INTERNATIONAL CIVIL AVIATION ORGANIZATION

REPORT OF THE THIRTIETH MEETING OF THE REGIONAL AIRSPACE SAFETY MONITORING ADVISORY GROUP (RASMAG/30)

BANGKOK, THAILAND, 14 – 17 JULY 2025

The views expressed in this Report should be taken as those of the Meeting and not the Organization

Approved by the Meeting
Published by the ICAO Asia and Pacific Office, Bangkok

CONTENTS

APPENDIXES TO THE REPORT

— — — — — — — —

INTRODUCTION

Meetings

1.1 The Thirtieth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/30) was held from 14 to 17 July 2025, at the Kotaite Wing of the ICAO Asia and Pacific Regional Office in Bangkok, Thailand.

Attendance

2.1 The Meeting was attended by 74 participants from 18 States, one Special Administrative Region of China, and one International Organization including Australia, Brunei Darussalam, Cambodia, China, Hong Kong China, India, Indonesia, Japan, Lao PDR, Malaysia, Mongolia, Pakistan, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand, United States, Viet Nam, and ICAO.

2.2 The List of Participants is at **Appendix A** to this Report.

Officers and Secretariat

3.1 Ms. Saifon Obromsook, Director of Safety Management Department, AEROTHAI, chaired the Meeting.

3.2 Mr. Ying Weng Kit, ATM Officer and Mr. Mior Adli Bin Mior Sallehhuddin, Regional Officer ATM, ICAO Asia and Pacific Office, were Secretaries of the Meeting. They were assisted by Mr. Hiroyuki Takata, Regional Officer ATM, Mr. Anony Tak Chuen Chui, AIM/ATM Officer, and Dr. Trish Prakayphet Chalayonnawin, Programme Analysis Associate, ATM.

Opening of the Meeting

4.1 Ms. Saifon Obromsook welcomed participants to the Meeting.

4.2 On behalf of Mr. Tao Ma, Regional Director of ICAO Asia and Pacific Office, Mr. Ying Weng Kit welcomed all participants.

Documentation and Working Language

5.1 English was used as the working language for the Meeting and for all documentation.

Note: airspace safety estimates in this report are measured in terms of fatal accidents per flight hour (fapfh).

5.2 A total of 39 Working Papers (WPs), six Information Papers (IPs), one Presentation and two Flimsies were presented to the Meeting.

5.3 The List of Papers is at **Appendix B** to this Report.

5.4 **DISCLAIMER**: The presentation of material in this report does not imply the expression of any opinion whatsoever on the part of ICAO, APANPIRG or the RASMAG of APANPIRG concerning the legal status of any country, territory, city or area of its authorities, or concerning the delimitation of its frontiers or boundaries.

Conclusions, Draft Conclusions, Draft Decisions and Decisions of RASMAG – Definition

6.1 RASMAG recorded its actions in the form of Draft Conclusions, Draft Decisions and Decisions within the following definitions:

a) **Draft Conclusions** of RASMAG related to matters that are not just of a purely technical or operational nature, which need to be considered by APANPIRG;

b) **Conclusions** of RASMAG related to matters of a purely technical or operational nature, which APANPIRG had delegated authority to RASMAG to act upon;

c) **Draft Decisions** related solely to matters dealing with the internal working arrangements of the RASMAG, which need to be considered by APANPIRG; and

d) **Decisions** of RASMAG that related solely to matters dealing with the internal working arrangements of the RASMAG, which APANPIRG had delegated authority to RASMAG to act upon.

List of Draft Conclusions, Conclusions, Draft Decisions and Decisions

7.1 List of Draft Conclusions

Nil.

7.2 List of Conclusions

<table>
<tr><td colspan="3">Conclusion RASMAG/30-1: New LHD/LLE/LLD Category ‘R’ for GNSS RFI occurrences in Asia and Pacific Region</td></tr>
<tr><td colspan="2">What: That, Asia and Pacific Region to adopt a new Category for Large Height Deviation/Large Longitudinal Error /Large Lateral Deviation (LHD/LLE/LLD) as Category R.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To classify the emerging trends of GNSS RFI occurrences effectively for possible identification of prevention and mitigation measures.</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: 17-Jul-25</td><td colspan="2">Status: Adopted by Subgroup</td></tr>
<tr><td colspan="3">Who: ☒Sub groups ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: Monitoring Agencies</td></tr>
</table>

<table>
<tr><td colspan="3">Conclusion RASMAG/30-2: Large Lateral Deviation Reporting Criteria in Asia and Pacific Region</td></tr>
<tr><td colspan="2">What: That,
a) Asia and Pacific Region to adopt a Large Lateral Deviation Reporting Criteria 5 NM threshold when applying or planning to implement lateral separation minima less than 50NM. This revised value balances operational practicality with safety oversight requirements.
b) The 5 NM reporting criteria for lateral separation minima less than 50 NM to be updated in the Asia/Pacific Regions En-route Monitoring Agency (EMA) Handbook on the ICAO APAC eDocuments Webpage.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: Adopting a 5 NM reporting threshold harmonized the requirements between the ADS-C downlink reports and manual reporting.</td><td colspan="2">Follow-up: ☒Required from States</td></tr>
<tr><td>When: 17-Jul-25</td><td colspan="2">Status: Adopted by Subgroup</td></tr>
<tr><td colspan="3">Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:</td></tr>
</table>

7.3 List of Draft Decisions

Nil.

7.4 List of Decisions

Nil.

— — — — — — — —

REPORT ON AGENDA ITEMS – RASMAG/30

Agenda Item 1: Adoption of Agenda

1.1 The provisional agenda (WP/1) was adopted by the Meeting. The Meeting noted IP/01 (List of Working and Information Papers).

Agenda Item 2: Review Outcomes of Related Meetings

FIT-Asia Meeting Outcomes (WP/2)

2.1 The Fifteenth Meeting of the FANS Interoperability Team-Asia (FIT-Asia/15) was held in Bangkok, Thailand from 24 to 27 June 2025.

2.2 FIT-Asia/15 had been provided with updated information on the status of Asia/Pacific engagement in data link problem reporting through the FANS-CRA website, and performance analysis reporting to a recognized FIT. **Figure 1** illustrated the number of PRs submitted by the FIT-Asia States per calendar year.

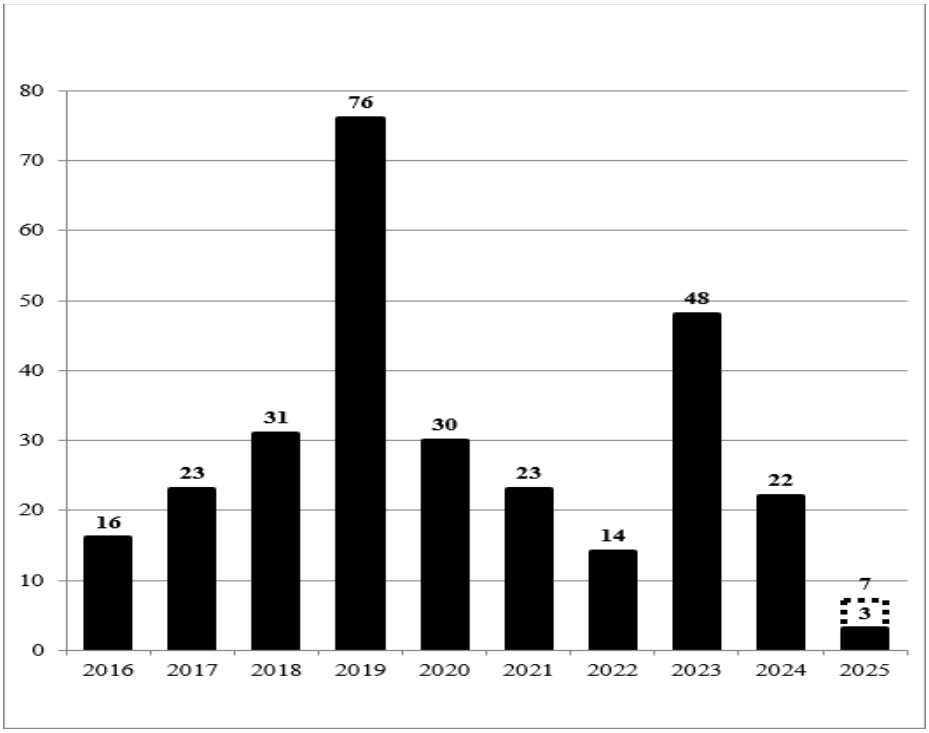


Figure 1: FIT-Asia PR Submissions per Year

Asia/Pacific Region Combined PBCS Monitoring Report

2.3 Indonesia and Malaysia prepared and provided the aggregated data link performance monitoring report for the Asia/Pacific Region. States/Administrations were invited to double-check the data before submission each year to avoid format errors and consistency issues. The details, including PBCS data provided by States/Administrations, could be found in **RASMAG/30 WP/02 Attachment A**.

2.4 **Table 1** showed the combined data for RSP across all media types in 2024. The 95% standard was achieved in all Flight Information Regions (FIRs). None of the FIRs met the 99.9% standard, but all FIRs except Chennai and Kolkata achieved a clearance rate of 99.0%.

Table 1: RSP Aggregated Data (All Media Types)

REQUIRED SURVEILLANCE PERFORMANCE						
Region	Asia-Pacific Region					
Performance Criteria	RSP180					
Time Period	2024 January-June			2024 July-December		
Colour Key Meets Criteria 99.0%-99.89% Under Criteria	No. Messages	Criteria		No. Messages	Criteria	
		95% % < = 90sec	99.90% % <= 180sec		95% % < = 90sec	99.90% % <= 180sec
Aggregate All RGS						
KZAK	5971271	98.69%	99.61%	6372030	98.77%	99.63%
NFFF	323568	99.12%	99.64%			
NTTT	113440	99.59%	99.83%	98835	99.40%	99.67%
NZZO	491645	98.93%	99.73%	461189	98.45%	99.51%
YBBB	1450812	99.49%	99.83%	1397596	99.37%	99.77%
YMMM	1120452	99.48%	99.82%	1120452	99.48%	99.82%
VVTS	271764	98.74%	99.72%	289712	98.88%	99.72%
ZWWW	210283	98.40%	99.50%	155462	98.40%	99.50%
ZLLL	331337	98.20%	99.50%	312276	98.30%	99.50%
VOMF	287424	97.49%	98.92%	283528	96.83%	98.54%
VECF	557384	98.00%	98.96%	291377	97.58%	98.66%
VABF	774232	97.51%	99.11%	782999	96.91%	98.74%
RJJJ	3091247	98.41%	99.59%	3659783	98.45%	99.58%
WMFC	335522	98.65%	99.57%	253690	98.72%	99.55%
RPHI	627,080	98.38%	99.39%	680993	98.28%	99.29%
WSJC	810654	98.84%	99.76%	795579	98.92%	99.75%
VCCF	102604	98.83%	99.84%	402896	98.53%	99.65%
PAZA	1911481	98.74%	99.62%	2253510	98.87%	99.66%
WAAF	241952	98.96%	99.48%	277369	99.01%	99.48%

2.5 RCP240 performance in the Asia/Pacific region was generally robust in 2024, with most FIRs meeting or exceeding the 95% criteria for ACP and ACTP. However, performance against the 99.9% criteria showed greater variability, with several FIRs, including Kolkata, Kuala Lumpur, and Manila, underperforming in at least one half of the year (**Table 2**).

Table 2: RCP Aggregated Data (All Media Types)

REQUIRED COMMUNICATIONS PERFORMANCE										
Region	Asia-Pacific Region									
Performance Criteria	RCP240									
Time Period	2024 January-June					2024 July - December				
Colour Key: Meets Criteria / 99.0%-99.89% / Under Criteria	No. Messages	ACP Criteria		ACTP Criteria		No. Messages	ACP Criteria		ACTP Criteria	
		95%	99.90%	95%	99.90%		95%	99.90%	95%	99.90%
Aggregate All RGS		% <= 180sec	% <= 210sec	% <= 120sec	% <= 150sec		% <= 180sec	% <= 210sec	% < = 120sec	% <=150sec
KZAK	356648	99.37%	99.53%	99.60%	99.70%	392772	99.31%	99.46%	99.55%	99.65%
NFFF	10980	99.49%	99.74%	99.74%	99.80%					
NTTT	3902	99.67%	99.85%	99.77%	99.87%	3110	99.71%	99.74%	99.71%	99.81%
NZZO	92307	99.23%	99.50%	99.47%	99.68%	84705	98.96%	99.25%	99.30%	99.48%
YBBB	43673	99.54%	99.54%	99.67%	99.68%	42531	99.54%	99.57%	99.71%	99.73%
YMMM	46001	99.63%	99.63%	99.76%	99.75%	49595	99.72%	99.74%	99.81%	99.83%
VVTS	76964	98.36%	99.66%	98.89%	99.82%	76981	98.35%	99.61%	98.88%	99.80%
ZWWW	33	87.87%	87.87%	87.87%	87.87%	34	100.00%	100.00%	100.00%	100.00%
ZLLL	2164	98.38%	99.12%	98.75%	99.63%	2389	98.40%	98.15%	98.74%	98.95%
VOMF	145895	99.80%	99.80%	99.81%	99.62%	149114	99.63%	99.76%	99.74%	99.82%
VECF	17958	98.60%	98.92%	98.91%	99.21%	20325	98.77%	98.94%	99.01%	99.16%
VABF	147275	98.55%	99.24%	99.07%	99.65%	171155	98.41%	99.14%	99.01%	99.59%
RJJJ	67522	99.68%	99.70%	99.79%	99.80%	78527	99.61%	99.61%	99.76%	99.74%
WMFC	5833	98.75%	98.63%	99.14%	99.11%	5583	98.82%	98.85%	99.21%	99.28%
RPHI	23358	98.30%	98.69%	98.56%	98.87%	44358	98.44%	98.63%	98.65%	98.81%
WJSC	45233	99.28%	99.42%	99.51%	99.60%	51007	99.43%	99.47%	99.61%	99.65%
VCCF	5678	97.68%	99.51%	98.66%	99.70%	20337	96.84%	99.22%	99.01%	99.72%
PAZA	119296	99.39%	99.45%	99.59%	99.64%	138314	99.08%	99.53%	99.36%	99.67%
WAAF	42694	99.37%	99.80%	99.53%	99.85%	46592	99.31%	99.75%	99.43%	99.79%

2.6 **Table 3** illustrated that certain combinations of aircraft operators and aircraft types, each with over 1,000 message counts in either half of 2024, did not achieve PORT compliance.

Table 3: Combinations of Aircraft Operators and Types Confirmed Non-Compliance of PORT

Criteria		RCP240										
Period		Jan - Jun 2024						Jul - Dec 2024					
Colour Key: Meets Criteria / 99.0%-99.89% / Under Criteria		Message Counts	95% benchmark		99.9% Benchmark		95%	Message Counts	95% benchmark		99.9% Benchmark		95%
			ACP	ACTP	ACP	ACTP	PORT		ACP	ACTP	ACP	ACTP	PORT
FIR			% < = 180sec	% <= 120sec	% < = 210sec	% <= 150sec	%<60secs		% < =180sec	% <= 120sec	% < = 210sec	% <= 150sec	%<60secs
		By Aircraft Operator / Type (only message counts >100 recorded)											
KZAK	UAL/B738	6779	96.80%	97.43%	97.83%	98.97%	94.73%	7841	95.92%	96.88%	97.35%	98.55%	93.19%
KZAK	MIL/C17	2693	98.14%	99.70%	98.55%	99.85%	94.69%	2536	97.99%	99.53%	98.34%	99.72%	94.79%
KZAK	MIL/K35R	1456	97.46%	99.79%	98.15%	99.93%	90.18%	1676	97.37%	99.76%	98.15%	99.82%	91.29%
VVTS	AAR	1135	98.29%	99.74%	98.68%	100.00%	94.27%	838	98.10%	99.27%	99.50%	99.61%	93.80%
VVTS	CAL	2905	97.90%	99.40%	98.66%	99.54%	94.87%	2818	98.10%	99.10%	98.69%	99.44%	95.88%
VVTS	JAL	1522	98.14%	99.93%	98.90%	100.00%	95.20%	1377	97.97%	99.98%	98.68%	100.00%	93.92%
VVTS	KAL	3776	97.56%	99.13%	98.39%	99.62%	94.15%	3057	97.87%	99.54%	98.69%	99.73%	94.80%
VVTS	SJX	1525	98.37%	99.10%	98.76%	99.52%	95.68%	1411	97.43%	98.70%	98.37%	99.15%	94.47%
VABF	ALK/A21N	789	96.61%	99.11%	97.31%	99.41%	90.75%	1068	97.33%	98.83%	98.33%	99.23%	92.42%
VABF	ALK/A332	1347	98.22%	99.38%	99.10%	99.87%	94.28%	692	97.69%	98.96%	98.63%	99.74%	93.50%
VABF	ETD/A320	3140	97.44%	99.25%	98.22%	99.48%	91.24%	2633	95.71%	98.82%	97.85%	99.42%	88.49%
VABF	ETD/A321	4613	97.31%	99.45%	98.19%	99.71%	90.53%	5720	95.89%	98.74%	97.47%	99.44%	90.02%
VABF	KAC/A20N	1092	97.07%	99.11%	98.24%	99.97%	91.85%	1293	96.44%	97.76%	97.64%	98.70%	92.34%
VABF	MAU/A332							1300	98.86%	99.67%	99.31%	99.98%	94.31%
VABF	QTR/A332	900	98.01%	99.80%	98.40%	99.84%	90.22%	2009	98.06%	99.50%	98.82%	99.82%	91.29%
VABF	QTR/A333	2025	97.71%	99.58%	98.42%	99.74%	91.56%	2489	98.03%	99.46%	98.58%	99.65%	91.92%
VABF	QTR/B77W	9722	97.73%	97.92%	98.64%	98.94%	96.55%	11176	96.69%	97.19%	98.09%	98.35%	95.63%
VABF	SVA/A333	3057	97.17%	99.54%	97.96%	99.80%	88.06%	2969	97.00%	99.81%	97.91%	99.96%	86.09%
VABF	THY/A333	878	97.45%	99.48%	98.34%	99.85%	91.12%	1485	97.64%	99.09%	98.52%	99.39%	92.19%
VABF	VTI/A21N	1595	97.66%	100.00%	97.93%	100.00%	92.66%	1332	98.02%	99.81%	98.71%	99.87%	92.12%
RPHI	CAL/A359	830	94.10%	92.77%	94.54%	93.77%	92.53%	1300	93.24%	91.02%	93.64%	91.74%	91.62%
RPHI	CSN/B789	1737	95.75%	95.68%	96.06%	96.35%	93.96%	2365	96.14%	94.93%	96.44%	95.60%	94.29%
RPHI	SIA/A359	1384	94.67%	95.05%	95.16%	95.58%	92.73%	2721	95.69%	95.14%	95.96%	95.80%	93.38%
RPHI	SIA/B78X	1076	96.68%	95.57%	96.96%	96.33%	95.07%	2031	96.28%	96.12%	96.61%	96.73%	93.75%
WAAF	CPA/B77W	1759	98.64%	99.86%	99.39%	99.94%	92.33%	2375	98.78%	99.86%	99.24%	99.90%	94.40%
PAZA	CKS/B744	3154	97.94%	97.75%	98.57%	98.60%	96.07%	3931	96.51%	98.37%	97.69%	98.98%	94.38%
PAZA	CPA/B748	2571	98.02%	98.33%	99.07%	98.95%	95.76%	3061	94.51%	98.14%	96.21%	98.56%	91.44%
PAZA	DAL/A339	2220	98.47%	99.23%	99.05%	99.50%	95.90%	1774	98.76%	99.66%	99.27%	99.89%	94.59%
PAZA	CPA/B77W	1426	98.88%	99.09%	99.37%	99.37%	96.91%	2122	98.30%	98.87%	98.73%	99.48%	94.67%

Air Navigation Deficiencies Relating to Data Link Performance Monitoring and Analysis

2.7 This year India had submitted the data link performance report for all the three FIRs, including Mumbai FIR, and completed annual Survey of the *Status of Current and Planned Implementation of Performance-Based Horizontal Separation Minima form* for 2025.

2.8 Therefore, FIT-Asia/15 meeting agreed to the proposal to remove India from the APANPIRG ATM and Airspace Deficiencies List in the Data Link field, to RASMAG for further consideration.

2.9 To remove from deficiencies list:

India: Performance monitoring and analysis not reported for Mumbai FIRs.

Outcomes of CNS SG/29 (WP/39)

2.10 ICAO presented the latest outcomes of significant discussions held in various CNS contributory bodies meetings on different matters in the CNS area under the CNS SG umbrella that may interest the RASMAG. The paper introduced the Air Traffic Services Interfacility Data Communications (AIDC) Implementation and RASMAG Hotspot Chart produced by APAC Air Traffic Management Automation System Task Force (ATMAS TF).

2.11 The ATMAS TF agreed that the chart was useful for a quick overview of AIDC implementation and hotspots. New Zealand, during the ATMAS TF, offered to conduct internal coordination and collate the required information for the future to include the South Pacific States.

2.12 It was noted that hotspots might not be solely caused by AIDC issues but by other contributing factors. Suggestions included updating the chart regularly or after RASMAG identifies new hotspot trends or ATMAS TF notes major updates. The ICAO Secretariat would coordinate internally and inform the ATMAS TF of any significant changes.

2.13 The Republic of Korea emphasized the importance of AIDC implementation to reduce errors between ATC facilities, causing Category E Large Height Deviation (LHD) events.

2.14 ICAO clarified that the AIDC Implementation and RASMAG Hotspot Chart would be updated on request or when there were changes to the hotspots and AIDC implementation status.

2.15 The Meeting was also appraised of the ***Decision CNS SG/29/11 (ATMAS TF/06/02) – Adoption of the AIDC Implementation and Operations Guidance Document (IGD) Edition 2.0***. It was advised that States should retain full discretion to implement and exchange AIDC messages beyond the recommended message set where operationally beneficial, provided such implementation adhered to the published Interface Control Document (ICD).

Outcomes of RASMAG/MAWG and RMACG Meetings (WP/03)

2.16 The Twelfth Meeting of the Regional Airspace Safety Monitoring Advisory Group Monitoring Agencies Working Group (RASMAG/MAWG/12) was held from 17 to 20 February 2025 in Tokyo, Japan and the Twentieth Meeting of RMA Coordination Group (RMACG/20) was held from 19 to 23 May 2025 in Bangkok, Thailand, in a hybrid format.

2.17 Some salient points discussed during MAWG/12 and RMACG/20:

RVSM Minimum Monitoring Requirements (MMR)

2.18 The Reduced Vertical Separation Minimum (RVSM) Minimum Monitoring Requirements (MMR) Version 2025 was reviewed and adopted by the RMACG meeting, which could be found in the **RASMAG/30 WP/3 Attachment 1**.

Subcategory of Category E LHD

2.19 The Asia Pacific Monitoring Agencies decided to apply the following E sub-categories starting from RASMAG/30:

a) E-NT: No Transfer or Negative Transfer;

b) E-LT: Late Transfer;

c) E-RI: No or Late Revision of Transfer Information; and

d) E-OT: Any Other Types.

2.20 Southeast Asia Safety Monitoring Agency (SEASMA) presented an assessment tool, the Human Factors Assessment Questionnaire (HFAQ), designed to identify the human factors that might contribute to Category E LHD. By identifying specific human factors contributions to LHDs, appropriate interventions could be developed and implemented to enhance ATC coordination. The Chair tasked MAAR to incorporate the HFAQ into the *Guidance Material for the Continued Safety Monitoring of the Asia-Pacific RVSM Airspace* for States and Air Traffic Service Providers (ATSPs) to analyze human factors issues. The details were provided in a separate working paper.

ASE Technical Interchange Meeting

2.21 The FAA and EUROCONTROL planned to jointly host the next Altimetry System Error (ASE) Technical Interchange Meeting during the period of 9 to 11 September 2025, at the Edgewater Hotel in Seattle, Washington, USA. This event was intended to expand its focus on the role of the industry, as well as highlighting new emerging topics relevant to the safe operation of RVSM airspace. Some new topics of discussion were proposed for this event to increase awareness and invite collaboration on solutions.

2.22 The Meeting was informed that there would be discussions on the extension of RVSM operations above flight level (FL) 410. Participants were invited to register using the QR code shown in the attachment to the paper.

APAC Lateral Deviation Reporting

2.23 During the MAWG/12 meeting, PARMO presented the proposed changes to reporting requirements for LLDs for the Asia/Pacific Region that would align with other ICAO regions. PARMO suggested that the MAWG considered the process used in the North Atlantic (NAT) for reporting lateral deviations. The concept of Lateral Infringement Distance (LID) was introduced as a determining criterion depending on the location of the deviation and filed flight plan information. Using this method, no minimum reporting threshold was required.

2.24 MAWG/12 extensively discussed whether this approach was possible for the applicable portions of the APAC Region. The meeting agreed to ICAO's suggestion to incorporate the LID table, when finalized, into the APAC EMA Handbook. The meeting also agreed with the Chair's suggestion for the EMAs to consider the LLD reporting criteria from ATSPs - if the LLD reporting criteria should be any deviations greater than 5NM (previously proposed by JASMA) or deviations of all magnitudes (currently used in the NAT), then submit papers to discuss at RASMAG/30.

RASMAG Safety Bulletin

2.25 JASMA presented the proposal for the content of "Crew/Team Resource Management" as the third issue of the RASMAG Safety Bulletin. The proposed draft was provided in a separate working paper.

Agenda Item 3: Reports from Asia/Pacific RMAs and EMAs

RVSM Risk Assessment in the Brisbane, Honiara, Melbourne, Nauru, And Port Moresby Flight Information Regions, 1 January 2024 to 31 December 2024 (WP/4)

3.1 The Australian Airspace Monitoring Agency (AAMA) provided an airspace safety review of RVSM airspace risk in the Brisbane, Honiara, Melbourne, Nauru, and Port Moresby FIRs for the period 1 January 2024 to 31 December 2024.

3.2 **Table 4** detailed the results for the technical, operational and total risk, each of which met the Target Level of Safety (TLS).

Table 4: RVSM Risk Estimates for the period 1 January 2024 to 31 December 2024

Source of risk	Risk estimate	TLS	Comparison with TLS
Technical risk	0.084×10^{-9}	2.5×10^{-9}	Below technical TLS
Operational risk	0.84×10^{-9}	-	-
Total risk	**0.93×10^{-9}**	**5.0×10^{-9}**	**Below total TLS**

3.3 The number of estimated annual flight hours was 1,245,193 based on the December 2024 Traffic Sample Data (TSD).

3.4 The reporting safety culture metric be measured by the reporting rate of occurrence per flight hour, with occurrences grouped by attribution is shown in **Table 5**. A high rate of reporting of occurrences with ATC attribution is an indication of a positive reporting culture, especially if ATC were comfortable reporting on their own errors as part of a 'Just Culture' framework.

Table 5: Safety Culture Metric for Australia, Nauru, Papua New Guinea, and Solomon Islands by LHD Attribution for the Period 1 January 2023 to 31 December 2023

Attribution	Number of reports	Flight hours	Number of reports per flight hour ($\times 10^{-5}$)
Pilot/Aircrew (A, B, C)	35	1 245 193	2.81
ATC (D, E, F)	25	1 245 193	2.00
Other	11	1 245 193	0.88
Total	**71**	**1 245 193**	**5.70**

3.5 A map identifying the geographic location of LHD occurrences for the period 1 January 2024 to 31 December 2024 was provided in **Figure 2**. The occurrences at each location were represented by a coloured circle, with the radius proportional to the total risk at that location. The map was intended to provide a means to identify and visualize risk hotspots related to RVSM operations.

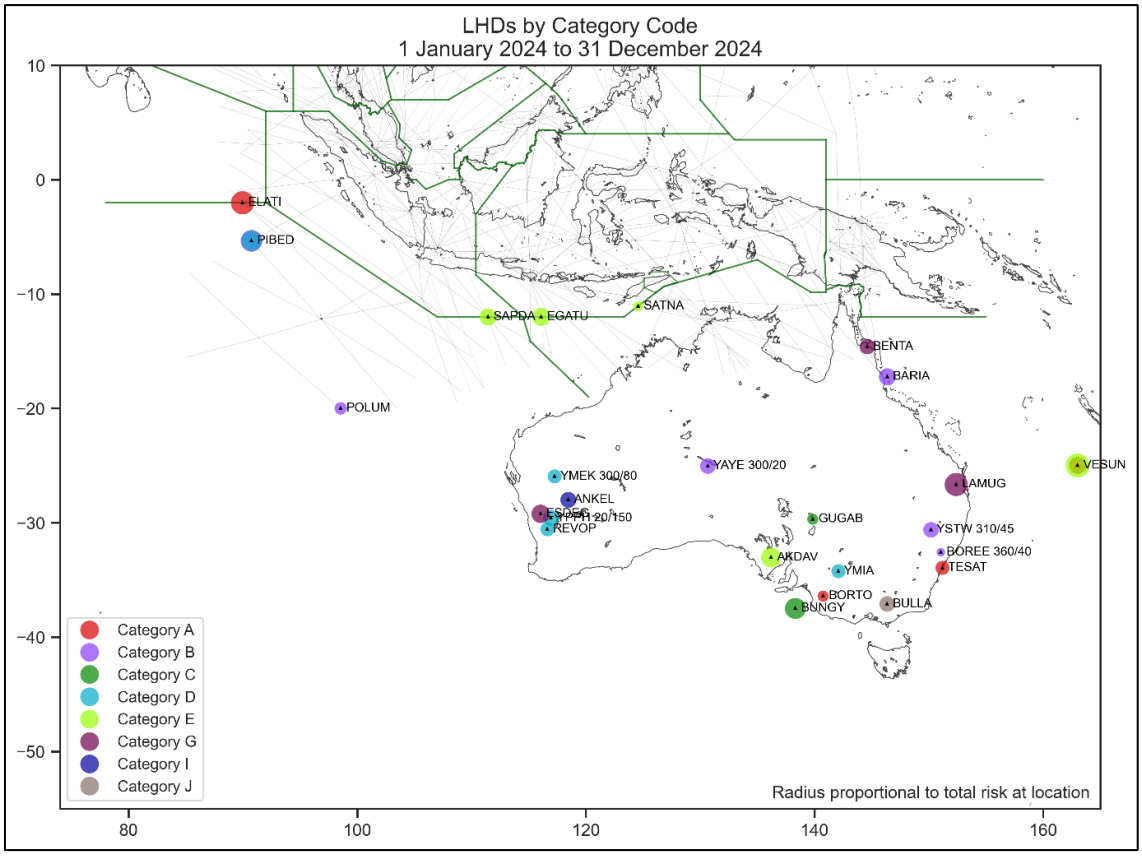


Figure 2: Geolocation of LHDs for Brisbane, Honiara, Melbourne, Nauru, and Port Moresby FIRs for the period 1 January 2024 to 31 December 2024

3.6 The total risk (0.93×10^{-9}) was less than the risks reported for the last two annual reporting periods (1.51×10^{-9} reported at RASMAG/29 and 1.73×10^{-9} reported at RASMAG/28). Category E was the most common LHD category (18), although only six were assessed as risk-bearing. The others mostly involved aircraft coordinated to the relevant FIR boundary at the wrong flight level – mistakes that were queried by receiving ATC and rectified before the aircraft transited the boundary.

RVSM Risk Assessment in the Jakarta and Ujung Pandang Flight Information Region, 1 January 2024 to 31 December 2024 (WP/5)

3.7 AAMA provided an airspace safety review of RVSM airspace risk in the Indonesian FIRs for the period 1 January 2024 to 31 December 2024.

3.8 The results for the technical, operational, and total risk for the RVSM implementation in Jakarta and Ujung Pandang FIRs were detailed in **Table 6**.

Table 6: RVSM Risk Estimates for the period 1 January 2024 to 31 December 2024.

Source of risk	Risk estimate 2024	Risk estimate 2023	TLS	Comparison with TLS
Technical risk	0.13×10^{-9}	0.12×10^{-9}	2.5×10^{-9}	Below technical TLS
Operational risk	2.12×10^{-9}	5.23×10^{-9}	-	-
Total risk	2.25×10^{-9}	5.35×10^{-9}	5.0×10^{-9}	Below total TLS

3.9 The number of estimated annual flying hours was 548,638 based on the December 2024 TSD. Values for 2023 were included for reference.

3.10 The total risk in 2024 (**2.25 x 10^{-9}**) has decreased from the value reported for calendar year 2023 (then 5.35 x 10^{-9}).

3.11 Almost 83% of the operational risk was presented by 51 Category E LHDs (ATC coordination error as a result of human factor issues). Most involved aircraft flying on -way routes, and they reported an average of 0.7 flight levels crossed and 0.3 minutes in duration. **Figure 3** showed the geolocation of LHDs.

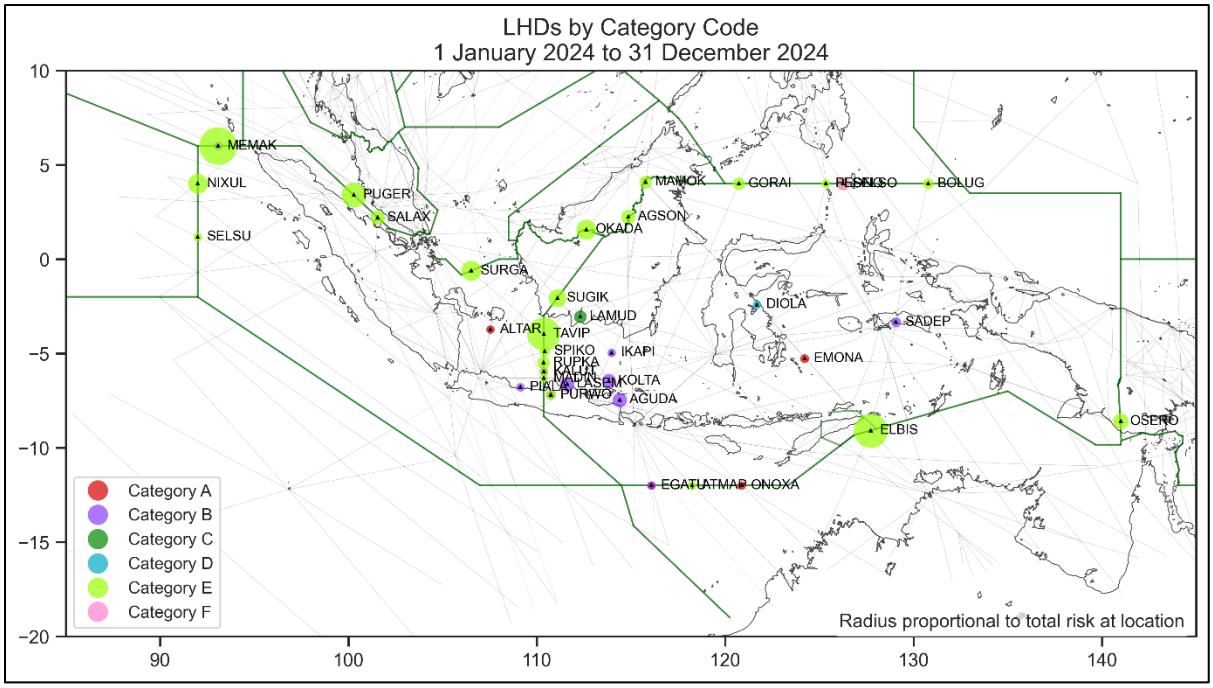


Figure 3: Geolocation of LHDs for the Indonesian FIRs for the period 1 January 2024 to 31 December 2024

Assessment of Safety Reporting Culture

3.12 An assessment of safety reporting culture for Indonesia is shown in **Table 7**.

Table 7: Safety culture metric for Indonesia by LHD attribution for the period 1 January 2024 to 31 December 2024

Attribution	Number of reports	Flight hours	Number of reports per flight hour (x 10^{-5})
Pilot/Aircrew (A, B, C)	84	548 638	15.3
ATC (D, E, F)	18	548 638	3.3
Other	0	548 638	0

3.13 Of the 81 Category E LHDs, 48 reports corresponded to errors made by neighbouring ATCs, and 33 reports correspond to errors made by Jakarta or Ujung Pandang ATCs.

3.14 In response to queries, AAMA clarified that they would submit the analysis using the revised Category E sub-categories contained in **RASMAG/30 Flimsy/2**.

2024 Analyses for the Transfer of Control Point Between Incheon FIR and Shanghai FIR, Hot Spot B1 (WP/6)

3.15 PARMO provided an update on the analysis of the Incheon FIR airspace interface with Shanghai/Fukuoka/Taibei FIRs related to Hot Spot B1 using TSD and LHD reports from for calendar years 2015 – 2024.

3.16 The RASMAG/29 meeting agreed to split Hot Spot B into smaller areas at the interface level. The Hot Spot B was divided into three smaller areas as follows and the remaining Hot Spot was Hot Spot B1.

a) B1 for Incheon (TOC point of Incheon ACC and Shanghai ACC);

b) B2 for the area with four intersection points of A593, Y590, Y711, and Y722; and

c) B3 for Fukuoka and Incheon FIR boundary.

Reported LHDs for AKARA Corridor Airspace

3.17 There were 126 LHDs reported for calendar year 2024 representing a 66% increase in the overall number of reported LHDs compared to calendar year 2023 (74 reported occurrences in 2023 vs 126 occurrences reported in 2024).

3.18 Most of the reported LHDs involved errors in ATC transitions and were attributed to LHD Category E - Coordination errors in ATC-to-ATC transfer of control responsibility due to human factors issues. All reported LHDs were identified by the receiving ATC-unit prior to the aircraft entering their airspace, as a result all reported LHD occurrences were categorized as non-risk bearing. This means that all reported LHDs had zero duration and did not affect the operational vertical collision risk estimates.

3.19 **Figure 4** provided the geographic location of LHD reports during the calendar year 2024. There were 120 reports at the SADLI location, two reports at the ONIKU and one report at the ATOTI. All reported LHDs indicated risk was mitigated by available surveillance and direct speech circuit, or other means.

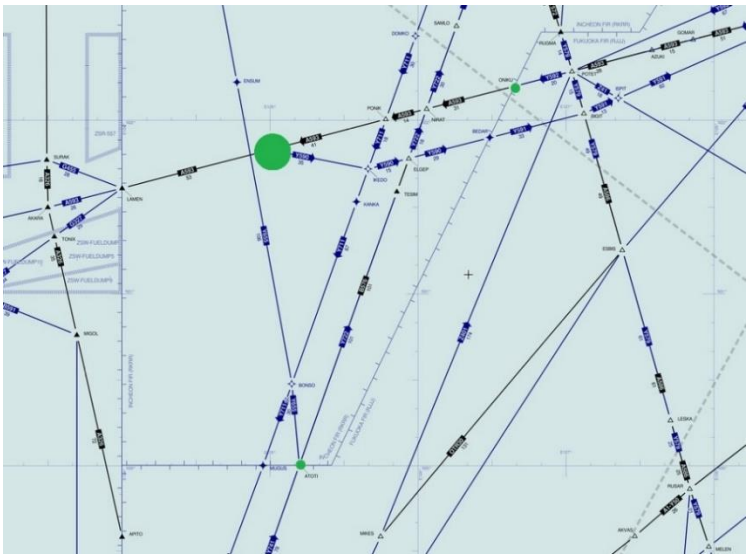


Figure 4: Geographical Locations of Category E LHDs – 2024

Vertical Risk Estimate

3.20 None of the reported LHDs in calendar year 2024 contributed towards the estimate of operational vertical risk. Therefore, the vertical operational risk estimate was zero for calendar year 2024. The vertical technical risk 0.56×10^{-9} fapfh.

3.21 **Figure 5** showed the twelve-month rolling vertical collision risk estimates for AKARA airspace for 2017 through 2024.

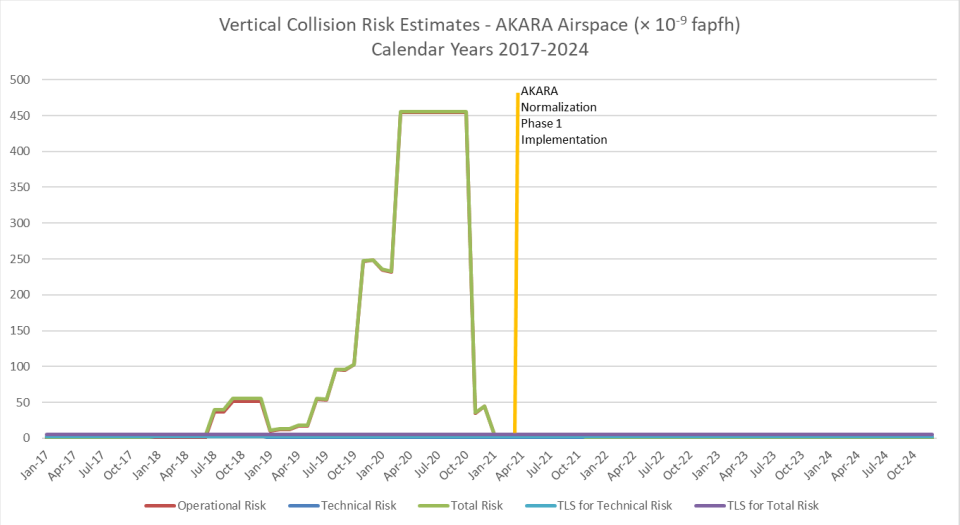


Figure 5: Vertical Collision Risk Estimates, 2017-2024

Hot Spot Identification Process

3.22 The Hot Spot Identification process was applied to Hot Spot B1. This process was developed at the Ninth Meeting of the RASMAG Monitoring Agencies Working Group (RASMAG/MAWG/9). The results from 2022 through 2024 fulfilled the hot spot criteria.

3.23 The process to provide the LHD reports to the adjacent ATC-unit had improved since RASMAG/29. The LHD data collected towards the end of calendar year 2024 represented a hybrid from the old and new processes. It was expected that the 2025 analysis would show improvement in the number of confirmed LHD reports.

3.24 The new process for sharing reported LHD information was improved compared to the previous process. From the PARMO's perspective, the newer process was more efficient and should assist in enhancing airspace safety. The previous process required LHD reports to be relayed via the designated Regional Monitoring Agencies (RMAs). Due to the delays associated with the previous process, data retention would often expire before the adjacent ATC-unit could confirm the report but more importantly, data retention expiration limited the investigation of underlying causal factors.

Summary of AKARA LHD Events and Progress on Sharing Mechanism (WP/7)

3.25 In 2024, China RMA recorded a total of 84 LHD events reported by Shanghai ACC, with 81 occurring within RVSM airspace. Additionally, 42 LHD events were reported by Incheon ACC, of which 23 were within RVSM airspace. Through collaborative verification efforts, 26 events were jointly confirmed by both Shanghai ACC and Incheon ACC. The majority of LHD reports fell under Category E events, primarily involving issues such as no transfer, late transfer, or no flight level revision. Notably, some events within Shanghai FIR were attributed to unidentified aircraft operations. Despite the occurrence of LHD events, the vertical risk in the AKARA Corridor had remained compliant with safety

standards following the implementation of Phase 1, as transfer issues were detectable via surveillance capabilities.

3.26 Building on the outcomes of the 2024 China-Republic of Korea ATM/CNS Coordination Meeting and subsequent discussions, a new LHD event sharing mechanism was established between China and the Republic of Korea. This mechanism, which commenced operation in early 2025, featured a two-week/15-day reporting interval typically.

3.27 China RMA received data from both States, forwarded the verified data to the other State's POC within two working days. PARMO was also copied throughout the process for further discussion and risk analysis purposes. This streamlined approach ensured the prompt LHD sharing and confirmation, addressing previous challenges related to data expiration and untimely reporting.

3.28 As illustrated in the data from early 2025 in **Figure 6**, the number of confirmed LHD events had shown a positive trend, reflecting the effectiveness of the new mechanism in promoting collaboration and data accuracy between China and the Republic of Korea. The improved timeliness and accuracy of data exchange had contributed to more effective identification and analysis of LHD events, thereby supporting risk mitigation efforts in this airspace.

