INTERNATIONAL CIVIL AVIATION ORGANIZATION

REPORT OF THE TWENTY-SIXTH MEETING OF THE REGIONAL AIRSPACE SAFETY MONITORING ADVISORY GROUP (RASMAG/26)

VIDEO TELECONFERENCE, 20 – 23 SEPTEMBER 2021

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

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

CONTENTS

APPENDIXES TO THE REPORT

INTRODUCTION

Meetings

1.1 The Twenty-Sixth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/26) was held from 20 to 23 September 2021 by Video Teleconference (VTC) from the ICAO Asia and Pacific Regional Office, Bangkok, Thailand.

Attendance

2.1 A total of 119 participants were registered for RASMAG/26 from Australia, Bangladesh, Cambodia, China, Hong Kong China, Fiji, India, Indonesia, Japan, Malaysia, New Zealand, Pakistan, Philippines, Republic of Korea, Singapore, Somalia, Sri Lanka, Thailand, United States of America, Viet Nam, CANSO, IATA, IFALPA IFATCA and ICAO.

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

Officers and Secretariat

3.1 Ms. Saifon Obromsook, Engineering Manager of AEROTHAI and the Monitoring Agency for the Asian Region (MAAR), chaired the meeting.

3.2 Mr. Shane Sumner, Regional Officer, Air Traffic Management/Aeronautical Information Management (ATM/AIM), ICAO Asia and Pacific Office acted as the Secretary for the RASMAG/26 meeting. He was assisted by Mr. Hiroyuki Takata, Regional Officer, ATM, Mr. Chew Han Chee, ATM Officer, and Ms. 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. Shane Sumner 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 40 Working Papers (WPs), six Information Papers (IPs) and three flimsies were presented to the meeting.

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

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

<table>
<tr><td colspan="3">Draft Conclusion RASMAG/26-3: RVSM Approvals Data and Filing of RVSM Indicator in Flight Plans of State Aircraft</td></tr>
<tr><td colspan="2">What: That, States are urged to:
1. liaise with their State aircraft operators to:
a. share State aircraft RVSM approval data with the designated RMA where State aircraft RVSM approval processes are implemented;
b. confirm the RVSM approval status of State aircraft when queried by the RMA; and
c. not file ‘W’ in item 10 of the ICAO flight plan of aircraft that are not approved for RVSM; and
2. respond to a survey on RMA and State responsibility on the matter of RVSM approvals of State aircraft.</td><td>Expected impact:
☒ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To improve airspace safety by ensuring that only RVSM-approved State aircraft file the RVSM ‘W’ indicator in filed flight plans, and facilitating the monitoring of RVSM approvals and performance of State aircraft by Regional Monitoring Agencies</td><td colspan="2">Follow-up: ☒Required from States</td></tr>
<tr><td>When: 2-Dec-21</td><td colspan="2">Status: Draft to be adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☒ICAO HQ ☒Other: RASG</td></tr>
</table>

7.2 List of Conclusions

<table>
<tr><td colspan="2">Conclusion RASMAG/26-1: FANS1/A CPDLC Latency Timer Value</td></tr>
<tr><td>What: That, recognizing:
1. the need for aircraft to provide an appropriate indication when the age of the time stamp of a received CPDLC message exceeds a defined value (latency timer value), in accordance with ICAO Doc 9869 PBCS Manual safety requirement SR-15;
2. a latency timer value of 300 seconds supports both RCP240 and RCP400 operations;
3. the need for a single, standardized global value; and
4. the trialling of a value of 300 seconds in the North Atlantic Region;
States are urged to implement a latency timer value of 300 seconds on a trial basis and report outcomes to FIT-Asia.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To to provide latency timer value that has been successfully used over several years of its operational implementation on a trial basis in the NAT region for States intending to implement the latency timer in accordance with PBCS safety requirement SR-15, and to support regional and global standardization</td><td>Follow-up: ☒Required from States</td></tr>
<tr><td>When: 23-Sep-21</td><td>Status: Adopted by Subgroup</td></tr>
<tr><td colspan="2">Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:</td></tr>
</table>

<table>
<tr><td colspan="2">Conclusion RASMAG/26-2: RVSM MMR Update</td></tr>
<tr><td>What: That, the Reduced Vertical Separation Minimum (RVSM) Minimum Monitoring Requirement (MMR) update at Appendix C to the Report be utilized by Regional Monitoring Agencies (RMAs) and States as appropriate.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: The Regional Monitoring Agencies Coordination Group (RMACG) updated the MMR for RMAs/States to utilize.</td><td>Follow-up: ☒Required from States</td></tr>
<tr><td>When: 23-Sep-21</td><td>Status: Adopted by Subgroup</td></tr>
<tr><td colspan="2">Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: Regional Monitoring Agencies (RMAs)</td></tr>
</table>

7.3 List of Draft Decisions

Nil.

7.4 List of Decisions

Nil

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REPORT ON AGENDA ITEMS – RASMAG/26

Agenda Item 1: Adoption of Agenda

1.1 The provisional agenda (WP01) was adopted by the meeting. The meeting noted IP01 (List of Working and Information Papers).

Agenda Item 2: Review Outcomes of Related Meetings

Relevant Meeting Outcomes (WP02)

2.1 The Secretariat provided briefings on the outcomes of relevant meetings, including the:

a) Eighth Meeting of the APANPIRG Air Traffic Management Sub-Group (ATM/SG/8) of the Asia Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) held by video teleconference from 23 to 27 November 2020; and

b) The Thirty-First Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/30) was held by video teleconference from 14 to 16 December 2020.

FIT-Asia Meeting Outcomes (WP03)

2.2 The Eleventh Meeting of the FANS Interoperability Team-Asia (FIT-Asia/11) was held by video teleconference from 23 to 26 August 2020.

