

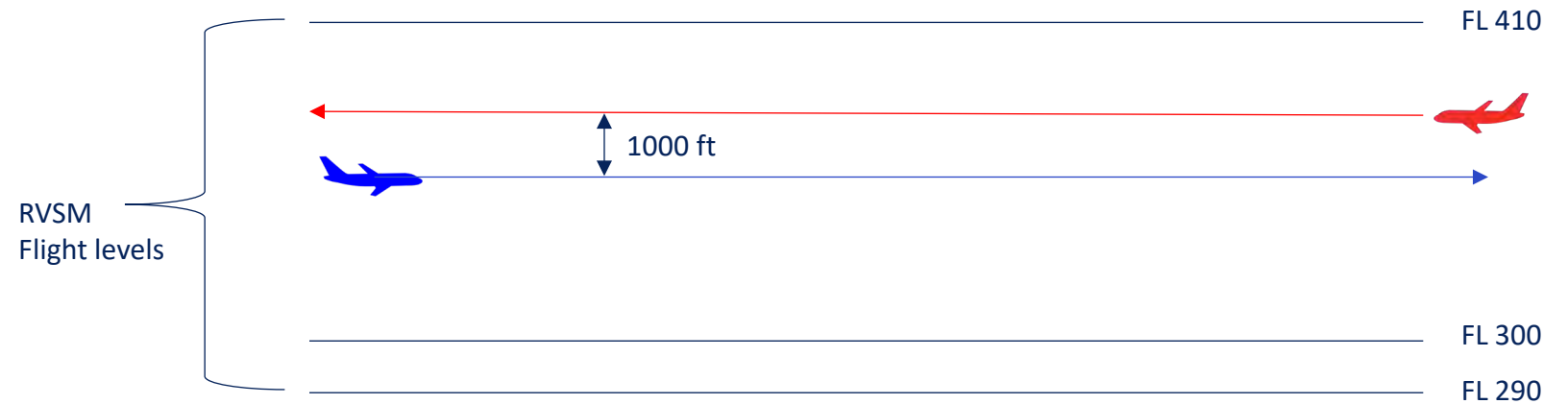
South Pacific Regional Monitoring Agency Update

Australian Airspace Monitoring Agency (AAMA)
30 April 2026

Outline

Content

- Who we are
- RVSM vertical safety assessment
- RVSM-approved aircraft
- Long-Term Height Monitoring



Aircraft altimeters for assessing altitude can be less accurate at higher flight levels – FL 290 (29,000 ft) to FL 410 (41,000 ft)

ICAO requires monitoring, by approved Regional Monitoring Agencies (RMA), of

- Individual aircraft altimetry performance and approval status
- Average risk
- Risk from operational errors – large height deviations.

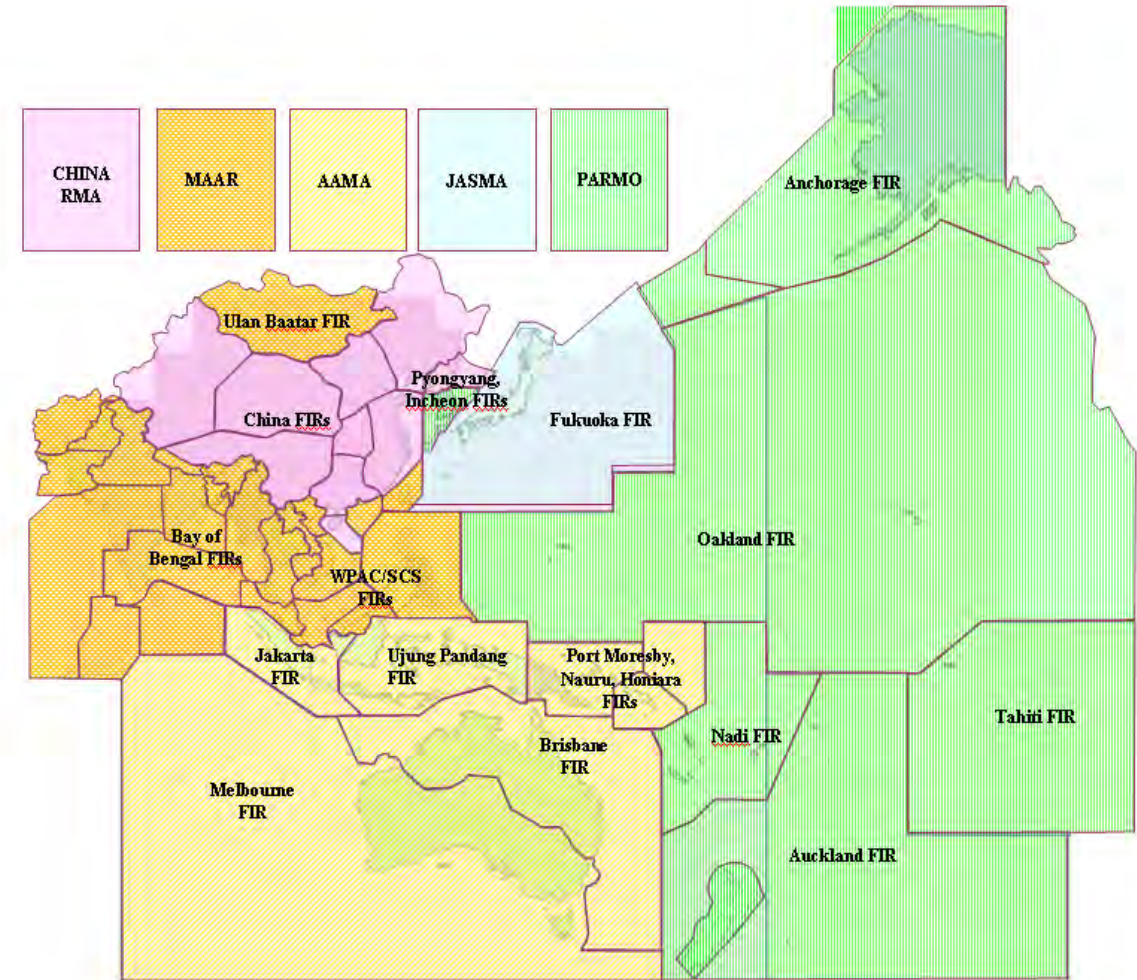
Results are reported to ICAO at regional and global meetings, and monthly to other RMAs.