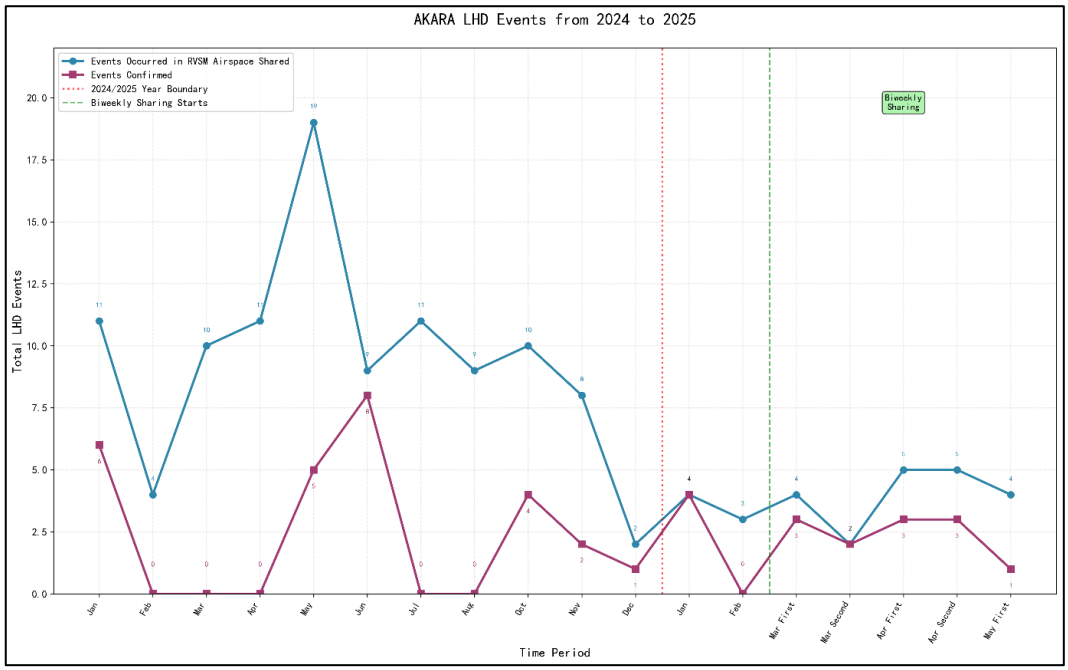


Figure 6: AKARA LHD Events from 2024 to early 2025

3.29 China RMA stated that its ongoing efforts would focus on further refining the sharing mechanism, exploring additional technical and operational improvements, and maintaining close coordination through bilateral meetings and the AKARA Corridor Technical Working Group (TWG) to continuously enhance the safety and efficiency of air traffic operations in the AKARA Corridor.

Sharing the Implementation Status of Safety Improvement Measures (WP/8)

3.30 The Republic of Korea had taken several measures to enhance safety at Hot Spot B1, following recommendations from RASMAG/29 meeting, including technical reviews, aimed at reducing human error among air traffic controllers. In September 2024, the Republic of Korea and China held the 10th ATM/CNS Coordination Meeting in Shanghai, China to discuss improvements in LHD data sharing between Incheon and Shanghai ACCs, the implementation of AIDC and structural enhancements to the air route connecting the two FIRs. As a result, both States agreed to exchange LHD

data twice a month between Republic of Korea's ATMO and China's RMA, with confirmed cases reported to PARMO. This process had been in effect since April 2025.

3.31 The Republic of Korea completed its AIDC infrastructure in June 2023 and requested testing with China, but China cited technical and regulatory challenges. Meanwhile, the Republic of Korea had advanced its use of ADS-B surveillance to allow Incheon ACC to identify aircraft from Shanghai ACC earlier, reducing risks from delayed or missing flight information. However, ADS-B data was used only as a supplementary tool due to potential GNSS interference and the lack of visibility into instructions issued by Shanghai ACC before transfer. This underscored the urgent need for full AIDC implementation, which the Republic of Korea's system was technically ready to support.

3.32 Further compounding the issue, the LAMEN–SADLI segment of ATS route A593 suffered from congestion especially for traffic bound for Shanghai, due to only one ATS route, unlike the dual-route structure on the other side. Additionally, the current 10-minute longitudinal separation between aircraft in this airspace was significantly larger than in other surveilled regions, contributing to congestion and safety concerns. The 14th Air Navigation Conference (AN-Conf/14) supported Project 30/10, which recommended reducing separation minima to 30 NM in oceanic and remote areas and 10 NM elsewhere. To address these structural and safety challenges, the Republic of Korea emphasized the need to promptly resume discussions on the second phase of A593 normalization.

3.33 After some discussion, the meeting noted the challenges and concerns on Hot Spot B1 over SADLI raised by China and the Republic of Korea, which were very complex involving more than just AIDC implementation.

3.34 China clarified that, to support RASMAG/29 requirements, China RMA achieved active coordination between Shanghai ACC, Incheon ACC, and PARMO to optimize the existing LHD event sharing mechanism, as detailed in RASMAG/30 WP/07. Besides, China stated, based on consensus from the TWG, the corridor optimization was officially referred as "The Implementation of New ATS arrangement in FUKUE-AKARA Corridor" instead of "A593 Normalization". China pointed out that AIDC was not the only measure to reduce LHD events in the corridor. Beyond AIDC, at the same time, China proposed a number of measures, including all FLs availability, climb/decent flexibility, and cancelling FLAS in the corridor between SADLI and LAMEN. According to the consensus achieved by the TWG, AIDC should be implemented together with some of the optimization measures subject to mutual agreement. China recommended that the stakeholders should respect the TWG consensus.

3.35 ICAO clarified that discussions of AIDC implementation matters could be raised at ATMAS TF or RASMAG, and ATM matters related to operations could be raised at ATM/SG. In addition, when required, ICAO Asia/Pacific Regional Office could be approached for assistance.

3.36 China and the Republic of Korea agreed to continue bilateral discussion to discuss mitigations measures including Phase 2.

3.37 ICAO further added that the ICAO Technical Working Group had not conducted any meeting since the implementation of Phase 1 and the matter was considered a regional matter between China and the Republic of Korea, and ICAO HQ would no longer be involved. It was also highlighted that AIDC implementation remained a priority in the Asia and Pacific region as provided in APANPIRG/24 conclusions and the *Asia/Pacific Seamless ANS Plan*.

China RMA Vertical Safety Report (WP/9)

3.38 The China Regional Monitoring Agency (China RMA) provided an RVSM safety report for nine Chinese FIRs and the Pyongyang FIR (Democratic People's Republic of Korea).

3.39 The 2024 RVSM risk estimates for the Chinese FIRs (**Table 8**) indicated that the TLS had

been met, at **0.52 x 10^{-9}** fapfh.

Table 8: Risk Estimates for the RVSM airspace of Chinese FIRs

The RVSM Airspace of Chinese FIRs – estimated annual flying hours = 2878308.0 hours *(note: estimated hours based on Dec 2024 traffic sample data)*			
Source of Risk	**Risk Estimation**	**TLS**	**Remarks**
RASMAG 29 Total Risk	*0.75 x 10^{-9}*	*5.0 x 10^{-9}*	*Below TLS*
Technical Risk	0.10 x 10^{-9}	2.5 x 10^{-9}	Below Technical TLS
Operational Risk	0.42 x 10^{-9}	-	-
Total Risk	**0.52 x 10^{-9}**	5.0 x 10^{-9}	**Below TLS**

3.40 According to the result of Hot spot identification, there was no Hot Spot in the Chinese FIRs.

3.41 **Figure 7** provided the geographic location of risk bearing LHD reports within airspace of Chinese FIRs during the assessment period.

Figure 7: Airspace of Chinese FIRs – Risk Bearing LHD

3.42 **Table 9** provided the Pyongyang FIR RVSM technical, operational, and total risk estimates. According to the email response from ATMB of Democratic People's Republic of Korea, there was no LHD event (NIL report) and zero flying hours in in Pyongyang FIR in 2024, so the operational risk, the technical risk and the total risk remained 0.

3.43 In response to queries, China RMA clarified that the full list of LHD occurrences as reported including "Lost RVSM capability due to TCAS failure" events were included in the attachment to the paper. However, not all events were assessed to affect RVSM capabilities and therefore excluded from the risk analysis.

Table 9: RVSM Risk Estimates for Pyongyang FIR

The RVSM Airspace of Chinese FIRs – estimated annual flying hours = 0 hours *(note: estimated hours based on Dec 2024 traffic sample data)*			
Source of Risk	**Risk Estimation**	**TLS**	**Remarks**
RASMAG 29 Total Risk	*0*	*5.0 x 10^{-9}*	*Below TLS*

The RVSM Airspace of Chinese FIRs – estimated annual flying hours = 0 hours *(note: estimated hours based on Dec 2024 traffic sample data)*			
Source of Risk	**Risk Estimation**	**TLS**	**Remarks**
Technical Risk	0	2.5×10^{-9}	Below Technical TLS
Operational Risk	0	-	-
Total Risk	**0**	5.0×10^{-9}	**Below TLS**

Classification of Four Events in Nanning Airspace as M-class LHD Incidents (WP/10)

3.44 China RMA presented the risk analysis of four deviation events in Nanning airspace between April and June 2024. These events involved aircraft entering the R343 route instead of continuing R474. As a follow-up to ATM/SG/12 report and action item, further analysis was presented for RASMAG/30 attention.

3.45 The four events should be classified as LHD incidents because they involved aircraft deviated from their planned routes and unexpectedly entering the R343 route at various flight levels within RVSM airspace. Such deviations introduce unanticipated aircraft into a controller's scenario, potentially creating vertical overlap risks with other aircraft operating in or near the R343 route. However, the duration of these deviations should not be counted, as the aircraft were under continuous and specific surveillance by controllers, meaning the situations were controlled and did not persist in an uncontrolled state. This interpretation aligned with the LHD definition and was recognized at the RMACG/20 meeting.

3.46 Following a detailed risk analysis, the China RMA concluded that these events should indeed be classified as LHD incidents, though without any duration time. This classification reflected the safety risks posed by the aircraft's unexpected presence in RVSM airspace while acknowledging that the deviations were managed under active surveillance. Furthermore, the details of the operational challenges and the slew of risk control measures were listed in the **RASMAG/30 WP/10 Attachment A**.

JASMA Vertical Safety Report (WP/11)

3.47 JASMA provided an executive summary of the airspace safety oversight assessment of the RVSM implementation in the Fukuoka FIR. A detailed report was also provided in **RASMAG/30 WP/11** attachment.

3.48 The total risk for the reporting period from 1 January to 31 December 2024 was 4.91×10^{-9} fapfh, which met the TLS, in

3.49

3.50 **Table** 10 and **Figure 8** presented the collision risk estimate trends for the period.

Table 10: Fukuoka FIR RVSM Risk Estimates

Fukuoka FIR – estimated annual flying hours = 1,794,073 hours *(note: estimated hours based on Dec 2024 traffic sample data)*			
Source of Risk	**Risk Estimation**	**TLS**	**Remarks**
RASMAG 29 Total Risk	*2.36×10^{-9}*	*5.0×10^{-9}*	*Below TLS*
Technical Risk	0.32×10^{-9}	2.5×10^{-9}	Below Technical TLS
Operational Risk	4.58×10^{-9}	-	-
Total Risk	**4.91×10^{-9}**	5.0×10^{-9}	**Below TLS**

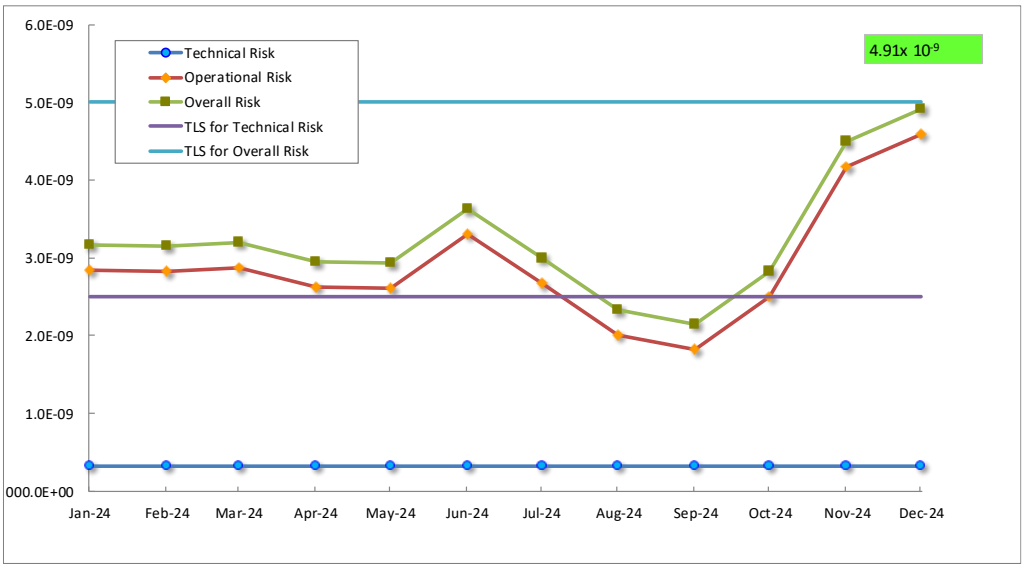


Figure 8: Fukuoka FIR RVSM Risk Estimate Trends

3.51 **Figure 9** provided the geographic location of LHD reports occurred within Fukuoka FIR during the assessment period. The filled blue square symbols represent LHD location in the RVSM stratum of Fukuoka FIR. The circles represented LHD duration of 50 seconds or more.

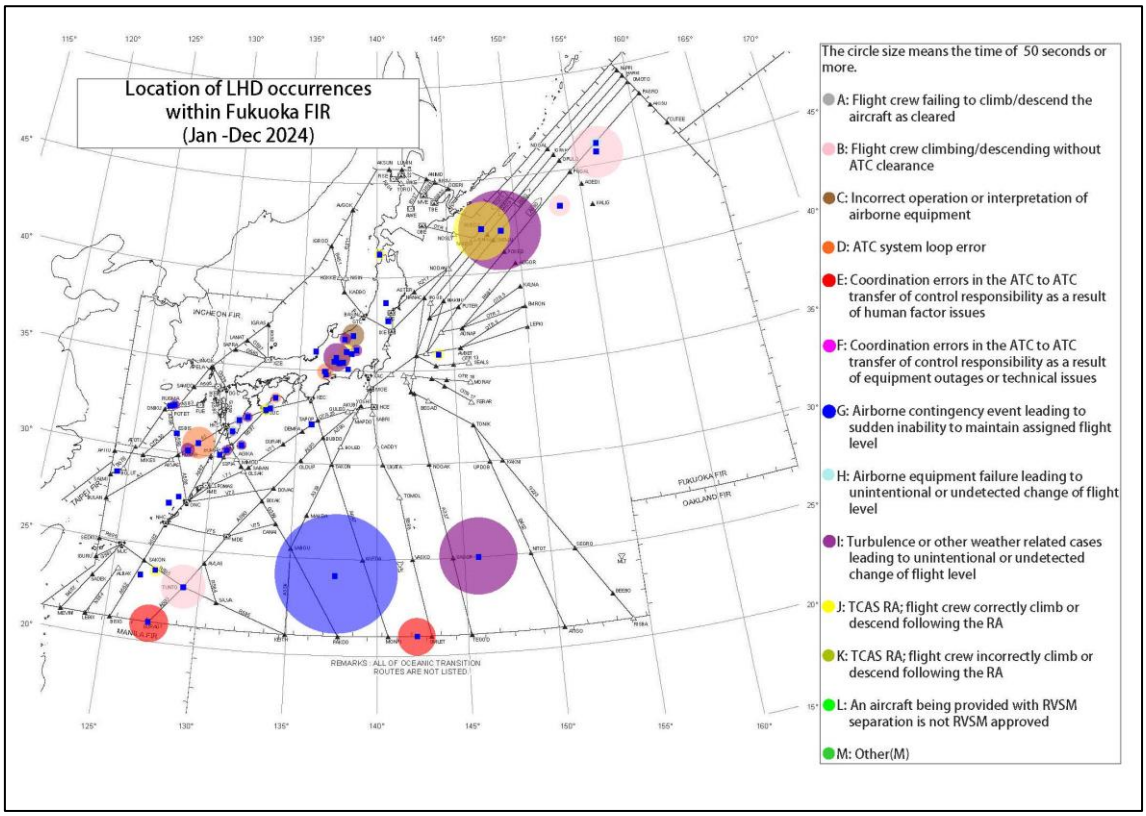


Figure 9: Geographical Location of LHDs within Fukuoka FIR

3.52 The total traffic volume of Fukuoka FIR showed a solid recovery from 2021, in 2024 it was approximately 93% of it in 2019, which was a peak traffic volume before the COVID-19 pandemic. On the other hand, the traffic volumes of the RVSM altitude stratum in 2025 will be expected to exceed the volume in 2019.

Hot Spot D1 (FIR Boundary between Fukuoka and Manila FIRs)

3.53 **Figure 10** presented the number of LHD occurrences at the FIR boundary between Fukuoka FIR and Manila FIR, where designated as Hot Spot D1. One LHD of Category E occurred while transferring from Manila ACC to Fukuoka ACC in 2024.

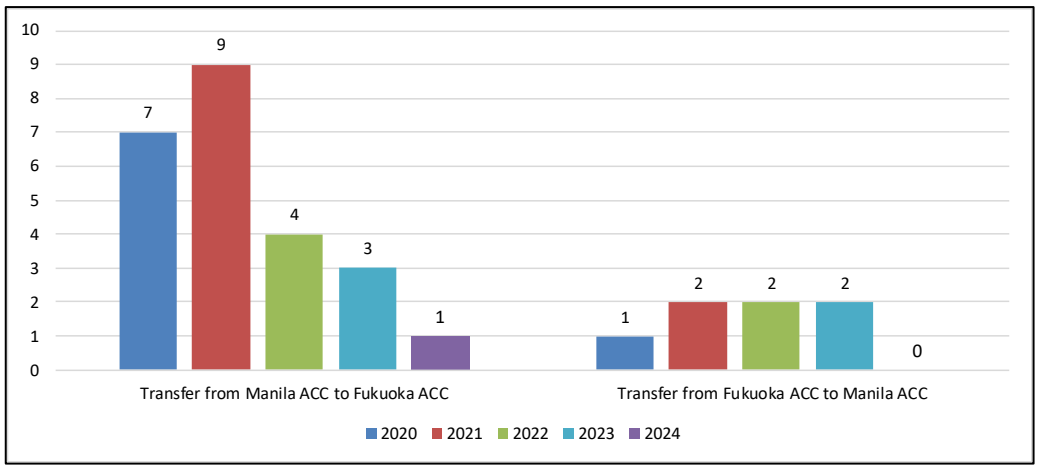


Figure 10: Number of LHDs at Hot spot D between Fukuoka and Manila FIR

3.54 In order to mitigate transfer error caused by human factors at Hot Spot D1, regular bilateral meetings between Fukuoka and Manila ACCs had been held (i.e. four times since December 2022), encouraging mutual understanding of both ACCs and the next meeting would be held in the fall of 2025.

PARMO Vertical Safety Monitoring Report (WP/12)

3.55 PARMO provided a vertical safety assessment for 2024 for the Pacific RVSM airspace and a portion of Northeast Asia RVSM airspace.

Pacific Airspace

3.56 There was a total of 90 reported LHDs accounting for 880.5 minutes of operation at incorrect flight level in Pacific airspace. The 2024 RVSM risk estimate for Pacific airspace indicated that the TLS had not been met at **25.4×10^{-9}** (**Table 11** and **Figure 11**).

Table 11: Pacific Airspace RVSM Risk Estimates

Pacific Airspace – estimated annual flying hours = 1,933,809 hours *(note: estimated hours based on Dec 2024 traffic sample data)*			
Source of Risk	**Risk Estimation**	**TLS**	**Remarks**
RASMAG 29 Total Risk	*18.6×10^{-9}*	*5.0×10^{-9}*	*Above TLS*
Technical Risk	0.08×10^{-9}	2.5×10^{-9}	Below Technical TLS
Operational Risk	25.3×10^{-9}	-	-
Total Risk	**25.4×10^{-9}**	5.0×10^{-9}	**Above TLS**

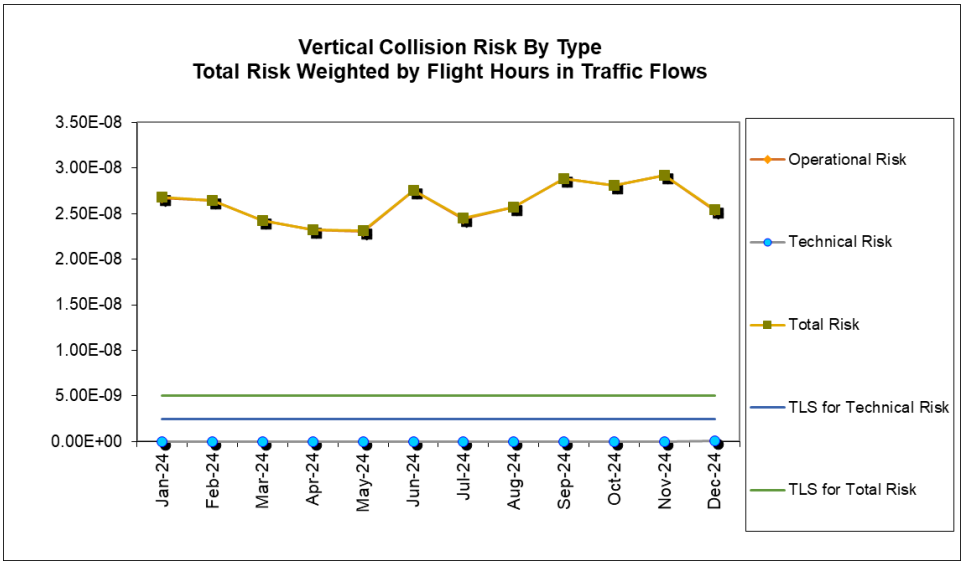


Figure 11: Pacific Airspace RVSM Risk Estimate Trends

3.57 The highest contributor towards the vertical risk estimate was one long duration occurrence within the CENPAC traffic flow and the errors in ATC coordination between Oakland Center and Honolulu Control Facility. The reported ATC coordination occurrences between Oakland Center and Honolulu Control Facility were part of the Hot Spot N area and were covered in RASMAG/30 WP/13.

Northeast Asia Airspace

3.58 There was a total of 126 reported occurrences for North East Asia RVSM airspace. **Table 12** summarized North East Asia airspace RVSM technical, operational, and total risks.

Table 12: North East Asia Airspace RVSM Risk Estimates

North East Asia Airspace – estimated annual flying hours = 197,565.8 hours *(note: estimated hours based on Dec 2024 traffic sample data)*			
Source of Risk	**Risk Estimation**	**TLS**	**Remarks**
RASMAG 29 Total Risk	*0.17×10^{-9}*	*5.0×10^{-9}*	*Below TLS*
Technical Risk	0.56×10^{-9}	2.5×10^{-9}	Below Technical TLS
Operational Risk	0.00×10^{-9}	-	-
Total Risk	**0.56×10^{-9}**	5.0×10^{-9}	**Below TLS**

3.59 There were 126 reported LHDs affecting the Incheon FIR, all reported occurrences had zero duration, and zero flight levels crossed without ATC clearance. These reported occurrences were within the AKARA corridor airspace and were also reported in **RASMAG/30 WP/06**.

2024 Central East Pacific Traffic Flow Assessment (WP/13)

3.60 PARMO presented the 2024 vertical risk assessment for the Central East Pacific (CEP) traffic flow in Pacific airspace. This area was designated as Hot Spot N at RASMAG/24. The CEP traffic flow contained air traffic between mainland North America and Hawaii.

3.61 In calendar year 2024, there were 40 reported LHDs that occurred within the CEP traffic flow. This was a slight increase over the 37 reported LHDs in calendar year 2023. There were eight Category B, 31 Category E, and one Category M reported LHDs. **Figure 12** provided the reported LHD by cause code from 2018 – 2024 and **Figure 13** showed the locations of the reported LHDs within the CEP in 2024.

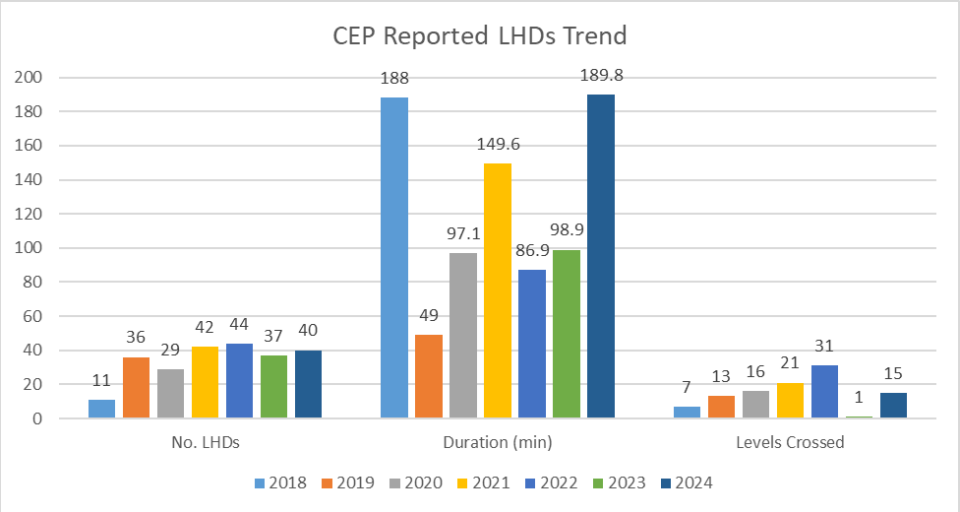


Figure 12: Reported LHDs Comparison Summary

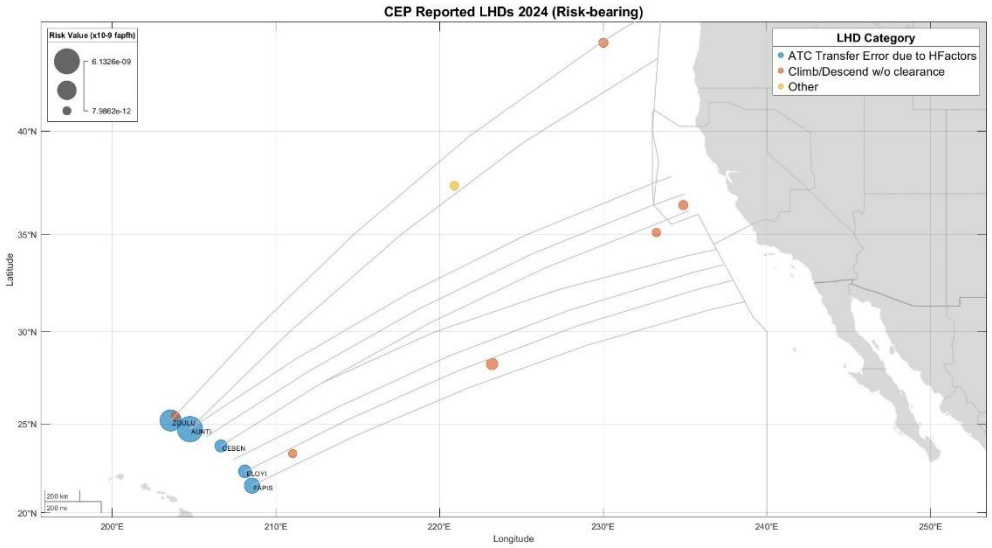


Figure 13: Reported LHDs within the CEP Traffic Flow – 2024

3.62 Various mitigations strategies had been implemented prior to the EnRoute Automation Modernization (ERAM) system implementation at the Honolulu Control Facility (HCF), expected by the end of 2025. Furthermore, the FAA's Air Traffic Safety Oversight Service was providing oversight of the development and implementation of additional mitigations aimed at reducing the vertical risk estimate in the CEP prior to ERAM implementation.

3.63 The overall vertical risk for the CEP in 2024 was 15.1×10^{-9} fapfh, a value that exceeded the TLS. This value represented a slight increase from that reported in 2023. **Figure 14** shows the five-year (rolling 12-month) trend for the CEP vertical collision risk estimates.

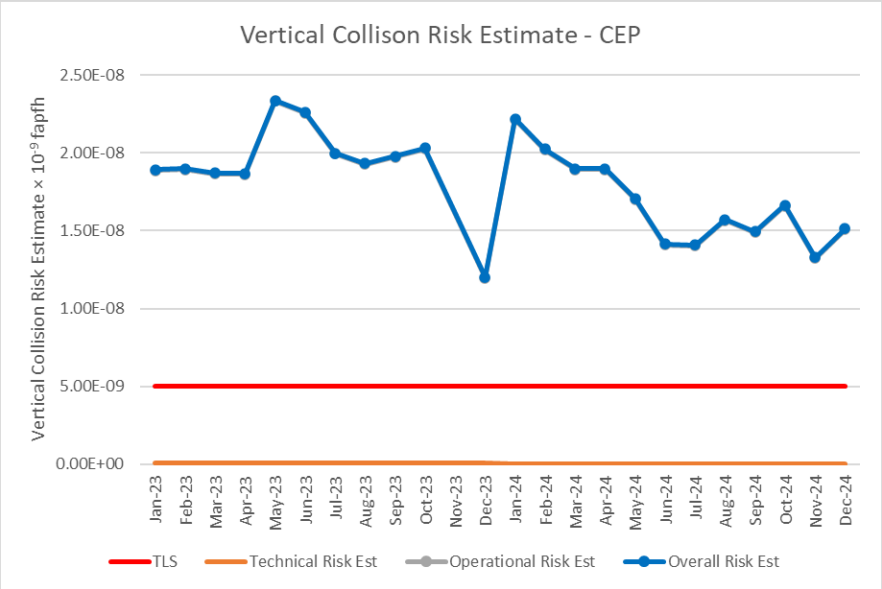


Figure 14: CEP vertical collision risk estimates by calendar year (rolling 12-month)

MAAR Safety Report (WP/14)

3.64 MAAR presented the results of 2024 airspace safety oversight for RVSM operations in South Asia/Indian Ocean (SA/IO) airspace, Southeast Asia (SEA) airspace, and Mongolian airspace.

South Asia Indian Ocean Airspace

3.65 The 2024 RVSM risk estimate for SA/IO airspace indicated that the TLS had met at **2.21 x 10^{-9}** fapfh (**Table 13**).

Table 13: Trends of Risk Estimates for SA/IO RVSM Airspace

SA/IO Airspace – estimated annual flying hours = 3,386,302 hours *(note: estimated hours based on Dec 2024 traffic sample data)*			
Source of Risk	**Risk Estimation**	**TLS**	**Remarks**
RASMAG 29 Total Risk	*4.05 x 10^{-9}*	*5.0 x 10^{-9}*	*Below TLS*
Technical Risk	0.89 x 10^{-9}	2.5 x 10^{-9}	Below Technical TLS
Operational Risk	1.32 x 10^{-9}	-	-
Total Risk	**2.21 x 10^{-9}**	5.0 x 10^{-9}	**Below TLS**

3.66 **Table 14** showed the number of LHD and operational risk of each cluster as well as the results of checking against the criteria in SA/IO airspace.

Table 14: Results of identifying hot spots in SA/IO Airspace

2024 Clusters (SA/IO)	**Mumbai/Muscat (Hot Spot G)**	**Mogadishu/Mumbai (Hot Spot F)**	**Chennai/Dhaka/ Kolkata/Yangon (Hot Spot A1)**	**Karachi/Muscat**
Number of LHDs	132	6	12	15

2024 Clusters (SA/IO)	Mumbai/Muscat (Hot Spot G)	Mogadishu/Mumbai (Hot Spot F)	Chennai/Dhaka/Kolkata/Yangon (Hot Spot A1)	Karachi/Muscat
Check Criteria: Number >= 40.8	Positive	Negative	Negative	Negative
Operational Risk (x 10^{-9} FAPFH)	1.09	0.05	0.00	0.00
Check Criteria: Risk >= 0.26 x 10^{-9} FAPFH	Positive	Negative	Negative	Negative
Check Criteria: Operation Risk >= 5.00 x 10^{-9} FAPFH	Negative	Negative	Negative	Negative

3.67 In the analysis of hot spots, the following were proposed:

a) at the Mumbai/Sanaa and Mogadishu/Mumbai FIR boundaries, the number of LHDs, the number of non-zero-duration LHDs and the operational risk were significantly lower compared to the values at Mumbai/Muscat FIR boundary;

b) with the differences in the working environment and risk profile at Hot Spot G which covers both the Mumbai/Muscat and Mumbai/Sanaa FIR boundaries, MAAR proposed splitting Hot Spot G into Hot Spot G1 (Mumbai/Muscat) and Hot Spot G2 (Mumbai/Sanaa). This subdivision enabled more efficient monitoring and reporting;

c) in the process of identifying hot spot, the Mumbai/Muscat FIR boundary (Hot Spot G1) continued to satisfy the hot spot criteria in terms of the number of LHDs and the operational risk. In contrast, the Mumbai/Sanaa FIR boundary (Hot Spot G2) and Mogadishu/Mumbai FIR boundary (Hot Spot F) had not satisfied any criteria since 2021. However, the AIDC implementation or other mitigation measures had not been completed yet;

d) Hot Spots G1, G2 and F should remain in the list of hot spots and continue to be monitored until further safety improvement initiatives or prevention measures, such as AIDC, were completed and demonstrated their effectiveness;

e) Hot Spot A1 did not satisfy any hot spot identification criteria in 2024. However, the AIDC implementation between Kolkata ACC and Yangon ACC, as well as between Chennai ACC and Yangon ACC, was initiated but remained in the testing phase and had not yet been operated; and

f) Hot Spot A1 should remain on the list of hot spots and continue to be monitored until further safety improvement initiatives (specifically AIDC) were implemented and successfully reduce the number of LHDs.

Southeast Asia Airspace

3.68 The 2024 RVSM risk estimate for SEA airspace indicated that the TLS for total risk had been met at **2.54x 10^{-9}** fapfh, as shown in **Table 15.**

Table 15: SEA Airspace RVSM Risk Estimates

SEA Airspace – estimated annual flying hours = 3,054,228 hours *(note: estimated hours based on Dec 2024 traffic sample data)*			
Source of Risk	**Risk Estimation**	**TLS**	**Remarks**
RASMAG 29 Total Risk	*2.91 x 10^{-9}*	*5.0 x 10^{-9}*	*Below TLS*
Technical Risk	1.34 x 10^{-9}	2.5 x 10^{-9}	Below Technical TLS
Operational Risk	1.20 x 10^{-9}	-	-
Total Risk	**2.54 x 10^{-9}**	5.0 x 10^{-9}	Below TLS

3.69 68 of the 89 reported LHDs in SEA airspace were classified as Category E. To further analyze Category E LHDs, they were broken down into sub-categories, as shown in **Figure 15**. the largest portion, E-RI: No or Late Revision of Transfer Information, accounts for 65% of Category E LHDs. This was followed by E-NT: No Transfer or Negative Transfer, which accounts for 34%.

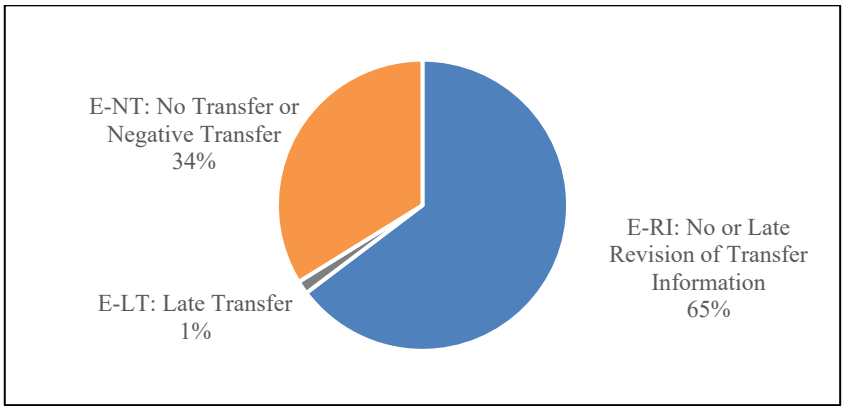


Figure 15: **Sub-Categories of Category-E LHDs in SEA Airspace**

3.70 **Table 16** shows the number of LHDs and operational risk of each cluster as well as the results of checking against the criteria in SEA airspace.

Table 16: The Results of Identifying Hot Spots in SEA Airspace

2024 Clusters (SEA)	**Bangkok/Ho Chi Minh/Kuala Lumpur/Singapore (Hot Spot O)**	**Hong Kong/Manila**	**Ho Chi Minh/Manila (Hot Spot D5)**	**Jakarta/Singapore (Hot Spot J)**	**Kota Kinabalu/Manila (Hot Spot D7)**	**Manila/Taibei**	**Manila/Ujung Pandang (Hot Spot D8)**
Number of LHDs	3	5	6	11	6	6	8
Check Criteria: Number >= 11.13	Negative	Negative	Negative	Negative	Negative	Negative	Negative
Operational Risk (x 10^{-9} FAPFH)	0.15	0.04	0.14	0.12	0.12	0.02	0.06
Check Criteria: Operational Risk >= 0.15 x 10^{-9} FAPFH	Positive	Negative	Negative	Negative	Negative	Negative	Negative

2024 Clusters (SEA)	Bangkok/Ho Chi Minh/Kuala Lumpur/Singapore (Hot Spot O)	Hong Kong/Manila	Ho Chi Minh/Manila (Hot Spot D5)	Jakarta/Singapore (Hot Spot J)	Kota Kinabalu/Manila (Hot Spot D7)	Manila/Taibei	Manila/Ujung Pandang (Hot Spot D8)
Check Criteria: Operational Risk >= 5.00 x 10^{-9} FAPFH	Negative	Negative	Negative	Negative	Negative	Negative	Negative

3.71 According to the results in **Table 16**, the Bangkok/Ho Chi Minh/Kuala Lumpur/Singapore FIR boundaries (Hot Spot O) satisfied the hot spot criteria in terms of the operational risk. On the other hand, other clusters and previously listed hot spots, including Hot Spots D1, D5, D7, D8 and J, did not satisfy any hot spot criteria in 2024.

3.72 Based on the hot spot identification process, analysed statistics, and existing mitigation measures, the following was discussed and agreed:

a) LHD Hot Spot D1 (Fukuoka and Manila FIR boundary) **proposed as a potential non-hot spot**. This area had not satisfied the hot spot criteria since 2023. Fukuoka and Manila ACCs had actively collaborated to investigate the causes and implement mitigations such as adjustment of the timing for sending transfer information from Manila ACC to Fukuoka ACC. Consequently, the coordination meetings were held to identify the root causes of transfer errors. Additionally, the two ACCs would continue with coordination meetings to further enhance airspace safety, prevent transfer errors, and improve operational procedures;

b) LHD Hot Spot D5 (Ho Chi Minh and Manila FIR boundary) should remain on the Hot Spot list even though Hot Spot D5 had not satisfied the hot spot criteria since 2022. This was due to the mitigation measures, such as the implementation of AIDC, had not been initiated;

c) LHD Hot Spot D7 (Kota Kinabalu and Manila FIR boundary) should remain on the Hot Spot list even though it had not met the hot spot criteria since 2021. This was due to the mitigation measure implementation of AIDC was currently in the operational trial phase, which was expected to complete in Q4 2025;

d) LHD Hot Spot D8 (Manila and Ujung Pandang FIR boundary) **proposed as a potential non-hotspot**. Hot Spot D8 had not satisfied the hot spot criteria in 2024 and AIDC had been successfully operated since 2020 as a mitigation measure;

e) LHD Hot Spot J (Jakarta and Singapore FIR boundary) **proposed as a potential non-hot spot** because the efforts of FIR realignment, ongoing coordination, and increased operational awareness had contributed to the significant reduction in both the number of LHDs and the level of operational risk in 2024; and

f) Hot Spot O (Bangkok/Ho Chi Minh/Kuala Lumpur-Singapore FIR boundary) should remain in the Hot Spot list. The LHD cluster of Hot Spot O continued to satisfy the hot spot criteria in terms of the operational risk.

3.73 India provided an update of their mitigation measures such as AIDC implementation and enhancement of surveillance capability, but automation compatibility and/or availability issues remained with neighbouring States.

Mongolian Airspace

3.74 In 2024, the total risk was estimated as 0.72 x 10^{-9} fapfh. No LHD was reported within or at the boundary of the Mongolian airspace. Hence, the analysis of operational errors could not be conducted.

APANPIRG Deficiencies

3.75 To facilitate the process of RVSM safety oversight, States were required to annually submit a December TSD (APANPIRG Conclusion 16/4) and ANSPs were responsible for submitting LHD data to their RMAs on a monthly basis.

3.76 MAAR had not received any data from Afghanistan since the political issue in August 2021. Additionally, MAAR had not received the TSD for 2024 from Nepal within the designated timeframe and in the correct format. The Meeting noted that MAAR had taken much effort to accommodate the incorrect formatting of data submitted from States and the submission of data should be conducted consistently without additional reminders each year. Therefore, MAAR proposed to maintain Afghanistan and include Nepal on the APANPIRG List of Deficiencies in the ATM and Airspace Safety, under "Non-Provision of Safety-related Data".

Reporting Culture

3.77 Over the past several years, MAAR had observed continuous improvement among the States and ANSPs under its jurisdiction. Almost all States now regularly submit their LHD reports to MAAR through the Online LHD Submission System and cooperate in addressing LHD-related matters. Only Nepal and Myanmar continued to use the LHD reporting template and submit their reports via email.

3.78 Furthermore, most reported LHDs in MAAR's area of responsibility were located at the boundary of FIRs and classified as Category E LHD, which refers to coordination errors in the ATC-to-ATC transfer of control responsibility. There were a small number of other LHD categories observed. Additionally, MAAR had received a number of NIL reports, indicating that no LHDs occurred on that particular month, from Delhi, Dhaka, Vientiane and Ulaanbaatar FIRs for the past three years. On the other hand, the number of NIL reports raised concerns whether all LHDs were being captured and reported, indicating the possibility of under-reporting.

3.79 Thus, MAAR encouraged the LHD POCs of the States to expand their focus on other LHD occurrences in addition to Category E, while promoting a positive safety reporting culture within their States/organizations.

JASMA Horizontal Safety Report (WP/15)

3.80 JASMA provided the horizontal risk assessment results of the Fukuoka FIR conducted by the Japan Airspace Safety Monitoring Agency (JASMA). A detailed report was also provided in RASMAG/30 WP/15. In this paper, the risk estimation results of the following four horizontal separation standards were reported:

a) 50 NM lateral separation;

b) 25 NM lateral separation;

c) 10 minutes time-based longitudinal separation (without Mach number technique); and

d) 30 NM distance-based longitudinal separation (PBCS and RNP4).

3.81 **Table 17** provided the North Pacific Ocean airspace horizontal risk estimates during the period January 2024 to December 2024.

Table 17: North Pacific Ocean Airspace Horizontal Risk Estimates

North Pacific Ocean Airspace – estimated annual flying hours = 135,324 hours (note: estimated hours based on Dec 2024 traffic sample data)			
Risk	**Risk Estimation**	**TLS**	**Remarks**
RASMAG 29 50 NM Lateral Risk	*1.16×10^{-9}*	*5.0×10^{-9}*	*Below TLS*
RASMAG 29 10 MIN Time-Based Longitudinal Risk	*10.01×10^{-9}*	*5.0×10^{-9}*	*Above TLS*
RASMAG 29 30 NM Distance-based Longitudinal Risk	*0.003×10^{-9}*	*5.0×10^{-9}*	*Below TLS*
50 NM lateral Risk	**2.25×10^{-9}**	5.0×10^{-9}	**Below TLS**
25 NM lateral Risk	**0.78×10^{-9}**	5.0×10^{-9}	**Below TLS**
10 MIN Time-based Longitudinal Risk	**0.22×10^{-9}**	5.0×10^{-9}	**Below TLS**
30 NM Distance-based Longitudinal Risk	**0.016×10^{-9}**	5.0×10^{-9}	**Below TLS**

3.82 There was a total of 27 Large Lateral Deviations (LLDs) and Large Longitudinal Errors (LLEs) reported to JASMA in 2024. Category B, "Flight crew incorrect operation or interpretation of airborne equipment" was the top contributor during the calendar year 2024.

3.83 Currently in the Pacific Ocean airspace within Fukuoka FIR, 23 NM lateral separation minima based on PBCS and RNP4 has already been implemented entirely. In addition, RNAV10 (RNP10) routes and the Pacific Organized Track System (PACOTS) in the airspace were established by using 50 NM lateral separation. A new RNP4 route (i.e. M523) of NOPAC had started operation on 25 January 2024. Aircraft operating on ATS route M523 shall be equipped with PBCS and RNP4 capabilities. The new route was established with at least 23 NM separation from other neighbouring ATS routes.

3.84 The Meeting discussed the inclusion of additional description of LHD occurrences involving flight crew so that international organizations representing airspace users might propose different mitigation measures.

BOBASMA Horizontal Safety Monitoring Report (WP/16)

3.85 The Bay of Bengal Airspace Safety Monitoring Agency (BOBASMA) presented the horizontal safety assessment for the Bay of Bengal/Arabian Sea Indian Ocean airspace during the period January to December 2024. The 50 NM lateral and longitudinal risks remained below the TLS shown in **Table 18**.

Table 18: Bay of Bengal Arabian Sea Indian Ocean Airspace Horizontal Risk Estimates

Bay of Bengal Arabian Sea Indian Ocean Airspace Estimated annual flying hours = 756821Hours *(Note: Estimated Hours based on Dec 2024 Traffic Sample Data)*			
Source of Risk	**Risk Estimation**	**TLS**	**Remarks**
RASMAG 29 Lateral Risk	*1.57342×10^{-9}*	*5.0×10^{-9}*	*Below TLS*
RASMAG29 50NM Longitudinal Risk	*4.58856×10^{-9}*	*5.0×10^{-9}*	*Below TLS*
Lateral Risk	**1.59777×10^{-9}**	**5.0×10^{-9}**	**Below TLS**
50NM Longitudinal Risk	**1.65722×10^{-9}**	**5.0×10^{-9}**	**Below TLS**

3.86 There were nil LLD nor LLE reported in 2024.

SEASMA Horizontal Safety Report (WP/17)

3.87 The South East Asia Safety Monitoring Agency (SEASMA) provided a horizontal safety assessment report for operations on ATS routes N892, L625, N884 and M767 over the South China Sea. The assessment met the TLS values for lateral and longitudinal separation standards applicable for RNP 10 and RNP 4 operations. The assessment period covered was from 1 January to 31 December 2024.