2.3 The lower number of data link Problem Reports (PRs) submitted to the Central Reporting Agency (CRA) in the 2020-2021 reporting period (27, compared with 66 in 2019-2020) reflected the decrease in air traffic due to the impact of the COVID-19 pandemic.

2.4 Regarding PRs relating to flights in areas of poor VHF coverage with subsequent reversion to SATCOM (PR 3178-MM), or flights on the edge of VHF coverage experiencing media transitions (3099-KS) the FIT-Asia/11 meeting was reminded of the guidance for data link performance improvement for aircraft operators provided in **FIT-Asia/9 WP/03** and subsequently approved by RASMAG for regional use under ***Conclusion RASMAG/24-1: Guidance for Data Link Performance Improvement for Aircraft Operators***. The guidance was available on the ICAO Asia/Pacific Regional Office eDocuments web-page: https://www.icao.int/APAC/Pages/eDocs.aspx.

2.5 The CRA provided information to the FIT-Asia/11 meeting on causes of poor Performance-Based Communications and Surveillance (PBCS) performance in the South China Sea area, and potential resolutions. Removal of a specific VHF ground station had led to frequent media transitions to SATCOM.

2.6 The FIT-Asia/11 meeting had discussed the need for a adoption in the Asia/Pacific Region of a common Future Air Navigation Services 1/A (FANS1/A) Controller-Pilot Data Link Communications (CPDLC) Latency Timer value of 300 seconds, as was currently being successfully trialled in the North Atlantic (NAT) Region. The RASMAG/26 meeting agreed to the following Conclusion drafted by FIT-Asia/11:

Conclusion RASMAG/26-1: FANS1/A CPDLC Latency Timer Value

That, recognizing:

1. the need for aircraft to provide an appropriate indication when the age of the time stamp of a received CPDLC message exceeds a defined value (latency timer value), in accordance with ICAO Doc 9869 PBCS Manual safety requirement SR-15;
2. a latency timer value of 300 seconds supports both RCP240 and RCP400 operations;
3. the need for a single, standardized global value; and
4. the trialling of a value of 300 seconds in the North Atlantic Region;

States are urged to implement a latency timer value of 300 seconds on a trial basis and report outcomes to FIT-Asia.

2.7 The meeting was informed that over a period of four years a total of 19 APAC Administrations had responded to the annual regional survey of the status of current and planned implementation of performance-based horizontal separation minima, which was supported by several APANPIRG and RASMAG conclusions. Only Australia, Indonesia and Singapore had responded in 2021.

2.8 In response to a query ICAO informed the meeting that the annual survey questions on aircraft operator PBCS approvals were drawn from a checklist provided in ICAO Doc 9869 – PBCS Manual. Noting that there were cases where some States were using a process other than direct operational approvals to enable aircraft operators to file PBCS indicators in flight plans, ICAO undertook to study how information on such State regulatory processes could be obtained.

2.9 A Proposal for Amendment (PfA) to ICAO Doc 7030 *Regional Supplementary Procedures* (SUPPS) had been drafted to support the inclusion of relevant FIRs administered by Indonesia, Philippines, Singapore and Sri Lanka in sections supporting the application of performance-based separation that required PBCS. On receipt of formal communications from all States requesting the change, the PfA process would commence.

2.10 China had presented the Asia/Pacific Region Combined PBCS Monitoring Report to the FIT-Asia/11 meeting. The report highlighted consolidated performance data and issues associated with Automatic Dependent Surveillance - Contract (ADS-C) Actual Surveillance Performance (ASP) and CPDLC Actual Communications Performance (CPDLC) for the region.

2.11 Overall ASP for the region had met the 95% criterion of the Required Surveillance Performance 180 (RSP180) specification, but fell marginally below the 99.9% criterion. While the volume of data counts had significantly reduced in 2020, the trend of regional performance in both the 95% and 99.9% criteria had generally improved.

2.12 Overall ACP for the region met the 95% criterion (**Table 1**). ACP for most FIRs fell marginally below the 99.9% criterion, but several FIRs failed to meet it. In the first half of 2020 one FIR did not meet the 95% criterion for Actual Communications Technical Performance (ACTP) and two FIRs failed to meet the 99.9% criterion. In the second half of the year all reporting FIRs met the 95% criterion, but four did not meet the 99.9% criterion. Pilot Operator Response Time (PORT) performance requirements were not met by a number of aircraft operators.