The AAMA is an RMA for Australia, Indonesia, PNG, Vanuatu, Nauru and Solomon Islands.

Who we are

Who we are

- Monitoring is assessed against a target level of safety (TLS).
- The [Pacific Approvals Registry and Monitoring Organization \(PARMO\)](#) and [Australian Airspace Monitoring Agency \(AAMA\)](#) – monitor RVSM risk and report to ICAO and States
- Our functions can be summarised as:
 - establish and maintain a database of RVSM approvals;
 - monitor aircraft height-keeping performance and the occurrence of large height deviations, and report results appropriately;
 - conduct safety assessments and report results appropriately;
 - monitor operator compliance with State RVSM approval requirements; and
 - initiate necessary remedial actions if RVSM requirements are not met.



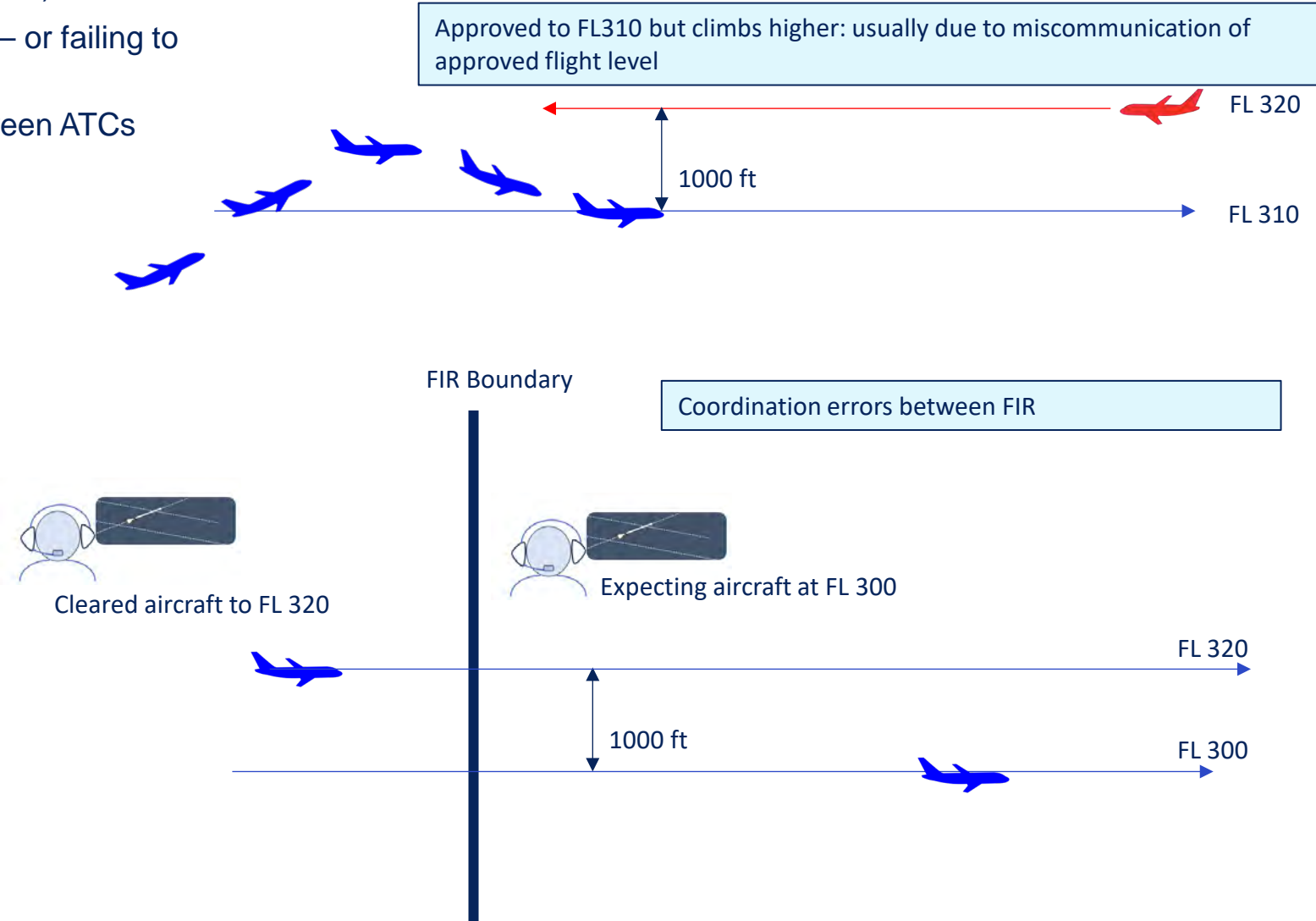
Regional Monitoring Agencies and the Flight Information Regions (FIRs) they are responsible for

RVSM vertical safety assessment

Large height deviations

Operational errors and Large Height Deviations (LHDs)