3.88 ATS routes M767 and N884 support a hybrid mode of RNP 4 and RNP 10 operations. The lateral and longitudinal collision risk estimate trends for RNP 4 operation presented in this paper was the risk assessment of these two ATS routes.

3.89 **Table 19** provides the horizontal risk estimates for the airspace over the South China Sea.

Table 19: Horizontal Risk Estimates

Airspace over the South China Sea – estimated annual flying hours = 53,828 hours (note: estimated hours based on December 2024 traffic sample data)			
Risk	**Risk Estimation**	**TLS**	**Remarks**
RASMAG 29 Lateral Risk (RNP 10)	*0.569×10^{-9}*	*5.0×10^{-9}*	*Meets TLS*
RASMAG 29 Longitudinal Risk (RNP 10)	*0.384×10^{-9}*	*5.0×10^{-9}*	*Meets TLS*
RASMAG 29 Lateral Risk (RNP 4)	*0.123×10^{-9}*	*5.0×10^{-9}*	*Meets TLS*
RASMAG 29 Longitudinal Risk (RNP 4)	*0.786×10^{-9}*	*5.0×10^{-9}*	*Meets TLS*
Lateral Risk (RNP 10)	**0.194×10^{-9}**	5.0×10^{-9}	**Meets TLS**
Longitudinal Risk (RNP 10)	**0.375×10^{-9}**	5.0×10^{-9}	**Meets TLS**
Lateral Risk (RNP 4)	**0.094×10^{-9}**	5.0×10^{-9}	**Meets TLS**
Longitudinal Risk (RNP 4)	**0.786×10^{-9}**	5.0×10^{-9}	**Meets TLS**

3.90 The number of LLDs decreased from five in calendar year 2023 to two in calendar year 2024, while the number of LLE remained at one. All occurrences reported in calendar year 2024 were categorized as Category E, involving coordination errors in the ATC-to-ATC transfer of control responsibility as a result of human factors issues.

PARMO Horizontal Safety Monitoring Report (WP/18)

3.91 PARMO submitted its 2024 horizontal safety monitoring report for the Anchorage, Auckland, Nadi, Oakland, and Tahiti FIRs. The lateral, longitudinal risks were all estimated to meet the TLS (**Table 20)**. Of the 144 reported LLDs and LLEs, 105 (73%) were Category E.

Table 20: Pacific Airspace Horizontal Risk Estimates

Pacific Airspace – estimated annual flying hours = 1,933,809.4 hours ***(note: estimated hours based on Dec 2024 traffic sample data)***			
Risk	**Risk Estimation**	**TLS**	**Remarks**
RASMAG 29 Lateral Risk	*0.173×10^{-9}*	*5.0×10^{-9}*	*Below TLS*
RASMAG 29 Longitudinal Risk	*0.040×10^{-9}*	*5.0×10^{-9}*	*Below TLS*
Lateral Risk	**1.15×10^{-9}**	5.0×10^{-9}	**Below TLS**
Longitudinal Risk	**0.014×10^{-9}**	5.0×10^{-9}	**Below TLS**

3.92 In calendar year 2024, the data showed a trend in Category A LLDs for aircrews deviating in the horizontal dimension without ATC clearance. 19 of the 24 reported Category A LLDs indicated

that weather (Category H) was a secondary causal factor. In these cases, the published procedures for weather deviations and other contingencies in oceanic controller airspace were not applied correctly.

3.93 The increasing trend of coordination occurrences between Honolulu Control Facility (HCF) and Oakland ARTCC was observed to continue in calendar year 2024. These occurrences affected multiple traffic flows within Pacific airspace due to the centric geographic location of the HCF. However, the metrics for the CEP traffic flow were the most significant due to the high traffic density. The related analysis was provided in **RASMAG/30 WP/13** as part of the Hot Spot N analysis.

Asia/Pacific Consolidated Safety Report (WP/19)

3.94 MAAR presented the Asia/Pacific Consolidated Safety Report, on behalf of the Asia/Pacific RMAs and EMAs (**Appendix C** to this report**)**.

3.95 The report was divided into the Pacific (PAC) area, and Asia area (**Figure 16**).

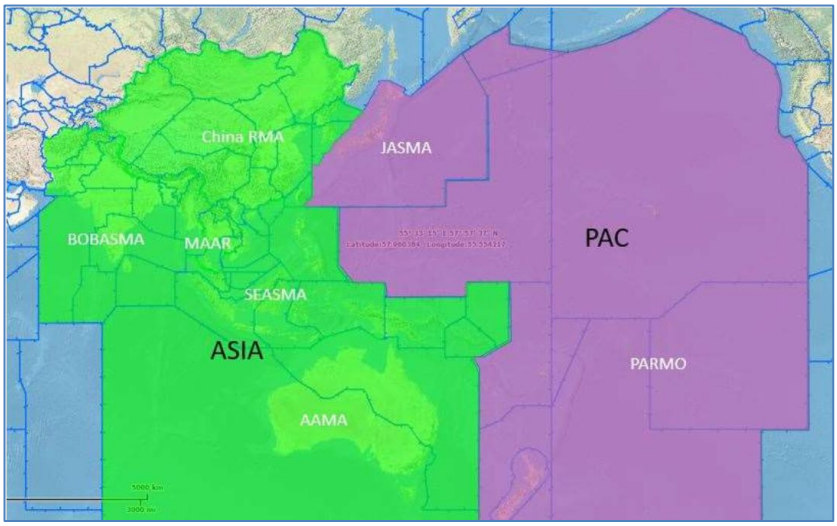


Figure 16**:** Asia and Pacific Safety Reporting Areas

Pacific Area Vertical Collision Risk

3.96 The estimated vertical collision risk for 2024 for the PAC area did not meet TLS. (**Table 21**).

Table 21: Pacific Area Vertical Collision Risk 2024

Pacific Area – annual flying hours = 3,727,882			
Source of Risk	**Risk Estimation**	**TLS**	**Remarks**
Vertical Technical Risk	0.20×10^{-9}	2.5×10^{-9}	Below Technical TLS
Vertical Operational Risk	15.33×10^{-9}	-	-
2024 Vertical Overall Risk	**15.53×10^{-9}**	5.0×10^{-9}	**Above TLS**

3.97 The PAC vertical collision risk estimates had been above TLS and trending upwards each year from 2016 to 2019. In 2024, there was an increase when compared to the previous year. **(Figure 17)**

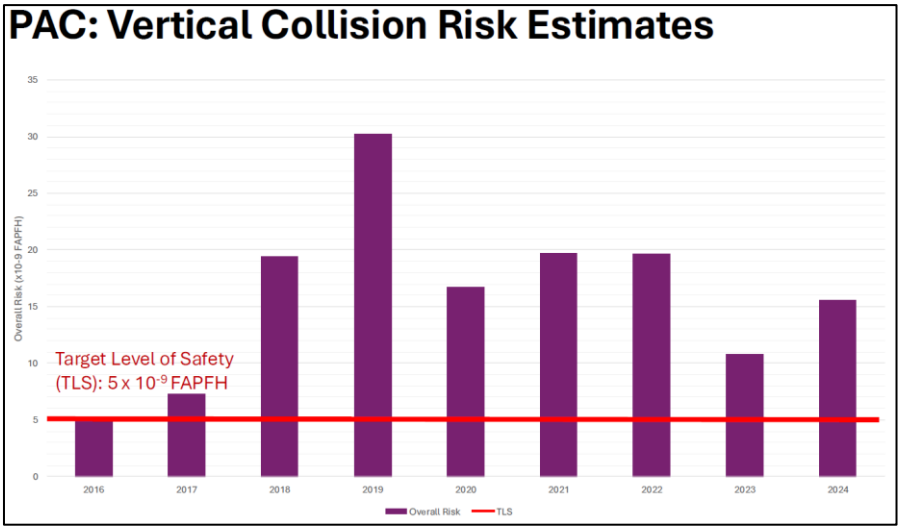


Figure 17: Pacific Area Vertical Collision Risk Estimates 2016 – 2024

3.98 There was a total of 139 LHDs in the Pacific area in 2024 (increased from 134 in 2023), with total duration 1,119 minutes and 75 levels crossed. 38 of the occurrences were Category A, B or C (27%), 65 were Category D, E or F (47%), two were Category G or H (1%), 15 in Category I (11%), 17 were Category J or K (12%), and two were Category L or M (1%).

Pacific Area Horizontal Collision Risk

3.99 The estimated horizontal collision risk for 2024 for the PAC area met TLS in all longitudinal and lateral risk categories. (**Table 22**)

Table 22: Pacific Area Horizontal Collision Risk 2024

2023 PAC Area	**Risk Estimation**	**Remarks**
Total Lateral Risk	0.24×10^{-9}	Below TLS
Total Longitudinal Risk	0.038×10^{-9}	Below TLS
2024 PAC Area	**Risk Estimation**	**Remarks**
Total Lateral Risk	1.22×10^{-9}	Below TLS
Total Longitudinal Risk	0.014×10^{-9}	Below TLS

3.100 There was a total of 171 LLDs and LLEs in the Pacific area in 2024 (increased from 141 in 2023), with a total duration of 2085 minutes and total horizontal deviation of 2015NM. 48 occurrences were Category A, B or C (28%), 114 of the occurrences were Category D, E or F (67%), zero in Category G, 8 were Category H (5%) and one in Category I or J (0.6%).

Asia Vertical Collision Risk

3.101 The estimated vertical collision risk for 2024 for the Asia area met TLS (**Table 23 and Figure 18**). The overall risk was below the TLS. There was a total of 763 LHDs reported in the Asia area in 2024 (decreased compared to 824 in 2023), with total duration 210 minutes and 225.2 levels crossed.

Table 23: Asia Area Vertical Collision Risk 2024

Asia Area – annual flying hours = 11,413,712 hours			
Source of Risk	**Risk Estimation**	**TLS**	**Remarks**
Vertical Technical Risk	0.70×10^{-9}	2.5×10^{-9}	Below Technical TLS

Vertical Operational Risk	1.29×10^{-9}	-	-
2024 Vertical Overall Risk	**1.99×10^{-9}**	5.0×10^{-9}	**Below TLS**

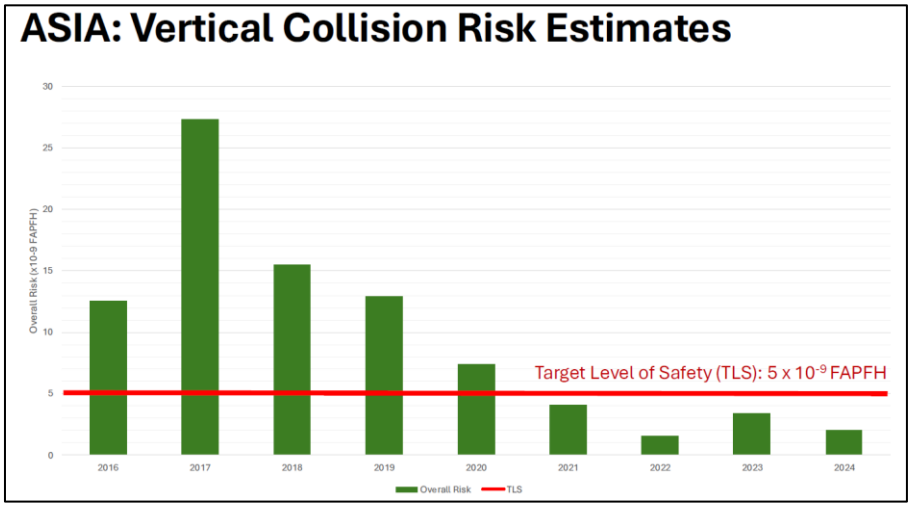


Figure 18: Asia Area Vertical Collision Risk Estimates 2016 –2024

Asia Area Horizontal Collision Risk

3.102 The estimated horizontal collision risk for 2024 for the Asia area met TLS in all longitudinal and lateral risk categories (**Table 24**). There were 3 LLDs and LLEs reported in the Asia area in 2024, with a duration of 114 minutes.

Table 24: Asia Area Horizontal Collision Risk 2024

Asia Area – annual flying hours = 789,118 hours		
2023 Asia Area	**Risk Estimation**	**Remarks**
Total Lateral Risk	1.517×10^{-9}	Below TLS
Total Longitudinal Risk	4.444×10^{-9}	Below TLS
2024 Asia Area	**Risk Estimation**	**Remarks**
Total Lateral Risk	**1.54×10^{-9}**	Below TLS
Total Longitudinal Risk	**1.62×10^{-9}**	Below TLS

Reporting Rate of LHDs, LLDs and LLEs

3.103 **Table 25** showed the number of LHD, LLD and LLE reports for 2018 to 2024, and the number of reports per flying hours. Total estimated flying hours had been increasing since 2020, at 16,087,567 in 2024, but total reports had decreased from 1,122 in 2023 to 1,077 in 2024.

3.104 The reporting rate for SEA, China and SA/IO had significantly decreased in 2024. No aircraft flying in the RVSM airspace of Democratic People's Republic of Korea in 2024. Nil reports submitted by Democratic People's Republic of Korea and Mongolia in 2024.

Table 25: Total LHD, LLD and LLE Reports, and Reports per Flying Hours, 2018 - 2024

Airspace	**# Reports**							**1 Report : Flying Hrs**						
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
DPRK	0	0	0	0	0	0	0	-	-	-	-	-	-	-

Mongolia	1	2	0	1	0	0	0	1: 158,891	1: 82,138	-	1: 121,621	-	-	-
SEA	205	152	42	70	62	95	74	1: 17,757	1: 22,275	1: 25,106	1: 15,456	1: 32,620	1:29,400	1:42,001
Japan	76	77	66	80	75	67	76	1: 20,632	1: 20,762	1: 14,737	1: 13,528	1: 18,751	1:23,452	1:25,387
SA/IO	681	439	152	135	143	254	204	1: 3,783	1: 7,955	1: 7,907	1: 11,167	1: 21,018	1:10,242	1:20,309
SW Pacific	53	101	46	47	81	65	71	1: 17,817	1: 9,335	1: 6,954	1: 11,975	1: 5,352	1:18,186	1:17,538
China	110	79	85	105	72	223	190	1: 22,229	1: 31,119	1: 26,867	1: 15,477	1: 18,003	1:10,525	1:15,149
Pacific	43	173	134	176	179	203	234	1: 45,064	1: 10,139	1: 6,404	1: 6,638	1: 8,280	1:8,736	1:8,264
Indonesia	23	37	18	41	54	125	102	1: 53,603	1: 33,321	1: 17,346	1: 7,402	1: 8,060	1:6,099	1:5,376
ROK and AKARA	12	34	5	24	108	75	126	1: 28,365	1: 18,959	1: 25,965	1: 6,285	1: 1,056	1:2,220	1:1,568
Total	**1,204**	**1,094**	**548**	**679**	**774**	**1,122**	**1,077**	**1: 12,332**	**1: 14,330**	**1: 11,712**	**1: 11,200**	**1:13,230**	**1:12,135**	**1:14,937**

Hot Spots

3.105 **Table 26** summarized current LHD Hot Spots, the FIRs involved, the year of identification, and status remarks.

Table 26: LHD Hot Spots in the Asia/Pacific Region

Hot Spot	Involved FIRs	Identified	Remarks
A1	Chennai/Dhaka/Kolkata/Yangon	2015	Cat. E LHDs and risk decreasing
B1	Incheon (Transfer-of-Control Point between Incheon ACC and Shanghai ACC)	2015	Cat. E LHDs increasing. Risk decreasing.
D1	Fukuoka/Manila	2015	Cat. E steady; risk decreasing. Mitigation in place. **Potential non-hotspot.**
D5	Ho Chi Minh/Manila	2015	Cat. E LHDs and risk slightly increasing.
D7	Kota Kinabalu/Manila	2015	Cat. E LHDs slightly increasing. Risk slightly decreasing.
D8	Manila/Ujung Pandang	2015	Cat. E LHDs and risk decreasing. Mitigation in place. **Potential non-hotspot.**
F	Mogadishu/Mumbai	2015	Cat. E LHDs decreasing. Risk slightly increasing.
G1	Mumbai/Muscat	2015	Cat. E LHDs slightly decreasing. Risk decreasing.
G2	Mumbai/Sanaa	2015	Cat. E LHDs slightly increasing. Risk decreasing.

Hot Spot	Involved FIRs	Identified	Remarks
J	Jakarta/Kota Kinabalu/Singapore	2018	Cat. E LHDs and risk decreasing. Mitigation in place. **Potential non-hotspot.**
N	Hawaii CEP/Oakland USA	2019	Cat. E LHDs and risk slightly increasing.
O	Bangkok/Ho Chi Minh/Kuala Lumpur/Singapore	2023	Cat. E LHDs and risk decreasing.

3.106 The Meeting discussed the following changes to the Asia Pacific Consolidated report:

a) revised description of the contributing factors and mitigations of Hot Spots B1 (China and the Republic of Korea agreed to continue the relevant discussions during the bilateral meetings) and O;

b) corrected the title of Hot Spot G2; and

c) revised values in the reporting rate of LHDs/LLDs/LLEs table.

3.107 FAA presented on behalf of APRAST the approved RASG-APAC Safety Advisory (RSA) on Category E LHDs titled: "Elevated Mid-Air Collision (MAC) risk in Reduced Vertical Separation Minima (RVSM) Airspace" intended for Civil Aviation Authorities responsible for State Safety Oversight of Air Navigation Services, and Air Navigation Service Providers (ANSPs). The RSA was provided in **RASMAG/30 Flimsy/01**.

Agenda Item 4: Airspace Safety Monitoring Documentation and Regional Guidance Material

RASMAG Safety Bulletin Issue 03 (WP/20)

4.1 At MAWG/11 in 2024, JASMA proposed the framework of RASMAG Safety Bulletin to ensure the publication every two years cycle. JASMA also proposed the topic of the Safety Bulletin Issue 3 was the Team Resource Management (TRM).

4.2 This paper presented the draft Safety Bulletin 03 developed by JASMA. JASMA considered the Crew/Team Resource Management would be appropriated as the topic of this Safety Bulletin, because COVID-19 had been forced to keep social distance and caused division of human relationships. Crew/Team Resource Management was recognized to be an importance and necessity for strengthen human relationships.

4.3 The Meeting agreed that the bulletin required further editing and additional comments should reach the Chair by end of September 2025 before publication on the ICAO APAC eDocument webpage by end of 2025 in accordance with ***Conclusion RASMAG23-5: RASMAG Safety Bulletins***.

> *That, recognizing the value of safety promotion activities by RASMAG, Safety Bulletins developed by relevant International Organizations and concerned States as endorsed by RASMAG would be posted on the ICAO Asia/Pacific website and circulated by State Letter, in addition to informal circulation by Regional Monitoring Agencies (RMAs).*

4.4 ICAO updated the Meeting that the Alphanumeric Call Signs topic was discussed during previous ATM/SG meetings and some Action Items in the ATM/SG task list remained open.

Incorporation of Human Factors Assessment Questionnaire (HFAQ) into the Guidance Material for Continued Safety Monitoring of Asia and Pacific RVSM Airspace (WP/21)

4.5 This paper presented the revised version of the LHD Analysis Form (Form A) incorporating the elements from the Human Factors Assessment Questionnaire (HFAQ) to assist the analysis of occurrences where human factors issues were identified, especially Category E LHDs.

4.6 The development of the sub-categories for Category E LHDs agreed by all monitoring agencies for implementation to APAC airspace during RASMAG MAWG/12 meeting, as shown below:

a) E-NT: No Transfer or Negative Transfer;

b) E-LT: Late Transfer;

c) E-RI: No or Late Revision of Transfer Information; and

d) E-OT: Any Other Types.

4.7 However, the analysis of Category E LHDs by the above-mentioned sub-categories did not consider the underlying human factors that contribute to the direct erroneous actions or inaction by the individuals involved in the occurrence. To address this gap, MAAR and SEASMA collaborated to integrate the elements of HFAQ into the LHD Analysis Form (Form A) as guidance on the Human Factors Assessment, which serves as guidelines to analyze occurrences where human factors issues were identified, especially Category E LHDs.

4.8 The HFAQ comprised a three-tiered approach to data collection and analysis:

a) Level 1: Individual Actions. The immediate errors that lead to LHDs can be categorized as Slips, Lapses, or Mistakes;

b) Level 2: Contributing Factors. These were the latent conditions in the workplace that directly influence human performance and provided context for the errors; and

c) Level 3: Supervisory/Organizational Factors. These organizational elements also shaped workplace conditions affecting human performance.

4.9 The guidance on the HFAQ was appended to Form A, to guide users to the identification of the individual's actions. The next section contained the list of contributing factors which were grouped into 4 categories: Procedures/LOAs, Human Factor Issues, Systems/Equipment, and Other Factors. Form A has also been modified with drop-down lists under each category of contributing factors.

4.10 States and ANSPs were encouraged to utilize the revised version of Form A, which incorporated the guidelines from the HFAQ and provide comments for the HFAQ and Form A by end of 2025 for further discussion in the MAWG meeting next year.

4.11 In response to a query, the HFAQ was intended to be applied after every occurrence, conversely it might be applied to a group of similar occurrences for assessment.

Agenda Item 5: Airspace Safety Monitoring Activities/Requirements in the Asia/Pacific Region

Classification and Reporting for Non-RVSM Approved Aircraft Operating in RVSM

Airspace and Occurrences Caused by GNSS Radio Frequency Interference (WP/22)

5.1 This paper clarified the classification and reporting for both non-RVSM approved aircraft operating in RVSM airspace and occurrences caused by GNSS RFI.

5.2 LHD Category L scenarios involved situations where an aircraft was provided with RVSM separation despite not being RVSM approved. The possible scenarios that should be reported as LHD Category L as follows:

a) Aircraft Operator's Errors in Flight Plan Filing

- An operator mistakenly inserted the letter "W" (indicating RVSM approval) in field 10 of the flight plan for a non-RVSM approved aircraft. Consequently, the aircraft was then cleared to an RVSM flight level and provided 1,000-feet vertical separation.

b) Lack of Verification by ATS Units

- A controller mistakenly assigned a non-RVSM approved aircraft to a RVSM flight level and provided 1,000 feet vertical separation without querying the pilot or verifying RVSM approval status.

c) Outdated List of Non-RVSM Approved Aircraft

- The RMA's list of non-RVSM-approved aircraft that was distributed to the States and ANSPs was not distributed, properly communicated or updated to the air traffic controllers handling the aircraft. As a result, the air traffic controllers might not be aware that an aircraft's RVSM approval was not valid. This could lead to the aircraft being cleared to operate at RVSM flight levels with 1,000-feet vertical separation.

d) System-Induced Errors in Flight Plan Processing

- A flight data processing system in a certain FIR erroneously inserted "W" in the flight plan for a non-RVSM approval aircraft. Then, non-RVSM approval aircraft was cleared to operate in RVSM airspace with 1,000-feet vertical separation, relying on incorrectly system-generated label.

5.3 The following scenarios illustrated the various occurrences that could result from GNSS RFI with their classification and reporting guidance.

a) No Deviation (Increased Workload or Operational Complexity)

- GNSS RFI was detected, but the aircraft remained at its correct position without any lateral, longitudinal, or vertical deviation. However, both the ATS unit and flight crew must revert to traditional non-GNSS procedures (e.g., ground-based navigation or time-based reporting), resulting in increased workload or operational complexity. This scenario did not need to be reported as LHD, LLD, or LLE.

b) Lateral Deviation

- GNSS RFI was detected, and the aircraft laterally deviated from the flight plan track by greater than a regionally agreed value relevant to the applied separation minimum. This scenario should be reported as LLD.

c) Longitudinal Deviation

- GNSS RFI was detected, and the aircraft's reported position or pilot estimate varies from the expected estimate, affecting the spacing with other traffic. This scenario should be reported as LLE.

- In another case, the aircraft reached the transfer point earlier than expected by more than the longitudinal separation criteria. This was treated similarly to a "Negative Transfer" or a case where the transfer information was not coordinated. As a result, the aircraft may enter the adjacent FIR unexpectedly, potentially leading to both horizontal and vertical risks. Thus, this should be reported as both LLE and LHD.

d) Vertical Deviation

- GNSS RFI caused the aircraft to deviate by **300 feet or more** from the assigned flight level or unintentionally cross over another flight level. This scenario should be reported as LHD.

5.4 The GNSS RFI occurrences could be correlated the existing LLD/LLE/LHD categories as shown in **Table 27.** RMAs and EMAs would utilize this mapping to classify the occurrences consistently for safety analysis.

Table 27: Classification of GNSS RFI-Related Occurrences under LLD, LLE, and LHD Categories

Type of Occurrence	Category	Description
GNSS RFI led to LLD	Category G	Navigation errors due to airborne equipment failure
GNSS RFI led to LLE	Category G	Navigation errors due to airborne equipment failure
GNSS RFI led to LHD	Category H	Airborne equipment failure leading to unintentional or undetected change of flight level

5.5 Pilots, air traffic controllers, and State authorities were encouraged to closely monitor occurrences involving non-RVSM-approved aircraft (LHD Category L) and those related to GNSS RFI. It was vital that these occurrences that led to LHD/LLE/LLD were reported to the respective RMAs or EMAs so that their effects on safety risk could be assessed for possible identification of prevention and mitigation measures.

5.6 In response to a query, the purpose of Category H LHD in **Table 27** could be used when a GNSS RFI occurrence had led to an unexpected position of aircraft creating a LHD occurrence similar to the case of negative transfers.

5.7 RASMAG noted the lack of data for GNSS RFI occurrence therefore this paper was developed to provide guidance, it was a small step and improvement towards future analysis of GNSS RFI occurrences.

5.8 The Meeting discussed the formation of a new LHD/LLE/LLD category for the classification of GNSS RFI occurrences leading to LHD/LLE/LLD and agreed to **Conclusion RASMAG/30-1: New LHD/LLE/LLD Category 'R' for GNSS RFI occurrences in Asia and Pacific Region**

What: That, Asia and Pacific Region to adopt a new Large Height Deviation/Large Longitudinal Error /Large Lateral Deviation (LHD/LLE/LLD) Category as Category R.

Why: To classify the emerging trends of GNSS RFI occurrences effectively for possible identification of prevention and mitigation measures.

JASMA Post-Implementation Safety Assessment of the 12 Nm Lateral Separation Minima using ATS Data Link Services in Fukuoka FIR Oceanic Airspace (IP/2)

5.9 JASMA presented the post-implementation safety assessment of the 12 NM lateral separation minimum using ATS data link services applicable while one aircraft climbs/descends through the level of another aircraft in the Pacific Ocean airspace of the Fukuoka FIR.

5.10 Two hazards related to air traffic control operations were identified in the safety assessment before implementation. As a result of the risk evaluation, they were deemed acceptable with the implementation of mitigation measures.

5.11 During the trial, controllers implemented a manual checklist to mitigate the identified ATC system shortcomings. Subsequently, in October 2024, the ATC system was upgraded and the post-implementation assessment verified that other hazards for which mitigation measures were not required and confirmed that the situation has not worsened since the implementation of the 12 NM lateral separation minima. Therefore, the trial operation was terminated and full operation was implemented from 10 July 2025.

Large Lateral Deviation Reporting Criteria in Asia and Pacific Region (IP/3)

5.12 The information paper discussed the proposed revision of LLD reporting criteria in the Asia and Pacific Region, specifically considering the reduction of the current 10 NM threshold. Two previously proposed approaches: a 5 NM reporting threshold presented by JASMA at RASMAG/28 (IP/10) and the comprehensive deviation reporting (all lateral deviations regardless of deviation magnitude) suggested by PARMO at MAWG/12 (WP/13).

5.13 Both the 5 NM threshold approach and comprehensive reporting methodology present valuable perspectives for consideration. While comprehensive deviation reporting would ensure full data coverage, practical considerations such as implementation feasibility and resource allocation must be addressed. A structured 5 NM reporting threshold would enable monitoring agencies to focus resources on deviations with higher safety significance, supports efficient data analysis by balancing data volume with safety relevance, and facilitates clear, consistent reporting criteria for operational staff.

5.14 In conclusion, the adoption of a 5 NM threshold for LLD reporting would align with existing ICAO standards while maintaining operational efficiency. This approach provides a structured evolution of current practices while accommodating future enhancements based on operational experience and regional requirements.

5.15 India opined that in SA/IO airspace, only 50 NM lateral separation was used and the current reporting criteria of 10 NM would suffice. Therefore, the Meeting discussed that the criteria could be flexible and agreed to the following: **Conclusion RASMAG/30-2: Large Lateral Deviation Reporting Criteria in Asia and Pacific Region**

What:

a) Asia and Pacific Region to adopt a Large Lateral Deviation Reporting Criteria 5 NM threshold when applying or planning to implement lateral separation minima less than 50NM. This revised value balances operational practicality with safety oversight requirements.
b) The 5NM reporting criteria for lateral separation minima less than 50NM to be updated in the Asia/Pacific Regions En-route Monitoring Agency (EMA) Handbook on the ICAO APAC eDocuments Webpage.

Why: Adopting a 5 NM reporting threshold harmonized the requirements between the ADS-C downlink reports and manual reporting.

AAMA Assessment of Non-RVSM Approved Aircraft (WP/23)

5.16 AAMA highlighted the non-RVSM approved airframes filing a flight plan intending to operate within RVSM airspace from August 2024 through May 2025. As a result of monthly checks of flight plan data against the RVSM approval databases of all global RMAs.

5.17 22 airframes were identified as RVSM non-approved when compared with the Combined Approvals database.

China RMA Approvals of Non-RVSM Aircraft in 2025 (WP/24)

5.18 China RMA provided a detailed overview of China RMA's efforts in monitoring and updating RVSM approval statuses for aircraft operating in RVSM airspace from January to May 2025.

5.19 China RMA explained that the information of potential identified aircraft had already been demonstrated in the recent RMACG meeting earlier in May. Feedback was received from RMAs for all identified aircraft and information were verified.

JASMA Assessment of Non-RVSM-Approved Aircraft (WP/25)

5.20 JASMA presented a list of operator-aircraft type operating within the RVSM airspace of Fukuoka FIR with no registration of RVSM in the approval databases as of June 2025. Six aircraft which could not be confirmed in the RMA approval database were reported, but two aircraft were confirmed having RVSM approval after submission of WP. Finally, four aircraft were identified as non-RVSM approved aircraft, but no long-term rogue aircraft appeared on the list. The status update of one aircraft registered in the Republic of Korea was provided by the Republic of Korea.

MAAR Assessment of Non-RVSM Approved Aircraft (WP/26)

5.21 MAAR presented the results of the annual audit of aircraft filing ‘W’ to operate in RVSM airspace without valid RVSM approvals in RMAs’ database (a.k.a. rogue aircraft). MAAR analysis identified 26 aircraft operating without valid RVSM approvals in RMA databases (commonly referred to as rogue aircraft), which was consistent with last year’s audit.

5.22 The analysis identified 26 aircraft operating without valid RVSM approvals in RMA databases and two aircraft were identified as repeat rogue aircraft, having appeared on the list for a second consecutive year. Their registration details had been shared with relevant ATS States for appropriate action.

APANPIRG List of Deficiencies

5.23 Since India had not verified the RVSM approval status of 16 aircraft for over six months (since December 2024) and had not submitted the 2024 annual RVSM approval snapshot, India was proposed for inclusion in the APANPIRG ATM and Airspace Safety Deficiencies List, due to the continued failure to confirm RVSM approval status.

5.24 At the time of the submission of this paper, Bangladesh had not submitted the 2024 annual RVSM approval snapshot which may result in an inclusion in the APANPIRG List of Deficiencies in the ATM and Airspace Safety fields next year if the problem persists. During the Meeting, MAAR updated that Bangladesh had submitted the required RVSM data recently.

5.25 India and Indonesia provided the RVSM status of relevant aircraft. India was in the process of completing verification of all the 16 identified aircraft before the recommendation for inclusion to the deficiencies list could be removed. It was noted that 15 out of 16 identified aircraft had been submitted.

PARMO RVSM Traffic Compliance Monitoring (WP/27)

5.26 PARMO presented an assessment of non-State-approved operators using the RVSM airspace in the Pacific and a portion of North East Asia overseen by PARMO, the RVSM Approval records up to May 2025 and December 2024 TSDs provided were used for the assessment.

5.27 For the analysis period December 2024, the count of operations was 93,838. 45 entries were identified as having no approval or an expired approval and required further analysis.

5.28 As shown in **Table 28**, out of the 45 aircraft which were identified for further analysis, 34 were found to be approved, ferried, or exported, while 8 were found to be misfiles or typographical errors in flight plan data, leaving three aircraft remaining as non-approved.

Table 28: Categorization of Aircraft with Suspected Non-approved Operations

RMA	December 2023 Traffic Samples	Approved/Exported/ Cancelled	Typos/ Misfile	Unapproved
AAMA	Australia		2	
	Papua New Guinea	2		
CARSAM MA	Cayman Islands	1		
CHINA	China	4		
EURASIA	Kazakhstan	1		
MAAR	Philippines	1		
	Vietnam	1		
NAARMO	Canada	4		
	Mexico	3		
	United States	14	4	3
PARMO	Fiji		1	
	Republic of Korea	3	1	
	Total	**34**	**8**	**3**

5.29 Experience had shown that the primary reason for failure to match operations and approvals was a delay in State notification of the RVSM approval status of some operators to the appropriate RMA. Thus, the importance of timely notification by States of operator approval status to RMAs was emphasized by these results.

5.30 The PARMO had notified the pertinent RMAs and responsible States regarding the airframes detailed in this paper and incorporated the feedback received.

5.31 The Meeting proposed for MAWG to develop a formal process to maintain a compiled non-RVSM approved list intended for States in order to better address the risk of non-approval aircraft operation in RVSM airspace proactively.

Management of Confirmed Non-RVSM Approved Aircraft (WP/28)

5.32 This paper presented by the MAAR addressed the ongoing challenge of aircraft operating in RVSM airspace without proper RVSM approval. Despite existing regional initiatives and ICAO provisions (Doc 9574, Annex 6, and Doc 9937), non-compliant operations persist. MAAR had continued to monitor and distribute lists of confirmed and unverified non-RVSM approved aircraft to States and ANSPs for enforcement.

5.33 The Meeting was reminded of the APANPIRG Conclusions 24/26 and 28/12, which called for timely responses, legislative action, and direct RMA engagement with authorities.

5.34 Key actions by RMAs included identification and verification of "rogue aircraft" that incorrectly filed the 'W' RVSM approval indicator in flight plans and distribution of verified lists of non-approved aircraft.

5.35 There were current measures such as EUROCONTROL's approach of rejecting flight plans for repeat rogue aircraft, some States confirmed that they denied entry into RVSM airspace for the identified aircraft, while others permitted operations using a 2,000 feet vertical separation to reduce risk.

5.36 While these actions were commendable, MAAR acknowledged that denying access to RVSM airspace after an aircraft was already airborne could present operational challenges for ATC. It might also result in more significant impacts on aircraft operators, particularly due to disruption to scheduled operations. As a result, MAAR considered it more practical to address such cases earlier in the process specifically during flight planning or flight permission stages. Promoting early intervention during flight planning or permission stages to avoid operational disruptions. MAAR also initiated collaboration with Thailand's CAA to contact operators directly and correct improper flight plan filings.

5.37 In conclusion, States/Administrations and RMAs were urged to adopt a more proactive, coordinated strategy such as appropriate engagement with aircraft operators to prevent the incorrect filing of 'W' for aircraft with unverified RVSM approvals to enhance RVSM compliance and airspace safety.

JASMA Assessment of Non-PBCS Approved Aircraft (WP/29)

5.38 JASMA presented the trend of the numbers and percentages for the PBCS-filed flights and PBCS-approved flights flying in the Pacific Ocean airspace of Fukuoka FIR as of May 2025. The list of operator-aircraft combinations identified as non-PBCS-approved flight in May 2025 was also provided.

5.39 **Figure 19** showed the number of all flights in the Pacific Ocean airspace of Fukuoka FIR, the percentage of flights with "P2" and "RSP180" in their flight plans (hereinafter called "PBCS-filed flights"), and the percentage of the flights which were confirmed as PBCS approved aircraft in the approval databases (hereinafter called "PBCS-approved flights") for the period from January 2024 to May 2025.

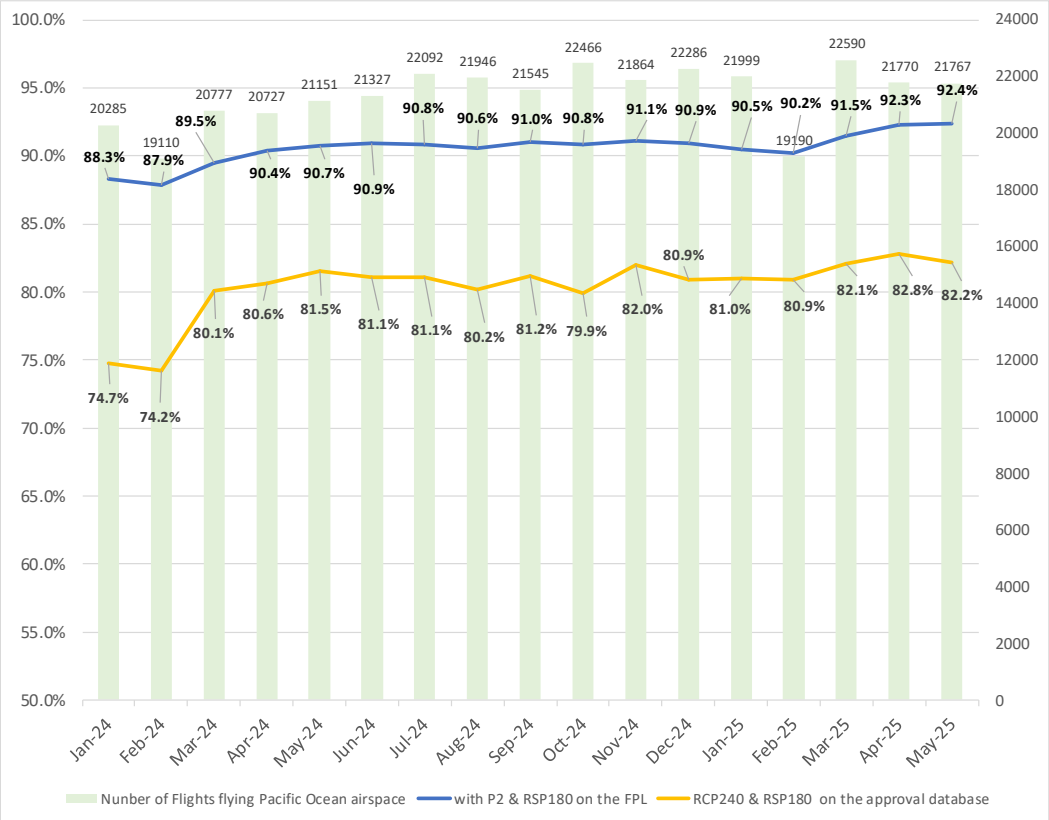


Figure 19: Percentage of PBCS-filed flights and PBCS-approved flights

5.40 There were approximately 70 flights per day and 2,200 flights per month flying in the Pacific Ocean airspace of Fukuoka FIR in May 2025 that filed "P2" and "RSP180" in their flight plans but were not confirmed their PBCS approval / authorization in the approval databases.

5.41 The PBCS approved status of some airlines still remained unverified, JASMA opined it was ideal that the PBCS status on flight plan and database not to be discrepant. JASMA would continue to assess PBCS approval status by comparing PBCS-filed flights / PBCS-approved flights.

5.42 The Meeting was informed that the list of RSP and RCP approvals would not be fully populated in the combined approvals snapshot because there are States that did not issue specific approvals for PBCS. Therefore, the benefits of such PBCS approval status monitoring activities may be reviewed.

5.43 The status update of some aircraft registered in the Republic of Korea was provided by PARMO and the Republic of Korea.

AAMA LTHM Monitoring (WP/30)

5.44 AAMA provided the monitoring burden based on the approvals contained within the AAMA approvals database and global monitoring data available as of 31 May 2025.

5.45 The total of number of unique airframes identified as having a full RVSM approval from a state of registry under AAMA responsibility as of 31 May 2025 was 1422, with a resultant monitoring burden of 477 out of which a total of 73 had not been monitored in the last two years. AAMA explained the monitoring burden for Indonesia (18%) was due in part to the recent submission of F2 forms for aircraft that had not yet undergone monitoring.

China RMA LTHM Burden Estimate Update (WP/31)

5.46 China detailed monitoring burden for the aircraft registered and operated under China RMA to meet the long-term height monitoring requirement. The data were based on the RVSM approval database by the end of May 2025. Detailed information was provided in **RASMAG/30 WP/31 Attachment A**.

5.47 The total number of RVSM approved aircraft was 4,642, with a resultant monitoring burden of 549 and a total of 46 aircraft remaining to be monitored, according to minimum monitoring requirements (MMR). For China, there were 4,638 approved aircraft, with a resultant monitoring burden of 545 and a total of 42 aircraft remaining to be monitored. The reason for the large reduction in the resultant monitoring burden in 2025 was due mainly to the adjustment of the MMR of certain major aircraft type since 2024.

5.48 For the Democratic People's Republic of Korea, there was one operator with four aircraft that require monitoring. In the last four years, due to the COVID-19 epidemic, the flight duration of Air Koryo was relatively short, and was currently monitored against the MMR of 1,000 flight hours requirements. China RMA was coordinating with Democratic People’s Republic of Korea for technical training and aircraft monitoring. It was expected to be carried out at the end of 2025.

JASMA LTHM Burden Estimate Update (WP/32)

5.49 JASMA presented the current monitoring burden for aircraft registered and operated by Japan to meet Annex 6 LTHM requirements, as of May 2025. Detailed information was provided in RASMAG/30 WP/32 Attachment A.

5.50 There was a total of 842 airframes that were approved for the RVSM on the RVSM approvals database maintained by the JASMA. Applying the MMR to the total of RVSM approved aircraft results in a total monitoring burden to be achieved of 164 airframes. Taking into account aircraft which was approved RVSM for the first time or were conducting height monitoring within the past two years, the outstanding burden was 15 airframes (1.8%).

5.51 The remaining aircraft were operated by small aircraft operators or State. JASMA supposed that the flight hours of these operators’ aircraft might not have reached 1,000 hours within the recent two years.

The Result of the Evaluation of AHMS for Height Monitoring (IP/4)

5.52 JASMA presented the result of the evaluation about the updated Height Monitoring System using ADS-B (AHMS: ADS-B Height Monitoring System). Japan was working on updating HMUs, which uses En-route Wide Area Multilateration*(WAM) to measure vertical error. The Setouchi HMU was undergoing evaluation and the Sendai and Niigata HMUs would be next.

5.53 The results of the evaluation confirmed that measuring vertical deviation with AHMS had performance equivalent to that of HMU, however there was an issue that to distinguish HAE from HAG. AHMS was equipped with the function to distinguish HAE from HAG. It was found that AHMS alone was functionally capable of measuring vertical deviation, but for the time being AHMS would be used as a complementary function to HMU.

PARMO RVSM Long Term Height Monitoring Burden (WP/33)

5.54 An assessment of the monitoring burden associated with the Long-Term Height Monitoring (LTHM) requirements for airframes for which PARMO was the responsible RMA, was provided to the meeting. PARMO approvals as of 31 May 2025 were used to assess the monitoring burden.

5.55 The total number of unique airframes identified as having a full RVSM approval from a State of registry under PARMO responsibility as of 31 May 2025 was 546, with a resultant monitoring burden of 127 and a total of eight aircraft not successfully monitored within the past two years. This total may include airframes under the 1,000-hour monitoring requirement.

5.56 A detailed list of the monitoring burden per State under PARMO responsibility was provided in **RASMAG/30 WP/33 Attachment A**.

NAARMO Long Term Height Monitoring Burden (IP/5)

5.57 The Meeting was provided with the NAARMO monitoring burden based on the approvals contained within the NAARMO approvals database and global monitoring data as of 31 May 2025.

5.58 The total number of unique airframes identified as having a full RVSM approval from a state of registry under NAARMO responsibility was 23,697 with a resultant monitoring burden of 14,988 and a total of 493 aircraft or 3% of the total approved airframes not successfully monitored within the past two years. This total might include airframes under the 1,000-hour monitoring requirement.

5.59 PARMO shared an example where a large ASE (500-600ft) was discovered by the new daily monitoring process, this process enabled the prompt identification of the operators and implementation of corrective actions to correct the ASE in a short time.

ASE Case Studies Highlighting the Importance of Compliance with the LTHM Requirement (IP/6)

5.60 MAAR highlighted the importance of complying with the LTHM requirement. Aircraft approved for RVSM operations were required to undergo Height-Keeping Performance Monitoring (HKPM) every 2 years or 1,000 flight hours, whichever was longer, to confirm that their height-keeping performance remains within acceptable safety limits. As ASE was not visible during normal operations, aircraft might continue to operate with significant errors without being detected.