ACTUAL COMMUNICATION PERFORMANCE - FIR AGGREGATE (ALL MEDIA TYPES)										
Region	Asia-Pacific Region									
Performance Criteria	RCP240									
Time Period	2020 January-June					2020 July - December				
Colour key: Meets criteria / 99.0%-99.9% / Under criteria	Message Counts	ACP Criteria		ACTP Criteria		Message Counts	ACP Criteria		ACTP Criteria	
		95%	99.90%	95%	99.90%		95%	99.90%	95%	99.90%
FIR		% <= 180sec	% <= 210sec	% <= 120sec	% <= 150sec		% <= 180sec	% <= 210sec	% < = 120sec	% <=150sec
PAZA	70739	99.12%	99.33%	99.21%	99.50%	68090	99.06%	99.32%	99.24%	99.48%
RJJJ	34547	99.57%	99.78%	99.65%	99.75%	31739	99.60%	99.76%	99.63%	99.73%
KZAK	192062	99.31%	99.53%	99.65%	99.77%	142934	99.46%	99.64%	99.72%	99.84%
NFFF	3764	99.62%	99.81%	99.81%	99.89%					
NTTT	2939	99.49%	99.78%	99.71%	99.78%	1002	99.40%	99.70%	100.00%	100.00%
NZZO	7999	99.58%	99.73%	99.72%	99.74%	2803	99.82%	99.71%	99.89%	99.89%
YBBB	24042	99.25%	99.29%	99.46%	99.48%	11475	99.29%	99.29%	99.48%	99.48%
YMMM	29335	99.55%	99.48%	99.67%	99.66%	12820	99.38%	99.38%	99.53%	99.53%
RPHI	4665	97.59%	97.84%	98.91%	99.24%	9044	98.24%	98.40%	98.58%	98.82%
VCCF	24214	98.45%	99.53%	99.28%	99.78%	16601	98.37%	99.39%	99.17%	99.76%
VOMF	31266	99.77%	99.86%	99.84%	99.86%	31445	99.77%	99.85%	99.84%	99.86%
VVTS	26896	95.80%	96.31%	99.40%	99.65%	31859	96.26%	96.64%	99.48%	99.72%
WAAF	21900	98.20%	98.45%	99.70%	99.78%	11451	97.80%	98.12%	99.68%	99.75%
WMFC	9261	98.14%	98.71%	98.54%	99.11%	30246	97.67%	98.45%	97.42%	98.40%
WSJC	19113	98.94%	99.29%	98.87%	99.22%	14758	98.93%	99.20%	99.05%	99.29%
ZLLL	2447	97.99%	98.32%	98.40%	98.81%	1140	97.10%	97.28%	98.42%	98.68%
ZWWW	464	95.90%	96.76%	93.31%	96.98%	111	97.29%	98.19%	96.39%	96.39%

Table 1: Asia/Pacific Region ACP (RCP240)

2.13 The meeting agreed to recommend the following update of data link-related ATM and Airspace Safety Deficiencies to APANPIRG/32:

- deletion of the following Deficiency:

  Fiji: *Problem reports not provided to CRA.*

- amendment of the following Deficiency:

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

- retention of the following Deficiency:

  Maldives: *Problem reports not provided to CRA. Performance monitoring and analysis not reported to FIT.*

2.14 These recommendations were included in the Deficiencies List provided for RASMAG/26 discussion and agreement in WP/37.

RASMAG/MAWG and RMACG Reports (WP04)

2.15 The Eighth Monitoring Agencies Working Group (MAWG/8) was held by video teleconference from 01 to 04 February 2021. The MAWG/8 meeting discussed a number of key issues relevant to the APAC Region including Altimetry System Error (ASE) and height monitoring activities, En-route Monitoring Agency (EMA)/Regional Monitoring Agency (RMA) safety monitoring, PBCS oversight, monitoring of non-RVSM approved aircraft and consolidated safety reporting to RASMAG.

2.16 The Sixteenth Meeting of the Regional Monitoring Agencies (RMAs) Coordination Group (RMACG/16) was also held by video teleconference, from 14 to 25 June and 28 June to 02 July 2021. The RMACG/16 meeting had discussed a number of key issues including RVSM and PBCS approvals and monitoring, technical height monitoring systems and techniques, aircraft technical height keeping performance, and RMA coordination and data exchange.

2.17 The meeting was informed of ***Action RMACG/16:2*** – detailing requested actions to assist the NAT Central Monitoring Agency (CMA) by RMAs receiving 'low data' PBCS non-compliance reports.

2.18 RMACG/16 had noted that in previous meetings the North American Approvals Registry and Monitoring Organization (NAARMO) had proposed removal of the 1,000 hour portion of the recurrent RVSM height monitoring requirement specified in Annex 6 to the Convention on International Civil Aviation. RMACG/16 had agreed in principle to the proposal, but noted it would require a robust documented justification and formal endorsement by the ICAO Separation and Airspace Safety Panel (SASP). Accordingly, ***Action RMACG/16:6*** requested all RMAs to provide data on operators that were taking advantage of the 1,000 hours monitoring requirement.

2.19 The meeting endorsed the new Minimum Monitoring Requirements (***RASMAG/26 WP/04 Attachment***) for applicability in the Asia/Pacific Region, and agreed to the following Conclusion.

Conclusion RASMAG/26-2: RVSM MMR Update

That, the Reduced Vertical Separation Minimum (RVSM) Minimum Monitoring Requirement (MMR) update at **Appendix C to the Report** be utilized by Regional Monitoring Agencies (RMAs) and States as appropriate.

2.20 The meeting was informed of the EUROCONTROL intention that flight plans for non-RVSM approved aircraft that had been listed in the EUR RMA Bulletin for a long time would be rejected by the EUROCONTROL Integrated Initial Flight Planning Processing System (IFPS).

2.21 The matter of monitoring and management of non-RVSM approved aircraft was further discussed under Agenda Item 5, WP/24.

2.22 During discussion of States' airspace occurrence reporting, IFATCA stated that reported occurrences often involved a number of contributing factors and/or outcomes. The determination of whether certain events are to be reported as LHDs, LLDs and LLEs should be done by appropriate management of the Air Navigation Service Provider (ANSP) or by the regulatory authority, rather than by the ATC personnel making the initial report.

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

JASMA AKARA Safety Improvement Update (WP/8)

3.1 The Japan Airspace Safety Monitoring Agency (JASMA) provided an updates, progress and proposals of the safety improvement plan for the AKARA – FUKUE Corridor. Phase 1 of the improvement plan had been implemented on 25 March 2021 (**Figure 1**).