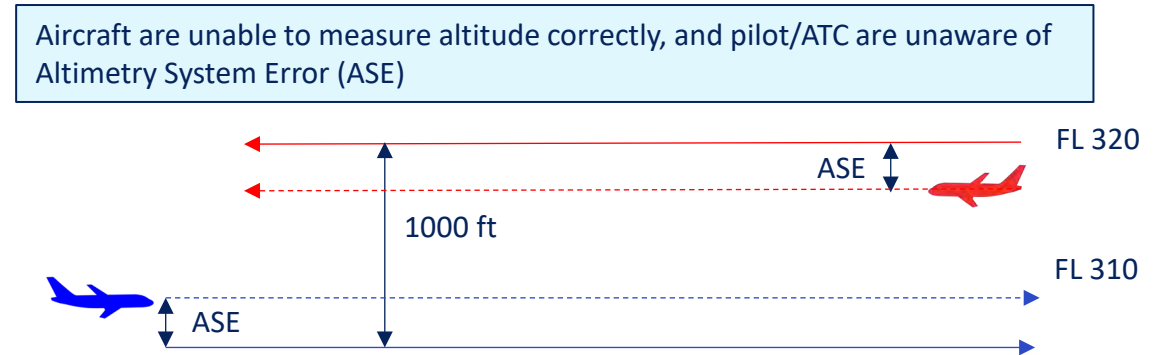
- Pilots climbing/descending without clearance – or failing to climb/descend as expected
- ATS loop errors (and coordination errors between ATCs managing adjacent sectors)
- Aircraft contingency events
- Deviations due to meteorological events
- Deviations due to ACAS



RVSM vertical safety assessment

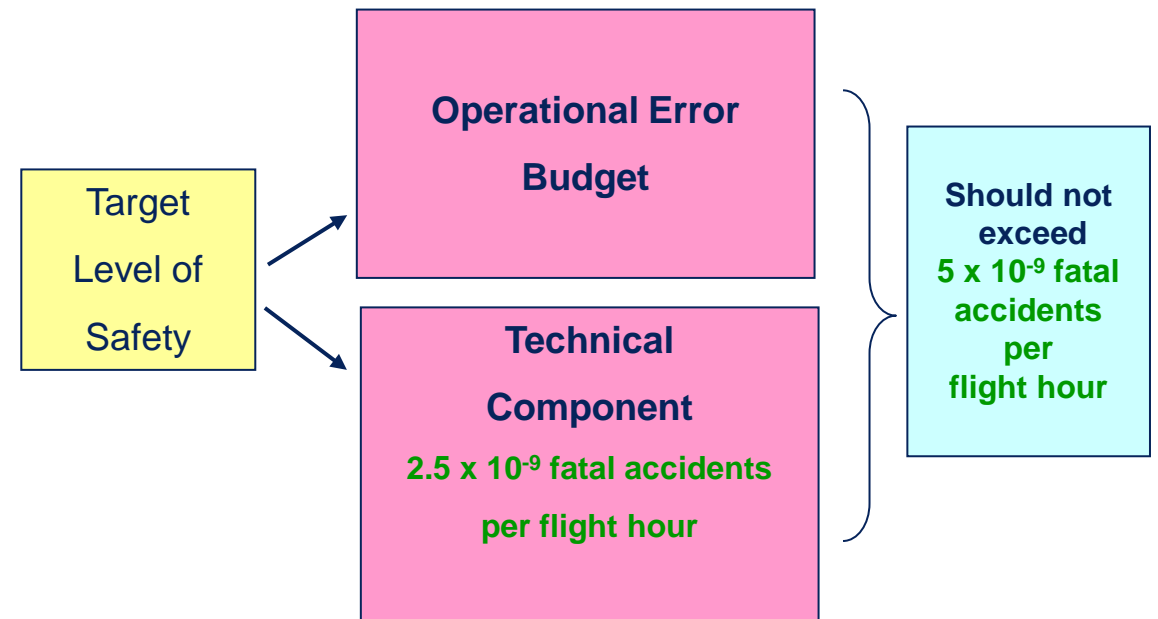
Technical (average) risk

- RVSM risk is also driven by technical risk
- This looks at average errors and flow of aircraft along routes.



Total RVSM risk

- RVSM risk is calculated by combining both technical and operational errors.



PARMO 2024 Vertical Safety Monitoring Report | Summary

This report contains a summary of LHD reports received by PARMO for 1 January to 31 December 2024.