5.61 Case studies drawn from investigations conducted by the EUR RMA and FAA demonstrated that non-compliant or modified aircraft can generate large ASE values—often identified only by chance through monitoring systems. These examples underscored that, without regular HKPM, unsafe conditions in RVSM airspace may go unnoticed. This paper reinforced the awareness of the LTHM requirement and encourage States and aircraft operators to maintain full compliance in order to ensure continued safety and integrity of RVSM operations.

APAC Consolidated LTHM Compliance Status (WP/34)

5.62 MAAR presented the overview of LTHM compliance status in the APAC Region, including assessments of five APAC RMAs – AAMA, China RMA, JASMA, MAAR and PARMO. The assessment, based on RVSM approval data as of 31 May 2025, yielded a remaining monitoring burden in the APAC Region of 324 aircraft, an increase compared to the previous year.

APANPIRG List of Deficiencies Consideration

5.63 Based on the criteria for State Responsibility to comply with the Annex 6 Height-Keeping Monitoring Requirement Annex 6 Part I Section 7.2.9 (12th Ed.) and Part II Section 2.5.2.10 (11th Ed.) for non-compliance with LTHM requirement (remaining monitoring burden 30% or more), the following recommendations were proposed to add, remove and retain their APANPIRG deficiency status in **Table 29.**

Table 29: List of States that could be subject to add, remove, and retain their APANPIRG deficiency status based on RVSM approval data as of 31 May 2025.

State	2023	2024	RASMAG recommendation
Afghanistan (MAAR)	**50%**	**50%**	**Retain**
India (MAAR)	**48%**	**46%**	**Retain**
Nepal (MAAR)	**45%**	**45%**	**Retain**
DPRK (China RMA)	**0%**	**100%**	**Add**
Malaysia (MAAR)	**25%**	**31%**	**Add**
Philippines (MAAR)	**40%**	**22%**	**Remove**

5.64 The paper also outlined some recommendations for States and operators such as:

a) APAC States are encouraged to inform their RMAs about any changes (such as transferred or de-registered aircraft) in a timely manner, as this will affect the number of aircraft required to be height-monitored.

b) APAC States are encouraged to provide their RMA with a list of aircraft meeting the 1,000 flight hour criteria. This will enable the RMA to subtract these aircraft from the remaining monitoring burden calculation, thereby decreasing the overall percentage.

c) APAC States should encourage aircraft operators to retrofit ADS-B-Out capability where feasible, as it would provide a more efficient and more cost-effective solution for height monitoring in the long run.

d) The operators that have ADS-B-Out equipped aircraft but still have not fulfilled their monitoring requirements should consult the respective RMAs for other feasible arrangements.

e) APAC States are encouraged to actively engage in sharing their ADS-B data with their designated RMA as another means to alleviate the monitoring burden.

5.65 During the Meeting, Malaysia provided an update on the list of deregistered aircraft to MAAR. Accordingly, the monitoring burden for Malaysia would be recalculated.

5.66 China RMA elaborated the engagement conducted with Democratic People's Republic of Korea and stressed the importance placed on the LTHM by Democratic People's Republic of Korea. Consequently, China RMA planned to provide monitoring services, technical exchanges and training for Democratic People's Republic of Korea before APANPIRG this year in order to mitigate the current resultant monitoring burden. ICAO clarified that Democratic People's Republic of Korea would be removed from the proposal of deficiencies list after the completion of monitoring and inform ICAO before APANPIRG/36.

5.67 For States with high remaining monitoring burden, the Chair highlighted the benefits of ADS-B Height Monitoring System to facilitate the monitoring requirement in a low cost and expeditious manner and strongly encouraged States to submit the ADS-B data to the respective RMA to fulfil the required monitoring assessment.

Competent Airspace Safety Monitoring Organizations List (WP/35)

5.68 The Meeting updated the *RASMAG List of Competent Airspace Safety Monitoring Organizations* (**Appendix D** to this Report).

Agenda Item 6: Air Navigation Services Deficiencies

ATM and Airspace Deficiencies List (WP/36)

6.1 The Meeting reviewed the APANPIRG ATM and Airspace Safety Deficiency List and agreed to make the following recommendation to APANPIRG/36, as recorded in **Appendix E** to this Report. The Meeting was informed that the deadline for submission of information (such as on reduction of the remaining monitoring burden or RVSM Approval Status verification) must reach MAAR by 24 October 2025 in order to be processed in time for APANPIRG/36.

a) To be retained in the Deficiencies list:

Safety Reporting Deficiencies

6.2 **Afghanistan** (Failure to submit Kabul FIR Large Height Deviation (LHD) data and traffic sample data (TSD)).

Long Term Height Monitoring Requirement Deficiencies

- **Afghanistan** (Remaining monitoring burden of 50%, RASMAG/30).
- **India** (Remaining monitoring burden of 46%, RASMAG/30).
- **Nepal** (Remaining monitoring burden of 45%, RASMAG/30).

b) Removal of Deficiency:

Long Term Height Monitoring Requirement Deficiencies

- **Philippines** (Remaining monitoring burden of 22%, RASMAG/30).

ATS Datalink Deficiencies

- **India**: Post implementation monitoring not implemented (insufficient data/evidence). India had submitted the data link performance report for all the three FIRs, including Mumbai FIR in 2025.

c) Add new Deficiency

Safety Reporting Deficiencies

6.3 **India** (Failure to confirm RVSM approval status and RVSM Approval Annual snapshot).

- **Nepal** (Failure to submit annual TSD on time and in correct format).

Long Term Height Monitoring Requirement Deficiencies

- **Democratic People's Republic of Korea** (Remaining monitoring burden of 100%, RASMAG/30).
- **Malaysia** (Remaining monitoring burden of 31%, RASMAG/30).

6.4 The Meeting noted that this recommendation reflects the current status as of RASMAG/30 and confirmed that, should accurate updates be provided by the deadline, the Secretariat would exclude such items from the recommendations to APANPIRG. Accordingly, relevant States/Administrations/Agencies were encouraged to submit any necessary updates by the specified deadline.

Agenda Item 7: Any Other Business

ATM Points of Contact (WP/37)

7.1 The Meeting participants were requested to review and updated the ATM Points of Contact (RASMAG/30 WP/37 Attachment A) as appropriate.

Education

7.2 During the Meeting, MAAR had received questions from some States concerning the education of RASMAG topics and proposed that a workshop might be conducted during the next RASMAG meeting to share information about RVSM approvals, collision risk modelling, etc. A quick poll revealed only a limited number of interested parties. ICAO, with discussion with the Chair, would consider taking this into account for the planning of the next RASMAG meeting.

Agenda Item 8: Review and Update RASMAG Task List

RASMAG Terms of Reference and Task List (WP/38)

8.1 The meeting reviewed the RASMAG Terms of Reference and reviewed and updated the RASMAG Task List (**Appendix F** to this Report).

Agenda Item 9: Date and Venue of the Next RASMAG Meeting

9.1 The RASMAG/31 would be planned in June/July 2026 in Bangkok, Thailand.

Closing of the Meeting

10.1 In closing, the Chair thanked participants for their contributions to the Meeting.

— — — — — — — —

LIST OF PARTICIPANTS

	STATE/NAME		TITLE/ORGANIZATION
1.	**AUSTRALIA (1)**		
	1.	Mr. Shea Houlihan	Risk Intelligence Specialist Airservices Australia **AUSTRALIA**
2.	**BRUNEI DARUSSALAM (2)**		
	2.	Mr. Mohamad Fauzi bin Mohamad Sidek	Deputy Director of Civil Aviation Regulator Department of Civil Aviation Brunei **BRUNEI DARUSSALAM**
	3.	Mr. Haji Azrol bin Haji Saruji	Chief Aerotelecommunications Officer Brunei ATELS Department of Civil Aviation Brunei **BRUNEI DARUSSALAM**
3.	**CAMBODIA (1)**		
	4.	Mr. Lorn Thyrith	Director of Quality, Safety & Security Department State Secretariat of Civil Aviation **CAMBODIA**
4.	**CHINA (4)**		
	5.	Mr. Yan Yonggang	Director ATC Division of Air Traffic Management Bureau (ATMB) Civil Aviation Administration of China **CHINA**

	STATE/NAME		TITLE/ORGANIZATION
	6.	Mr. Meng Long	Senior officer of ATC Division, Air Traffic Management Bureau (ATMB) Civil Aviation Administration of China **CHINA**
	7.	Mr. Yongyue Chen	Engineer China RMA **CHINA**
	8.	Mr. Yang Hong	Engineer China RMA **CHINA**
5.	**HONG KONG, CHINA (1)**		
	9.	Mr. Isaac Wong	Senior Air Traffic Management Standards Officer Civil Aviation Department, Hong Kong China **HONG KONG, CHINA**
6.	**INDIA (6)**		
	10.	Mr. Ashok Agarwal	Section Officer Ministry of Civil Aviation, Govt. of India **INDIA**
	11.	Mr. Ashish Dubey	Deputy Director DGCA India **INDIA**

	STATE/NAME		TITLE/ORGANIZATION
	12.	Mr. J. Masivayana	Deputy General Manager, BOBASMA-EMA Airports Authority of India **INDIA**
	13.	Mr Harshad Vijay Khatavkar	Joint General Manager (ATM) Airports Authority of India **INDIA**
	14.	Mr. Krishnan U. Rao	Joint General Manager (ATM) Airports Authority of India **INDIA**
	15.	Mr. Sudipta Kumar Mondal	AM (ATM) Airports Authority of India **INDIA**
7.		**INDONESIA (2)**	
	16.	Mr. Henry Wiranto	Air Navigation Inspector, DGCA Indonesia **INDONESIA**
	17.	Mr. Alit Yuliawan Prihadhi	Vice President of Safety Performance and Improvement AirNav Indonesia **INDONESIA**

	STATE/NAME		TITLE/ORGANIZATION
8.	**JAPAN (3)**		
	18.	Mr. Kazuto Fukuda	Special Assistant to the Director Japan Civil Aviation Bureau (JCAB) **JAPAN**
	19.	Mr. Kenichi Furukawa	Director Department of Research and Study Service Air Traffic Control Association Japan **JAPAN**
	20.	Mr. Koji Kato	Director Research & Planning Service Air Traffic Control Association Japan **JAPAN**
9.	**LAO PDR (4)**		
	21.	Mr. Phoutthasone BOUNNHAVONG	Deputy Director of Flight Standards Division Department of Civil Aviation of Lao PDR **LAO PDR**
	22.	Mr. Vixay VORLACHIT	ATM and SAR Officer Department of Civil Aviation of Lao PDR **LAO PDR**
	23.	Mr. Xaygnasith XOUYMANIVONG	Deputy Director Of Air Traffic Service Office Lao Air Navigation Services (LANS) **LAO PDR**

	STATE/NAME		TITLE/ORGANIZATION
	24.	Mr. Amphone THANASIN	Chief of Vientiane Area Control Center Lao Air Navigation Services (LANS) **LAO PDR**
10.	**MALAYSIA (2)**		
	25.	Mr. Muhd Muzaffar Bin Mustaffa Johari	Senior Assistant Director Air Navigation Services Safety Division Civil Aviation Authority of Malaysia **MALAYSIA**
	26.	Mr. Lim Tuan Chun	Senior Assistant Director Air Navigation Services Operations Division Civil Aviation Authority of Malaysia **MALAYSIA**
11.	**MONGOLIA (3)**		
	27.	Ms. Mandukhai Baasandorj	ATM Manager of ANSD NCAC SOLLC **MONGOLIA**
	28.	Mr. Enkhmunkh Bat-Ochir	Area Control Watch Supervisor National Civil Aviation Center of Mongolia **MONGOLIA**

	STATE/NAME		TITLE/ORGANIZATION
	29.	Mr. Demchigjav Delgersaikhan	Inspector of ATC Mongolian Civil Aviation Authority **MONGOLIA**
12.	**PAKISTAN (2)**		
	30.	Mr. Mohammad Ahsan Rasheed	Senior Joint Director ATS Pakistan Airports Authority **PAKISTAN**
	31.	Mr. Muhammad Waqas Khan	Senior Joint Director ATS Pakistan Airports Authority **PAKISTAN**
13.	**PHILIPPINES (4)**		
	32.	Capt. Paterno C. Labuga	Head, GAOCID Division, Flight Standards Inspectorate Service (FSIS) Civil Aviation Authority of the Philippines **PHILIPPINES**
	33.	Ms. Marianne O. Mamuad	ATMO V, ATS-SMS Air Traffic Service Civil Aviation Authority of the Philippines **PHILIPPINES**

	STATE/NAME		TITLE/ORGANIZATION
	34.	Ms. Anna Liza D. Chiefe	Air Traffic Management Officer III, Manila ACC Air Traffic Service Civil Aviation Authority of the Philippines **PHILIPPINES**
	35.	Mr. Ernesto P. Discaya Jr.	Supervising Aviation Services Safety Inspector Aerodrome and Air Navigation Safety Oversight Office (AANSOO) Civil Aviation Authority of the Philippines **PHILIPPINES**
14.	**REPUBLIC OF KOREA (4)**		
	36.	Mr. Hu-Ho HA	Senior Deputy Director for Air Traffic Korea Office of Civil Aviation Ministry of Land, Infrastructure and Transport **REPUBLIC OF KOREA**
	37.	Ms. Hayeong KIM	Assistant Director for Air Traffic Korea Office of Civil Aviation Ministry of Land, Infrastructure and Transport **REPUBLIC OF KOREA**
	38.	Ms. Kyung-Hee JOO	Assistant Director for Airspace Management Air Traffic Management Office Ministry of Land, Infrastructure and Transport **REPUBLIC OF KOREA**

	STATE/NAME		TITLE/ORGANIZATION
	39.	Mr. Oungseob SHIN	Aviation Safety Researcher Korea Institute of Aviation Safety Technology **REPUBLIC OF KOREA**
15.	**SINGAPORE (3)**		
	40.	Mr. Wen Pei Goh	Master Air Traffic Control Officer Civil Aviation Authority of Singapore **SINGAPORE**
	41.	Mr. Lam Seng Lim	Safety Manager Civil Aviation Authority of Singapore **SINGAPORE**
	42.	Mr. Chee Hui Tai	Senior ATC Manager Civil Aviation Authority of Singapore **SINGAPORE**
16.	**SRI LANKA (2)**		
	43.	Mr. Thivanka Weerasinghe	Senior Manager (ATC): Safety Airport & Aviation Services Sri Lanka (PVT) Ltd **SRI LANKA**
	44.	Mr. G A Sahan Sameera	Air Traffic Controller Airport & Aviation Services Sri Lanka (PVT) Ltd **SRI LANKA**

	STATE/NAME		TITLE/ORGANIZATION
17.	**THAILAND (17)**		
	45.	Mr. Varayu Vanasuvan	Senior Airworthiness Officer 7 The Civil Aviation Authority of Thailand **THAILAND**
	46.	Ms. Wichanan Kanchana	Senior Airworthiness Officer 8 The Civil Aviation Authority of Thailand **THAILAND**
	47.	Mr. Nitchaphon Chuaprang	Senior Air Navigation Operations Officer 8 The Civil Aviation Authority of Thailand **THAILAND**
	48.	Mr. Chavalit Ithiapa	Senior Air Navigation Services Standards Officer 8 The Civil Aviation Authority of Thailand **THAILAND**
	49.	Mr. ThamawootPocathikorn	Senior Air Navigation Services Standards Officer 8 The Civil Aviation Authority of Thailand **THAILAND**
	50.	Ms. Sataporn Chainarong	Senior Air Navigation Services Standards Officer 8 The Civil Aviation Authority of Thailand **THAILAND**

	STATE/NAME		TITLE/ORGANIZATION
	51.	Mr. Suphichet Phatcharaphisutsin	Senior Flight Operations Standards Officer 8 The Civil Aviation Authority of Thailand **THAILAND**
	52.	Mr. Apiwat Torpradit	Senior Flight Operations Standards Officer 8 The Civil Aviation Authority of Thailand **THAILAND**
	53.	Ms. Saifon Obromsook	Director, Safety Management Department Aeronautical Radio of Thailand Ltd. **THAILAND**
	54.	Ms. Rinthida Jorntes	Safety Management System Assistant Manager Aeronautical Radio of Thailand Ltd. **THAILAND**
	55.	Ms. Chantima Sritiapetch	Executive Systems Engineer (Safety Management System) Aeronautical Radio of Thailand Ltd. **THAILAND**
	56.	Mr. Dolsarit Somseang	Executive Systems Engineer (Safety Management System) Aeronautical Radio of Thailand Ltd. **THAILAND**
	57.	Mr. Ponkrit Sawedsud	System Engineer (Safety Management System) Aeronautical Radio of Thailand Ltd. **THAILAND**

	STATE/NAME		TITLE/ORGANIZATION
	58.	Mr. Raksit Soontornmalai	Senior Safety Management System Officer Aeronautical Radio of Thailand Ltd. **THAILAND**
	59.	Capt. Sorawat Prasongdee	Team Lead of Flight Operation Safety, Security and Risk Management Department Operations Department Thai Airways International Public Company Limited **THAILAND**
	60.	Mrs. Kaew Dhapagupta	Senior Aircraft Engineer Aviation Safety Group, Technical Department Thai Airways International Public Company Limited **THAILAND**
	61.	Capt. Thammarat Thammalikhit	Administrative Assistant, Safety Management System Department Corporate Quality, Safety and Security Assurance Department Thai Airways International Public Company Limited **THAILAND**
18.	**UNITED STATES (4)**		
	62.	Mr. Shayne Campbell	Senior Air Traffic Representative, Asia Pacific Federal Aviation Administration Air Traffic Organization, System Operations **SINGAPORE**

	STATE/NAME		TITLE/ORGANIZATION
	63.	Mr. Micah Lyman	Foreign Affairs Specialist Federal Aviation Administration Air Traffic Safety Oversight **UNITED STATES**
	64.	Ms. Christine Falk	Manager, Separation Standards Analysis Branch Federal Aviation Administration Separations Standards Analysis **UNITED STATES**
	65.	Mr. José Pérez	Computer Specialist Separation Standards Analysis Branch Federal Aviation Administration **UNITED STATES**
19.	**VIET NAM (4)**		
	66.	Mr. Le Cong Khoi Anh	Deputy Manager of Safety, Quality and Security Department of SORATS **VIET NAM**
	67.	Mr. Nguyen Van An	Officer of Safety and Quality Department Viet Nam Air Traffic Management Corporation **VIET NAM**
	68.	Ms. Nguyen Thi Tuyet Mai	Officer of Safety, Quality and Security Department of NORATS **VIET NAM**

	STATE/NAME		TITLE/ORGANIZATION
	69.	Ms. Bui Hanh Hoa	Officer of Air Traffic Department Viet Nam Air Traffic Management Corporation **VIET NAM**
20.	**ICAO (5)**		
	70.	Mr. Hiroyuki Takata	Regional Officer, Air Traffic Management ICAO Asia and Pacific Regional Office **THAILAND**
	71.	Mr. Mior Adli Bin Mior Sallehhuddin	Regional Officer, Air Traffic Management ICAO Asia and Pacific Regional Office **THAILAND**
	72.	Mr. Weng Kit Ying	Air Traffic Management Officer ICAO Asia and Pacific Regional Office **THAILAND**
	73.	Mr. Tak Chuen Chui	AIM/ATM Officer ICAO Asia and Pacific Regional Office **THAILAND**
	74.	Dr. Trish Prakayphet Chalayonnawin	Programme Analysis Associate, Air Traffic Management ICAO Asia and Pacific Regional Office **THAILAND**

— — — — — — — —

LIST OF PAPERS

LIST OF WORKING PAPERS

NUMBER	AGENDA	TITLE	PRESENTED BY
WP/01	1	Provisional Agenda	Secretariat
WP/02	2	FIT-Asia Meeting Outcomes	Secretariat
WP/03	2	Outcomes of RASMAG-MAWG and RMACG Meetings	Chairperson
WP/04	3	RVSM Risk Assessment in the Brisbane, Honiara, Melbourne, Nauru, And Port Moresby Flight Information Regions, 1 January 2024 to 31 December 2024	AAMA
WP/05	3	RVSM Risk Assessment in the Jakarta and Ujung Pandang Flight Information Region, 1 January 2024 to 31 December 2024	AAMA
WP/06	3	2024 Analyses for the Transfer of Control Point Between Incheon FIR and Shanghai FIR, Hot Spot B1	PARMO
WP/07	3	Summary Of AKARA LHD Events and Progress on Sharing Mechanism	China RMA
WP/08	5	Sharing the Implementation Status of Safety Improvement Measures	Republic of Korea
WP/09	3	China RMA Vertical Safety Report	China RMA
WP/10	3	Classification of Four Events in Nanning Airspace as M-class LHD Incidents	China RMA
WP/11	3	JASMA Vertical Safety Report	JASMA
WP/12	3	PARMO Vertical Safety Monitoring Report 2024	PARMO
WP/13	3	2024 Central East Pacific Traffic Flow Assessment	PARMO
WP/14	3	MAAR Vertical Safety Report	MAAR
WP/15	3	JASMA Horizontal Safety Report	JASMA
WP/16	3	BOBASMA Horizontal Safety Monitoring Report	BOBASMA
WP/17	3	SEASMA Horizontal Safety Report	SEASMA
WP/18	3	PARMO Horizontal Safety Monitoring Report 2024	PARMO
WP/19	3	Asia/Pacific Consolidated Safety Report	MAAR
WP/20	4	RASMAG Safety Bulletin Issue 03	JASMA
WP/21	4	Incorporation of Human Factors Assessment Questionnaire (HFAQ) into the Guidance Material for Continued Safety Monitoring of Asia and Pacific RVSM Airspace	MAAR/SEASMA
WP/22	5	Classification and Reporting for Non-RVSM Approved Aircraft Operating in RVSM Airspace and Occurrences Caused by GNSS Radio Frequency Interference	MAAR
WP/23	5	AAMA Assessment of Non-RVSM Approved Aircraft	AAMA

NUMBER	AGENDA	TITLE	PRESENTED BY
WP/24	5	China RMA Approvals of Non-RVSM Aircraft in 2025	China RMA
WP/25	5	JASMA Assessment of Non-RVSM Approved Aircraft	JASMA
WP/26	5	MAAR Assessment of Non-RVSM Approved Aircraft	MAAR
WP/27	5	PARMO RVSM Traffic Compliance Monitoring	PARMO
WP/28	5	Management of Confirmed Non-RVSM Approved Aircraft	MAAR
WP/29	5	JASMA Assessment of Non-PBCS Approved Aircraft	JASMA
WP/30	5	AAMA LTHM Monitoring	AAMA
WP/31	5	China RMA LTHM Burden Estimate Update	China RMA
WP/32	5	JASMA LTHM Burden Estimate Update	JASMA
WP/33	5	PARMO RVSM Long Term Height Monitoring Burden	PARMO
WP/34	5	APAC Consolidated LTHM Compliance Status	MAAR
WP/35	5	Competent Airspace Safety Monitoring Organizations List	Secretariat
WP/36	6	ATM and Airspace Deficiencies List	Secretariat
WP/37	7	Airspace Safety Points of Contact	Secretariat
WP/38	8	RASMAG Terms of Reference and Task List	Secretariat
WP/39	2	Outcomes of CNS SG/29	Secretariat

LIST OF INFORMATION PAPERS

NUMBER	AGENDA	TITLE	PRESENTED BY
IP/1	-	List of Working Papers (WPs) and Information Papers (IPs)	Secretariat
IP/2	5	JASMA Post-Implementation Safety Assessment of the 12 Nm Lateral Separation Minima Using ATS Data Link Services in FUKUOKA FIR Oceanic Airspace	JASMA
IP/3	5	Large Lateral Deviation Reporting Criteria in Asia Pacific Region	SEASMA
IP/4	5	The result of the evaluation of AHMS for Height Monitoring	JASMA
IP/5	5	NAARMO RVSM Long Term Height Monitoring Burden	NAARMO
IP/6	5	ASE Case Studies highlighting the importance of Compliance with the LTHM Requirement	MAAR

LIST OF PRESENTATIONS

NUMBER	AGENDA	TITLE	PRESENTED BY
SP/1	5	APAC Consolidated LTHM Compliance Status (WP/34)	MAAR

LIST OF FLIMSIES

NUMBER	AGENDA	TITLE	PRESENTED BY
Flimsy/1	3	Elevated Mid-Air Collision (MAC) Risk in Reduced Vertical Separation Minima (RVSM) Airspace	United States
Flimsy/2	3	AAMA RVSM Vertical Safety Assessment: Further Analysis of Category E LHDS	AAMA

— — — — — — — —

2024 Asia Pacific Consolidated Safety Report

Thirtieth Meeting of the Regional Airspace Safety Monitoring Advisory Group

(RASMAG/30)

Bangkok, Thailand

14 – 17 July 2025

Prepared by APAC RMAs and EMAs

Outline

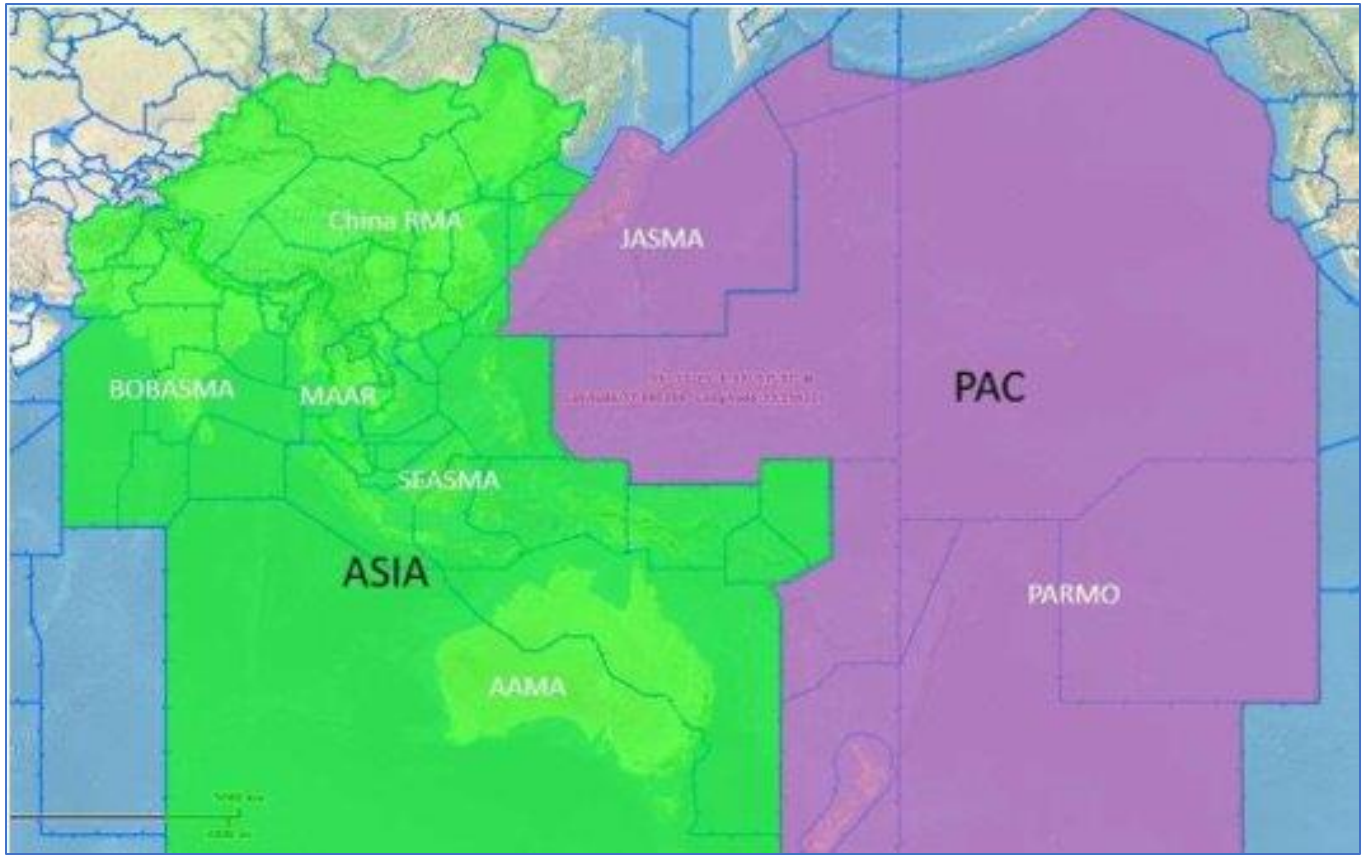
- Background
- PAC Area
  - Vertical Collision Risk Estimates and Summary of LHDs
  - Horizontal Collision Risk Estimates and Summary of LLDs and LLEs
  - Geolocations of LHDs/LLDs/LLEs
  - Hot Spots
- Asia Area
  - Vertical Collision Risk Estimates and Summary of LHDs
  - Horizontal Collision Risk Estimates and Summary of LLDs and LLEs
  - Geolocations of LHDs/LLDs/LLEs
  - Hot Spots
- Reporting Rate of LHDs/LLDs/LLEs
- Conclusion

Background

In 2019 (MAWG/6), APAC monitoring agencies agreed to consolidate key elements from their safety risk analysis into one report to give an overall picture of airspace safety risk in Asia Pacific.

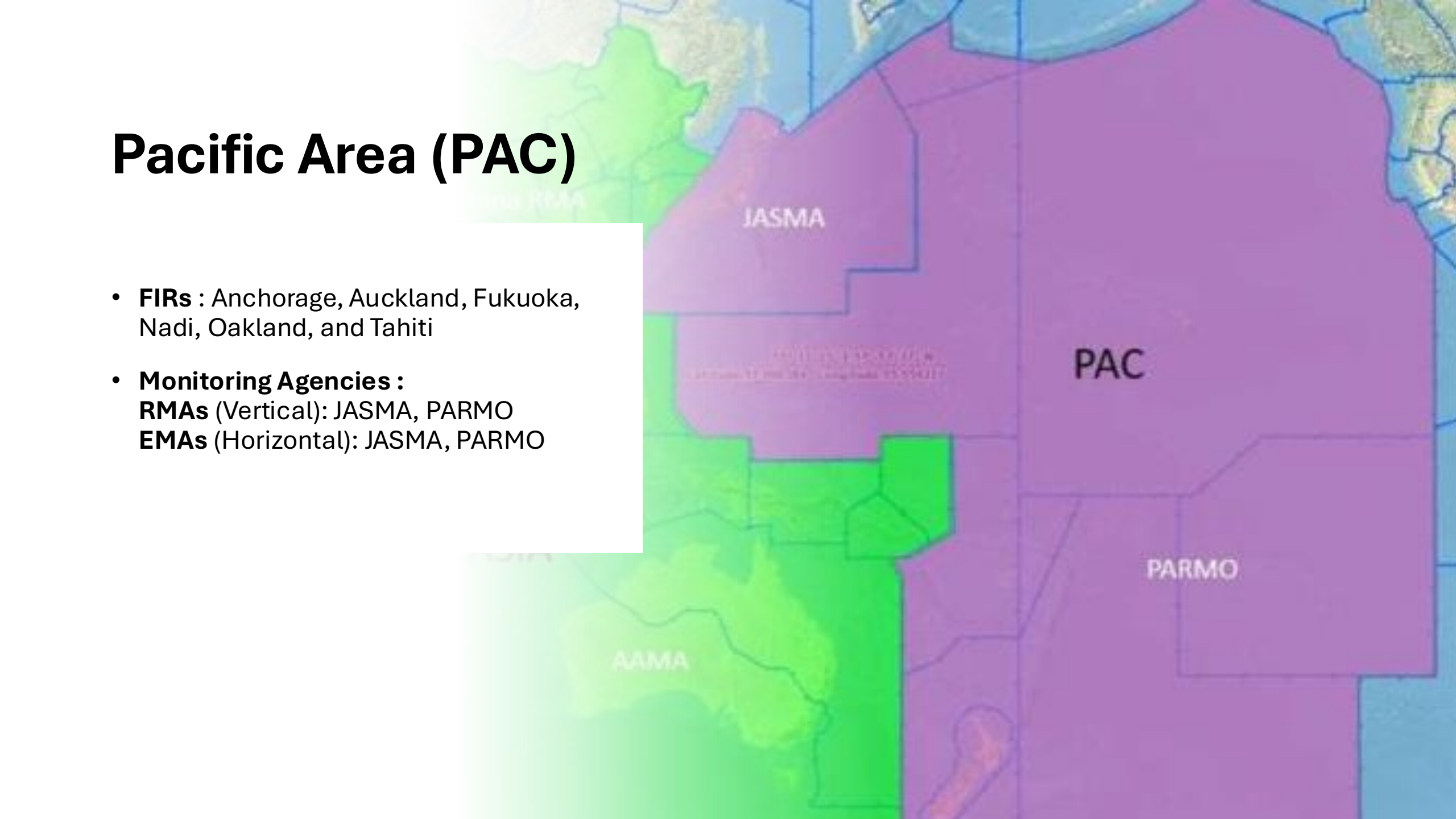
The report is divided into:

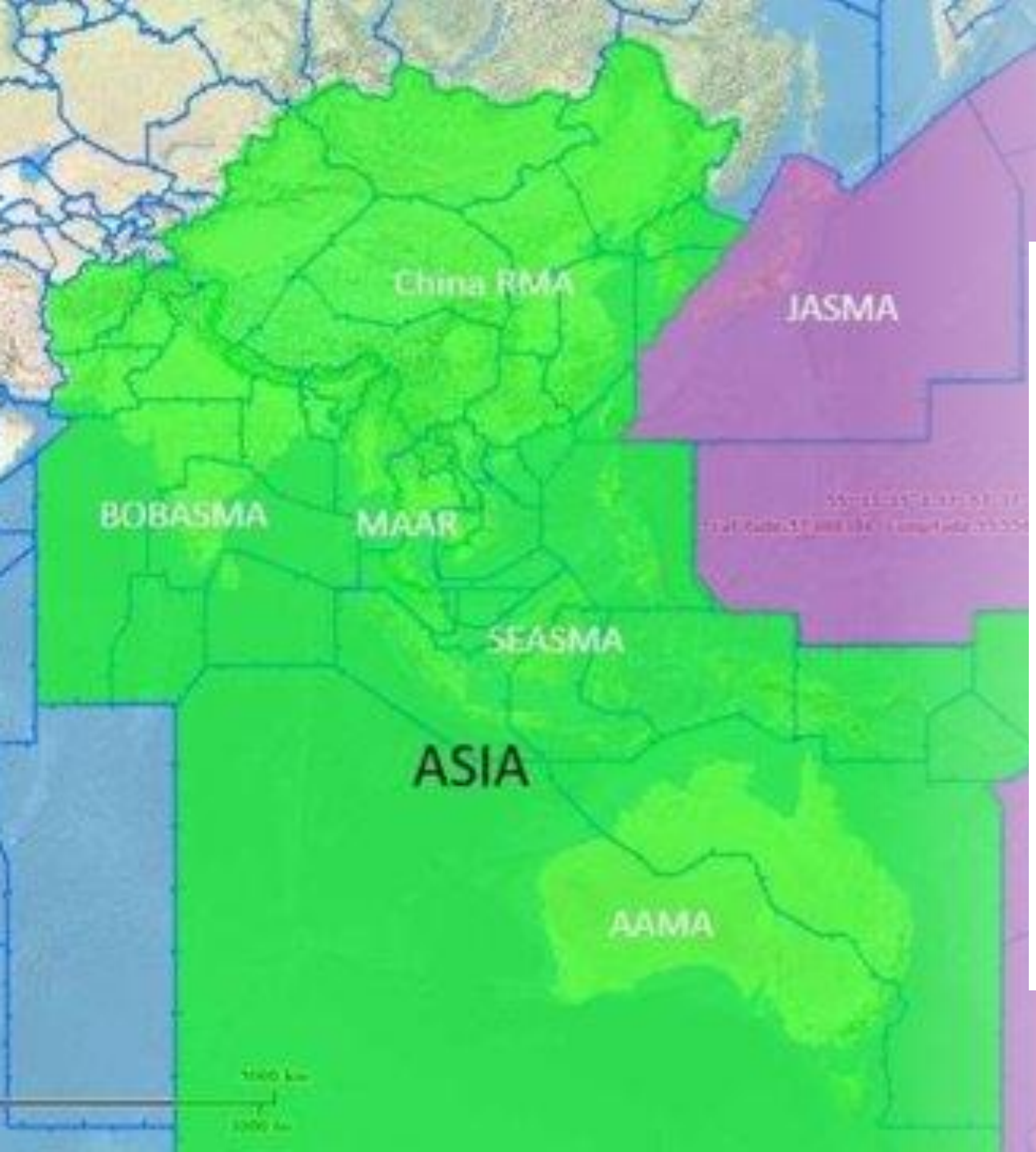
- **Pacific (PAC) Area**
- **Asia Area**



Pacific Area (PAC)

- **FIRs** : Anchorage, Auckland, Fukuoka, Nadi, Oakland, and Tahiti
- **Monitoring Agencies :**
  RMAs (Vertical): JASMA, PARMO
  EMAs (Horizontal): JASMA, PARMO





Asia Area (Asia)

- **FIRs** : Bangkok, Beijing, Brisbane, Chennai, Colombo, Dhaka, Delhi, Guangzhou, Hanoi, Ho Chi Minh, Hong Kong, Honiara, Incheon, Jakarta, Karachi, Kathmandu, Kolkata, Kota Kinabalu, Kuala Lumpur, Kunming, Lahore, Lanzhou, Male, Manila, Melbourne, Mumbai, Nauru, Phnom Penh, Port Moresby, Pyongyang, Sanya, Shanghai, Shenyang, Singapore, Taibei, Ujung Pandang, Ulaanbaatar, Urumqi, Vientiane, Wuhan, and Yangon
- **Monitoring Agencies :**
  RMAs (Vertical): AAMA, China RMA, MAAR, PARMO
  EMAs (Horizontal): BOBASMA, SEASMA

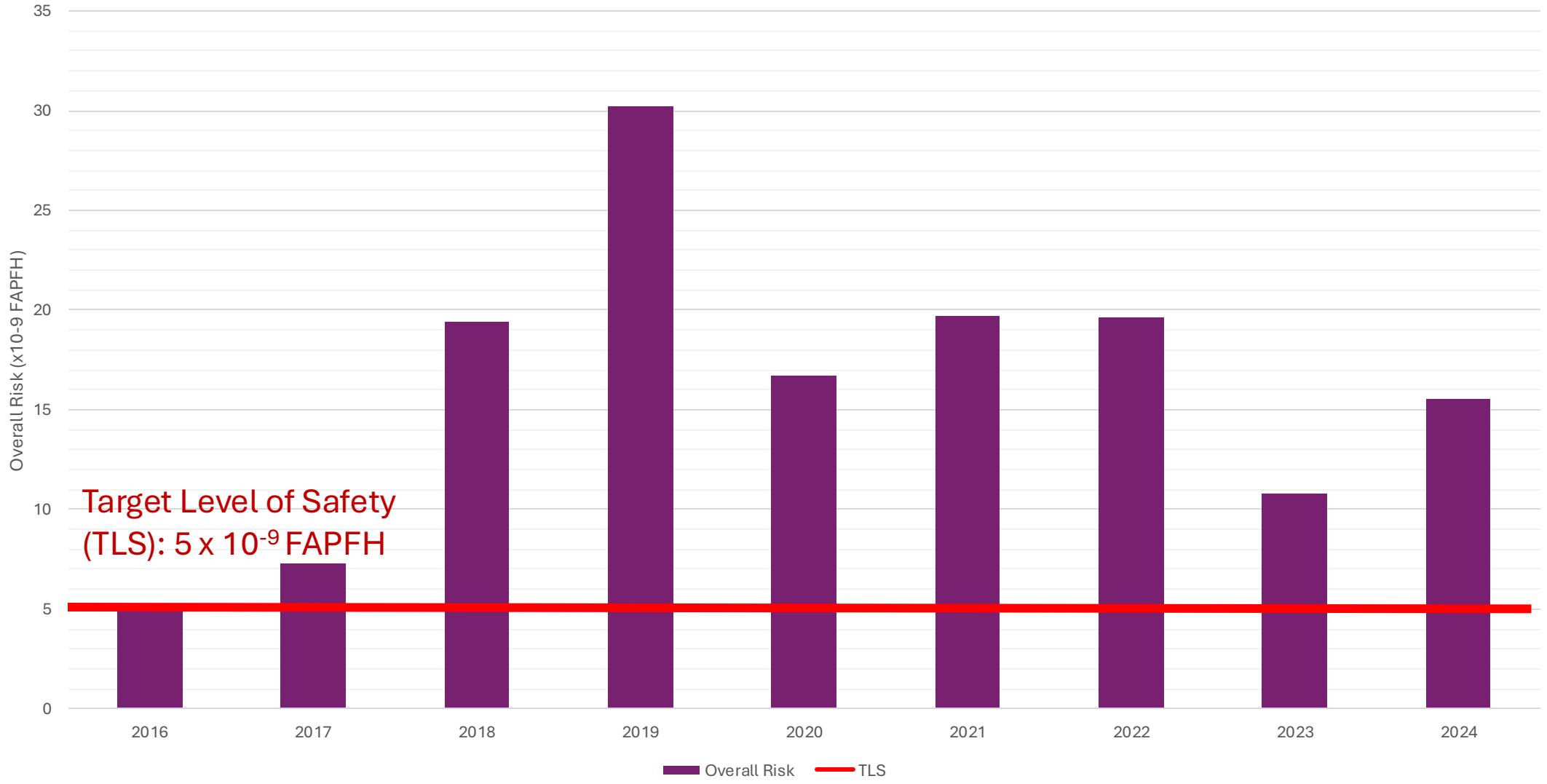
PAC : Vertical Collision Risk

PAC: Vertical Collision Risk Estimates

Annual flying hours: 3,727,882 hours/year

Risk Estimates		Remark
Vertical Technical Risk	0.20×10^{-9} FAPFH	Below Technical TLS
Vertical Operational Risk	15.33×10^{-9} FAPFH	
Vertical Overall Risk	15.53×10^{-9} FAPFH	Above TLS

PAC: Vertical Collision Risk Estimates



PAC: Summary of LHDs

Attributions	Category Code	Description	Number of Occurrences	Duration (minutes)	Number of Levels Crossed
Aircrew/ Pilot	A	Flight crew failing to climb/descend the aircraft as cleared	7	5	3
	B	Flight crew climbing/descending without ATC Clearance	27	45	31
	C	Incorrect operation or interpretation of airborne equipment	4	352	6
ATC	D	ATC system loop error	6	67	3
	E	Coordination errors in the ATC-to-ATC transfer of control responsibility as a result of human factors issues	55	442	1
	F	Coordination errors in the ATC-to-ATC transfer of control responsibility as a result of equipment outage or technical issues	4	108	0

PAC: Summary of LHDs

Attributions	Category Code	Description	Number of Occurrences	Duration (minutes)	Number of Levels Crossed
Aircraft/ Avionics/ Contingencies	G	Aircraft contingency event leading to sudden inability to maintain assigned flight level	1	28	25
	H	Airborne equipment failure leading to unintentional or undetected change of flight level	1	1	0
Weather/ Turbulence	I	Turbulence or other weather-related causes leading to unintentional or undetected change of flight level	15	48	4
TCAS	J	TCAS resolution advisory, flight crew correctly climb or descend following the resolution advisory	17	23	0
	K	TCAS resolution advisory, flight crew incorrectly climb or descend following the resolution advisory	0	0	0
Other	L	An aircraft being provided with RVSM separation is not RVSM approved	0	0	0
	M	Other	2	0	2
		Total	**139**	**1,119**	**75**

PAC : Horizontal Collision Risk

PAC: Horizontal Collision Risk Estimates

Annual flying hours: 2,069,133 hours/year

2024 Horizontal Risk Estimates		Remark
Total Lateral Risk	1.22×10^{-9} FAPFH	Below TLS
Total Longitudinal Risk	0.014×10^{-9} FAPFH	Below TLS
2023 Horizontal Risk Estimates		**Remark**
Total Lateral Risk	0.24×10^{-9} FAPFH	Below TLS
Total Longitudinal Risk	0.038×10^{-9} FAPFH	Below TLS

Note: JASMA's longitudinal risk estimates include values based on both the 30 NM and 10-minute separation standards. However, the PAC's total longitudinal risk value is based on the 30 NM separation standard.