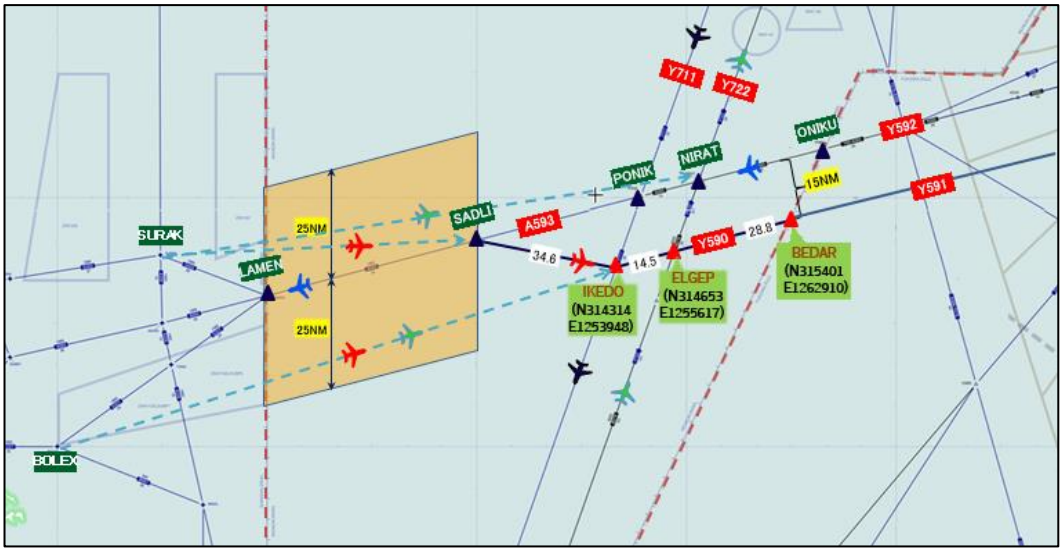

Figure 1: ATS route structure of AKARA-FUKUE Corridor Safety Improvement Plan Phase 1

3.2 All Air Traffic Control (ATC) responsibility for ATS route A593 between ONIKU and SADLI had been handed over to Incheon Area Control Centre (ACC).

3.3 Due to the use of ATS Inter-Facility Data Communication (AIDC) there had been no Large Height Deviations (LHDs) at BEDAR and ONIKU reported to JASMA from 25 March to 31 August 2021.

3.4 As at August 2021 the transition from Phase 1 to Phase 2 of the improvement plan had been discussed between China and Republic of Korea, but the transition date had not yet been determined.

3.5 **Figure 2** shows the ATS route structure of Phase 2.

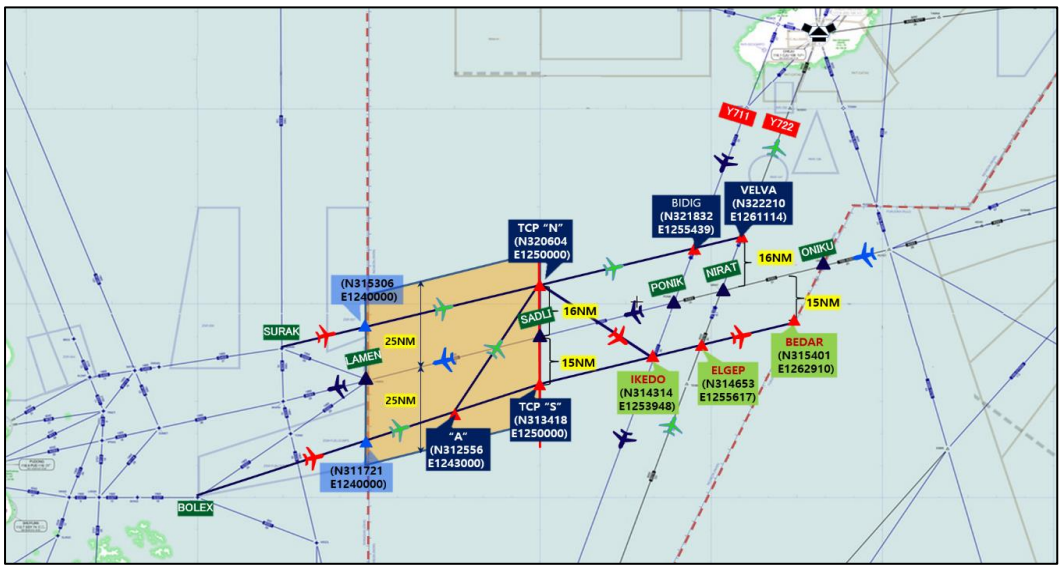

Figure 2: ATS route structure of AKARA-FUKUE Corridor Safety Improvement Plan Phase 2.

3.6 **Table 2** shows the result of a safety assessment in the AKARA – FUKUE corridor **airspace** conducted by JASMA and the Electronic Navigation Research Institute (ENRI), using fast-time simulation of traffic sample data (TSD) based on flight records between 0100 and 0700 UTC.

	AKARA Airspace *(note: based on Dec 2019 traffic sample data)*			
Source of Risk	**Same & Opposite Risk**	**Intersection Risk**	**Total Risk**	**Remarks**
Technical Risk (only A593 with FLAS)	*15.4×10^{-9}*	*0.16×10^{-9}*	*15.6×10^{-9}*	*Past*
Technical Risk (Phase 1 with FLAS)	0.03×10^{-9}	0.23×10^{-9}	0.26×10^{-9}	Current
Technical Risk (Phase 1 without FLAS)	0.02×10^{-9}	0.20×10^{-9}	0.22×10^{-9}	
Technical Risk (Phase 2 with FLAS)	0.01×10^{-14}	0.17×10^{-9}	0.17×10^{-9}	
Technical Risk (Phase 2 without FLAS)	**0.05×10^{-15}**	**0.12×10^{-9}**	**0.12×10^{-9}**	**Best future**

Table 2: JASMA/ENRI result of safety assessment using fast-time simulation

3.7 The technical risk estimate may not have met the Target Level of Safety (TLS) until transition to Phase 1. Establishing new parallel routes of A593 as non-bidirectional routes in Phase 1 seemed to decrease the technical risk estimates for the same and opposite directions significantly. Therefore, phase 2, establishing parallel routes in the entire AKARA corridor airspace, would further decrease the technical risk estimates.

