International Civil Aviation Organization

Ninth Meeting of the Surveillance Implementation Coordination Group (SURICG/9)

Bangkok, Thailand, 07 – 10 May 2024

Agenda Item 7: 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 2024.

2. DISCUSSION

2.1. As of Jan 1st, 2024, New Zealand's surveillance structure is based on ADS-B as the **PRIMARY** surveillance source, with six MSSRs, and a MLAT system providing cooperative surveillance back-up and 3 PSRs providing a non-cooperative backup where required.

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

2.1.1.1. As of April 9th, 2024, Mode S transponders equipped 3243 New Zealand registered aircraft, of which 3140 or 96.83% are ADSB capable.

2.1.1.2. ADSB equipped aircraft are made up of 0.8% DO260, 0.1% DO260A and 99.1% DO260B systems.

2.1.1.3. 2407 (77%) of the 3140 ADSB transponder types 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.

2.1.1.3.1. The high uptake of ADSB-IN is significant in improving safety especially for VFR GA traffic.

2.1.1.4. 50 aircraft have Electronic Conspicuity (EC) devices with 8 of these having MODE S transponders as well.

2.1.2. The current Thales MSSRs and PSRs are all 30 plus years old and at end of their operational life. Purchase of spares to keep these systems running remains extremely difficult.

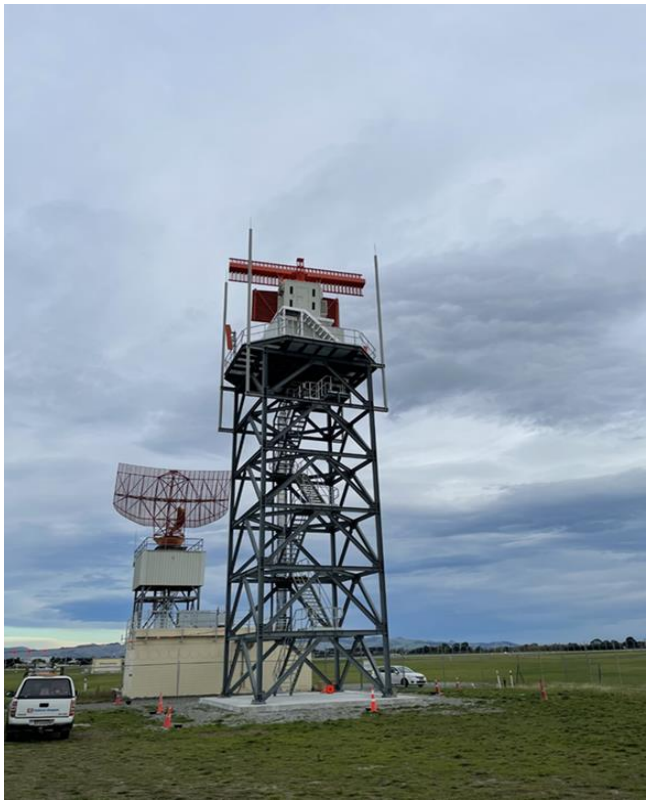
2.1.3. The ERA Wide Area Multilateration (WAM) system, used for approach and enroute in the lower South Island, and the Multilateration (MLAT) system used for surface movements at Auckland, are also nearing end of life, and replacement systems are being considered.

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. An RFP in 2019 resulted in INDRA winning a contract to provide Airways with three combined MSSR/PSR at NZCH, NZAA and NZWN to cover the regulatory requirement mentioned in 2.2.

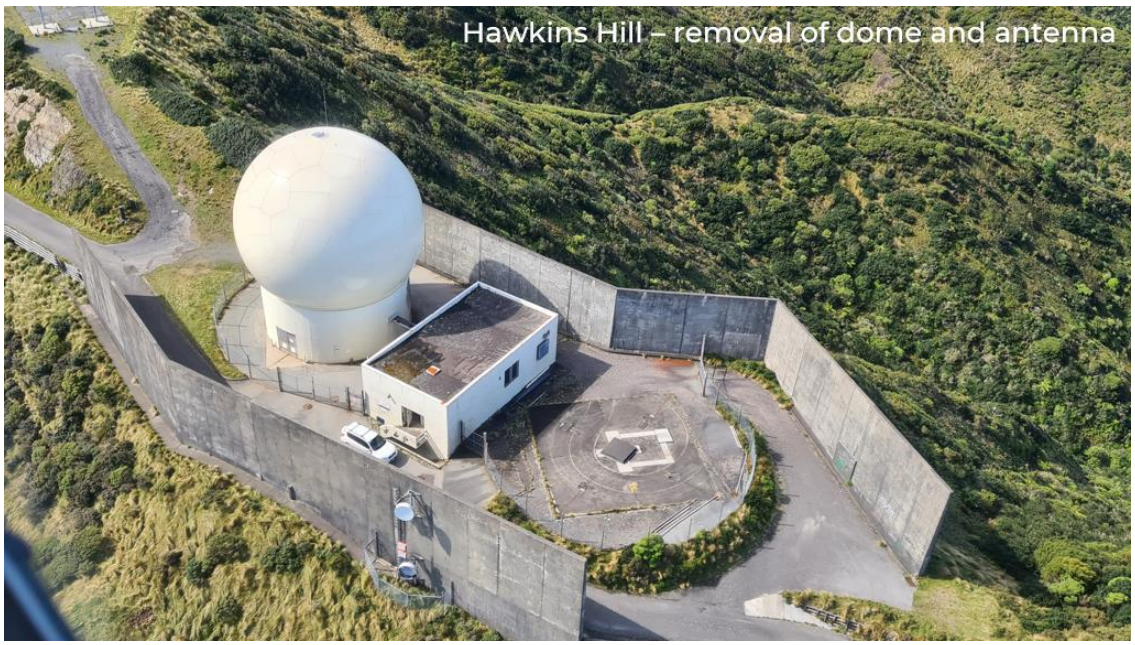
2.3.1. The first of the 3 INDRA MSSR/(3D) PSR’s has been installed in NZCH and is due to become operational in the 2nd quarter of 2024. The existing PSR at NZCH has been withdrawn from service to allow Surveillance Engineering to complete their commissioning process for the new INDRA radar, and the Requirements team to complete end to end testing for 3NM and 5NM compliance within the ATMS.