PAC: Summary of LLDs and LLEs

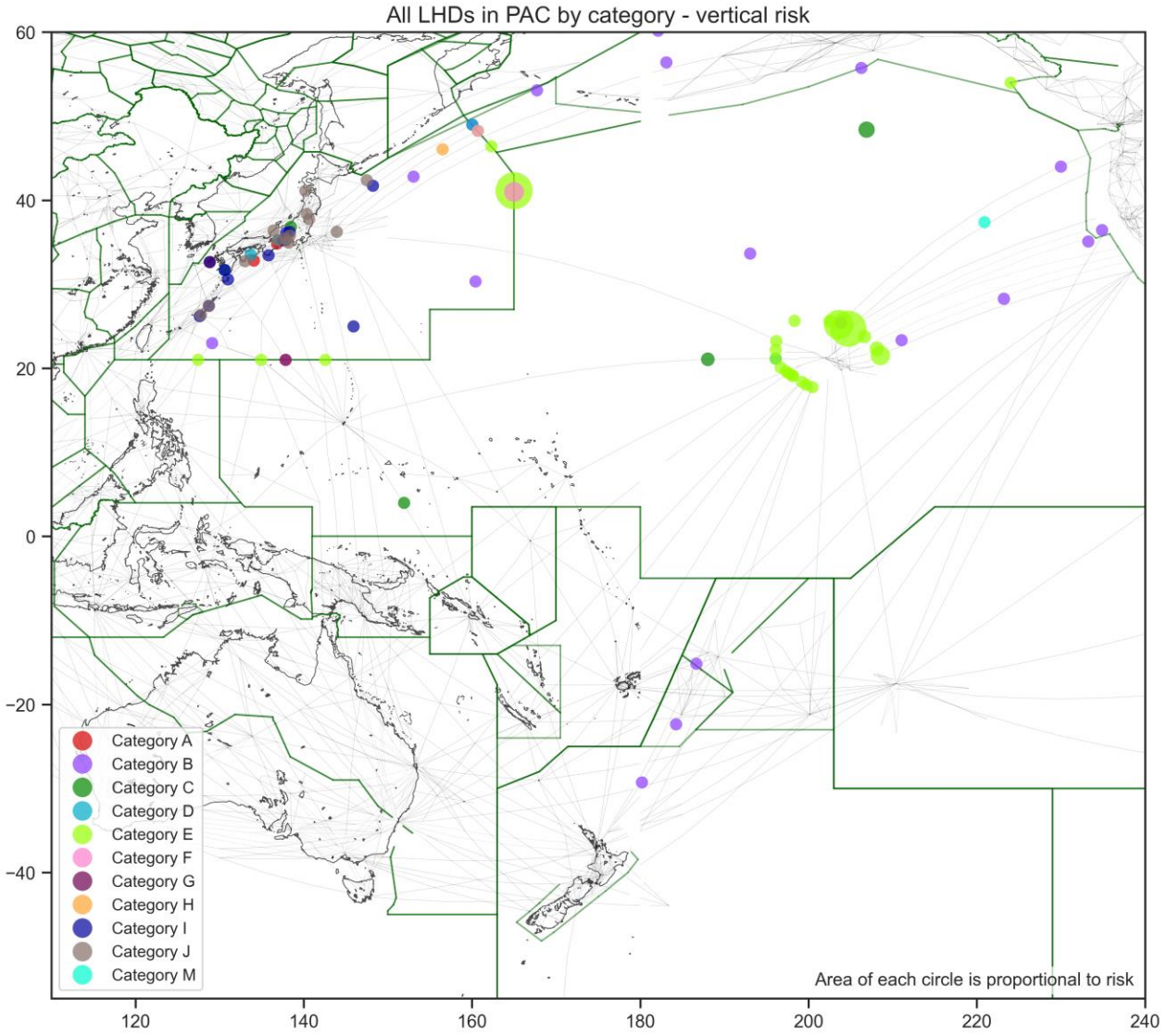
Attributions	Category Code	Description	Number of Occurrences	Duration (minutes)	Horizontal Deviation (NM)
Aircrew/ Pilot	A	Flight crew deviate without ATC Clearance	27	69	1100
	B	Incorrect estimate or route provided due to incorrect operation or interpretation of airborne equipment	12	438	93
	C	Flight crew waypoint insertion error, due to correct entry of incorrect position or incorrect entry of correct position	9	162	420
ATC	D	ATC system loop error	5	64	5
	E	Coordination errors in the ATC-to-ATC transfer of control responsibility as a result of human factors issues	107	1176	151
	F	Coordination errors in the ATC-to-ATC transfer of control responsibility as a result of equipment outage or technical issues	2	58	50

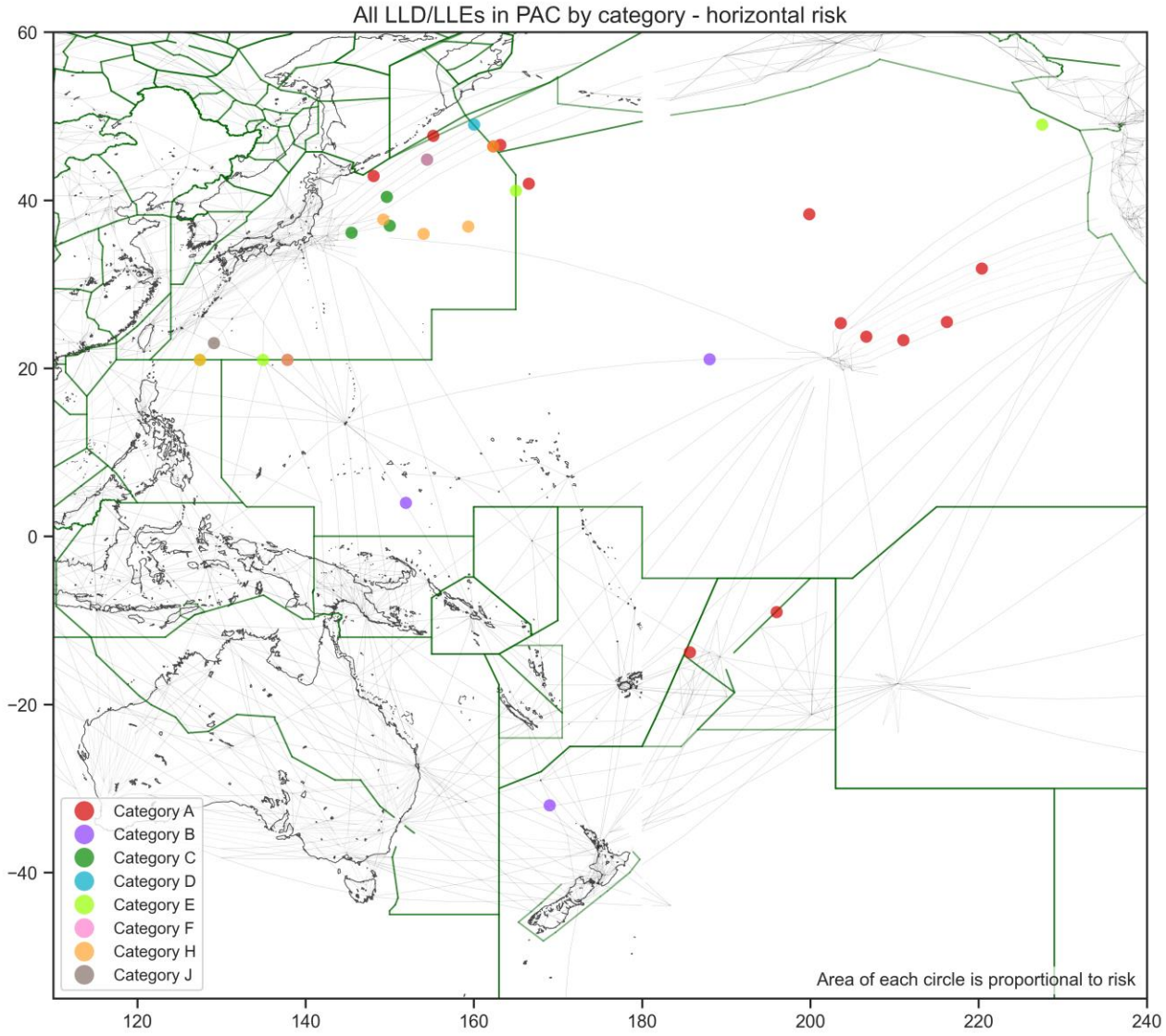
PAC: Summary of LLDs and LLEs

Attributions	Category Code	Description	Number of Occurrences	Duration (minutes)	Horizontal Deviation (NM)
Aircraft/ Avionics/ Contingencies	G	Navigation errors due to airborne equipment failure	0	0	0
Weather/ Turbulence	H	Turbulence or other weather-related causes leading to a deviation in the horizontal dimension	8	106	166
Other	I	An aircraft was provided with reduced horizontal separation minima but did not meet the RNP/RSP/RCP specification;	0	0	0
	J	Other	1	12	30
		Total	**171**	**2085**	**2015**

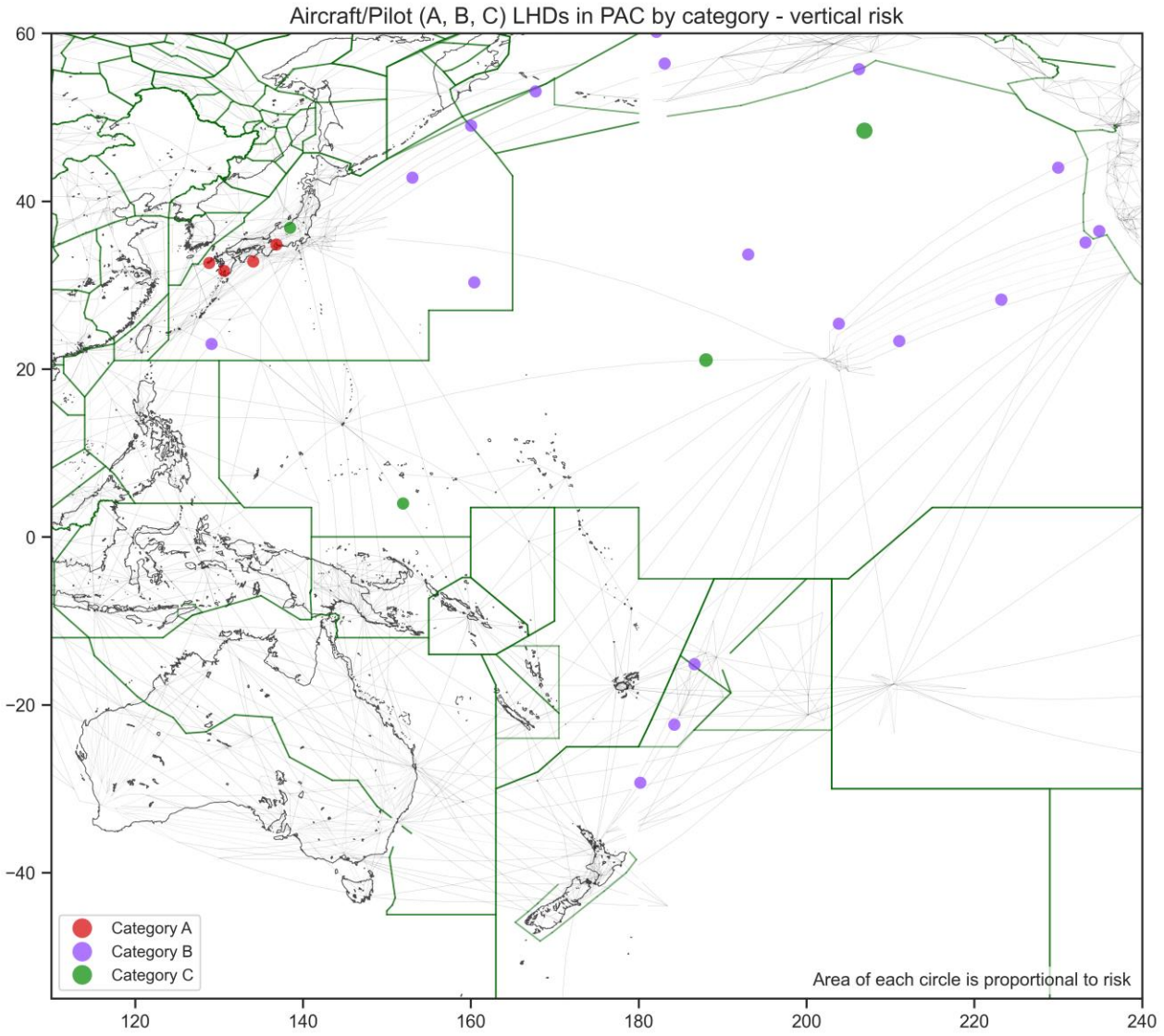
PAC : Geolocation of LHDs/LLDs/LLEs

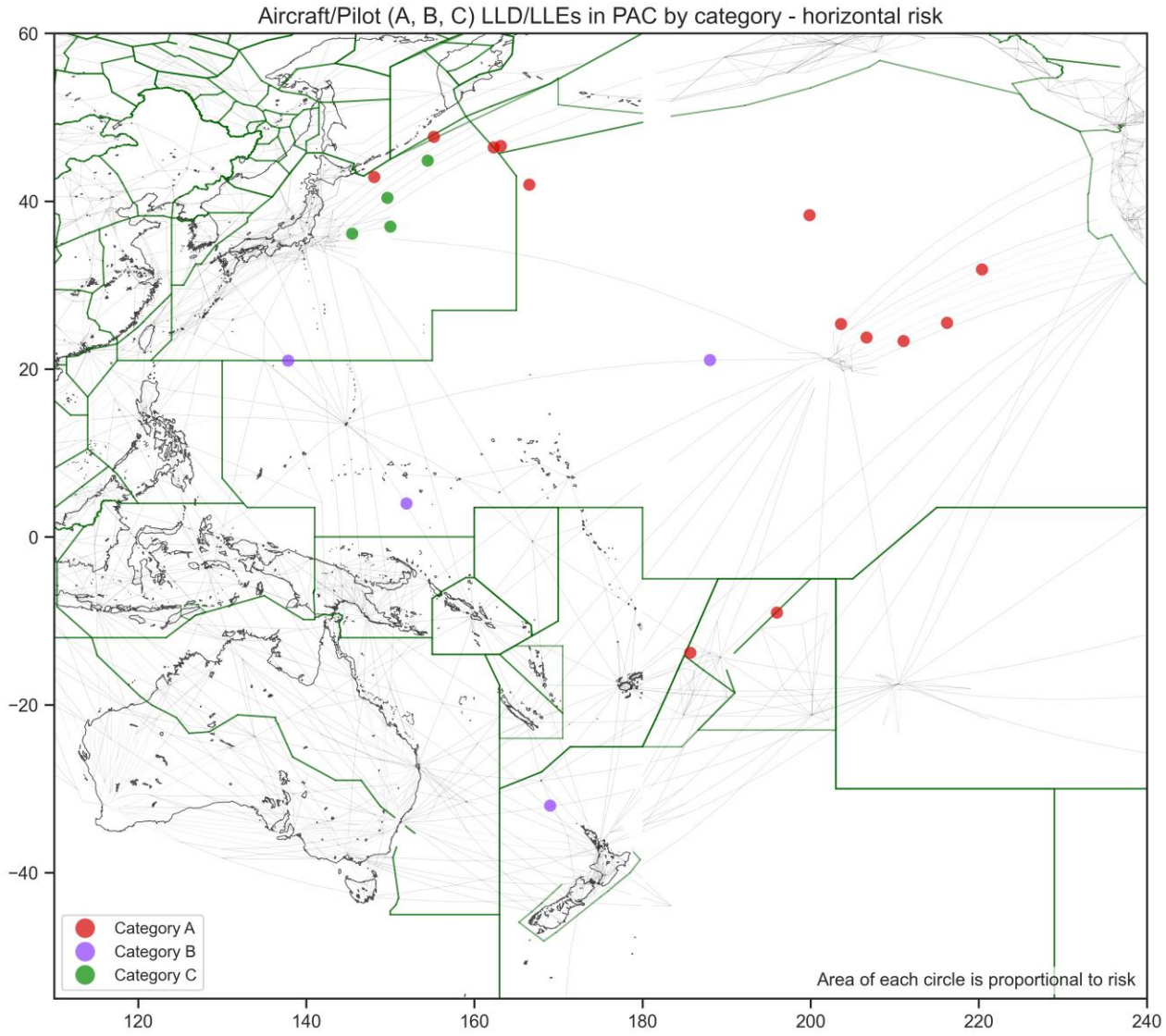
PAC: All Categories



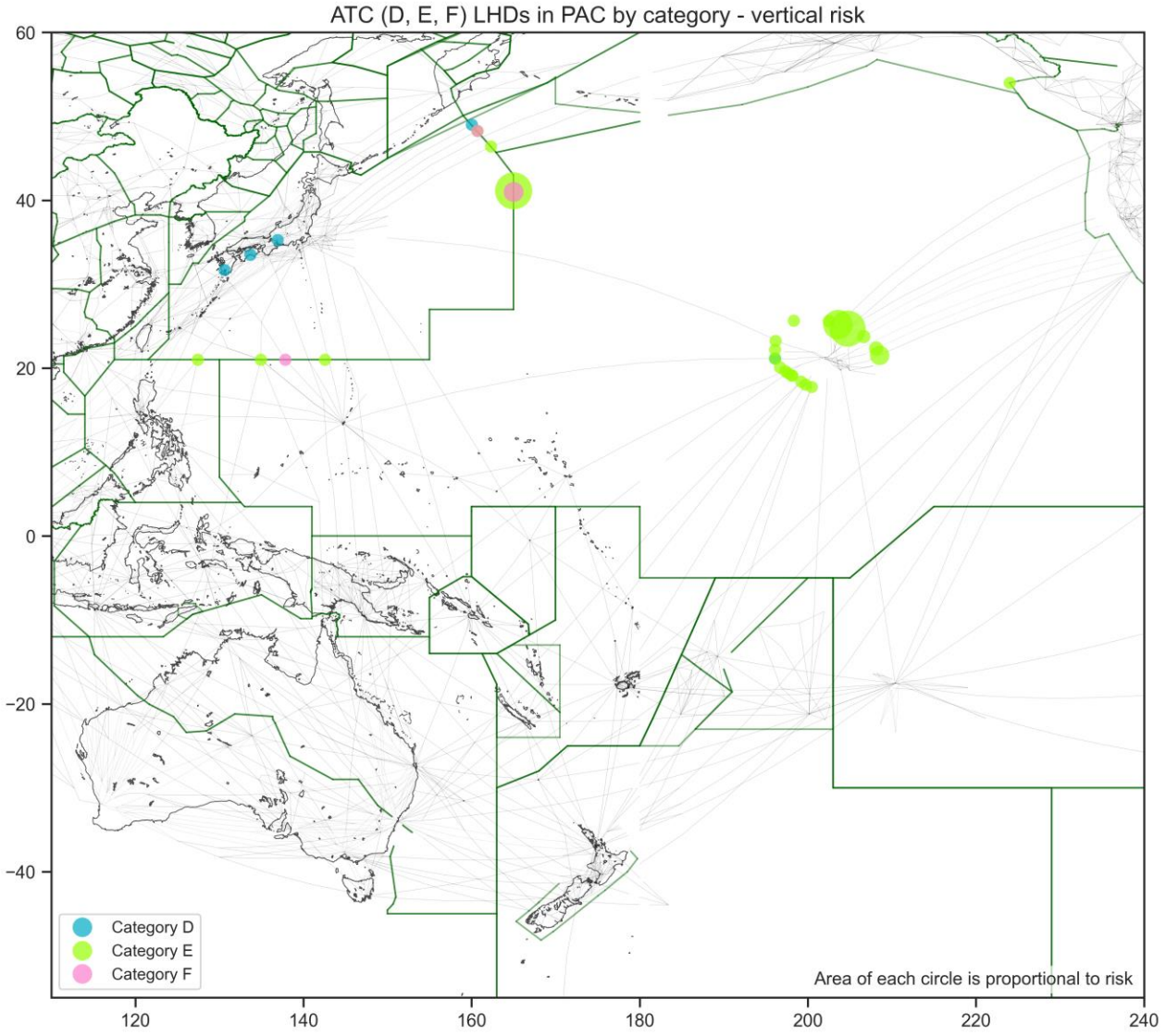


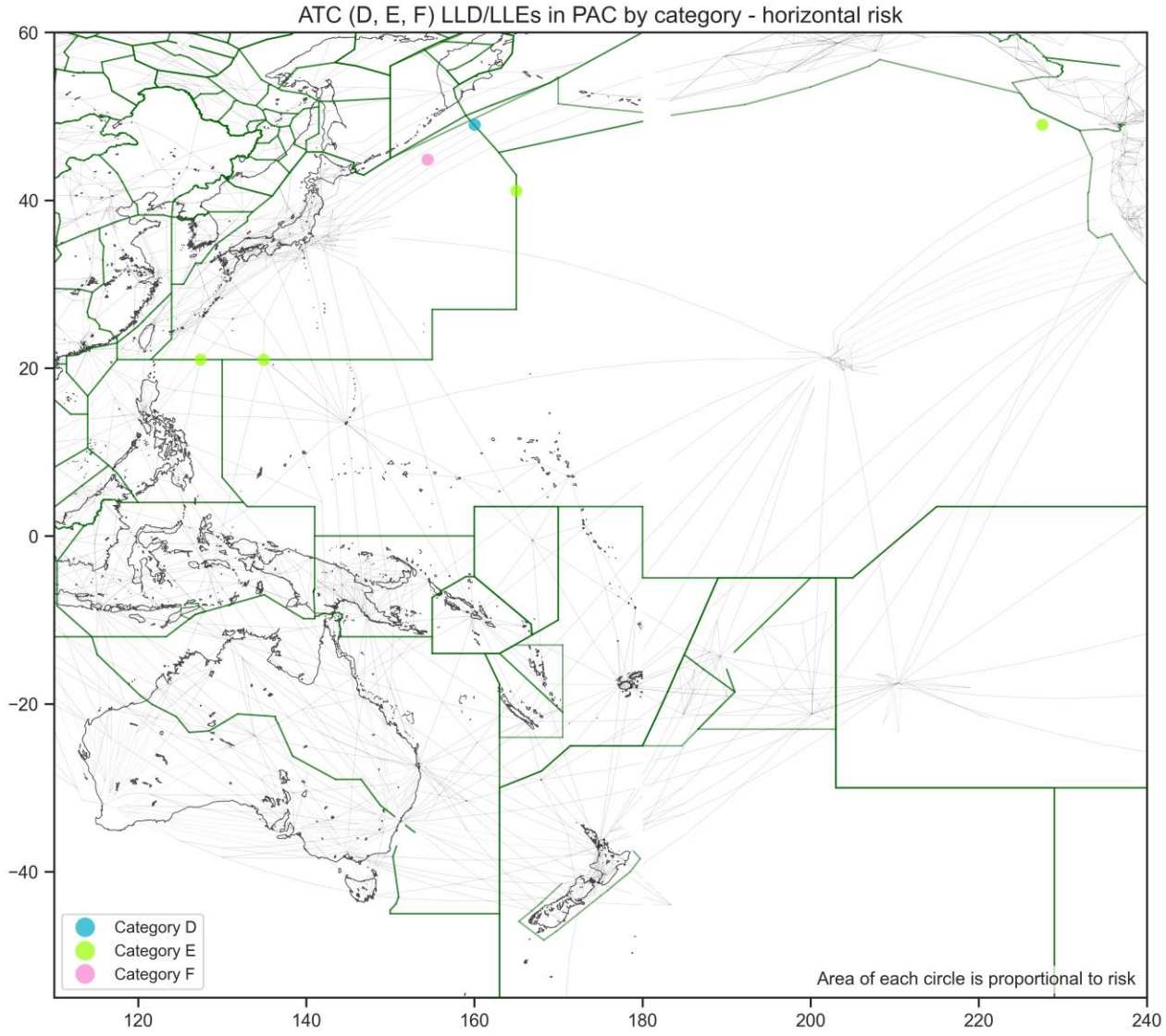
PAC: Aircrew/Pilot (A, B, C)





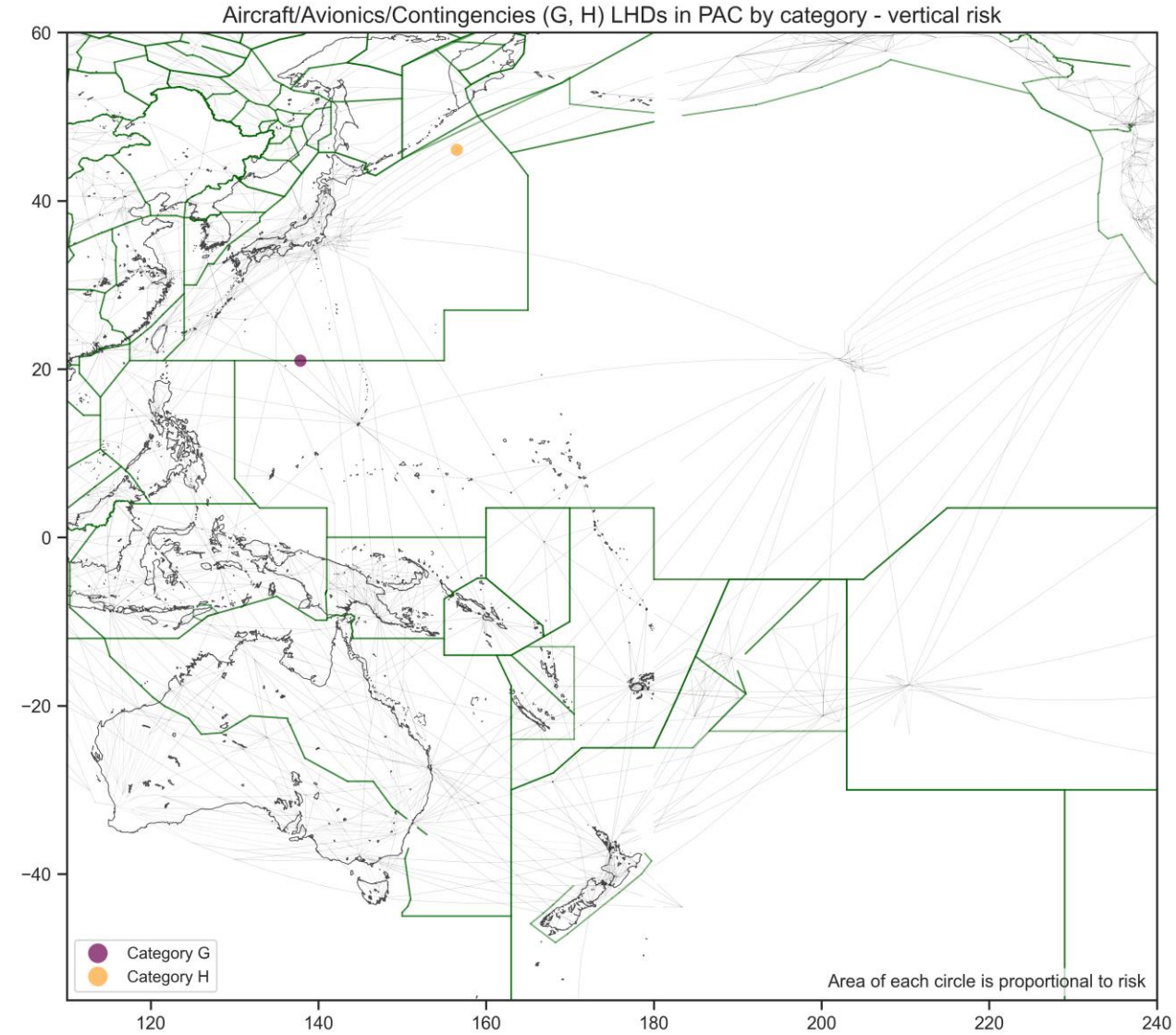
PAC: ATC (D, E, F)

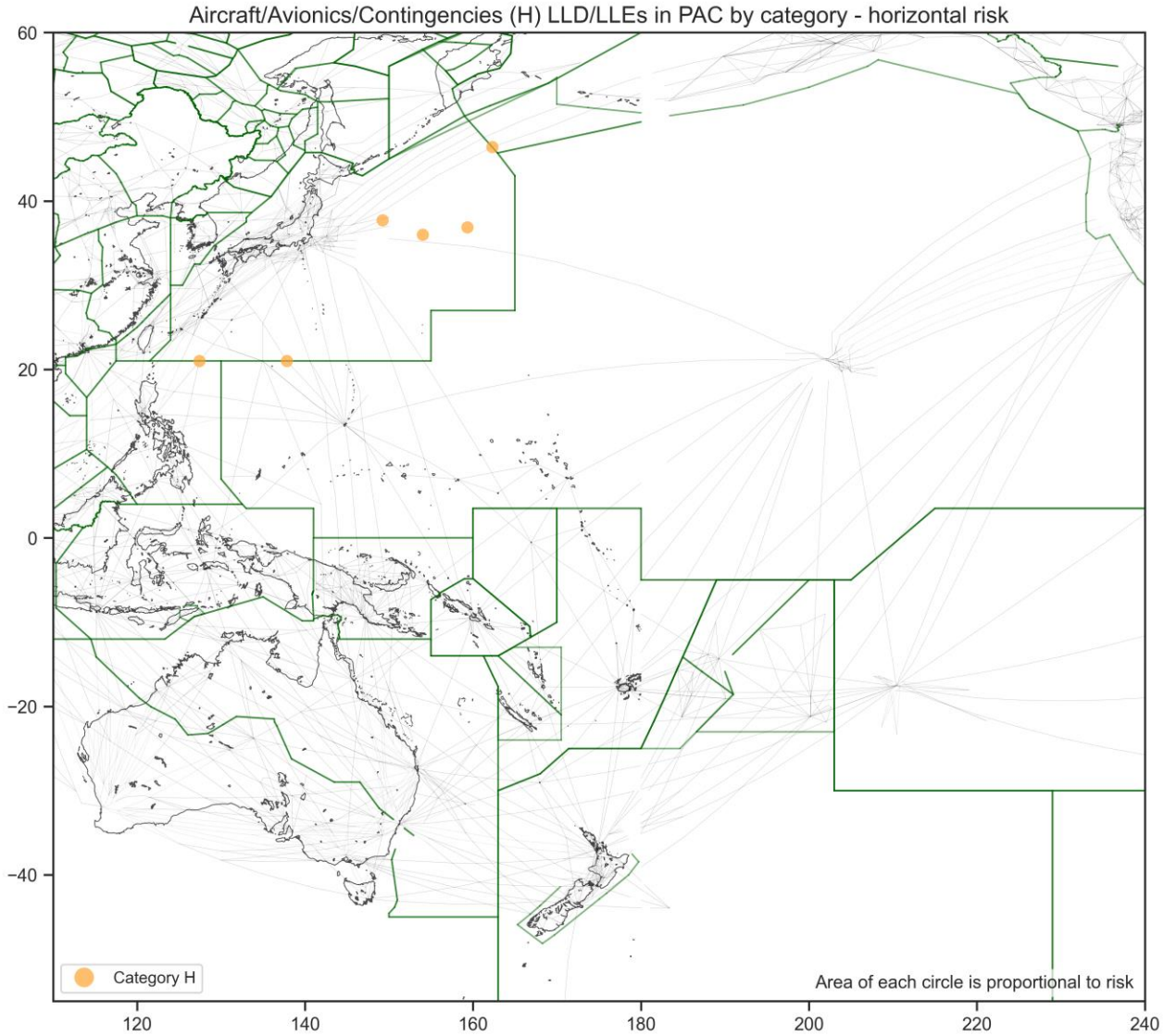

ATC (D, E, F) LHDs in PAC by category - vertical risk
60
40
20
0
−20
−40
120
140
160
180
200
220
240
Category D
Category E
Category F
Area of each circle is proportional to risk


ATC (D, E, F) LLD/LLEs in PAC by category - horizontal risk
60
40
20
0
−20
−40
120
140
160
180
200
220
240
Category D
Category E
Category F
Area of each circle is proportional to risk

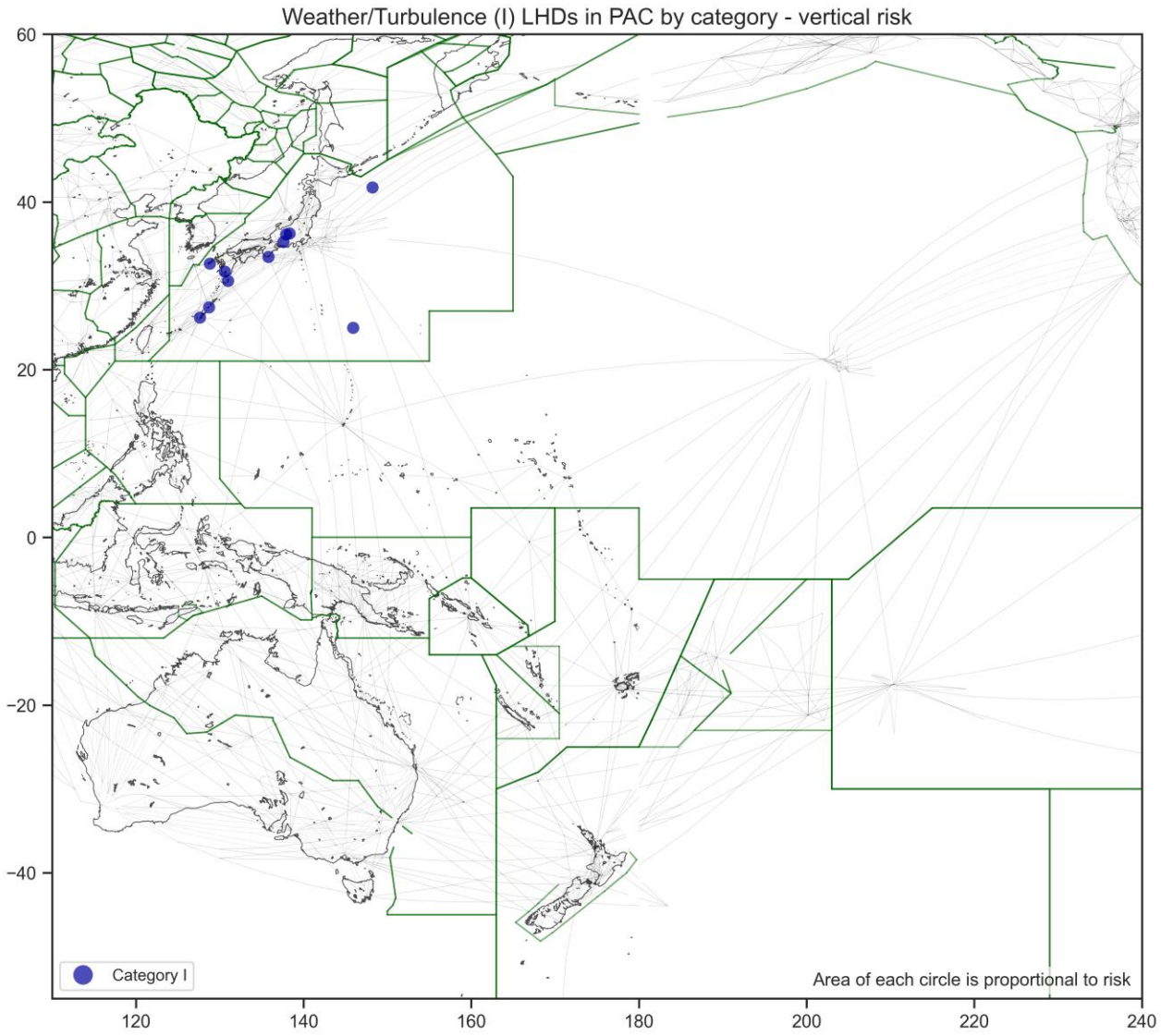
PAC: Aircraft Avionics/Contingencies

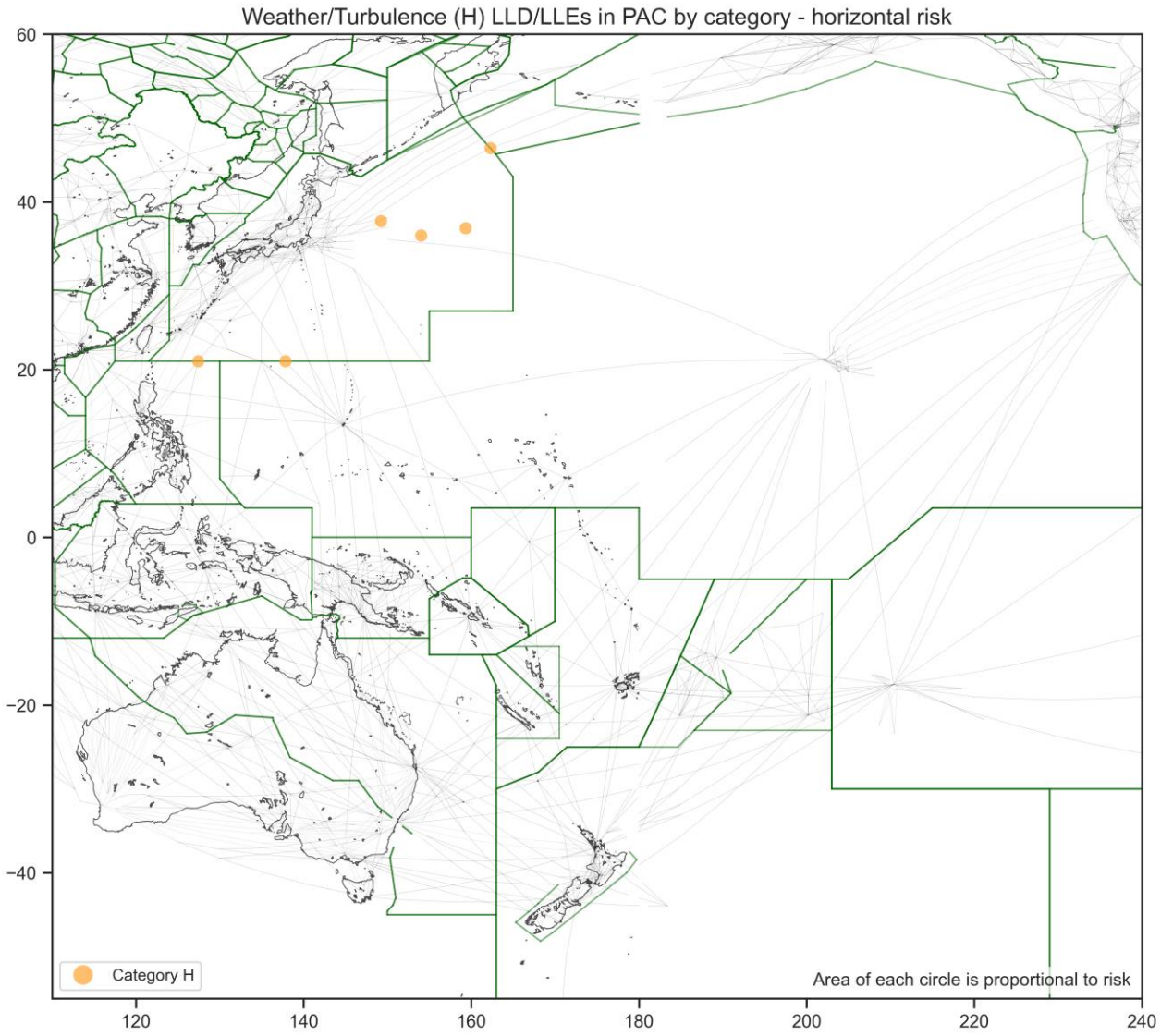
(LHD:G,H, LLD/LLE:H)



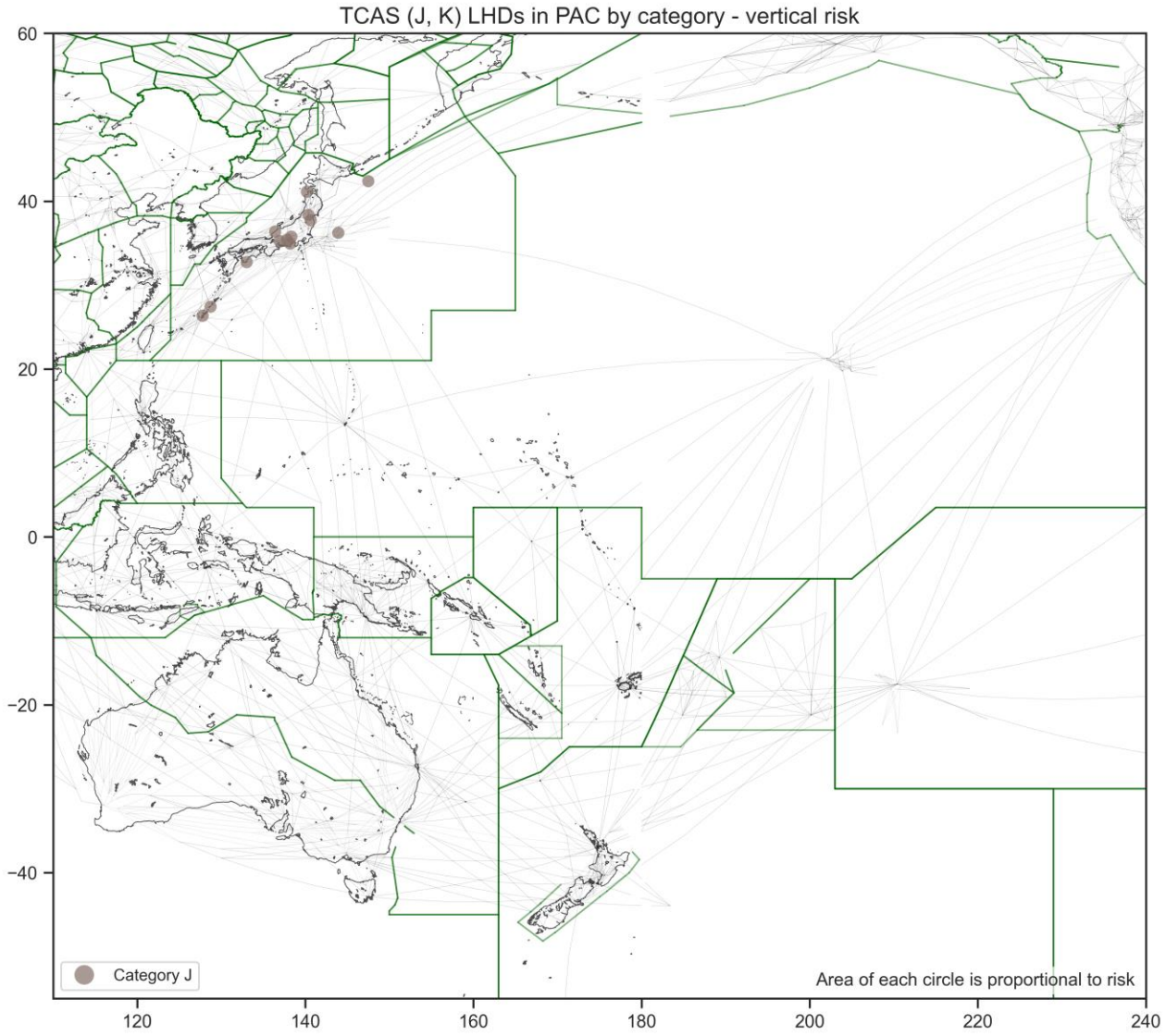


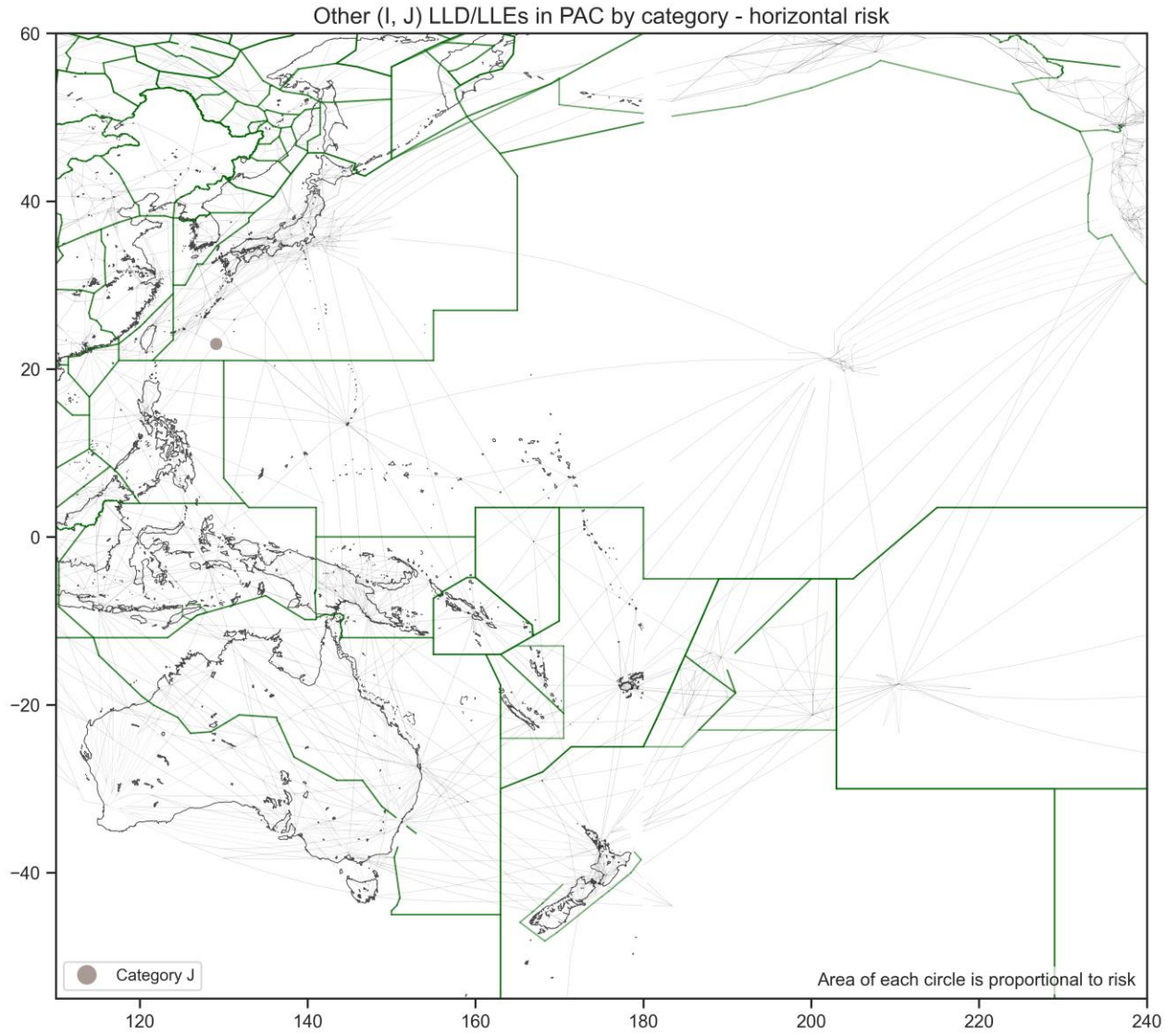
PAC: Weather/Turbulence (LHD:I, LLD/LLE:H)





PAC: TCAS (LHD:J, K, LLD/LLE:I,J)





PAC : Hot Spots

PAC: LHD Hot Spot N (Hawaii CEP/Oakland USA)

Nature of Occurrences: Coordination errors as a result of human factors issues (Category E)

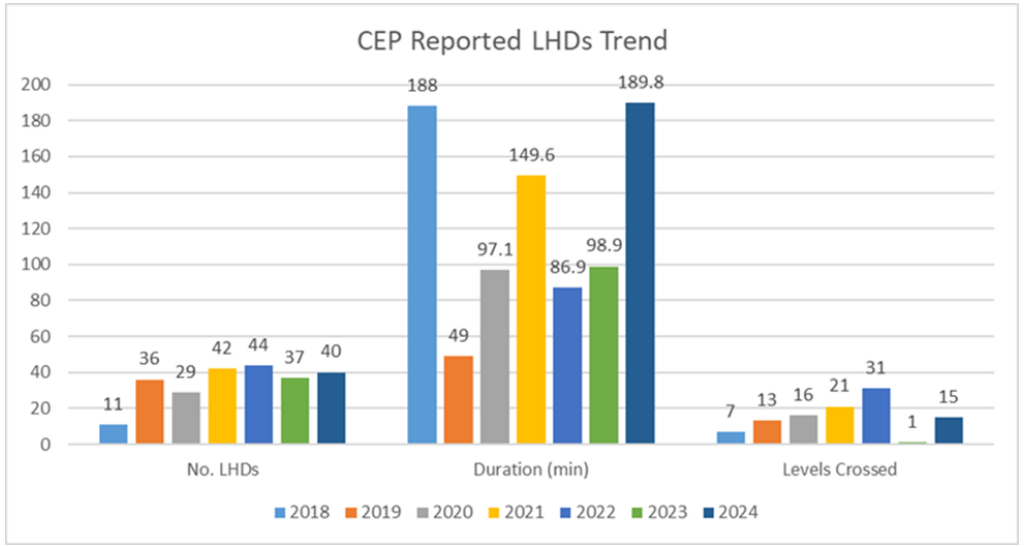
Contributing Factors : High-volume Central East Pacific (CEP) traffic flow and the user-preferred routes that cross the CEP airways.