3.8 Eliminating the Flight Level Allocation Scheme (FLAS) would contribute to decreasing technical risk estimates as aircraft would have more opportunity to cross other aircraft with more than 1,000ft vertical separation if the FLAS was eliminated.

3.9 JASMA had received a report of category D LHD (ATC system loop error) that occurred more than 100NM East of the AKARA corridor airspace in May 2021. Pilots misunderstood a heading instruction by Fukuoka ACC as a descending clearance to the FLAS altitude. According to the investigation by Fukuoka ACC, pilots flying the AKARA corridor airspace expected flight level change before entering the corridor. JASMA considered the pilots' expectation for altitude change due to FLAS could not be overlooked as a potential risk of LHD.

3.10 JASMA proposed:

1. that the area of Hot Spot B be narrowed down from the entire AKARA – FUKUE airspace to only that airspace between 124E and 12620E, removing BEDAR/ONIKU; and

2. that relevant States conduct a swift transition from Phase 1 to Phase 2, and eliminate the FLAS, in order to prepare for the recovery of traffic volume after the COVID-19 pandemic.

3.11 The meeting was informed that China and Republic of Korea were currently negotiating on Phase 2 implementation, and more time was needed to reach agreement.

3.12 The meeting was reminded of the performance expectations in paragraph 7.35 of the Asia/Pacific Seamless ANS Plan, which supported retention of FLAS in Category S airspace only for safety and efficiency reasons where crossing track conflictions occurred within 50NM of the FIR boundary and ATS surveillance coverage did not overlap the FIR boundary concerned.

3.13 China, Japan and Republic of Korea, together with observers from other States and International Organizations, held a breakout session to discuss progress in the AKARA Corridor airspace. A summary of discussion is provided in **Appendix D to this Report**.

Normalization of the AKARA Corridor (WP/30)

3.14 Republic of Korea also provided information on the normalization progress of the AKARA – FUKUE Corridor.

3.15 The meeting was reminded of the identification of the Corridor as one of the five LHD hot spot areas in the APAC Region at RASMAG/20 (Bangkok, Thailand, 26-29 May 2015). The Pacific Approvals Registry and Monitoring Organization (PARMO) RMA had conducted safety assessments for the Corridor every year since 2015 (**Table 3**).

Year	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Overall vertical collision risk	46.2×10^{-9}	2.08×10^{-9}	1.75×10^{-9}	55.1×10^{-9}	247.0×10^{-9}	45.1×10^{-9}

Table 3: Vertical safety assessment of the AKARA - FUKUE Corridor

3.16 The 62% fall in traffic volume in the Corridor due to the coronavirus outbreak had led to the number of LHD reports falling from 29 in 2019 to 5 in 2020. However, the overall vertical collision risk continued to exceed the TLS due to the Corridor being highly susceptible to even a single deviation resulting in the airspace not meeting TLS.

3.17 As a safety measure by States concerned a new eastbound unidirectional ATS route (Y590/Y591) connecting Incheon FIR and Fukuoka FIR was established in the Corridor with a view to eliminating opposite passing traffic while keeping the existing ATS route A593 for westbound traffic only. This had also mitigated crossing traffic which had been frequent at the intersection of A593 and north/south routes Y711/Y722. The reduced opposite direction and crossing vertical crossing value was expected to effect a positive impact on the 2021 vertical collision risk estimate.

3.18 The establishment of a single ATC unit at intersection points had facilitated easier altitude change and the immediate response as appropriate to abnormal situations such as weather deviation or emergency descent.

3.19 Incheon ACC and Shanghai ACC had signed a new Letter of Agreement (LoA) for the first time since 1983, and a Direct Speech Circuit (DSC) for ATC coordination between the two centres had been installed.

3.20 Following on from the Phase 1 implementation described above, the timing of Phase 2 of the project was the subject of ongoing consultation among the States concerned.

3.21 Republic of Korea expressed gratitude to PARMO for conducting safety assessments, and to China RMA, JASMA and MAAR for providing relevant data. Republic of Korea hoped that PARMO would take the new ATS arrangements into consideration in their 2021 safety assessment, and suggested that the Corridor be taken off the LHD hot spot list.

2020 Analyses for the Incheon FIR AKARA Corridor Interface with Shanghai/Fukuoka/Taipei FIRs (WP/9)

3.22 PARMO provided an update of its analysis of AKARA corridor airspace using December 2020 TSD and reported LHD events in 2020. It was noted the analysis used traffic data and reported occurrences from calendar year 2020, before the normalization of the AKARA corridor on 25 March 2021.

3.23 The AKARA Corridor interface with Shanghai/Fukuoka/Taibei FIRs was identified by RASMAG/20 as LHD Hot Spot B.

3.24 Prior to 25 March 2021 ATS services for operations on ATS route A593 were provided by Fukuoka ACC for traffic east of SADLI, Shanghai ACC for traffic west of SADLI, and Incheon ACC for north-south traffic, with a Flight Level Orientation Scheme (FLOS) in place.

3.25 There were five reported LHDs in the AKARA airspace in 2020, which was a decrease from the 29 reported LHDs in calendar year 2019. The observed decrease was expected as the likely result of COVID-19-related reduction in air travel.

3.26 **Figure 3** maps the reported LHD locations and associated categories, including LHD reports of zero duration. Two Category D, Two Category E and one Category J LHDs were recorded.