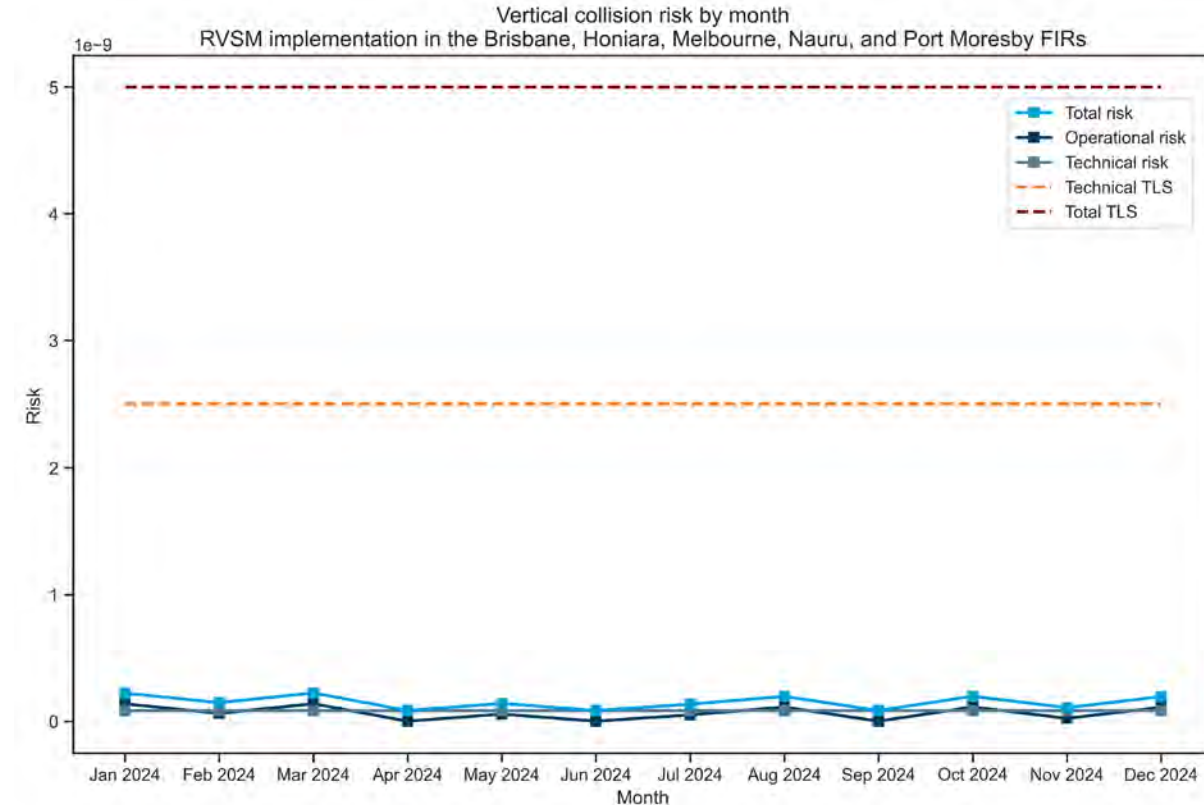
- > **90** reported LHDs accounting for **880.5** minutes of operation at incorrect FL in Pacific oceanic airspace.
- > This is an **increase** from 2023 where there were **78** reported LHDs and **190.7** minutes spent at incorrect FLs

| LHD Code | LHD Category Description | Num | Duration (Min) | FLs Crossed w/o Clearance |
|---------------|---|-----------|----------------|---------------------------|
| A | Flight crew failing to climb/descend the aircraft as cleared; | 2 | 0.0 | 0 |
| B | Flight crew climbing /descending without ATC clearance; | 24 | 27.0 | 23 |
| C | Incorrect operation or interpretation of airborne equipment (e.g. flight plan followed rather than ATC clearance, etc); | 3 | 349.0 | 1 |
| D | ATC system loop error; | 3 | 72.1 | 0 |
| E-RI | Coordination errors in the ATC-unit-to-ATC-unit transfer of control responsibility as a result of human factors issues (incorrect time estimate/actual, flight level, etc); | 52 | 314.4 | 1 |
| E-NT | Coordination errors in the ATC-unit-to-ATC-unit transfer of control responsibility as a result of human factors issues (late or non-existent coordination); | 1 | 100.0 | 0 |
| F | Coordination errors in the ATC-to-ATC transfer of control responsibility as a result of equipment outage or technical issues; | 3 | 18.0 | 0 |
| M | Other | 2 | 0.0 | 2 |
| Totals | | 90 | 880.5 | 27 |

AAMA RVSM vertical safety assessment

Results

- For calendar year 2024, total risk in Brisbane, Honiara, Melbourne, Nauru and Port Moresby FIR RVSM airspace (0.92×10^{-9}) was safer than the Target Level of Safety (5×10^{-9}).
- This marks an improvement from 2023, when total risk was 1.51×10^{-9} .
- Half of LHDs in 2024 were risk-bearing, compared to 35% in 2023. 'Risk-bearing' means an aircraft is flying at an unprotected level for some period of time.
- Just under a third of the operational risk was contributed by 6 LHDs involving coordination errors in the ATC-to-ATC transfer or control responsibility as a result of human factors issues (Category E LHD). There were 12 additional LHDs falling into the same category; however, these presented no risk.
- The riskiest LHD is of particular interest, having occurred on a two-way route on the Brisbane/Nadi East FIR boundary. A March 2024 LHD assessed as Category E (ATC coordination error as a result of human factor issues) involved one ANSP coordinating an aircraft at the wrong flight level (FL360 instead of FL300, at which the aircraft crossed into the Brisbane FIR) and was reported as lasting 2 minutes in duration.