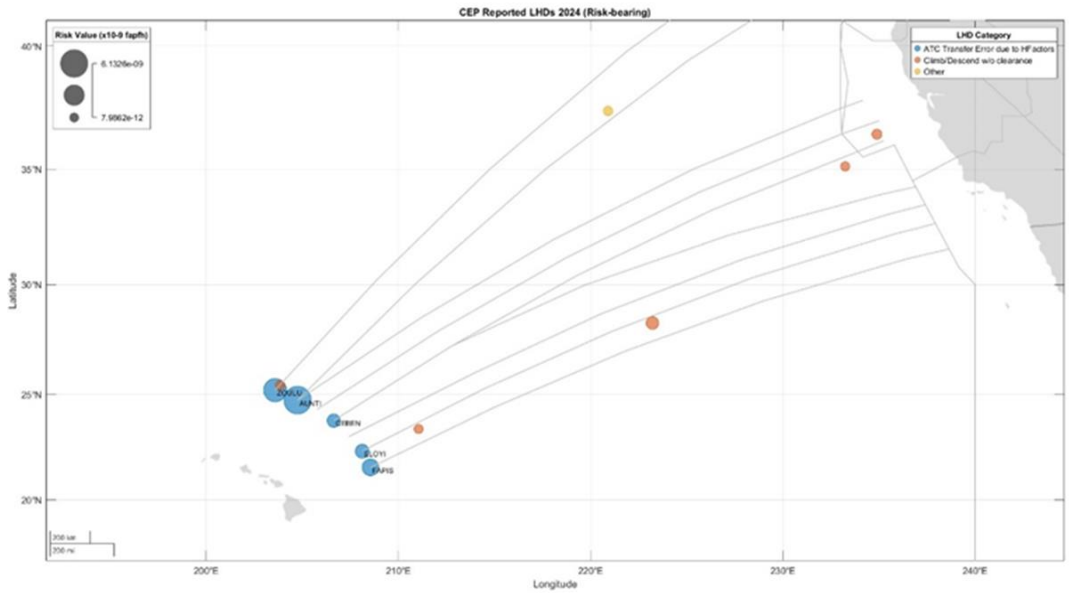
Trend: The number of LHDs in 2024 remained consistent with previous years.

Mitigations: Oakland ARTCC and Honolulu Control Facility (HCF) have developed mitigation procedures. The long term mitigation is a new ATC system scheduled to be implemented at the HCF in 2027.

Result from the hot spot identification process:

Hot Spot N remains on the list of hot spots and should continue to be monitored until the LHDs and risk are decreased and further safety improvement initiatives are implemented.





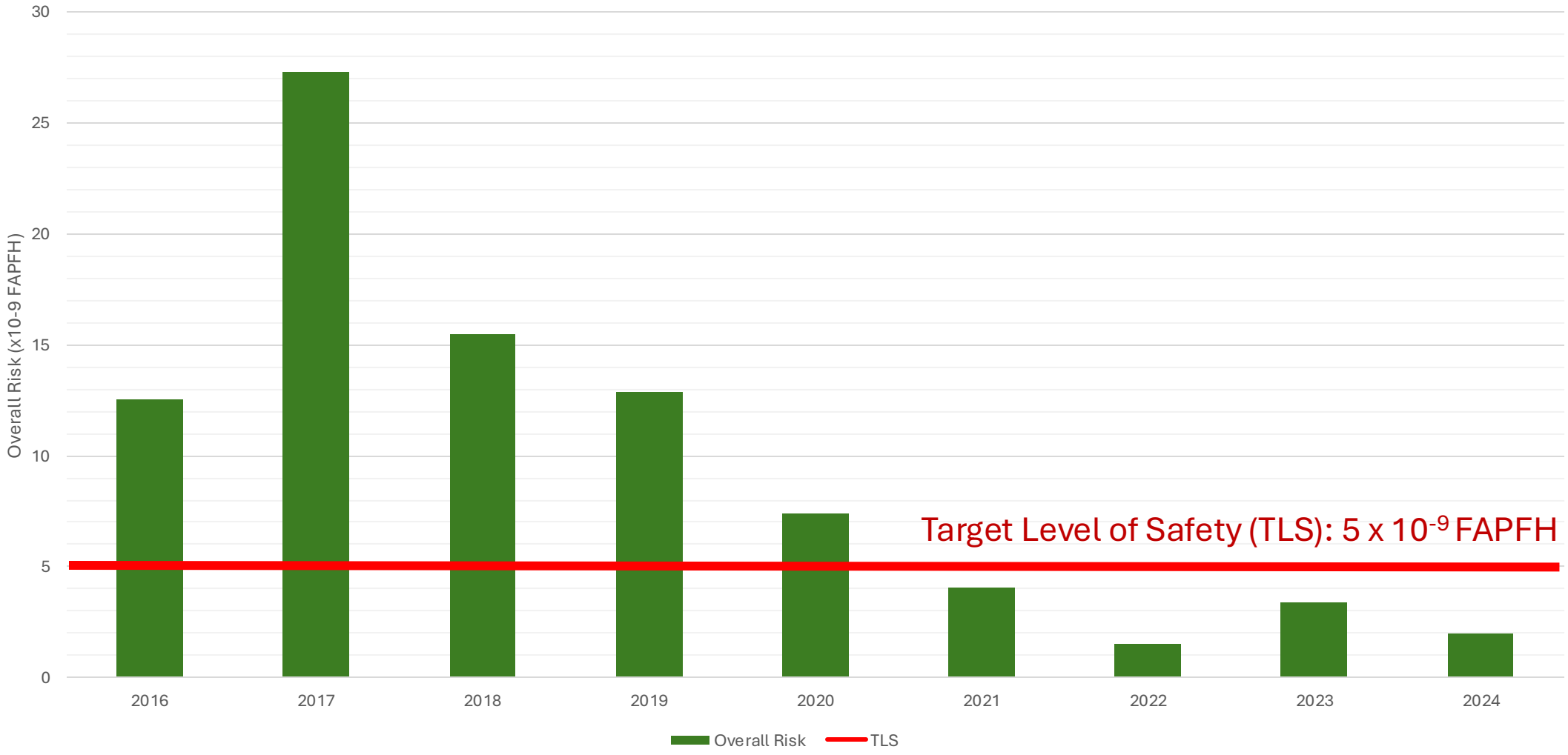
ASIA : Vertical Collision Risk

ASIA: Vertical Collision Risk Estimates

2024 Annual flying hours: 11,413,712 hours/year

Vertical Risk Estimates		Remark
Vertical Technical Risk	0.70×10^{-9} FAPFH	Below Technical TLS
Vertical Operational Risk	1.29×10^{-9} FAPFH	
Vertical Overall Risk	1.99×10^{-9} FAPFH	Below TLS

ASIA: Vertical Collision Risk Estimates



ASIA: Summary of LHDs

Attributions	Category Code	Description	Number of Occurrences	Duration (minutes)	Number of Levels Crossed
Aircrew/ Pilot	A	Flight crew failing to climb/descend the aircraft as cleared	22	6	15.5
	B	Flight crew climbing/descending without ATC Clearance	26	12	21.1
	C	Incorrect operation or interpretation of airborne equipment	19	4	14.5
ATC	D	ATC system loop error	14	6	9.5
	E	Coordination errors in the ATC-to-ATC transfer of control responsibility as a result of human factors issues	488	156	80.3
	F	Coordination errors in the ATC-to-ATC transfer of control responsibility as a result of equipment outage or technical issues	13	3	1

ASIA: Summary of LHDs

Attributions	Category Code	Description	Number of Occurrences	Duration (minutes)	Number of Levels Crossed
Aircraft/ Avionics/ Contingencies	G	Aircraft contingency event leading to sudden inability to maintain assigned flight level	4	4	9
	H	Airborne equipment failure leading to unintentional or undetected change of flight level	2	0	2
Weather/ Turbulence	I	Turbulence or other weather-related causes leading to unintentional or undetected change of flight level	58	2	57.3
TCAS	J	TCAS resolution advisory, flight crew correctly climb or descend following the resolution advisory	16	1	12
	K	TCAS resolution advisory, flight crew incorrectly climb or descend following the resolution advisory	0	0	0
Other	L	An aircraft being provided with RVSM separation is not RVSM approved	0	0	0
	M	Other	101	16	3
		Total	**763**	**210**	**225.2**

ASIA : Horizontal Collision Risk

ASIA : Horizontal Collision Risk Estimates

2024 Annual flying hours: 789,118 hours/year

2024 Horizontal Risk Estimates		Remark
Total Lateral Risk	1.54×10^{-9} FAPFH	Below TLS
Total Longitudinal Risk	1.62×10^{-9} FAPFH	Below TLS
2023 Horizontal Risk Estimates		**Remark**
Total Lateral Risk	1.517×10^{-9} FAPFH	Below TLS
Total Longitudinal Risk	4.444×10^{-9} FAPFH	Below TLS

ASIA : Summary of LLDs and LLEs

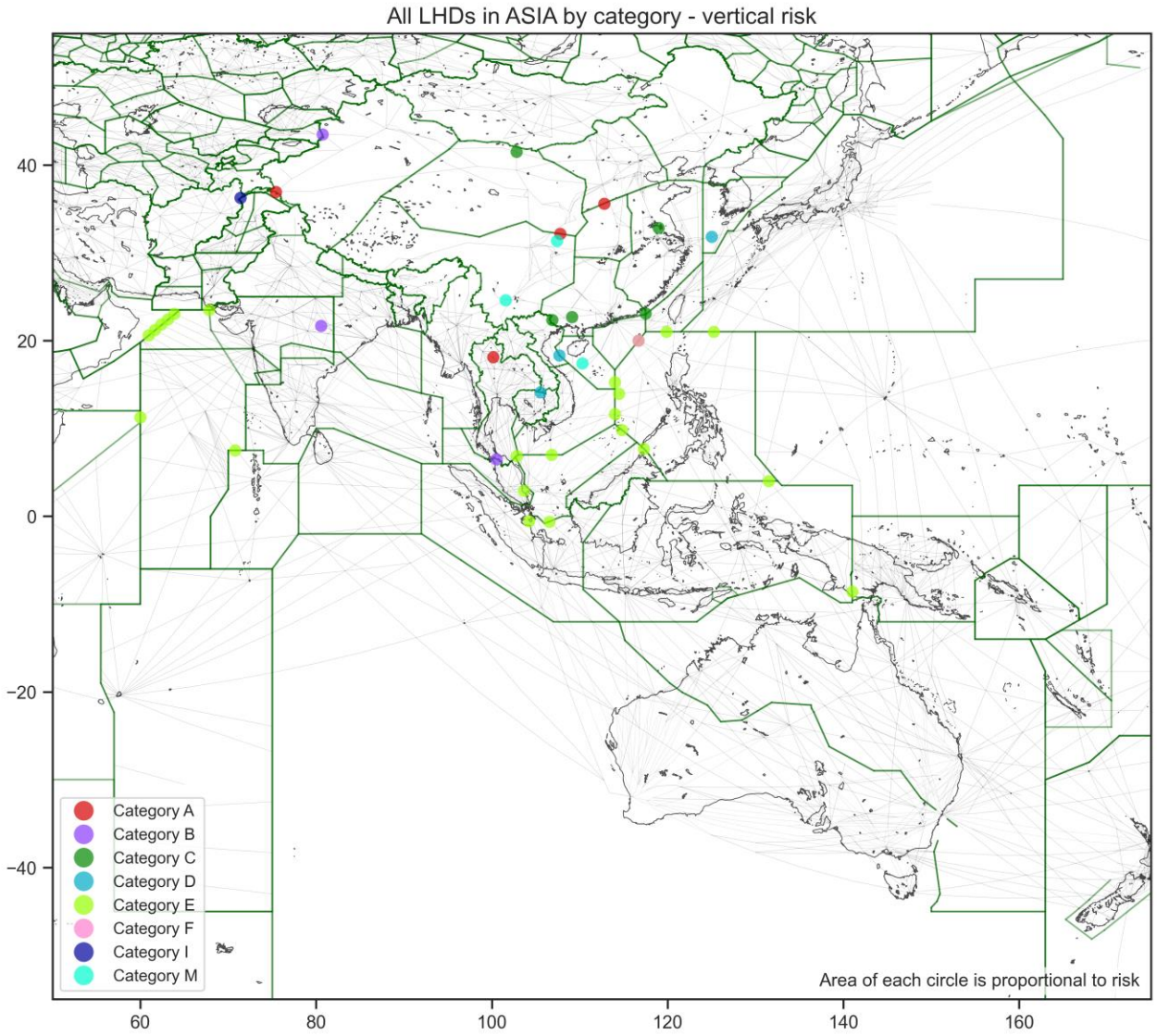
Attributions	Category Code	Description	Number of Occurrences	Duration (minutes)	Horizontal Deviation (NM)
Aircrew/ Pilot	A	Flight crew deviate without ATC Clearance	0	0	0
	B	Incorrect estimate or route provided due to incorrect operation or interpretation of airborne equipment	0	0	0
	C	Flight crew waypoint insertion error, due to correct entry of incorrect position or incorrect entry of correct position	0	0	0
ATC	D	ATC system loop error	0	0	0
	E	Coordination errors in the ATC-to-ATC transfer of control responsibility as a result of human factors issues	3	0	114
	F	Coordination errors in the ATC-to-ATC transfer of control responsibility as a result of equipment outage or technical issues	0	0	0

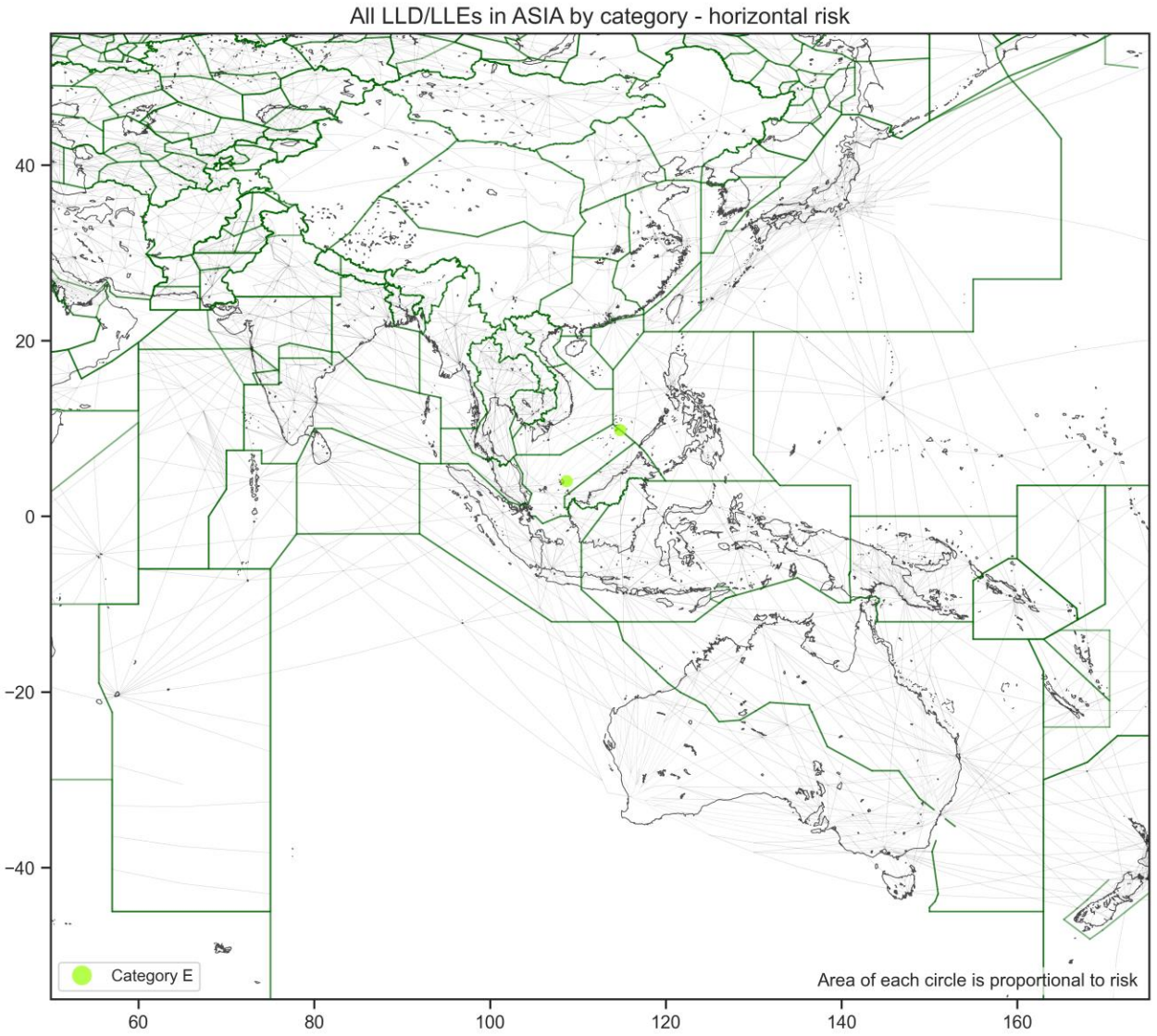
ASIA : Summary of LLDs and LLEs

Attributions	Category Code	Description	Number of Occurrences	Duration (minutes)	Horizontal Deviation (NM)
Aircraft/ Avionics/ Contingencies	G	Navigation errors due to airborne equipment failure	0	0	0
Weather/ Turbulence	H	Turbulence or other weather-related causes leading to a deviation in the horizontal dimension	0	0	0
Other	I	An aircraft was provided with reduced horizontal separation minima but did not meet the RNP/RSP/RCP specification;	0	0	0
	J	Other	0	0	0
		Total	**3**	**0**	**114**

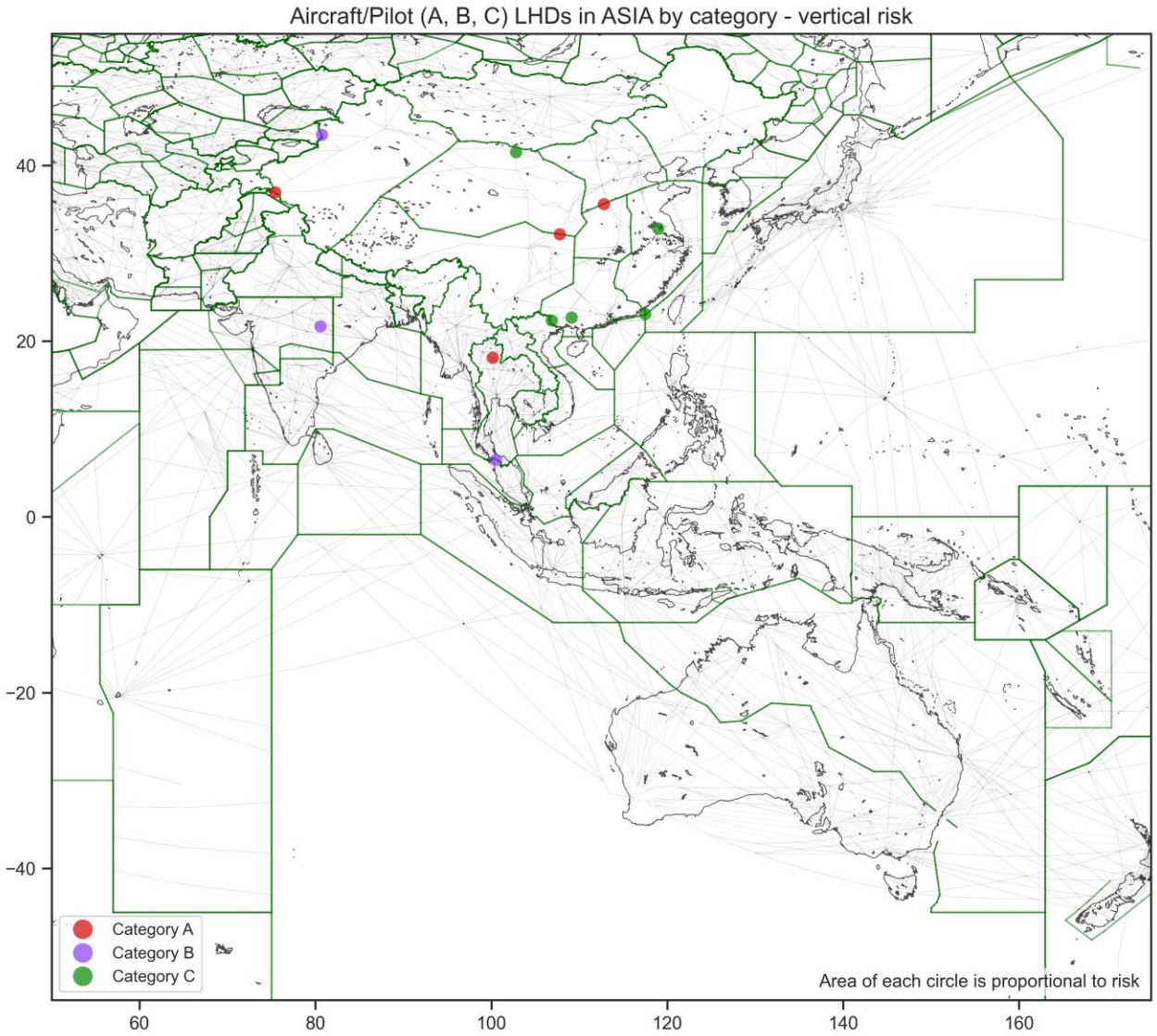
ASIA : Geolocation of LHDs/LLDs/LLEs

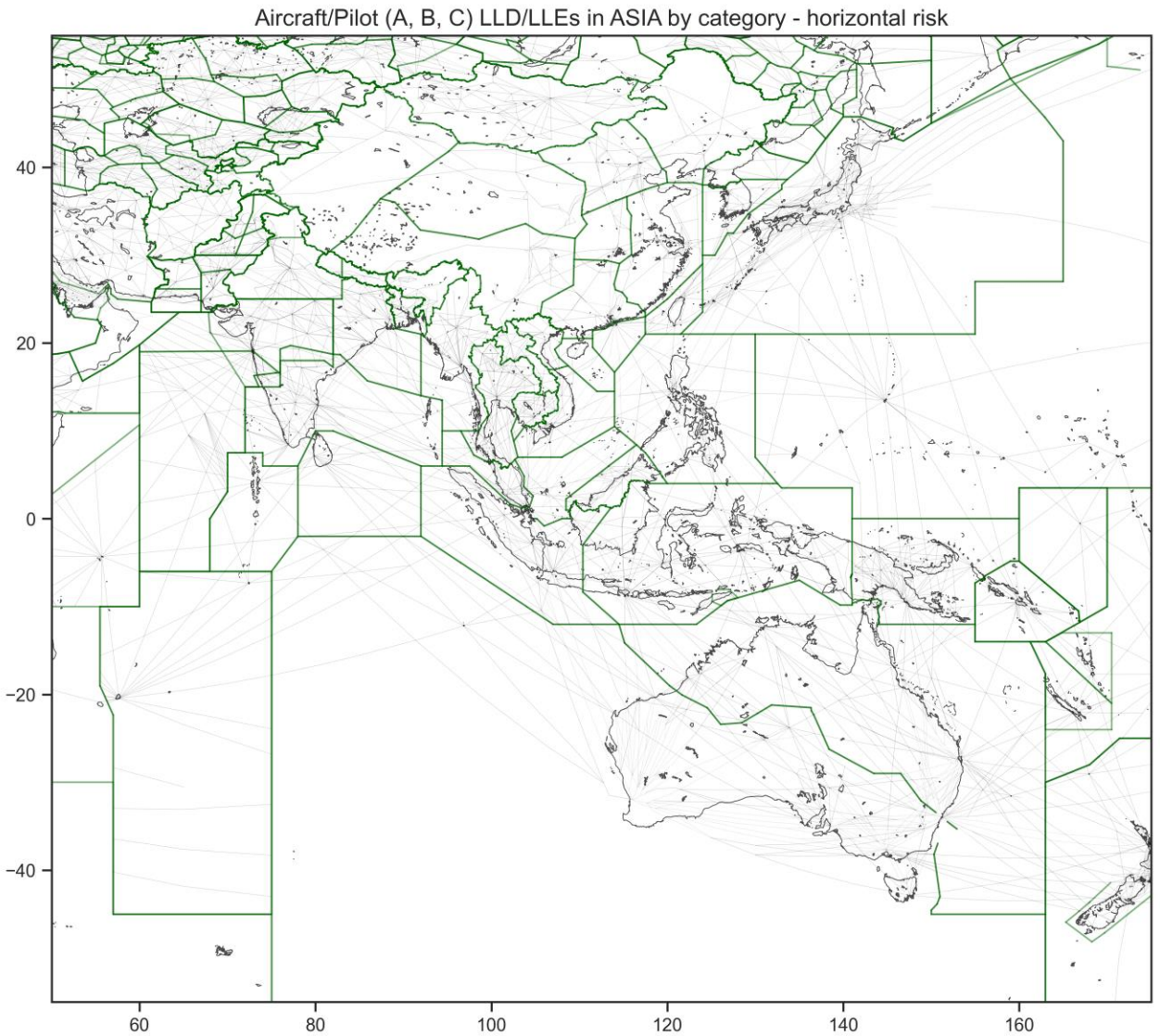
ASIA : All Categories



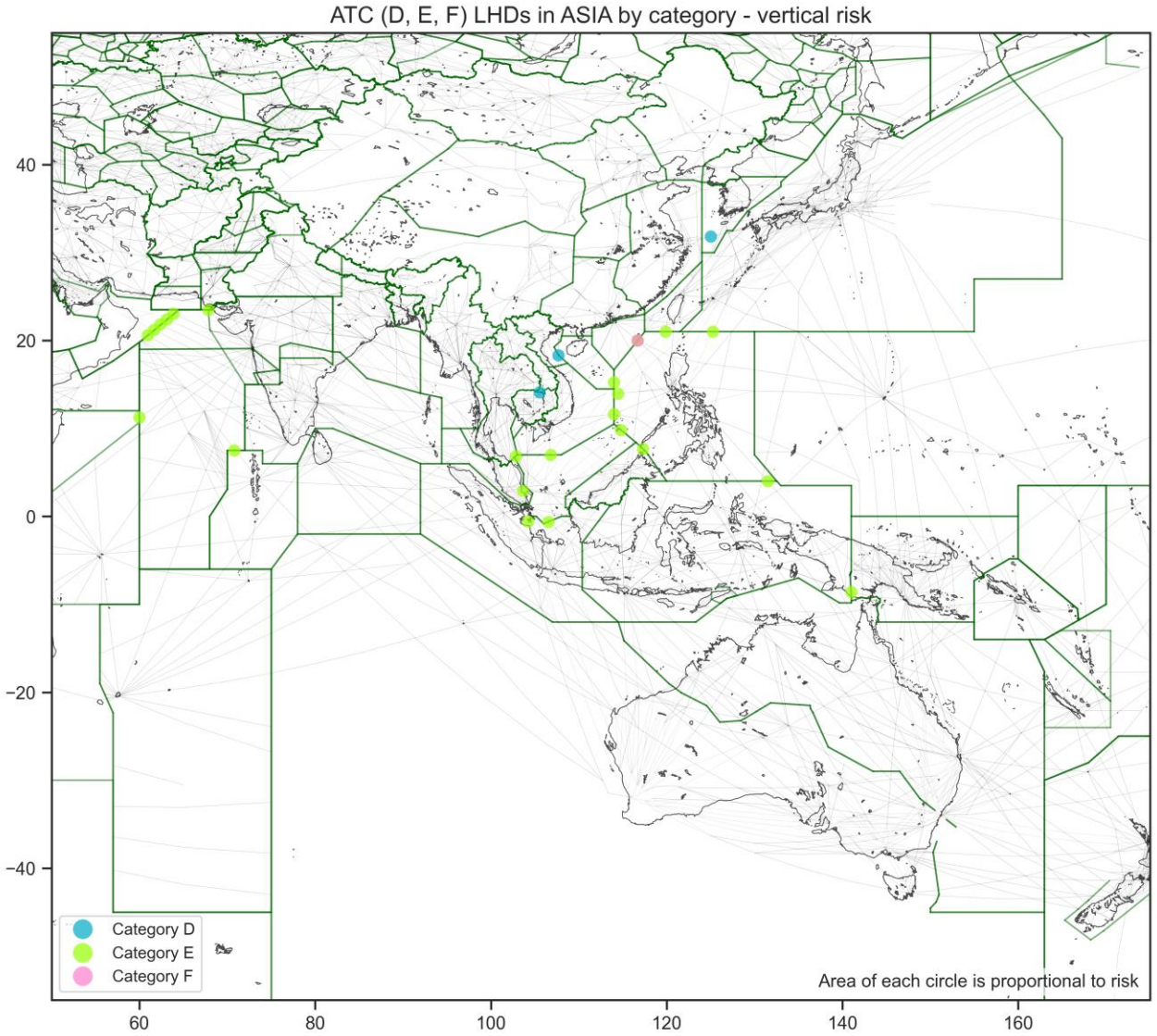


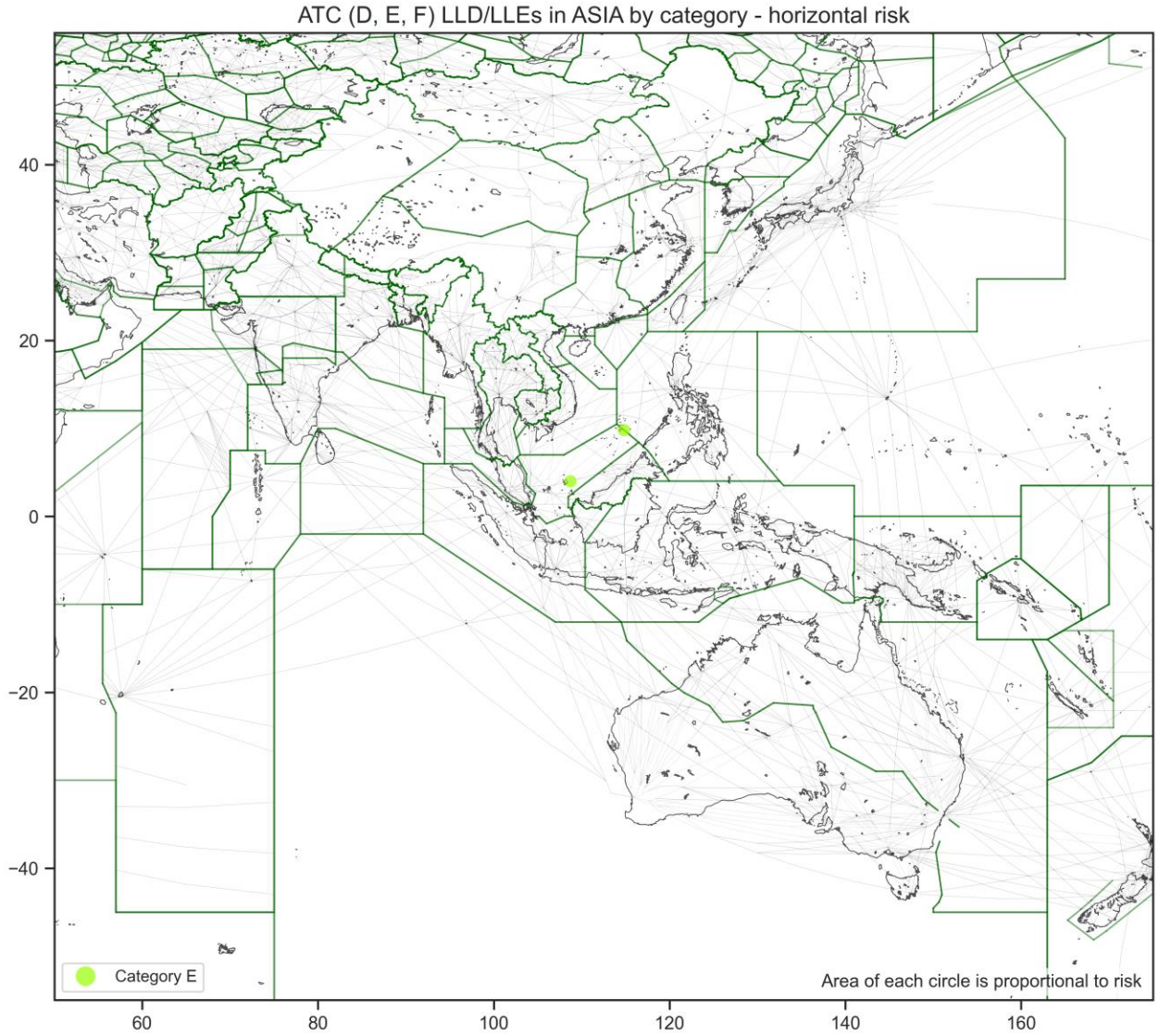
ASIA : Aircrew/Pilot (A, B, C)





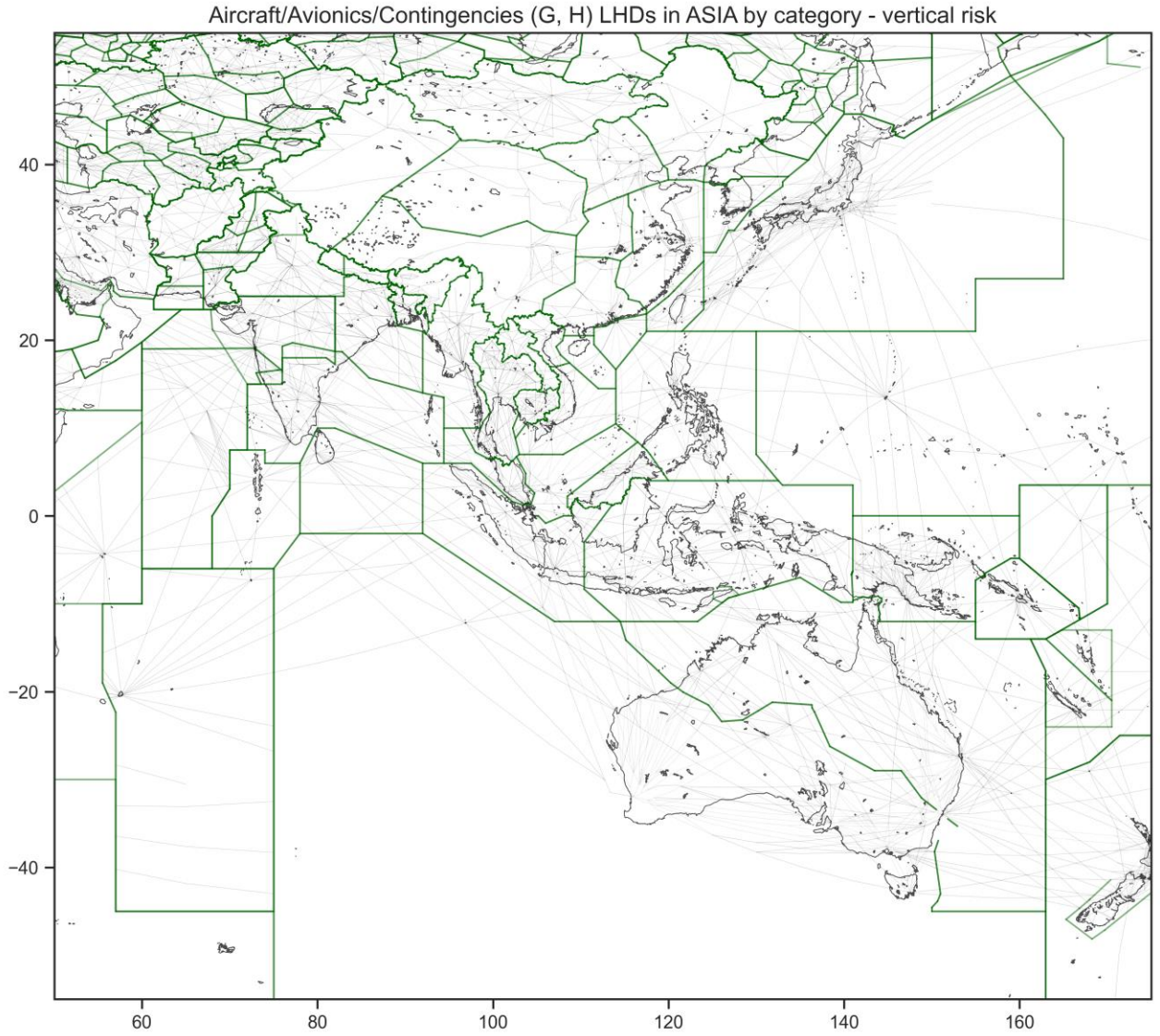
ASIA : ATC (D, E, F)

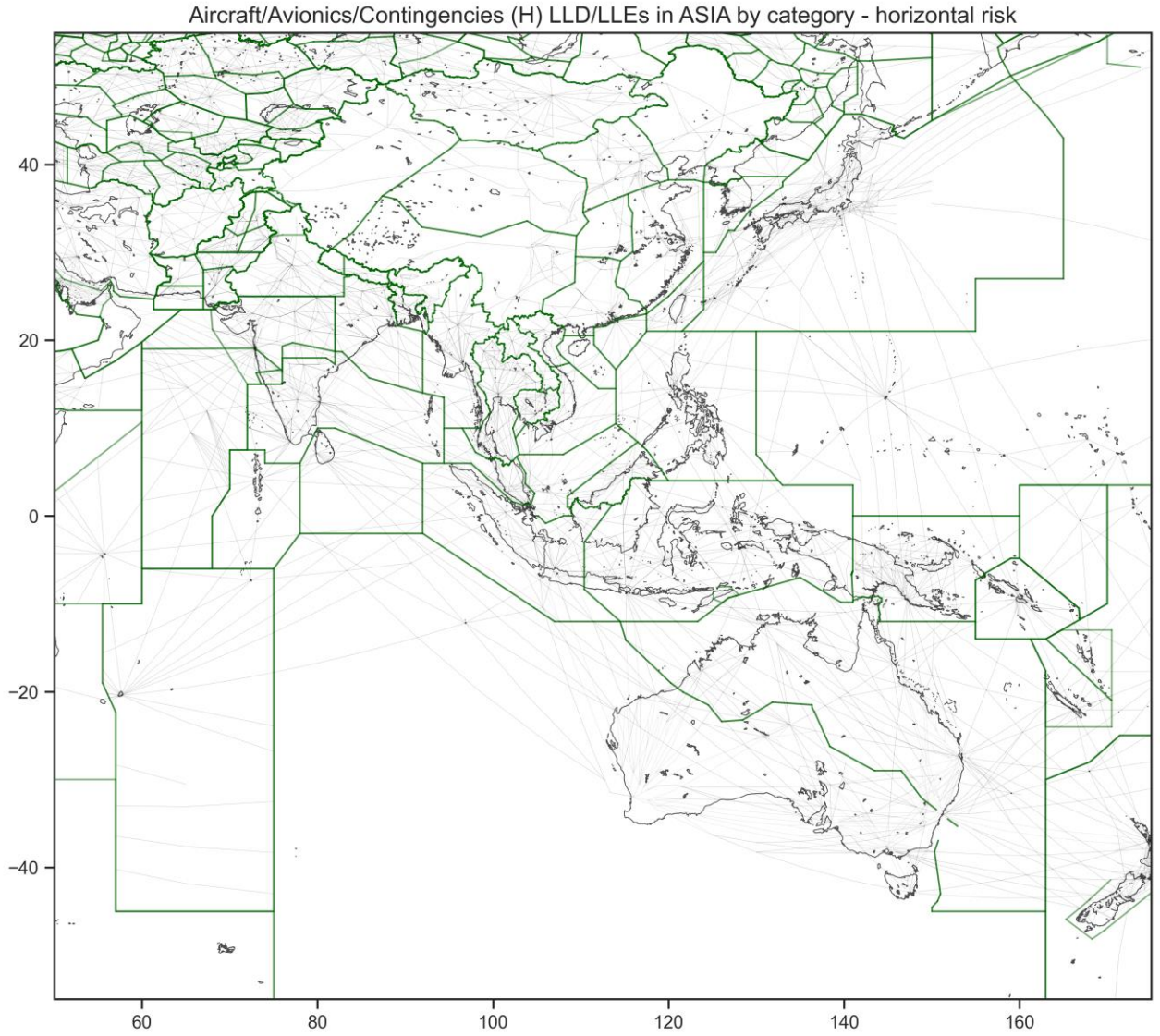

ATC (D, E, F) LHDs in ASIA by category - vertical risk
40
20
0
−20
−40
60
80
100
120
140
160
Category D
Category E
Category F
Area of each circle is proportional to risk


ATC (D, E, F) LLD/LLEs in ASIA by category - horizontal risk
40
20
0
−20
−40
60
80
100
120
140
160
Category E
Area of each circle is proportional to risk