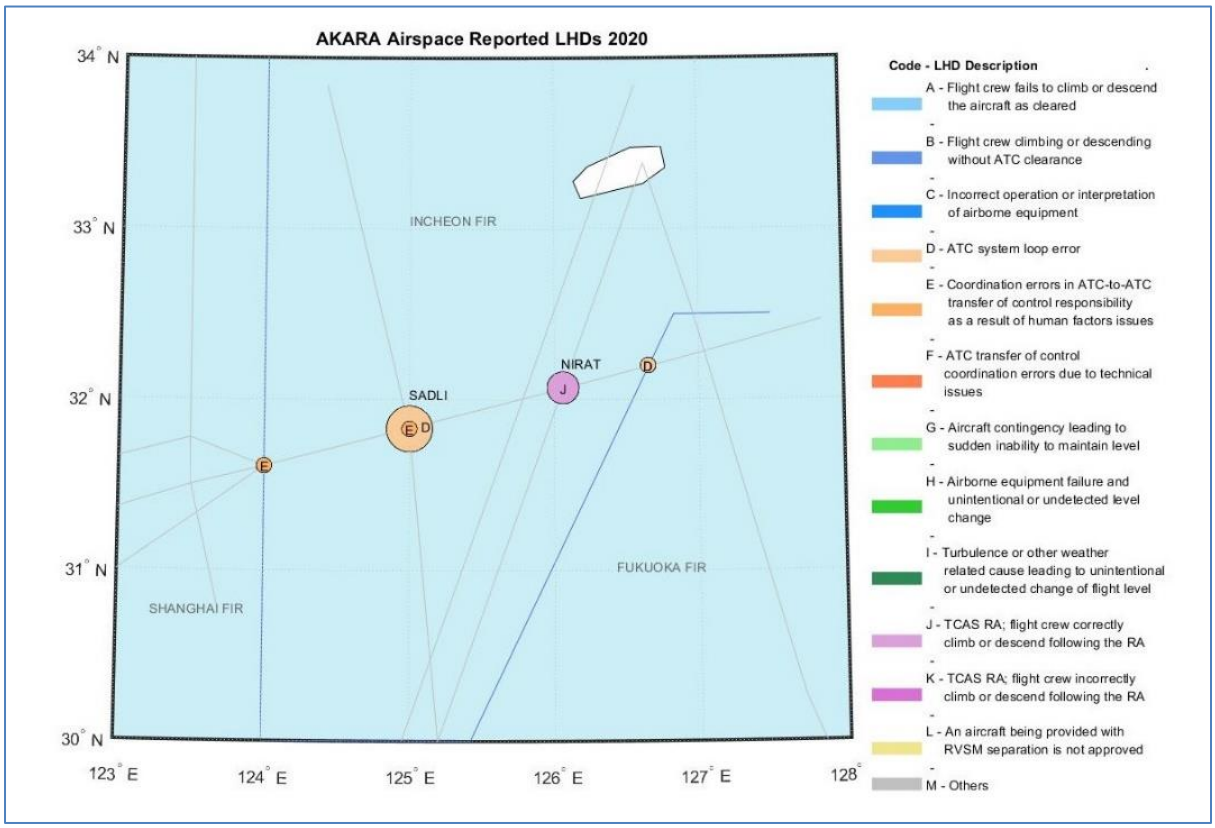

Figure 3: Locations of reported LHDs in AKARA Corridor airspace - 2020

3.27 The 2020 vertical collision risk estimate (**Figure 4**) was lower than the estimate in 2019. This was also likely to have been due to the reduction in air travel due the pandemic. The 2020 vertical technical risk estimate of 0.72×10^{-9} fapfh met the TLS for vertical technical risk (2.5×10^{-9} fapfh). The overall vertical risk estimate of 45.1×10^{-9} fapfh exceeded the overall vertical TLS of 5×10^{-9} fapfh.

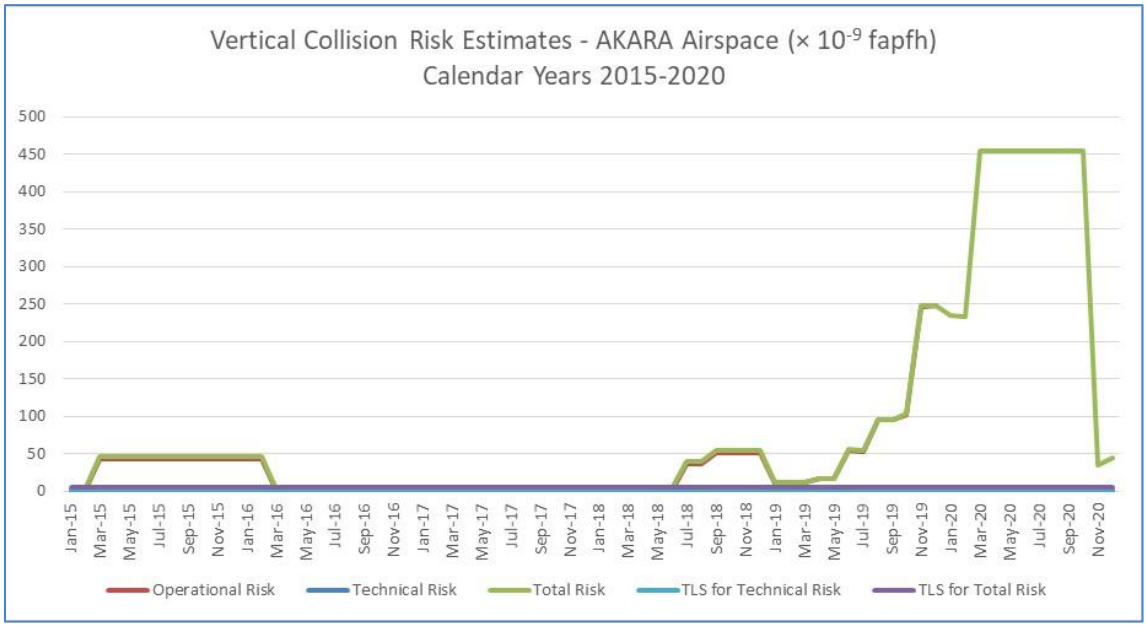

Figure 4: Twelve-month Rolling Vertical Collision Risk Estimates

3.28 Regarding Hot Spot B, the Chair reminded the meeting that usual RASMAG practice was to retain the identification of hot spots for 2 years following the achievement of collision risk below the TLS.