AAMA RVSM vertical safety assessment

Results

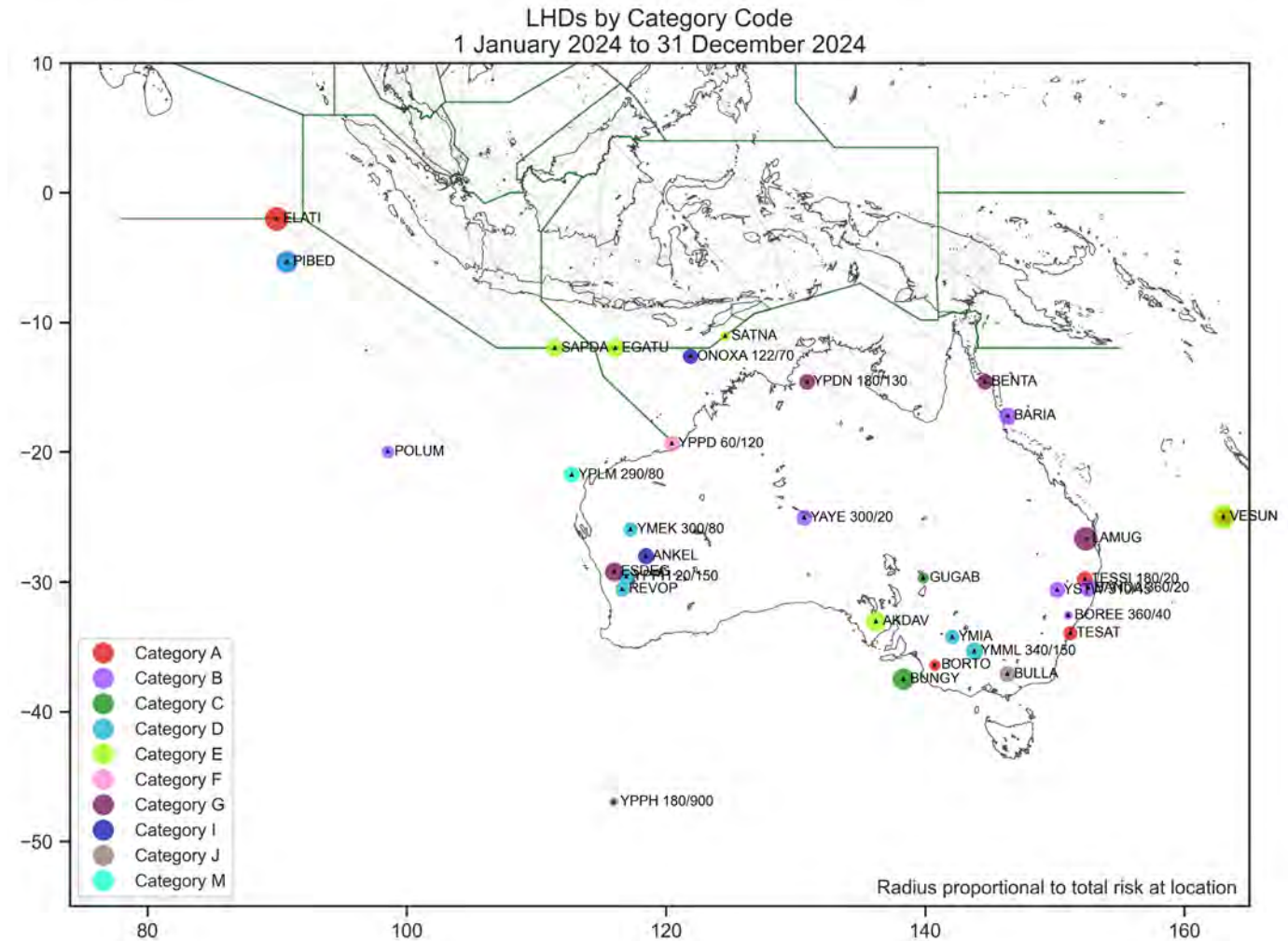
- Below is a summary of LHD occurrences by category for 1 January 2024 to 31 December 2024. Results for 2023 are also shown for comparison.
- Note the disproportionate share of coordination errors on the FIR boundaries (highlighted row).

| LHD category | LHD category description | 2024 | | | 2023 | | |
|--------------|--|-------------|----------------------------|---------------------------------|-------------|----------------------------|---------------------------------|
| | | Number LHDs | Duration of LHDs (minutes) | Number of flight levels crossed | Number LHDs | Duration of LHDs (minutes) | Number of flight levels crossed |
| A | Flight crew failing to climb/descend the aircraft as cleared | 13 | 5.5 | 3.5 | 12 | 11.0 | 3 |
| B | Flight crew climbing/descending without ATC clearance | 10 | 6.8 | 8.3 | 5 | 3.3 | 4 |
| C | Incorrect operation or interpretation of airborne equipment | 12 | 2.5 | 1.5 | 16 | 0 | 0 |
| D | ATC system loop error | 6 | 6 | 5 | 15 | 19.5 | 0 |
| E | Coordination errors in the ATC-to-ATC transfer or control responsibility as a result of human factors issues | 18 | 6.5 | 10.5 | 12 | 13.0 | 0 |
| F | Coordination errors in the ATC-to-ATC transfer or control responsibility as a result of equipment outage or technical issues | 1 | 1 | 1 | 1 | 0 | 0 |
| G | Deviation due to aircraft contingency event leading to sudden inability to maintain assigned flight level | 4 | 4.5 | 10 | 1 | 1.0 | 1 |
| H | Deviation due to airborne equipment failure leading to unintentional or undetected change of flight level | 0 | 0 | 0 | 0 | 0 | 0 |
| I | Deviation due to turbulence or other weather-related cause | 2 | 2 | 1.7 | 1 | 0.2 | 1 |
| J | Deviation due to TCAS resolution advisory; flight crew correctly following the resolution advisory | 2 | 1 | 1 | 1 | 0.5 | 1 |
| K | Deviation due to TCAS resolution advisory; flight crew incorrectly following the resolution advisory | 0 | 0 | 0 | 0 | 0 | 0 |
| L | An aircraft being provided with RVSM separation is not RVSM approved | 0 | 0 | 0 | 0 | 0 | 0 |
| M | Other | 3 | 1 | 1 | 1 | 0 | 1 |
| Total | | 71 | 36.8 | 43.5 | 65 | 48.5 | 9 |

