radome installed

- The MSSR at Auckland (Ruaotewhenua) was withdrawn from service in Feb 2025 to allow for:
  - The moving of ancillary equipment (microwave dishes, VHF antenna etc) to a new stand-along mast.
  - The dismantling of the old MSSR radar,
  - The provision of a new equipment building, and upgrade to the old radar stand, and
  - The installation of the new MSSR/PSR3d.

2.3.3 Airways will use the parts from all the dismantled MSSR radars to help keep the remaining old MMSR radars operational until a decision is made to remove them from service or replace them.

RUA – Original state with MSSR



RUA – Planned state with MSSR/PSR3D

2.4 The use of low-cost ADS-B avionics such as EC devices are not permitted in controlled airspace as they are not covered by regulatory rules. The effects of clutter, erroneous information on controllers' screens and the resulting inability to use EC derived data for surveillance separation, has meant that the data from such devices is filtered out from controllers displays.

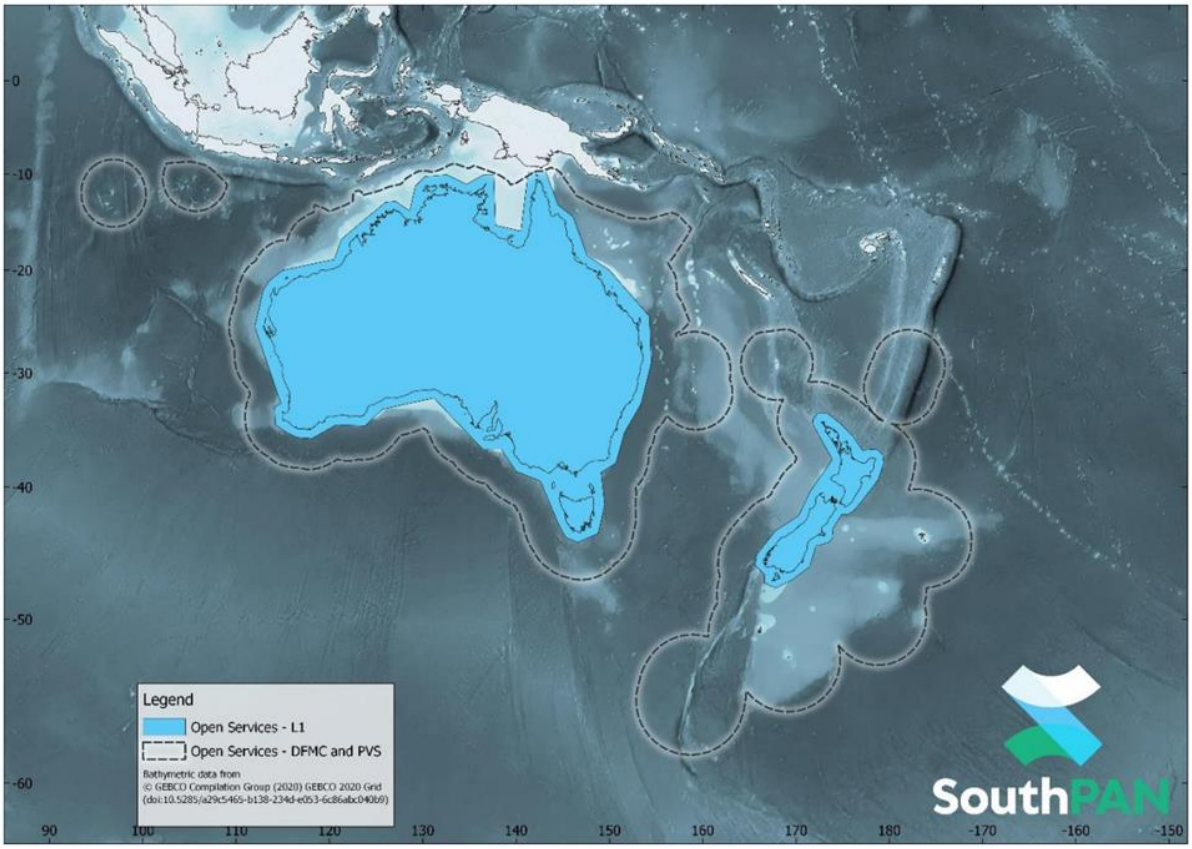
2.5 OTHER PROJECTS ASSOCIATED WITH SURVEILLANCE

2.5.1 New Zealand continues to work with Australia on the introduction of a Satellite-based augmentation system (Southern Positioning Augmentation Network (SouthPan)) with a fully certified "Safety of Life system" programmed to go-live in 2028.

2.5.2 Early Open Services available now include:

- L1 SBAS
- Dual Frequency Multi-Constellation (DFMC SBAS)
- PPP via SouthPan (PVS)
- Coverage area
- More information can be found at:

Note: PVS is similar to DFMC SBAS in that it augments GPS L1 C/A, GPS L5, Galileo E1 and Galileo E5a signals but provides additional information that allows end users to achieve more accurate position



COVERAGE AREA

SouthPan early Open Services coverage. OS_L1 coverage mainland Australia and New Zealand. OS-DFMC and OS-PVS cover both countries Exclusive Economic Zones.

2.6 CONCLUSION

2.6.1 New Zealand aviation continues to remain heavily invested in the use of GNSS for surveillance and navigation. Ongoing investment upgrades by airspace users, Airways, and the New Zealand government continues to support this new technology.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper; and

b) discuss any relevant matter as appropriate

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