3.29 ICAO proposed that any consideration of removal of hot spots should take into account the current major reduction in traffic and its effect on safety risk calculations. It would not be appropriate to remove hot spots under the prevailing circumstances only to find they had to be reimposed after traffic volumes returned to more normal levels.

RVSM Risk Assessment in the Brisbane, Honiara, Melbourne, Nauru, Port Moresby, Jakarta and Ujung Pandang FIRs – 1 January 2020 to 31 December 2020 (WP/5 and SP/1)

3.30 The Australia Airspace Monitoring Agency (AAMA) provided an airspace safety review of RVSM airspace risk within the Brisbane, Honiara, Melbourne, Nauru and Port Moresby FIRs. Southwest Pacific - Australian Airspace

3.31 **Table 4** details the technical, operational and weighted total risk, each of which met the specified TLS.

Source of risk	Risk estimate	TLS	Comparison with TLS
Technical risk	0.016×10^{-9}	2.5×10^{-9}	Below technical TLS
Operational risk	0.001×10^{-9}	-	-
Total risk	**0.017×10^{-9}**	**5.0×10^{-9}**	**Below total TLS**

Table 4: RVSM Risk Estimates for the period 1 January 2020 to 31 December 2020. The number of estimated annual flying hours is 398,424 based on the December 2020 TSD.

3.32 An assessment of safety reporting culture as proposed by the MAWG/7 meeting, measured against the reporting rate of occurrences per flight hour and grouped by attribution indicated reports were consistently made by both pilots and ATC (**Table 5**). LHDs with ATC attribution were the most widely reported, indicating a positive reporting culture if ATC were comfortable reporting on their own errors as part of a 'just culture' framework.

Attribution	Number of reports	Flight hours	Number of reports per flight hour (x 10^{-5})
Pilot/Aircrew (A, B, C)	16	398,424	4.02
ATC (D, E, F)	21	398,424	5.27
Other	9	398,424	2.26
Total	**46**	**398,424**	**11.5**

Table 5: Safety culture metric for Australia, Nauru, Papua New Guinea, and Solomon Islands by LHD attribution for the period 1 January 2020 to 31 December 2020.

3.33 **Figure 5** identifies the geographic location of LHD occurrences for the period 01 January to 31 December 2020, with the radius of each circle proportional to the total risk at that location.

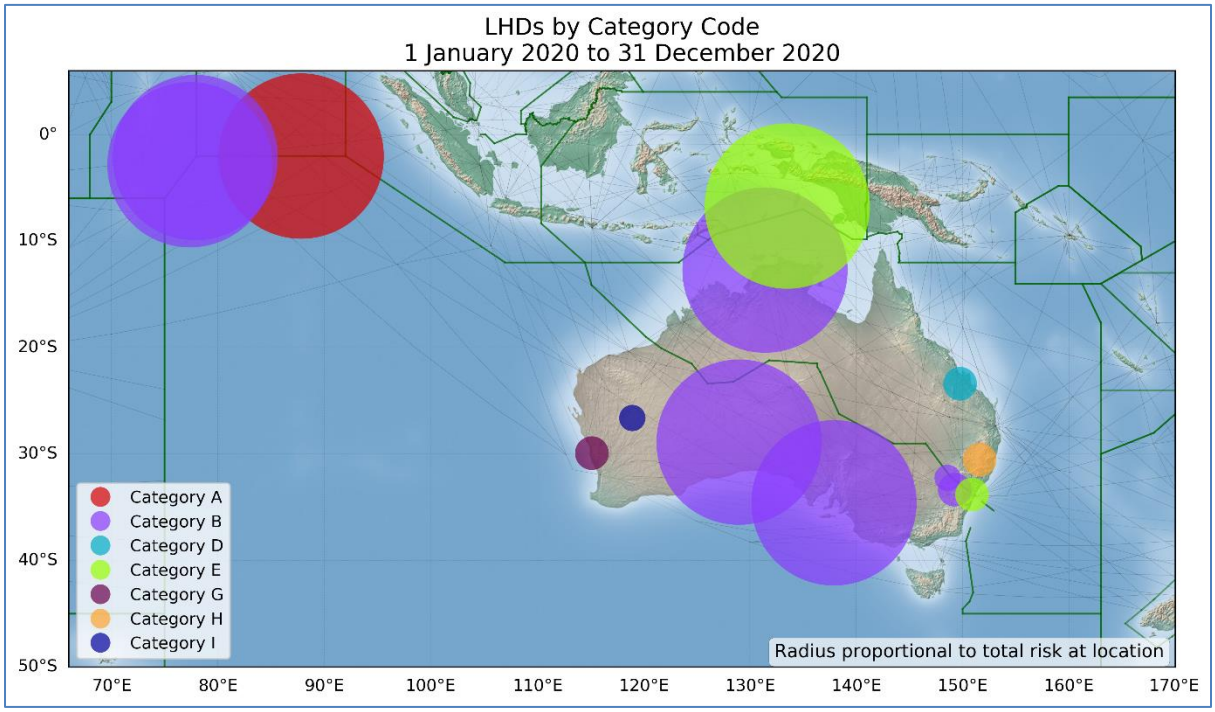

Figure 5: Geolocation of LHDs for Brisbane, Honiara, Melbourne, Nauru, and Port Moresby FIRs for the period 1 January 2020 to 31 December 2020.