AAMA RVSM vertical safety assessment

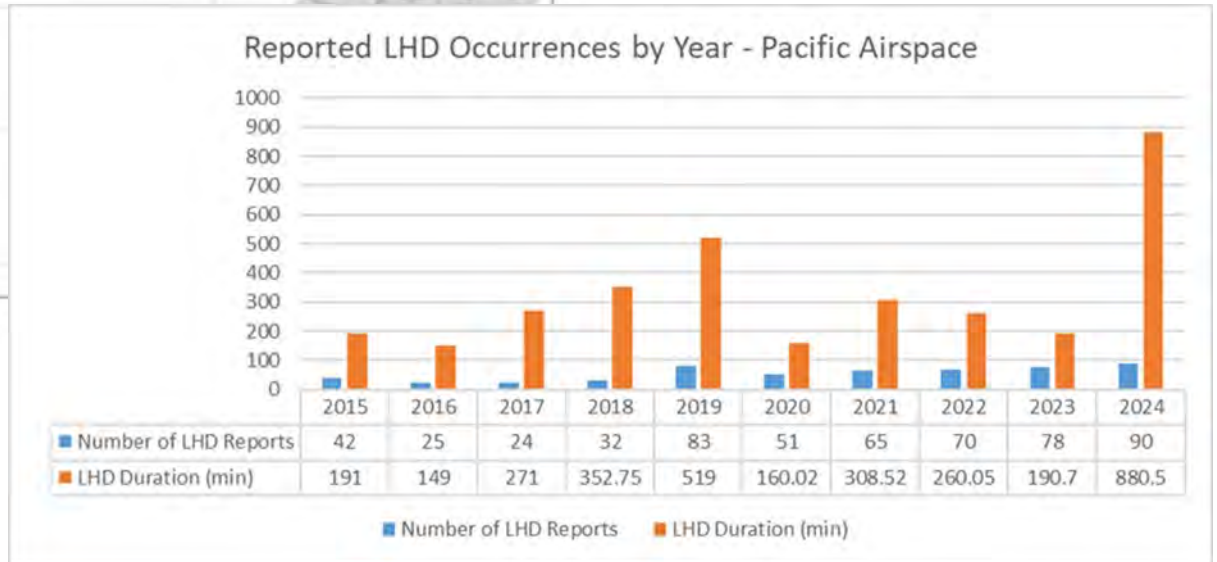
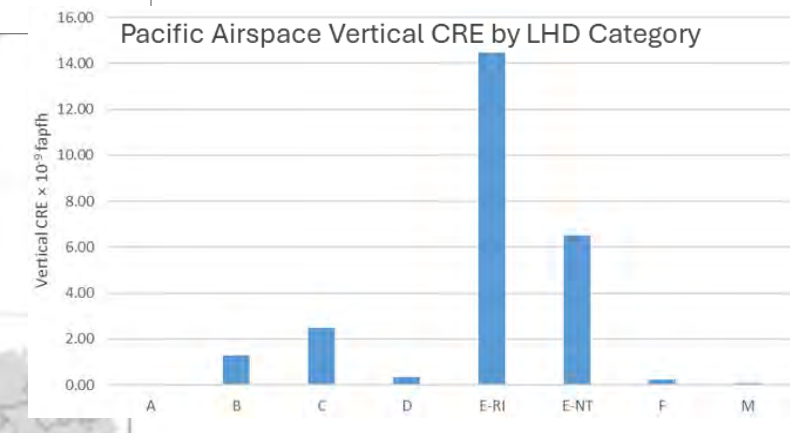
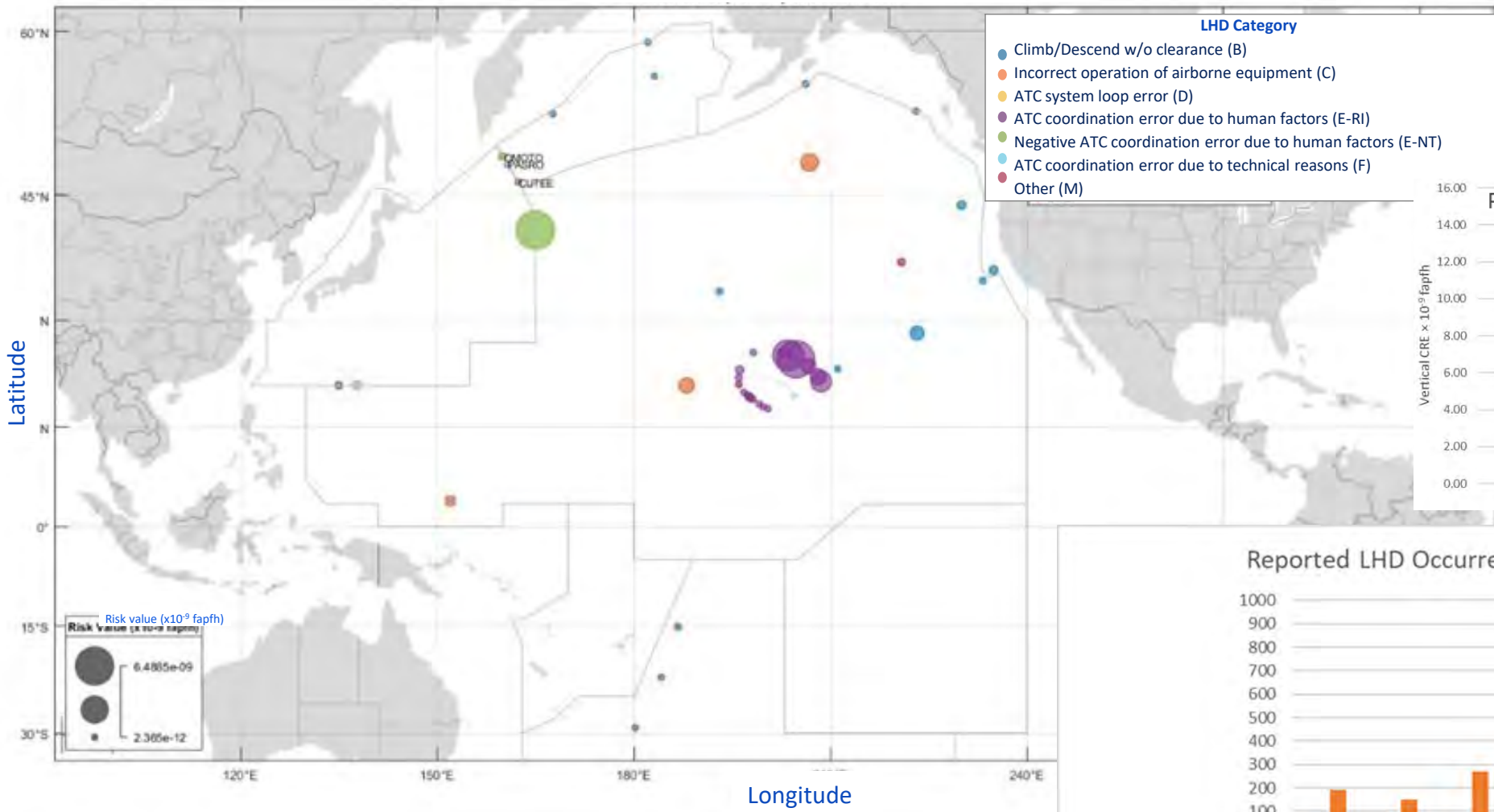
Identifying risk hotspots