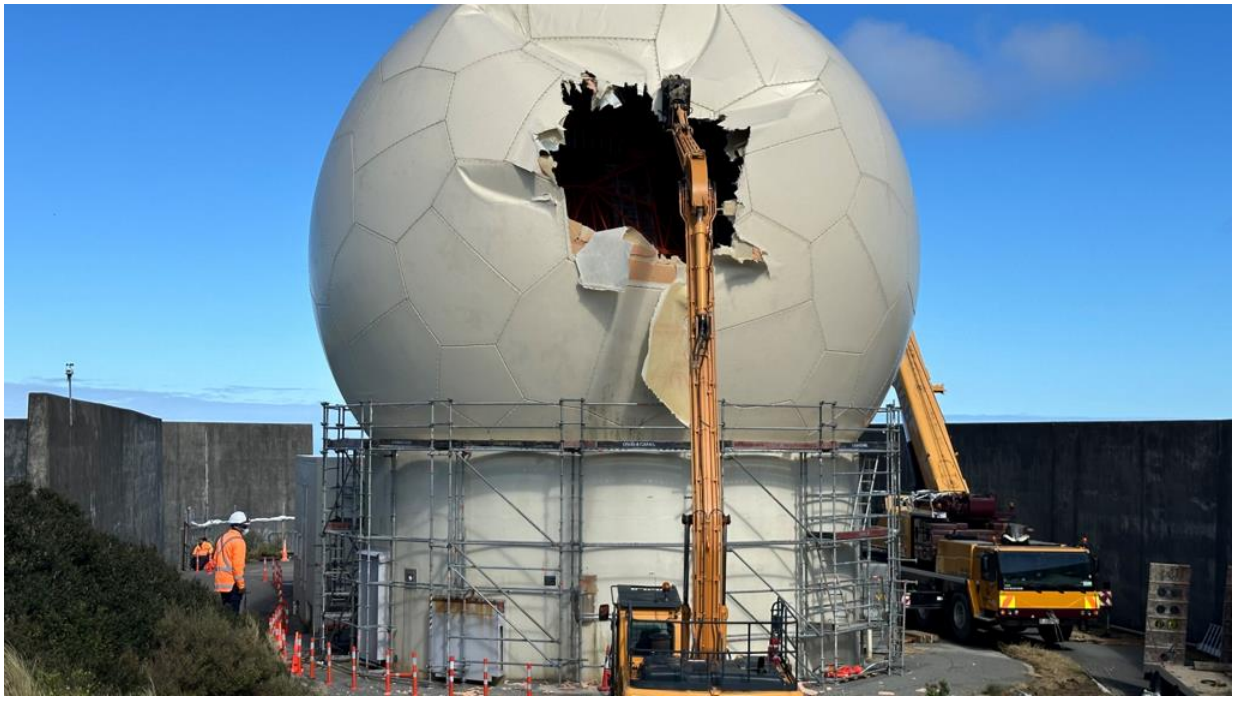
New INDRA MSSR/PSSR in front of the old Thales PSR

2.3.2. For the other two contingency sites:

2.3.2.1. The SSR at Wellington (Hawkins Hill) has now been removed from service to allow INDRA and Surveillance Engineering to remove the old radar and install the new radar.



Hawkins Hill radar site – 5M concrete wind wall for protection



Removing radome using a demolition cutter

Removing THALES PSR/MSSR antenna

2.3.2.2. The SSR at Auckland (Ruaotewhenua) will be withdrawn in early 2025 to allow the same process to occur.

2.3.2.3. Airways will use the parts from these radars to help keep the remaining Thales radars operational until a decision is made to remove them from service.

2.4. With the MLAT systems nearing end of life, work has commenced to investigate the benefits of replacing the current systems with either a like-for-like system, a contingency system which may provide greater or reduced coverage, or removal of the systems from use entirely. The current likely outcome from this work is that the MLAT systems will be removed, and coverage provided by additional ADSB sites.

2.5. 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. 50 such devices have so far been identified as being used by some operators.

2.6 OTHER PROJECTS ASSOCIATED WITH SURVEILLANCE

2.6.1 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.

2.6.1.1 Early Open Services include:
- L1 SBAS
- Dual Frequency Multi Constellation (DFMC SBAS)
PPP via SouthPan (PVS)

2.6.2 Airways is working with SkyKraft on a spaced based surveillance and communications capable solution.

2.7 CONCLUSION

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.