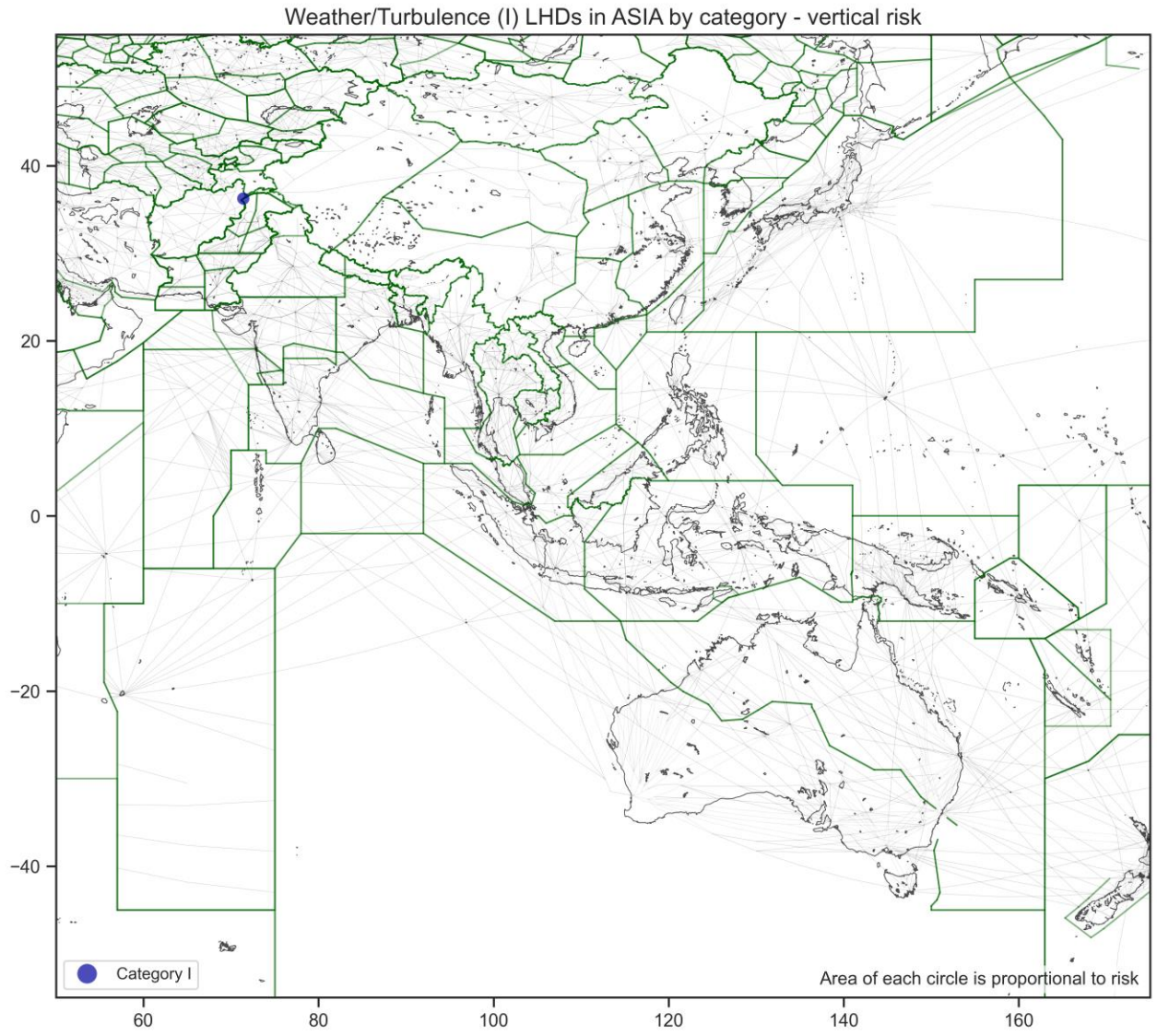
ASIA : Aircraft Avionics/Contingencies

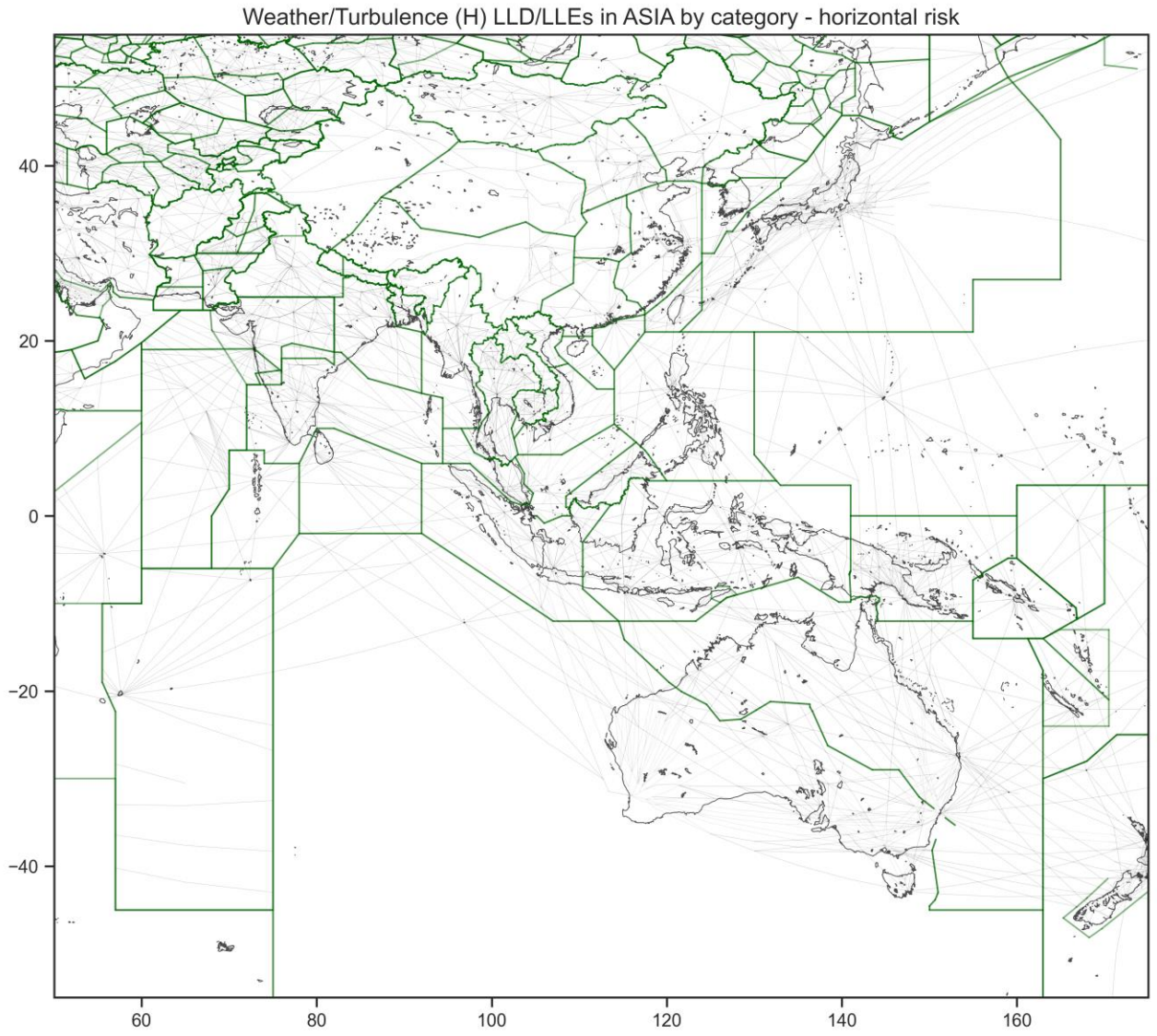
(LHD:G,H, LLD/LLE:H)



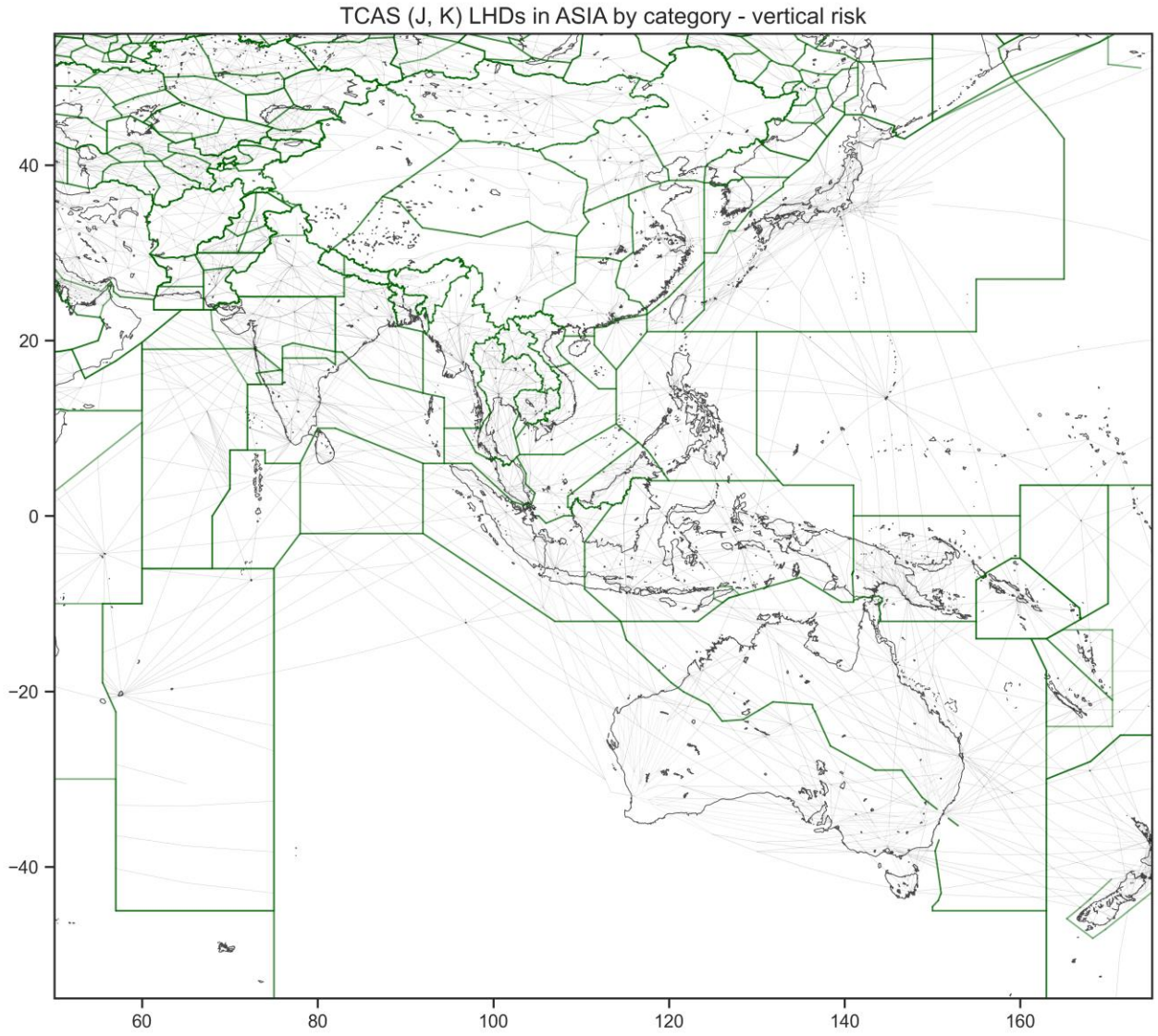


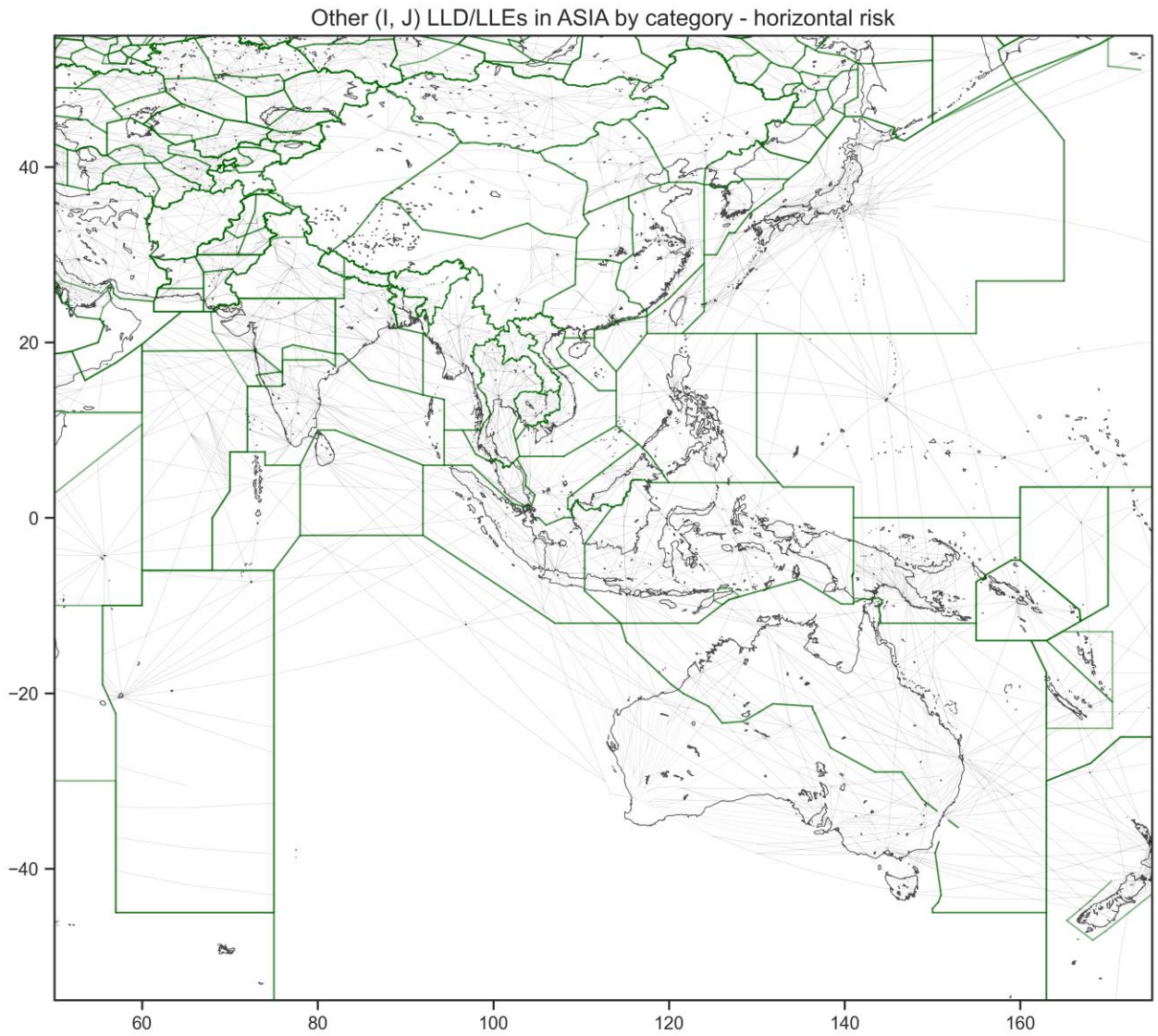
ASIA : Weather/Turbulence (LHD:I, LLD/LLE:H)





ASIA : TCAS (LHD:J, K, LLD/LLE:I,J)





ASIA : Hot Spots

ASIA : LHD Hot Spot A1 (Chennai/Dhaka/Kolkata/Yangon)

Nature of Occurrences: Coordination errors as a result of human factors issues (Category E)

Contributing Factors: Gaps in communication and surveillance among Chennai, Kolkata and Yangon ACC.

Area	Number of LHDs			Operational Risk (10^{-9} FAPFH)		
	2022	2023	2024	2022	2023	2024
Kolkata/Yangon	17	11	6	0.00	0.00	0.00
Chennai/Yangon	23	15	6	0.02	0.06	0.00

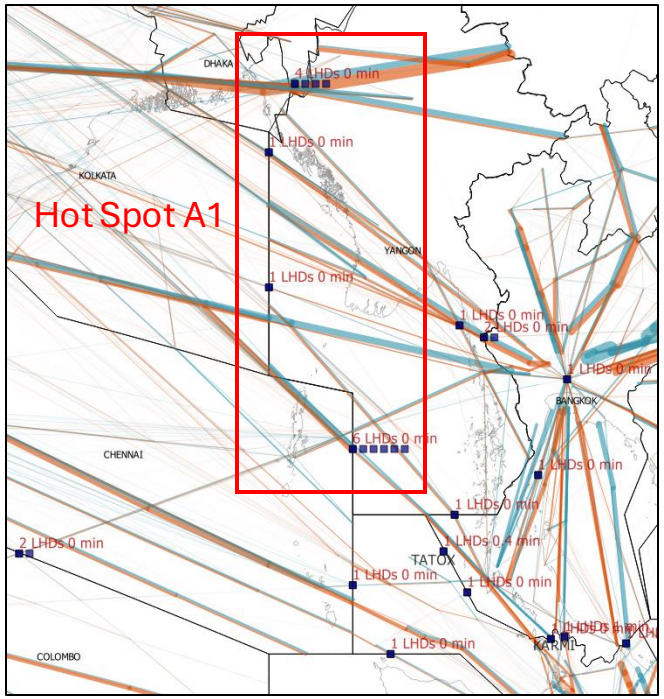
Trend:

-The number of LHDs gradually decreased.

-The operational risk reduced to zero.

Mitigations:

- Surveillance has been enhanced by Space-Based ADS-B in Indian FIRs and ADS-B data sharing among Kolkata, Chennai, and Yangon ACCs.
- The AIDC was initiated between Kolkata ACC/Chennai ACC and Yangon ACC, but full operational implementation has not been achieved.



Result from the hot spot identification process:

- Hot Spot A1 does not satisfy the hot spot criteria.
- However, AIDC implementation or other mitigation measures have not been completed.
- Consequently, **Hot Spot A1 remains on the list of hot spots** and should continue to be monitored until further mitigation are implemented.

ASIA : LHD Hot Spot B1

Incheon (Transfer-of-Control Point between Incheon ACC and Shanghai ACC)

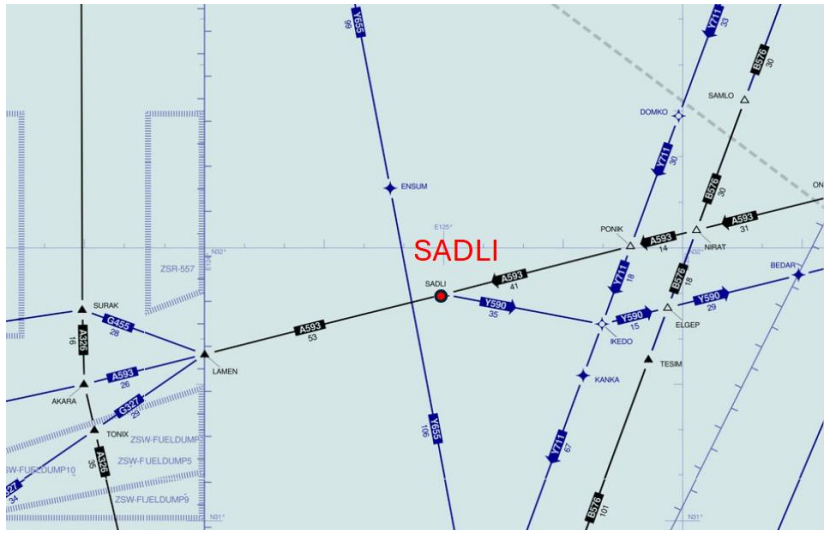
Nature of Occurrences: Coordination errors as a result of human factors issues (Category E)

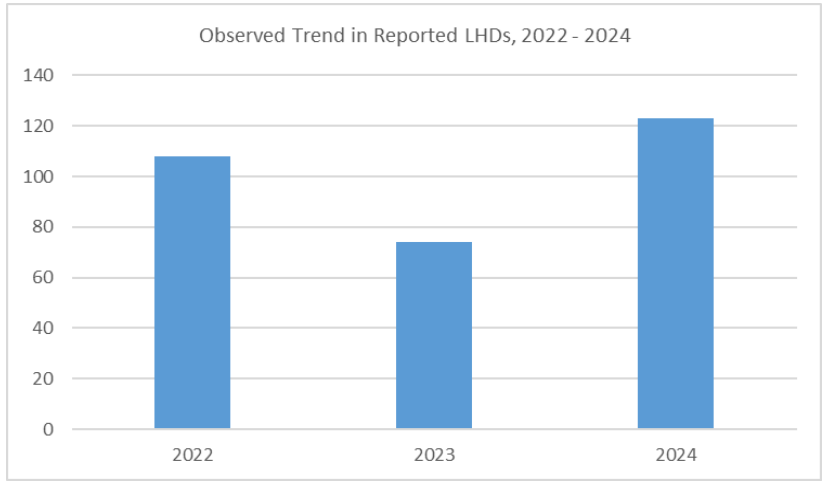
Contributing Factors:

- Lack of communication between stakeholders, including insufficient exchange and mutual understanding of LHD-related information
- High traffic demand through area with the existing airspace configuration

Trend :

- In 2024, the number of LHDs increased from 2023.
- The operational risk has been zero since 2021 because all reported occurrences were mitigated by available surveillance and direct speech circuit.





ASIA : LHD Hot Spot B1

Incheon (Transfer-of-Control Point between Incheon ACC and Shanghai ACC)

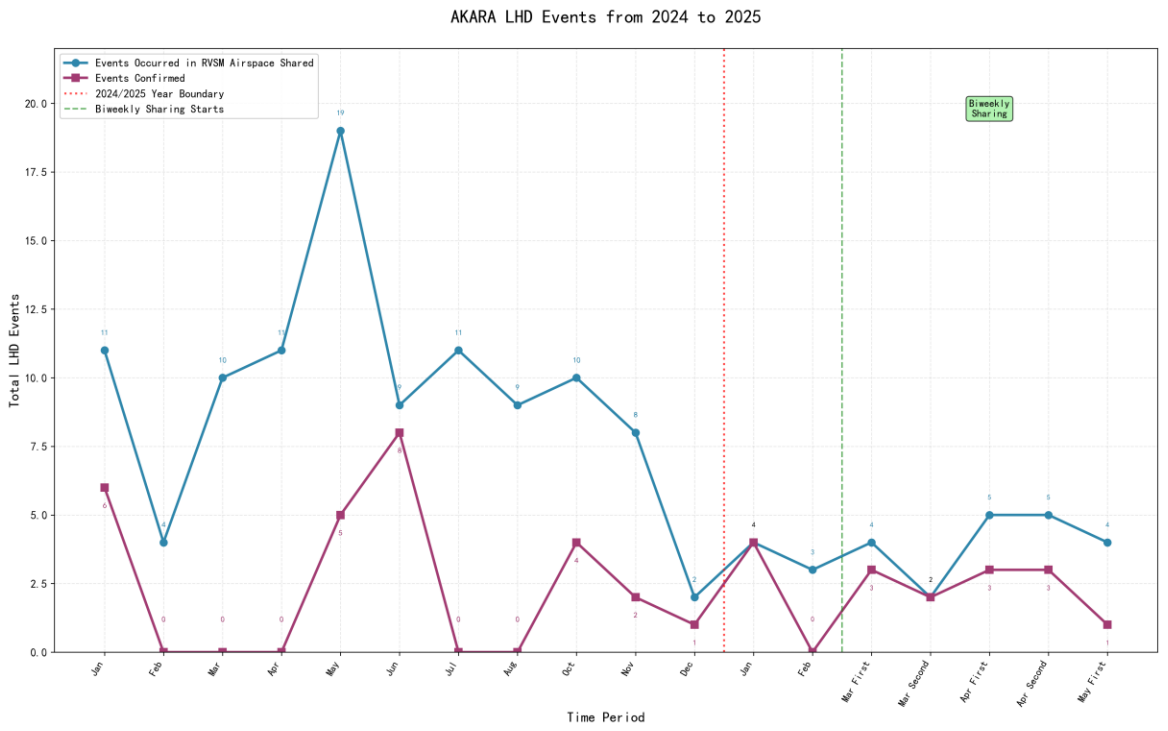
Mitigations :

- China and ROK held bilateral meetings to establish a mutual understanding of transfer errors and strengthened safety awareness.
- The LHD report-sharing mechanism was enhanced by doubling the data sharing frequency to enable more timely and effective validation.
- Route capacity has been improved since March 2021, by introducing the parallel airway Y590 on the eastern side of SADLI as Phase 1.
- Surveillance coverage was expanded. A direct speech circuit was established to support coordination.
- Bilateral meetings between ROK and China to discuss mitigation measures including Phase 2.

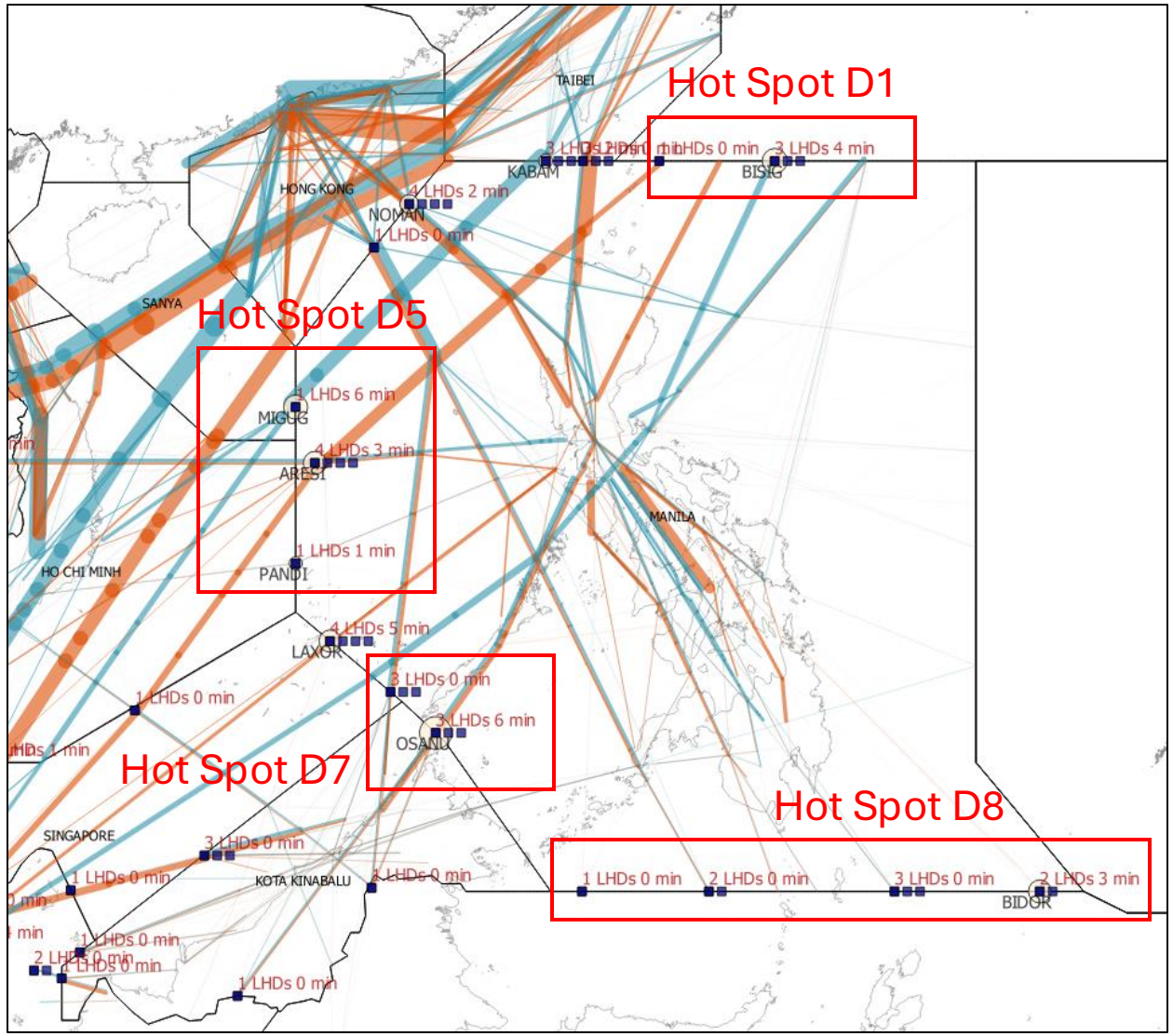
Result from the hot spot identification process:

- **Hot Spot B1 remains on the list of hot spots** and should continue to be monitored until the number of LHDs decreases and further safety improvement initiatives or mitigation measures are completed.

The trend of confirmed LHDs after doubling the report-sharing frequency among stakeholders



ASIA : LHD Hot Spot D1, D5, D7 and D8



Hot Spot D1: Fukuoka/Manila FIR boundary

Hot Spot D5: Ho Chi Minh/Manila FIR boundary

Hot Spot D7: Kota Kinabalu/Manila FIR boundary

Hot Spot D8: Manila/Ujung Pandang FIR boundary

Remark:

In 2024, Hot Spot D, which was represented the entire Manila FIR boundary, was subdivided into nine hot spots: D1 through D9.

Each subdivision was re-analyzed with the hot spot identification process using the historical data up to 2023. As a result, Hot Spots D2, D3, D4, D6, and D9 were removed from the list of hot spots due to continuous improvements achieved through existing mitigations.

ASIA : LHD Hot Spot D1 (Fukuoka/Manila)

Nature of Occurrences: Coordination errors as a result of human factors issues (Category E)

Contributing Factors :

- Gaps in communication and surveillance
- Complexity in the aircraft transfer procedure from Manila ACC to Fukuoka ACC

Trend:

- The number of LHDs and operational risk decreased.

Area	Number of LHDs			Operational Risk (10^{-9} FAPFH)		
	2022	2023	2024	2022	2023	2024
Hot Spot D1 (Fukuoka/Manila)	7	6	5	1.74	0.96	0.22

Note: The number of LHDs and operational risk include submissions from both the Manila FIR (MAAR) and the Fukuoka FIR (JASMA).

Mitigations:

- The timing for sending transfer information from Manila ACC to Fukuoka ACC was adjusted from 30 minutes to 20 minutes prior to the estimated time over the FIR boundary. This change reduced the complexity by allowing the transfer to be coordinated within a single sector instead of across two sectors.

Result from the hot spot identification process:

- Hot Spot D1 does not satisfy the hot spot criteria.
- In addition, Fukuoka and Manila ACCs have actively collaborated to investigate the causes and implement mitigations.
- As a result, **Hot Spot D1 is marked as a potential non-hotspot**.

ASIA : LHD Hot Spot D5 (Ho Chi Minh/Manila)

Nature of Occurrences: Coordination errors as a result of human factors issues (Category E)

Contributing Factors :

- Gaps in communication and surveillance

Trend:

- The number of LHDs and operational risk increased.

Area	Number of LHDs			Operational Risk (10^{-9} FAPFH)		
	2022	2023	2024	2022	2023	2024
Hot Spot D5 (Ho Chi Minh/Manila)	3	2	6	0.05	0.10	0.14

Mitigations:

- Since 2018, the Philippines has implemented safety improvement initiatives, including new ATM system, sector redesign, enhanced surveillance and ADS-C/CPDLC coverage, controller training, coordination with adjacent ACCs, and AIDC.

Result from the hot spot identification process:

- Hot Spot D5 does not satisfy the hot spot criteria.
- However, AIDC implementation has not been completed yet.
- Therefore, **Hot Spot D5 remains on the list of hot spots** and should continue to be monitored until further safety improvement initiatives are implemented.

ASIA : LHD Hot Spot D7 (Kota Kinabalu/Manila)

Nature of Occurrences: Coordination errors as a result of human factors issues (Category E)

Contributing Factors :

- Gaps in communication and surveillance

Trend:

- The number of LHDs slightly increased.
- Operational risk slightly decreased.

Area	Number of LHDs			Operational Risk (10^{-9} FAPFH)		
	2022	2023	2024	2022	2023	2024
Hot Spot D7 (Kota Kinabalu/Manila)	3	5	6	0.04	0.13	0.12

Mitigations:

- Since 2018, the Philippines has implemented safety improvement initiatives, including new ATM system, sector redesign, enhanced surveillance and ADS-C/CPDLC coverage, controller training, coordination with adjacent ACCs, and AIDC.

Result from the hot spot identification process:

- Hot Spot D7 does not satisfy the hot spot criteria.
- However, AIDC implementation is currently in the operational trial phase, with full implementation expected in the fourth quarter of 2025.
- Consequently, **Hot Spot D7 remains on the list of hot spots** and should continue to be monitored until further safety improvement initiatives are implemented.

ASIA : LHD Hot Spot D8 (Manila/Ujung Pandang)

Nature of Occurrences: Coordination errors as a result of human factors issues (Category E)

Contributing Factors :

- Gaps in communication and surveillance

Trend:

- The number of LHDs and operational risk decreased.

Area	Number of LHDs			Operational Risk (10^{-9} FAPFH)		
	2022	2023	2024	2022	2023	2024
Hot Spot D8 (Manila/Ujung Pandang)	2	15	8	0.11	0.41	0.06

Mitigations:

- Since 2018, the Philippines has implemented safety improvement initiatives, including new ATM system, sector redesign, enhanced surveillance and ADS-C/CPDLC coverage, controller training, coordination with adjacent ACCs, and AIDC.

Result from the hot spot identification process:

- Hot Spot D8 does not satisfy the hot spot criteria.
- In addition, AIDC has been successfully operated since 2020.
- Thus, **Hot Spot D8 is marked as a potential non-hotspot**.

ASIA : LHD Hot Spot F (Mogadishu/Mumbai)

Nature of Occurrences: Coordination errors as a result of human factors issues (Category E)

Contributing Factors: Gaps in communication and surveillance between Mogadishu and Mumbai ACC.

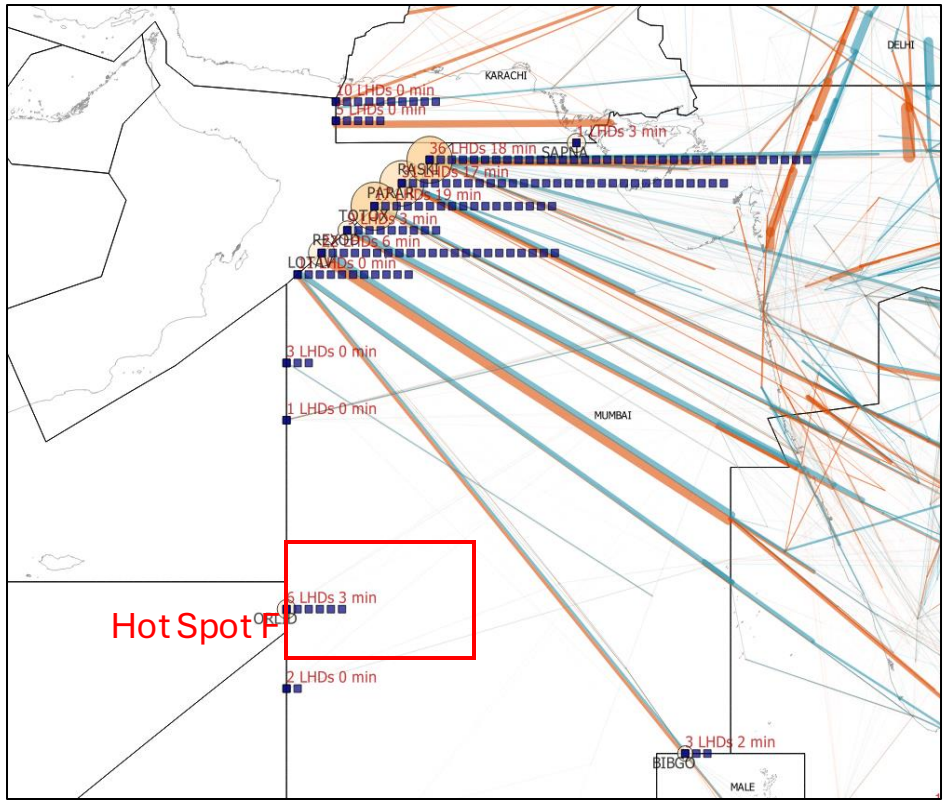
Trend:
- The number of LHDs slightly decreased.
- Operational risk increased, but remains at a low level.

Mitigations:
- Surveillance coverage was enhanced through Space-Based ADS-B in Indian FIRs.
- AIDC implementation between Mogadishu and Mumbai was initiated but remained in the testing phase.

Result from the hot spot identification process:

- Hot Spot F does not satisfy the hot spot criteria.
- However, AIDC implementation or other mitigation measures have not been completed yet.
- Thus, **Hot Spot F remains on the list of hot spots.**

Area	Number of LHDs			Operational Risk (10^{-9} FAPFH)		
	2022	2023	2024	2022	2023	2024
Hot Spot F (Mogadishu/Mumbai)	9	10	7	0.02	0.00	0.05



ASIA : LHD Hot Spot G1 (Mumbai/Muscat)

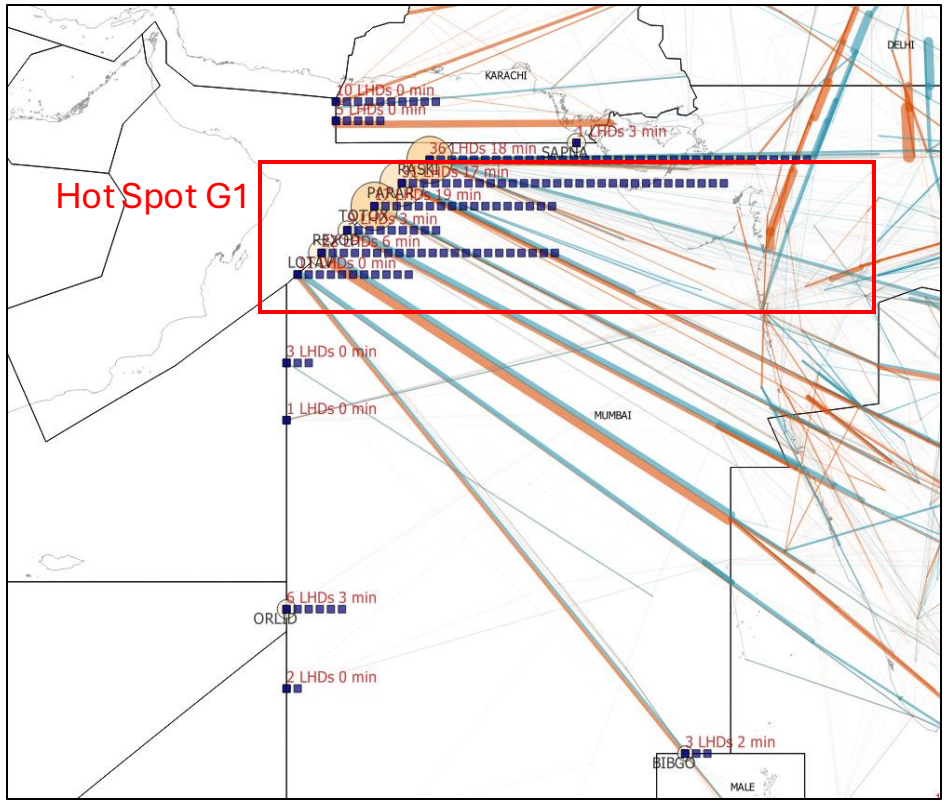
Nature of Occurrences: Coordination errors as a result of human factors issues (Category E)

Contributing Factors : Gaps in communication and surveillance among Mumbai and Muscat ACCs.

Area	Number of LHDs			Operational Risk (10^{-9} FAPFH)		
	2022	2023	2024	2022	2023	2024
Hot Spot G1 (Mumbai/Muscat)	43	138	132	0.79	2.79	1.09

Trend:
- The number of LHDs slightly decreased from 2023, but remains high.
- Operational risk decreased.

Mitigations:
- Surveillance coverage was enhanced through Space-Based ADS-B in Indian FIRs.
- The AIDC implementation between Mumbai and Muscat ACCs was initiated but remained in the testing phase.



Result from the hot spot identification process:

- Hot Spot G1 satisfies the hot spot criteria in terms of the number of LHDs and operational risk.
- Therefore, **Hot Spot G1 remains on the list of hot spots** and should continue to be monitored until the number of LHDs decreases and further safety improvement initiatives or mitigation measures, such as AIDC, are completed.

ASIA : LHD Hot Spot G2 (Mumbai/Sanaa)

Nature of Occurrences: Coordination errors as a result of human factors issues (Category E)

Contributing Factors : Gaps in communication and surveillance among Mumbai and Sanaa ACCs.

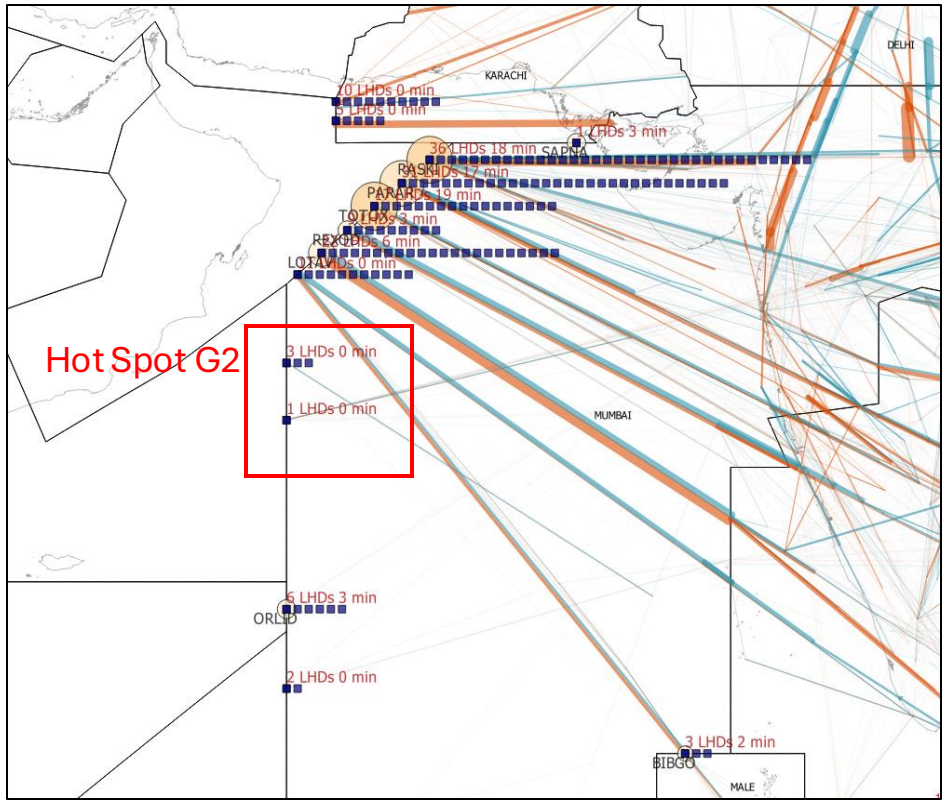
Area	Number of LHDs			Operational Risk (10^{-9} FAPFH)		
	2022	2023	2024	2022	2023	2024
Hot Spot G2 (Mumbai/Sanaa)	2	3	4	0.00	0.00	0.00

Trend:
- The number of LHDs slightly increased
- Operational risk was zero.

Mitigations:
- Surveillance coverage was enhanced through Space-Based ADS-B in Indian FIRs.

Result from the hot spot identification process:

- Hot Spot G2 does not satisfy the hot spot criteria.
- However, further mitigation such as AIDC implementation have not been planned.
- Therefore, **Hot Spot G2 remains on the list of hot spots** and should continue to be monitored until further safety improvement initiatives or mitigation measures, such as AIDC, are completed.



ASIA : LHD Hot Spot J (Jakarta/Singapore)

Nature of Occurrences: Coordination errors as a result of human factors issues (Category E)

Contributing Factors : Gaps in communication and surveillance between Jakarta and Singapore ACC.

Trend:

- The number of LHDs and operational risk significantly decreased.

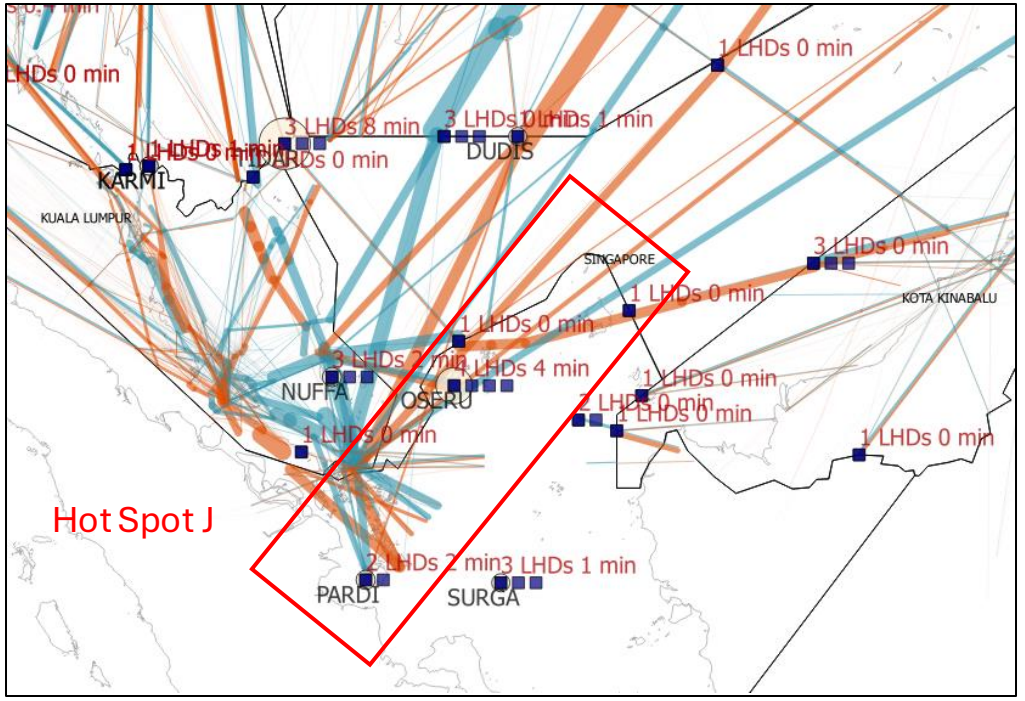
Mitigations:

- As of 21 March 2024, the FIR boundary between Jakarta and Singapore was realigned. To support the transition and maintain safety, the operational coordination meetings between both ACCs were regularly held since 2024, and planned to continue in 2025.
- The results of the LHD analysis were shared with controllers to enhance safety awareness.