- There were no identified hotspots in AAMA airspace – there is no discernible pattern to LHD categories.
- At Vesun waypoint (Nadi East and Brisbane FIR boundary), there were two relevant incidents: one in which an air crew ascending without clearance, and one in which there was a late coordination of a flight crossing into Brisbane FIR.



PARMO Vertical Safety Monitoring Report | Pacific Oceanic Airspace Vertical CRE 2024

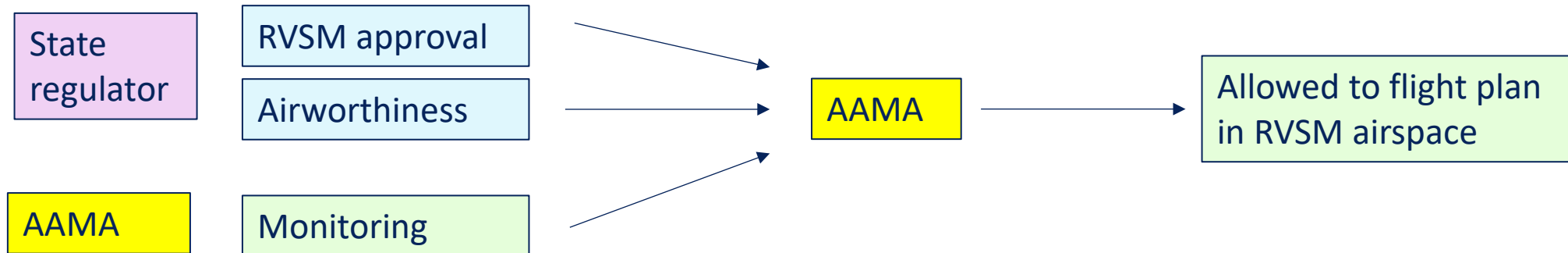
Pacific Airspaces Reported LHDs 2024



RVSM approvals for airframes

Why RVSM approvals matter

- Airframes that file a flight plan indicating their intention to fly in RVSM airspace – but do NOT have RVSM approval from the relevant regulator – are identified as potential ‘rogues’ by AAMA.
- Lists of rogues are shared by RMAs globally, and airframes that repeatedly signal their intention to fly in RVSM airspace may be barred from doing so in particular FIRs (e.g. those controlled by Eurocontrol).
- RVSM approval process:
 - Operators apply to DGCA Indonesia for approval
 - Operator needs two approvals per aircraft – airworthiness and operational
 - On issuing or withdrawing approval, the State authority provides notification to AAMA (F2, F3 forms)
 - Monitoring process – ASE is calculated by AAMA and notified to State authorities formally
 - AAMA captures approvals and monitoring data – shared globally with RMAs



RVSM approvals for airframes

AAMA results

- For calendar year 2024, AAMA knew of 23 aircraft which flew in RVSM airspace for which we do not have formal RVSM approval form on file.
- We suspect many of these 'rogues' are either de-registered or there has been some delay in the transmission of their RVSM approval (F2 form) to AAMA.

| RMA | Registration | Months repeated | Total flight plans filed |
|--------|--------------|-----------------|--------------------------|
| AAMA | VH8EB | 3 | 147 |
| AAMA | VH8NU | 2 | 142 |
| AAMA | VH8NV | 5 | 296 |
| AAMA | VH8NW | 2 | 75 |
| AAMA | VH8TP | 4 | 25 |
| AAMA | VH8YS | 1 | 11 |
| AAMA | VHAP7 | 2 | 15 |
| AAMA | VHCIK | 1 | 5 |
| AAMA | VHISS | 1 | 3 |
| AAMA | VHIXK | 3 | 296 |
| AAMA | VHJWP | 3 | 9 |
| AAMA | VHL7C | 1 | 3 |
| AAMA | VHOYW | 5 | 489 |
| AAMA | VHPDE | 1 | 4 |
| AAMA | VHTEA | 3 | 16 |
| AAMA | VHUXF | 1 | 9 |
| AAMA | VHUYX | 3 | 33 |
| AAMA | VHX4F | 2 | 326 |
| AAMA | VHXJI | 1 | 10 |
| AAMA | VHYUI | 3 | 31 |
| NAARMO | N175NG | 1 | 3 |
| NAARMO | N30NB | 2 | 17 |

Long-Term Height Monitoring

Why height monitoring is important

- LTHM is important to measure because an airframe's ability to 'know' its own flight level may degrade over time – meaning it is important to compare its reported flight level with what stations on the ground record as its actual flight level. The difference between an airframe's reported flight level and its actual flight level is called Altimetry System Error (ASE).
- LTHM burden refers to the number/proportion of aircraft that require monitoring to ensure their ASE is compliant with international standards.
- 'LTHM burden' is based on the number of aircraft requiring monitoring, the monitoring group they belong to (based on their aircraft type), and the frequency of monitoring required.

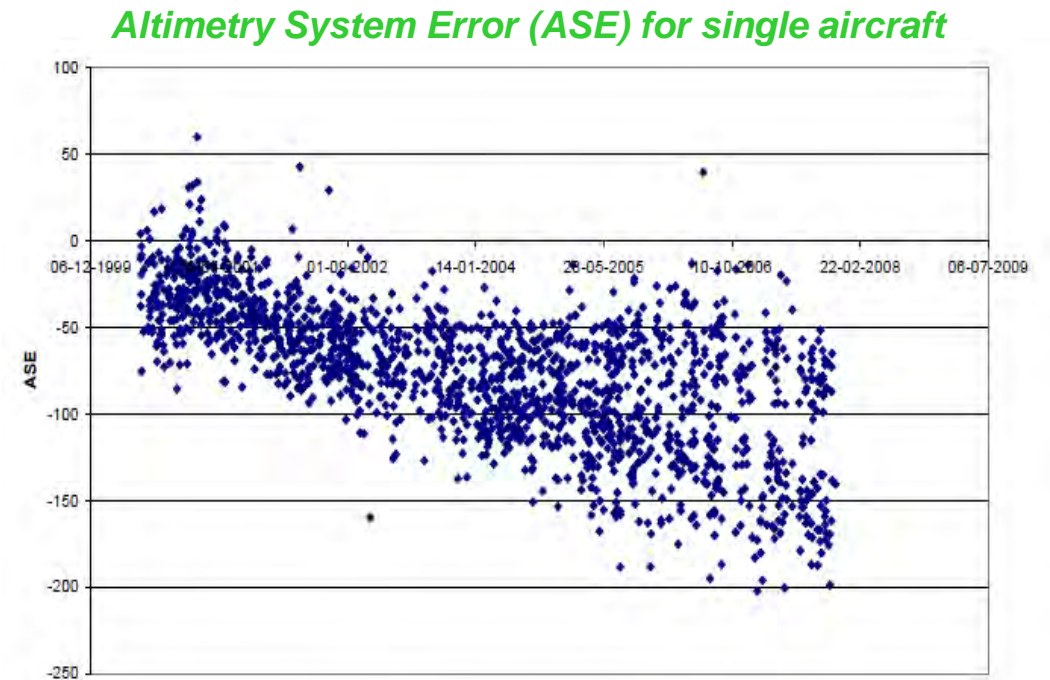
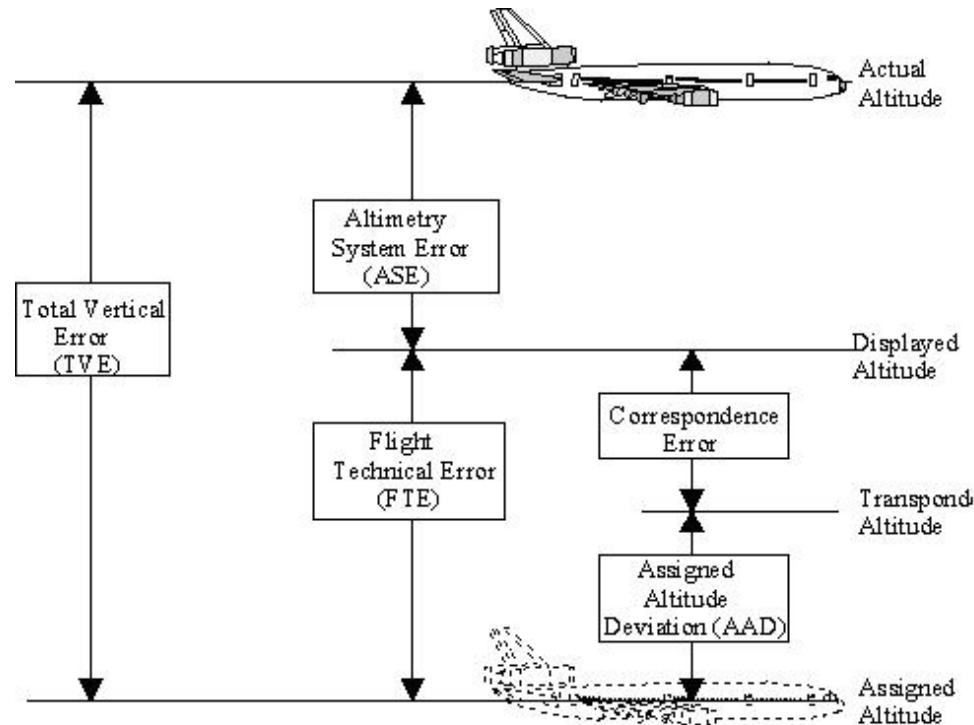


Figure 1: Long Term ASE Trend for a Single Airframe

Long-Term Height Monitoring

AAMA results

- States collect height-monitoring data (typically ADS-B surveillance data) and pass it to AAMA for processing to determine a given airframe's ASE. Those results are aggregated with the ASE results for all monitored airframes and are used to calculate a state's LTHM monitoring burden.
- Results are summarised below in a table.
- Some of those airframes that appear to require monitoring are likely de-registered, but AAMA cannot remove them until we are formally notified.

| State | Total # of approved airframes | Resultant monitoring burden (# airframes) | Total # airframes not monitored within two years as of 2 Aug 2025 | Percentage of monitoring burden |
|------------------|-------------------------------|---|---|---------------------------------|
| Australia | 863 | 367 | 55 | 15% |
| Indonesia | 533 | 94 | 17 | 18% |
| Papua New Guinea | 23 | 13 | 1 | 8% |
| Solomon Islands | 2 | 2 | 0 | 0% |
| Vanuatu | 1 | 1 | 0 | 0% |

Questions?

Please email aama@airservicesaustralia.com