Result from the hot spot identification process:

- Hot Spot J does not satisfy the hot spot criteria.
- In addition, the decrease in the number of LHDs and operational risk reflects the successful implementation of mitigation measures.
- Thus, **Hot Spot J is marked as a potential non-hotspot**.

Area	Number of LHDs			Operational Risk (10^{-9} FAPFH)		
	2022	2023	2024	2022	2023	2024
Jakarta/Singapore (Hot Spot J)	14	27	11	0.18	0.33	0.12



ASIA : LHD Hot Spot O

(Bangkok/Ho Chi Minh/Kuala Lumpur/Singapore)

Nature of Occurrences: Coordination errors as a result of human factors issues (Category E)

Contributing Factors: The route structure and ATC procedures of handling crossing traffic over this area can be complex due to the different Transfer of Control and Communication Points and the involvement of multiple ATS units.

Trend: The number of LHDs and operational risk decreased.

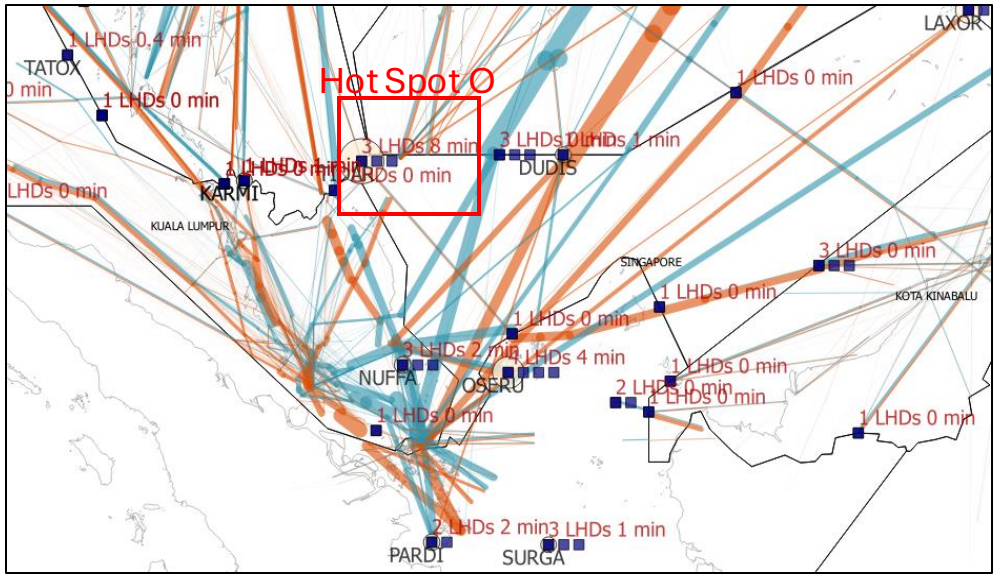
Mitigations:

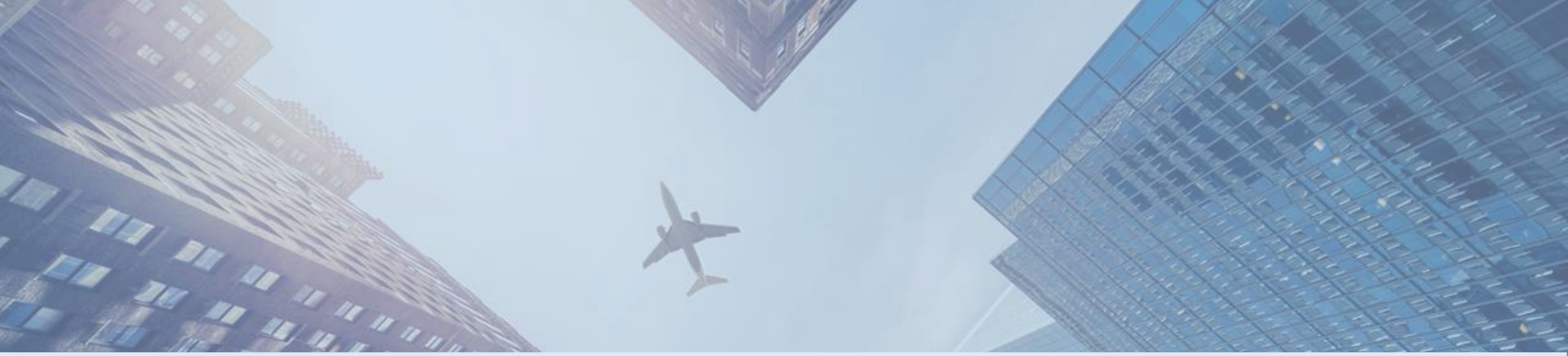
- Regular LHD analysis sharing with controllers and operational aids such as visual reminders on the Air Situational Display to enhance situational awareness have been implemented to mitigate the risk.
- Other collaborative improvement initiatives to prevent LHD occurrences are being explored.

Result from the hot spot identification process:

- Hot Spot O has satisfied the hot spot criteria in terms of the operational risk since 2022. Therefore, **Hot Spot O remains on the list of hot spots.**

Area	Number of LHDs			Operational Risk (10^{-9} FAPFH)		
	2022	2023	2024	2022	2023	2024
Hot Spot O (Bangkok/Ho Chi Minh /Kuala Lumpur/ Singapore)	7	5	3	0.58	0.51	0.15





Reporting Rate of LHDs/LLDs/LLEs

Reporting Rate of LHDs/LLDs/LLEs in 2024

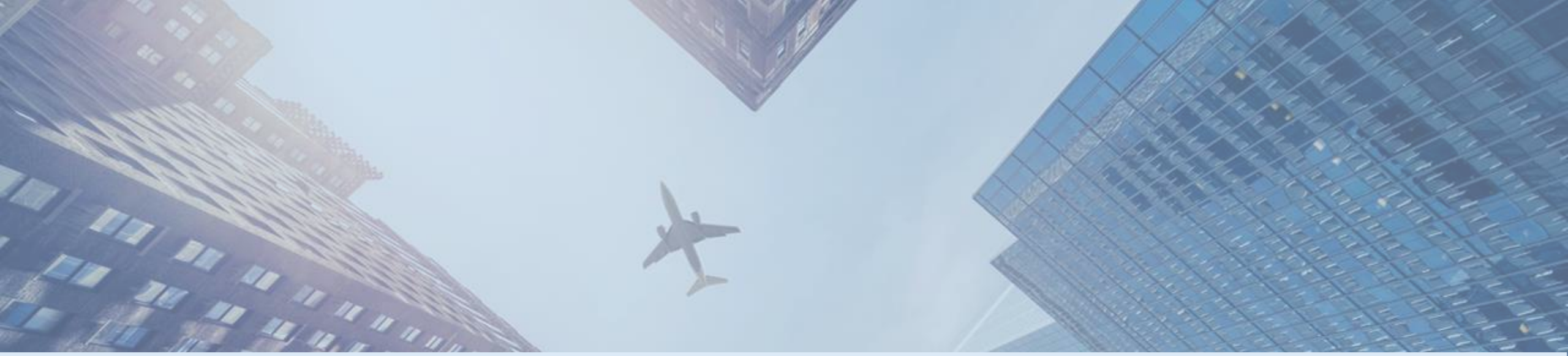
Airspace	Flying Hours	Aircrew/Pilot		ATC		Other		Total	
		# Reports	1 Report : Flying Hrs	# Reports	1 Report : Flying Hrs	# Reports	1 Report : Flying Hrs	# Reports	1 Report : Flying Hrs
DPRK	-	0	-	0	-	0	-	0	-
Mongolia	103,477	0	-	0	-	0	-	0	-
SEA	3,108,056	0	-	74	1: 42,001	0	-	74	1: 42,001
Japan	1,929,397	24	1:80,392	10	1: 192,940	42	1: 45,938	76	1: 25,387
SA/IO	4,143,123	3	1:1,381,041	194	1: 21,356	7	1: 591,875	204	1: 20,309
SW Pacific	1,245,193	35	1:35,577	25	1: 49,808	11	1: 113,199	71	1: 17,538
China	2,878,308	11	1:261,664	19	1: 151,490	160	1: 17,989	190	1: 15,149
Pacific	1,933,809	62	1:31,190	169	1: 11,443	3	1: 644,603	234	1: 8,264
Indonesia	548,638	18	1:30,480	84	1: 6,531	0	-	102	1: 5,379
ROK and AKARA	197,566	0	-	123	1: 1,606	3	-	126	1: 1,568
Total	16,087,567	153	1:105,147	689	1: 23,048	226	1: 71,184	1,077	1: 14,937

Note:

- There was no flying hours for DPRK in 2024, as no aircraft operated in its RVSM airspace.
- Both DPRK and Mongolia submitted NIL reports for all months in 2024.

Reporting Rate of LHDs/LLDs/LLEs in 2024

Airspace	# Reports							1 Report : Flying Hours						
	2018	2019	2020	2021	2022	2023	2024	2018	2019	2020	2021	2022	2023	2024
DPRK	0	0	0	0	0	0	0	-	-	-	-	-	-	-
Mongolia	1	2	0	1	0	0	0	1: 158,891	1: 82,138	-	1: 121,621	-	-	-
SEA	205	152	42	70	62	101	74	1: 17,757	1: 22,275	1: 25,106	1: 15,456	1:32,620	1:29,400	1: 42,001
Japan	76	77	66	80	75	72	76	1: 20,632	1: 20,762	1: 14,737	1: 13,528	1:18,751	1:23,452	1: 25,387
SA/IO	681	439	152	135	143	258	204	1: 3,783	1: 7,955	1: 7,907	1: 11,167	1:21,018	1:10,242	1: 20,309
SW Pacific	53	101	46	47	81	65	71	1: 17,817	1: 9,335	1: 6,954	1: 11,975	1:5,352	1:18,186	1: 17,538
China	110	79	85	105	72	223	190	1: 22,229	1: 31,119	1: 26,867	1: 15,477	1:18,003	1:10,525	1:15,149
Pacific	43	173	134	176	179	203	234	1: 45,064	1: 10,139	1: 6,404	1: 6,638	1:8,280	1:8,736	1:8,264
Indonesia	23	37	18	41	54	125	102	1: 53,603	1: 33,321	1: 17,346	1: 7,402	1:8,060	1:6,099	1:5,379
ROK and AKARA	12	34	5	24	108	75	126	1: 28,365	1: 18,959	1: 25,965	1: 6,285	1:1,056	1:2,220	1:1,568
Total	**1,204**	**1,094**	**548**	**679**	**774**	**1,122**	**1,077**	**1: 12,332**	**1: 14,330**	**1: 13,202**	**1: 11,200**	**1:13,230**	**1:12,135**	**1:14,937**



Conclusion

RVSM TLS Compliance - Vertical

- **The 2024 PAC vertical overall risk is 15.53 x 10^{-9} FAPFH, above the TLS,**
  driven by Hot Spot N (Hawaii CEP/Oakland, USA). To address this hot spot, the responsible units have implemented mitigation procedures and are planning an ATM system upgrade, scheduled to be implemented in 2027.
- **The 2024 ASIA vertical overall risk is 1.99 x 10^{-9} FAPFH, below the TLS.**

RVSM TLS Compliance - Horizontal

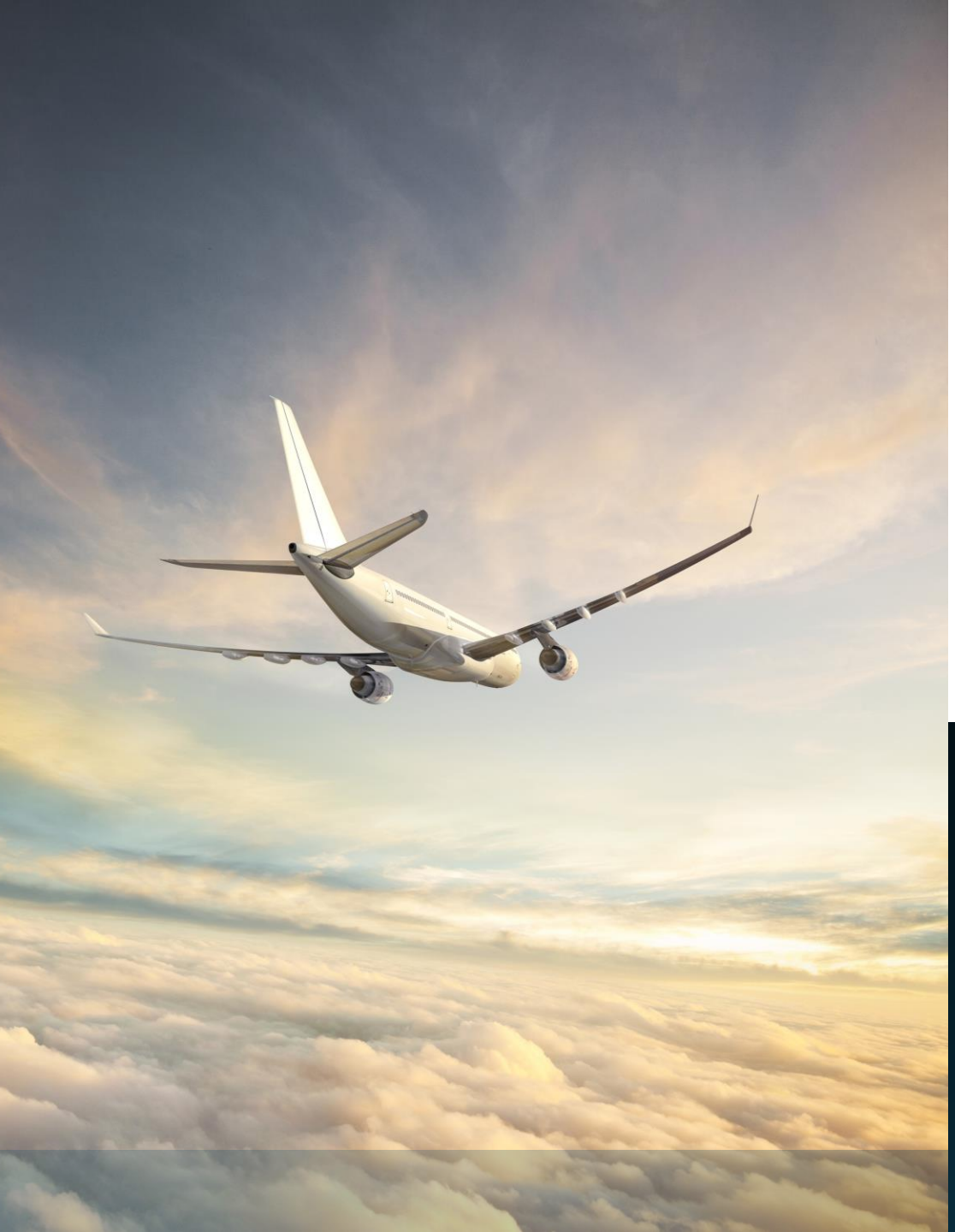
- **All horizontal risk estimates in 2024 are below the TLS.**

RASMAG's Hot Spot List

Hot Spot	Involved FIRs	Identified	Remarks
A1	Chennai/Dhaka/Kolkata/Yangon	2015	Cat. E LHDs and risk decreasing.
B1	Incheon (Transfer-of-Control Point between Incheon ACC and Shanghai ACC)	2015	Cat. E LHDs increasing. Risk decreasing.
D1	Fukuoka/Manila	2015	Cat. E steady; risk decreasing. Mitigation in place. **Potential non-hotspot**.
D5	Ho Chi Minh/Manila	2015	Cat. E LHDs and risk slightly increasing.
D7	Kota Kinabalu/Manila	2015	Cat. E LHDs slightly increasing. Risk slightly decreasing.
D8	Manila/Ujung Pandang	2015	Cat. E LHDs and risk decreasing. Mitigation in place. **Potential non-hotspot**.
F	Mogadishu/Mumbai	2015	Cat. E LHDs decreasing. Risk slightly increasing
G1	Mumbai/Muscat	2015	Cat. E LHDs slightly decreasing. Risk decreasing.
G2	Mumbai/Sanaa	2015	Cat. E LHDs slightly increasing. Risk decreasing.
J	Jakarta/Kota Kinabalu/Singapore	2018	Cat. E LHDs and risk decreasing. Mitigation in place. **Potential non-hotspot**.
N	Hawaii CEP/Oakland USA	2019	Cat. E LHDs and risk slightly increasing.
O	Bangkok/Ho Chi Minh/Kuala Lumpur/ Singapore	2023	Cat. E LHDs and risk decreasing.

Reporting Rate of LHDs/LLDs/LLEs

- **The estimated flying hours significantly increased** from
  13,615,545 hours in 2023 to
  16,087,567 hours in 2024.
- **The overall reporting rate of LHDs/LLDs/LLEs slightly degraded**, from
  1 report per 12,135 hours in 2023 to
  1 report per 14,937 hours in 2024.
- The reporting rate for **SEA, China, and SA/IO significantly dropped in 2024** due to the decrease in the number of LHDs with the increase in flying hours.
- The reporting rates for **other areas in 2024** were **close to 2023 values**.
- The reporting rate for **DPRK could not be calculated**, as there were no flying hours and no reported occurrence. No aircraft operated in DPRK's RVSM airspace in 2023 and 2024, and DPRK submitted NIL reports for all months in 2024.
- The reporting rate for **Mongolia could not be calculated**, as no occurrence were reported. Mongolia submitted NIL reports for all months in 2024.



THANK YOU

Thirtieth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/30)
Bangkok, Thailand
14 – 17 July 2025

Link for RASMAG meeting:
https://www.icao.int/APAC/Meetings/Pages/2025-RASMAG-30.aspx

APANPIRG Asia/Pacific Airspace Safety Monitoring

RASMAG LIST OF COMPETENT AIRSPACE SAFETY MONITORING ORGANISATIONS

The Regional Airspace Safety Monitoring Advisory Group of APANPIRG (RASMAG) is required by its terms of reference to recommend and facilitate the implementation of airspace safety monitoring and performance assessment services and to review and recommend on the competency and compatibility of airspace monitoring organisations. In order to assist in addressing these requirements, RASMAG updates and distributes the following list of competent airspace safety monitoring organizations for use by States requiring airspace safety monitoring services. In the context of the list, abbreviations have meanings as follows:

- RMA – Regional Monitoring Agency – safety assessment and monitoring in the vertical plane (i.e. RVSM);
- EMA – En-route Monitoring Agency – safety assessment and monitoring in the horizontal plane (i.e. RSP, RCP, RNP for performance-based horizontal separations);
- CRA – Central Reporting Agency – technical performance of data link systems (i.e. ADS/CPDLC); and
- FIT – FANS 1/A Interoperability/Implementation Team – parent body to a CRA.

DISCLAIMER: The presentation of material in this report does not imply the expression of any opinion whatsoever on the part of ICAO, APANPIRG or the ATM Sub-Group of APANPIRG concerning the legal status of any country, territory, city or area of its authorities, or concerning the delimitation of its frontiers or boundaries.

(Last updated 16 July 2025)

Organization *(including contact officer)*	**State**	**Competency**	**Status**	**Airspace assessed (FIRs)**
Australian Airspace Monitoring Agency (AAMA) - Airservices https://www.airservicesaustralia.com/about-us/our-services/aama/ Dr. Steven Barry, Risk Intelligence Lead steve.barry@AirservicesAustralia.com Dr Shea Houlihan, Risk Intelligence Specialist, Shea.Houlihan@AirservicesAustralia.com	Australia	RMA	Current	Brisbane, Honiara, Jakarta, Melbourne, Nauru, Port Moresby and Ujung Pandang (including Timor-Leste) FIRs
		EMA	Current	Brisbane, Melbourne, Honiara, Nauru, and Port Moresby FIRs

Organization *(including contact officer)*	**State**	**Competency**	**Status**	**Airspace assessed (FIRs)**
Risk Intelligence Airservices Australia Email: aama@airservicesaustralia.com;				
China RMA - **Air Traffic Management Bureau, (ATMB) of Civil Aviation Administration of China (CAAC)** http://www.chinarma.cn Mr. Yongyue Chen (Monsoon), Coordinator of China RMA, ADCC, ATMB of CAAC Email: rmachina@rmachina.cn;	China	RMA & EMA	Current	RMA for: Beijing, Guangzhou, Kunming, Lanzhou, Pyongyang, Sanya, Shanghai, Shenyang, Urumqi, and Wuhan FIRs. EMA for: Lanzhou and Urumqi FIRs
India Bay of Bengal Arabian Sea Indian Ocean Safety Monitoring Agency (BOBASMA) http://www.aai.aero/public_notices/aaisite_test/bobasma_index.jsp Mr. J. Masivayana, Assistant General Manager (ATM), Airports Authority of India Phone No:+ 91 44 22561253 Fax No: +91 44 22561740 Email: bobasmachennai@gmail.com; bobasma@aai.aero;	India	EMA	Current	Chennai, Colombo, Delhi, Dhaka, Kabul, Karachi, Kolkata, Lahore, Male, Mumbai, Yangon,
Japan Airspace Safety Monitoring Agency (JASMA) - Japan Civil Aviation Bureau (JCAB)	Japan	RMA and EMA	Current	Fukuoka FIR

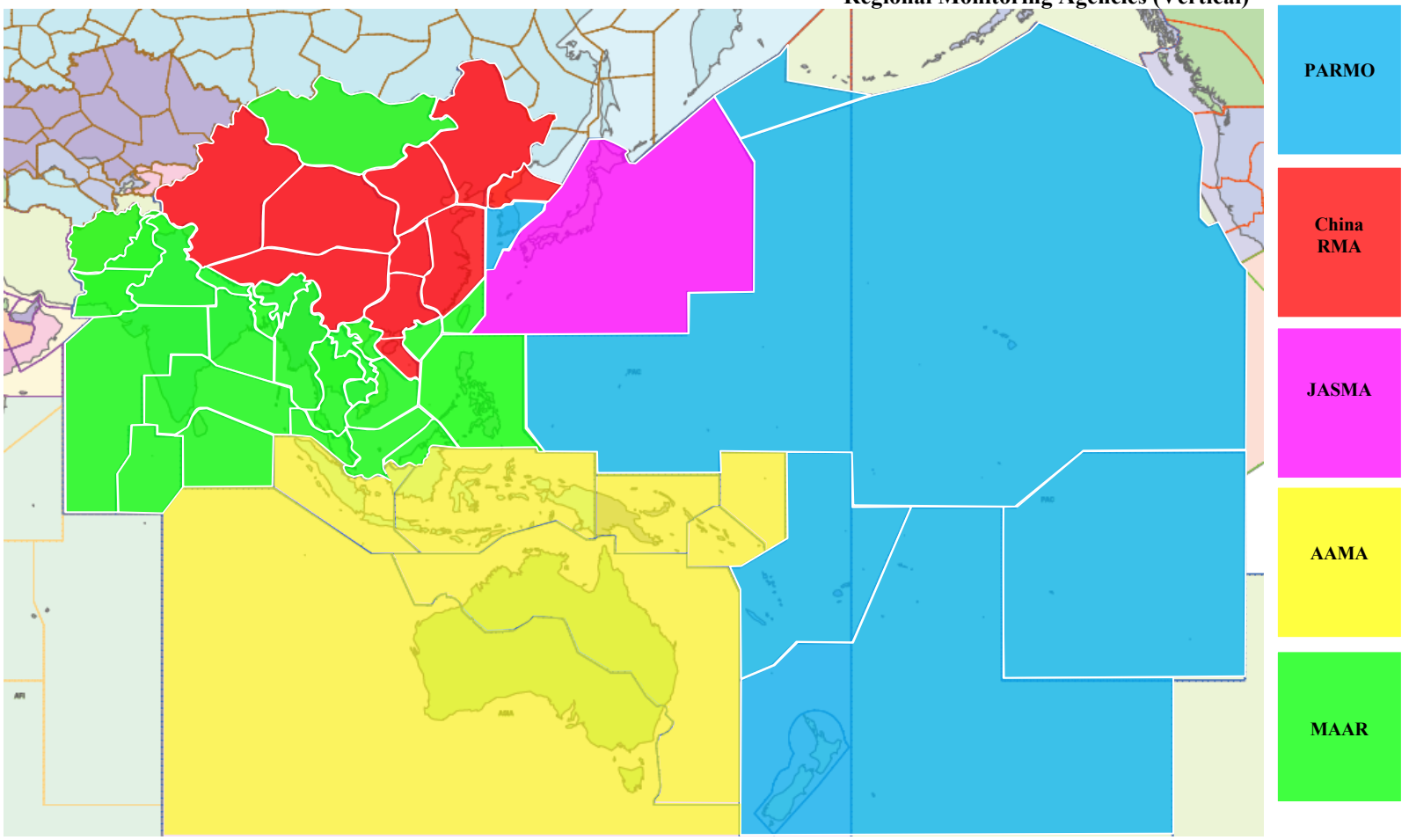
Organization *(including contact officer)*	**State**	**Competency**	**Status**	**Airspace assessed (FIRs)**
https://www.jasma.jp Mr. Kazuto Fukuda Email: fukuda-k46s4@mlit.go.jp; Central Reporting Agency Japan (CRA Japan) ~~Mr. Mototsugu Ichikawa~~ Mr. Motochika Ichikawa Email: ichikawa-m03c3@mlit.go.jp;		CRA	Current	Fukuoka FIR
Monitoring Agency for the Asia Region (MAAR) **Aeronautical Radio of Thailand LTD** (AEROTHAI) http://www.aerothai.co.th/maar Miss Saifon Obromsook Director, Safety Management Department & MAAR AEROTHAI Email: maar@aerothai.co.th;	Thailand	RMA	Current	Bangkok, Kolkata, Chennai, Colombo, Delhi, Dhaka, Hanoi, Ho Chi Minh, Hong Kong, Kabul, Karachi, Kathmandu, Kota Kinabalu, Kuala Lumpur, Lahore, Male, Manila, Mumbai, Phnom Penh, Singapore, Taibei, Ulaan Bataar, Vientiane, Yangon FIRs
Pacific Approvals Registry and Monitoring Organization (PARMO) – Federal Aviation Administration (US FAA) http://www.faa.gov/air_traffic/separation_standards/parmo/ Ms. Christine Falk ~~Federal Aviation Administration Separation Standards Analysis Branch~~ ~~Safety Analysis Subject Matter Expert~~	USA	RMA and EMA	Current	RMA for Anchorage Oceanic, Auckland Oceanic, Incheon, Nadi, Oakland Oceanic, Tahiti FIRs EMA for Anchorage Oceanic, Auckland Oceanic, Nadi, Oakland Oceanic, Tahiti FIRs

Organization *(including contact officer)*	State	Competency	Status	Airspace assessed (FIRs)
~~Email: parmo@faa.gov;~~ Manager, Separation Standards & Analysis Branch Federal Aviation Administration WJH Technical Center for Advanced Aerospace PARMO Email: parmo@faa.gov;				
South East Asia Safety Monitoring Agency (SEASMA) - Civil Aviation Authority of Singapore (CAAS) https://www.caas.gov.sg/operations-safety/airspace/south-east-asia-safety-monitoring-agency Mr. Tai Chee Hui Senior Air Traffic Control Manager (Safety Intelligence) Email: TAI_Chee_Hui@caas.gov.sg;	Singapore	EMA and CRA	Current	EMA for Hong Kong, Ho Chi Minh, Kota Kinabalu, Kuala Lumpur, Manila, Jakarta, Sanya, Singapore and Ujung Pandang FIRs CRA for Singapore, Viet Nam and Philippines
FIT-ASIA ICAO Asia and Pacific Regional Office Email: apac@icao.int; htakata@icao.int; Mr. Hong Yang Chair, FIT-Asia Email: hongyang@adcc.com.cn; Mr. Michael Matyas Boeing Engineering	FIT-Asia States Boeing USA	FIT CRA	Current Current	FIRs in the Asian Region not covered by IPACG/FIT and ISPACG/FIT FIRs in the Asian Region not covered by IPACG/FIT,

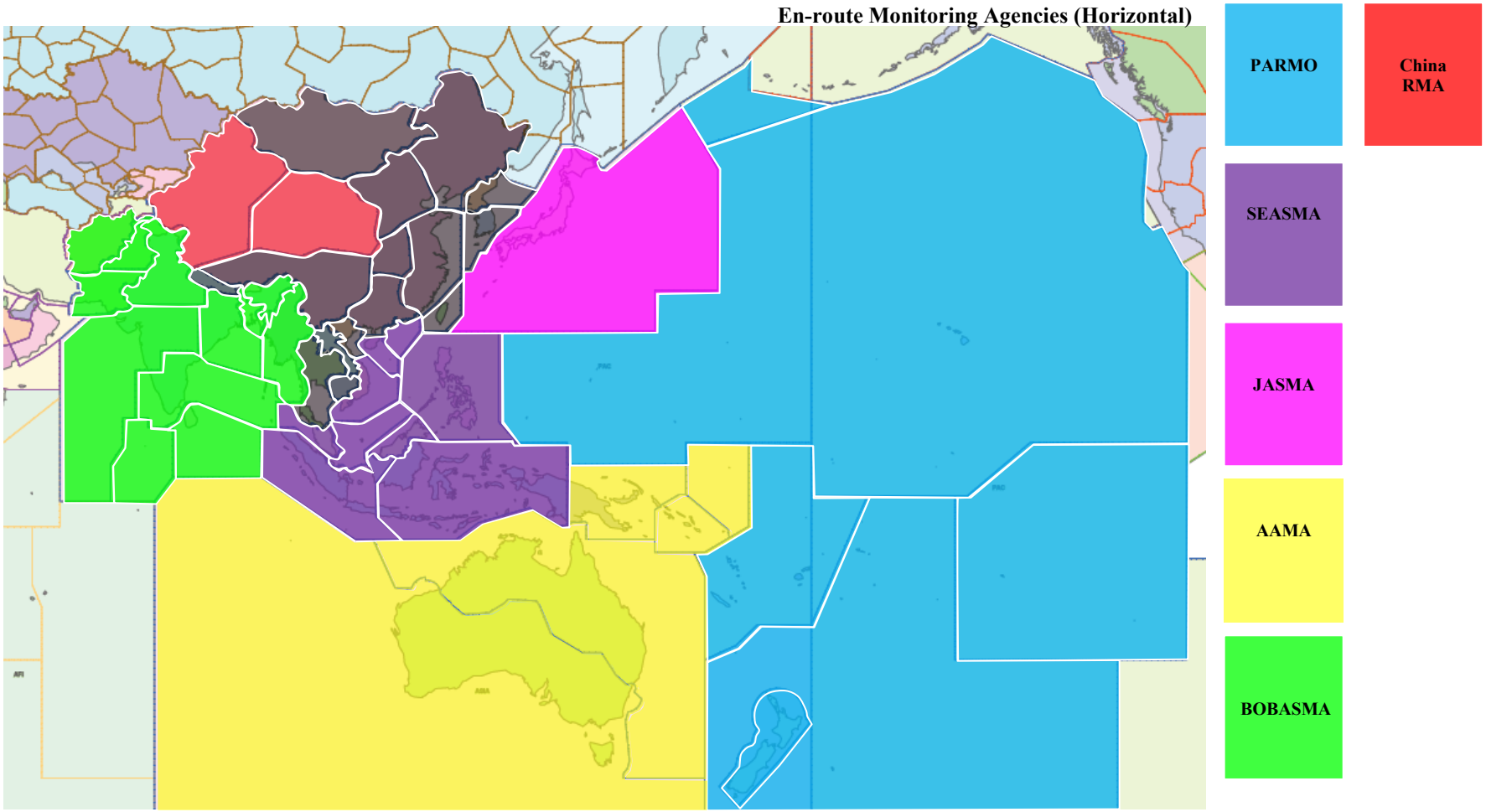
Organization *(including contact officer)*	State	Competency	Status	Airspace assessed (FIRs)
Email: michael.matyas@boeing.com; Mr Rami Ayari Boeing Engineering Email: rami.ayari@boeing.com				ISPACG/FIT, JASMA or SEASMA
IPACG/FIT ~~Mr. Hajime AOTO~~ Mr. Motochika Ichikawa IPACG/FIT Co-Chair (JCAB) Email : ~~aoto-h074i@mlit.go.jp~~; ichikawa-m03c3@mlit.go.jp; Mr. Sam El Zoobi FAA ISPACG Co- Chair Email: Sam.El-Zoobi@faa.gov; Mr. Michael Matyas, Boeing Engineering IPACG CRA Email: michael.matyas@boeing.com; Mr Noah Inahara Boeing Engineering IPACG CRA Email: noah.inahara@boeing.com;	Japan and USA Boeing USA	FIT CRA	Current	North & Central Pacific (Oceanic airspace within Fukuoka FIR, and Anchorage & Oakland FIRs) Oakland Oceanic, Anchorage Continental, and Anchorage Oceanic FIRs.
ISPACG/FIT	ISPACG States	FIT&CRA	Current	

Organization *(including contact officer)*	State	Competency	Status	Airspace assessed (FIRs)
Mr. Todd Kendall Airways New Zealand ISPACG Co-Chair Email: Todd.Kendall@airways.co.nz;				South Pacific FIRs and members of the Informal South Pacific ATS Coordination Group (ISPACG)
Mr. Sam El Zoobi FAA ISPACG Co- Chair Email: Sam.El-Zoobi@faa.gov;				
Ms. Lisa Bee, Inmarsat Aviation ISPACG/FIT Chair Email: Lisa.Bee@inmarsat.com;	Inmarsat	FIT		
Mr. Michael Matyas, Boeing Engineering ISPACG CRA Email: michael.matyas@boeing.com;	Boeing USA	CRA		
Mr Christopher Jirucha Boeing Engineering ISPACG CRA Email: christopher.j.jirucha@boeing.com;				

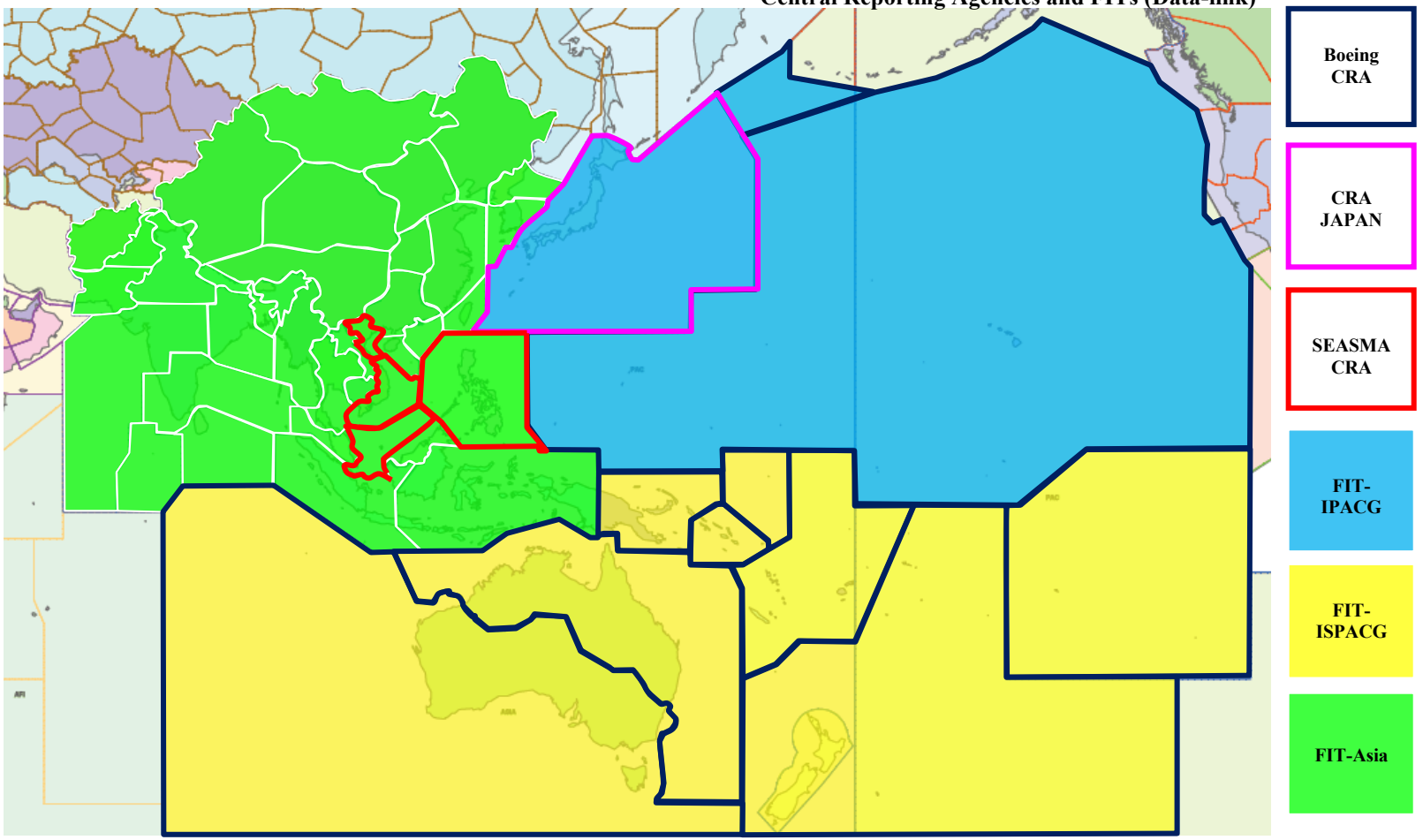
Regional Monitoring Agencies (Vertical)



En-route Monitoring Agencies (Horizontal)



Central Reporting Agencies and FITs (Data-link)



— — — — — — — — —

ATM and Airspace Safety Deficiencies List (Updated 02 July 2025)

	Deficiencies			Corrective Action		
States/facilities	**Description**	**Date first reported**	**Remarks**	**Executing body**	**Target date**	**Priority ****
	<u>Non Provision of Safety-related Data</u> Requirement of Paragraph 3.3.5.1 of Annex 11 (provision of data for monitoring the height-keeping performance of aircraft) and APANPIRG Conclusion 16/6 – Non Provision of safety related data by States					
Afghanistan	Non-provision of safety related data	12/07/2019	Failure to submit Kabul LHD data for January-December 2018 and 2020. Afghanistan had submitted data for the period January to July 2021, but no further LHD reports were received after August 2021.	Afghanistan	~~RASMAG/27~~ TBD	U
India	Non-provision of safety related data	RASMAG/30	India had not verified the RVSM approval status of 16 aircraft for over six months (since December 2024) and has not submitted the 2024 annual RVSM approval snapshot.	India	TBD	U
Nepal	Non-provision of safety related data	RASMAG/30	Failure to submit annual TSD on time and in correct format	Nepal	TBD	U
	State Responsibility to comply with the Annex 6 Height-Keeping Monitoring Requirement Annex 6 Part I Section 7.2.9 (10th Ed.) and Part II Section 2.5.2.10 (9th Ed.)					

	Deficiencies			Corrective Action		
States/facilities	**Description**	**Date first reported**	**Remarks**	**Executing body**	**Target date**	**Priority ****
Afghanistan	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/23	Remaining monitoring burden of 50% (RASMAG/30) MAAR informed ICAO that all known airframes in Afghanistan have complied with the monitoring requirement (November 2022). Deficiency retained due to the unknown status of the Afghanistan aeronautical authority responsible for ensuring monitoring is conducted.	Afghanistan	TBD	A
Democratic People's Republic of Korea	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/30	Remaining monitoring burden of 100% (RASMAG/30)	DPR Korea	TBD	A
India	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/29	Remaining monitoring burden of 46% (RASMAG/30)	India	TBD	A
Malaysia	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/30	Remaining monitoring burden of 31% (RASMAG/30)	Malaysia	TBD	A
Nepal	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/28	Remaining monitoring burden of 45% (RASMAG/30)	Nepal	TBD	A
~~Philippines~~	~~Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)~~	~~RASMAG/29~~	~~Remaining monitoring burden of 40% (RASMAG/29)~~ Remaining monitoring burden of 22% (RASMAG/30)	~~Philippines~~	~~TBD~~	~~A~~
	Data Link Performance Monitoring and Analysis Requirements of Paragraph 2.28 and/or 3.3.5.2 of Annex 11 not met					

	Deficiencies			Corrective Action		
States/facilities	**Description**	**Date first reported**	**Remarks**	**Executing body**	**Target date**	**Priority ****
~~India~~	~~Post-implementation monitoring not implemented~~	~~13/07/2017~~	~~Performance monitoring and analysis was reported for the Chennai and Kolkata FIRs, but was not reported for the Mumbai FIR. (FIT-Asia/14): Insufficient data/evidence to discuss the deficiency~~ (FIT-Asia/15): India had submitted the data link performance report for all the three FIRs, including Mumbai FIR.	~~India~~	~~TBD~~	~~A~~

** Note: In accordance with the *APANPIRG Handbook - Asia/Pacific Supplement to the Uniform Methodology for the Identification, Assessment and Reporting of Air Navigation Deficiencies*, priority for Air Navigation Deficiencies is guided by the principle that a deficiency with respect to an ICAO Standard is accorded a "U" status, while a non-compliance with a Recommended Practice or a PANS is considered as "A" or "B" subject to additional expert evaluation. The final prioritization of deficiencies is the prerogative of APANPIRG.

— — — — — — — —

RASMAG — TASK LIST

(last updated 17 July 2025)

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
25/2	The meeting suggested that the question be raised to the ATM/SG/8 on how to detect/handle State aircraft operators that incorrectly file 'W' in their flight plans (RASMAG/25/WP04).	~~ATM/SG/9~~ ~~RASMAG/28~~ RASMAG/29	ICAO	~~Open~~ Closed	RASMAG/26 update: ATM/SG/8 was informed of RASMAG/25 advice Draft Conclusion RASMAG/26-3 to also be discussed and endorsed at ATM/SG/9 RASMAG/27 update para 5.27 ref paper to Assembly. RASMAG/28 WP/32 continue to monitor
28/2	Discuss the definition of Sub categories of CAT. E LHDs to facilitate effective analysis at the next MAWG meeting	~~MAWG/11~~ MAWG/12	Monitoring Agencies	~~Open~~ Completed	RASMAG/28 report para 3.14 MAWG/12 WP/14
28/3	Review the data sharing procedure of additional data to support non-compliance reports	~~FIT/Asia/14~~ FIT/Asia/16	China RMA	Open	RASMAG/28 report para 4.7
29/1	Discuss a process of identification and de-identification of reports meant for sharing with stakeholders other than monitoring agencies	~~MAWG/12~~ MAWG/13	Monitoring Agencies	Open	RASMAG/29 report para MAWG/12 WP/04
29/2	Consider the use of the options proposed in RASMAG/29 report or other means to assist with the timely exchange of LHD reports	RASMAG/30	China and Republic of Korea	~~Open~~ Completed	RASMAG/29 report para RASMAG/30 WP/07 and WP/08
29/3	States to complete annual PBCS implementation Survey	~~28th February annually~~ Ongoing	All States	Open	Tracked as part of Annual PBCS implementation Survey to ICAO
29/4	ICAO to notify Bangladesh and Nepal of failure to submit the annual RVSM approval snapshot this year, which may result in an inclusion in the APANPIRG List of Deficiencies in the ATM and Airspace Safety fields next year	30 September 2024	ICAO	~~Open~~ Completed	RASMAG/29 report para 5.16 Two emails sent on 28/08/2024

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
29/5	Produce the draft of the next RASMAG safety Bulletin	MAWG/12	JASMA	~~Open~~ Completed	RASMAG/29 report para RASMAG/30 WP/20
30/1	Utilise the revised Category E sub-categories and hot spot identification method for future risk assessments	RASMAG/31	AAMA	Open	RASMAG/30 report para 3.14
30/2	Include additional description of LHD occurrences involving flight crew for the benefit of international organizations representing airspace users	RASMAG/31	Monitoring Agencies	Open	RASMAG/30 report para 3.82
30/3	Provide comments for the draft RASMAG Safety Bulletin to the Chair and Secretariat prior to the publication on the ICAO eDocuments webpage	30 Sep 2025	All	Open	RASMAG/30 report para 4.3
30/4	Provide comments for the HFAQ and Form A to MAAR and SEASMA by end of 2025 for further discussion in the MAWG meeting next year	31 Dec 2025	All	Open	RASMAG/30 report para 4.10
30/5	Promote awareness of GNSS RFI reporting so that their effects on safety risk are assessed for possible identification of prevention and mitigation measures	RASMAG/31	States/Administrations	Open	RASMAG/30 report para 5.5
30/6	Develop a formal process to maintain a consolidated non-RVSM approved list for sharing with States/Administrations	MAWG/13	Monitoring Agencies	Open	RASMAG/30 report para 5.31
30/7	Consider organizing a workshop in conjunction with RASMAG/31	RASMAG/31	ICAO and Chair	Open	RASMAG/30 report para 7.2

— END —