3.34 In response to a query on the root causes of Category B LHDs, the meeting was informed of an analysis provided by AAMA to the MAWG/8 meeting (Flimsy 03). In that analysis three of the seven Category B occurrences that were assessed as non-zero duration involved incorrect aircraft changing levels without a clearance as a result of call sign confusion. AAMA stated that Australia's ATC operations personnel were in favour of the Alphanumeric call sign initiative.

3.35 The total risk estimate for the Jakarta and Ujung Pandang FIRs was **0.181 x 10^{-9} (Table 6),** reflecting the significant decrease in flying hours and occupancy parameters. There were no non-zero duration reports for the Jakarta and Ujung Pandang FIRs in March, April, June, August, October and November 2020

Source of risk	Risk estimate	TLS	Comparison with TLS
Technical risk	0.125×10^{-9}	2.5×10^{-9}	Below technical TLS
Operational risk	0.057×10^{-9}	-	-
Total risk	**0.181×10^{-9}**	**5.0×10^{-9}**	**Below total TLS**

Table 6: 2020 RVSM Risk Estimate for the Jakarta and Ujung Pandang FIRs

China RMA Vertical Safety Report (WP/6)

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

3.37 The 2020 RVSM risk estimates for the Beijing, Guangzhou, Kunming, Lanzhou, Pyongyang, Sanya, Shanghai, Shenyang, Urumqi and Wuhan FIRs indicated that the TLS had not been met, at **7.107×10^{-9}**.

3.38 The risk estimate had resulted from 85 reported LHDs, including 34 Category I (*Turbulence or other weather related cause*. 40%), nine Category A (*Flight crew failing to climb/descend the aircraft as cleared*, 11%) and 10 Category E (*Coordination errors in the ATC-to-ATC transfer of control responsibility as a result of human factors issues*, 12%). Four Category E events had been reported in 2019.

3.39 The 2020 RVSM risk estimate for the Pyongyang FIR indicated that the TLS had been met at **1.04×10^{-9}**, as no LHD had been reported during 2020.

3.40 JASMA noted that five LHDs at SADLI did not appear to have been included in the PARMO report. China RMA informed the meeting that the data would be shared with JASMA and PARMO. Republic of Korea also requested the data be shared with them (China RMA also agreed that information on this area should be shared), and advised that they would share relevant data with China RMA, JASMA and PARMO.

3.41 China RMA also agreed to provide Pakistan with details of the Category E LHD event at the Lahore/Urumqi FIR boundary through MAAR.

JASMA Vertical Safety Report (WP/7)

3.42 The vertical safety assessment for the RVSM airspace in the Fukuoka FIR's RVSM airspace for the period from January to December 2020 was presented by the Japan Airspace Safety Monitoring Agency (JASMA). The 2020 RVSM risk estimate for the Fukuoka FIR indicated that the TLS had not been met at **11.57×10^{-9}** (**Figure 6**).

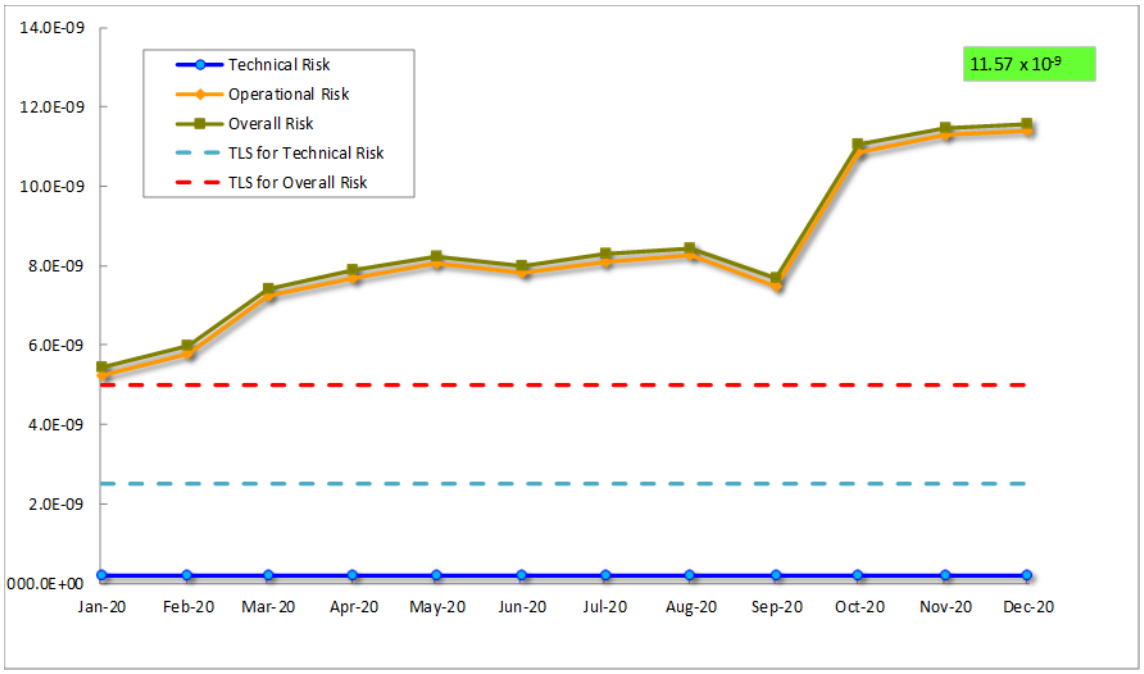

Figure 6: Japanese Airspace RVSM Risk Estimate Trends

3.43 Of the 42 LHDs reported during 2020 within the Fukuoka FIR:

- 10 were Category E (24%); and
- 11 were Category I (26%);

3.44 **Figure 7** illustrates the location of the risk-bearing LHDs during 2020. The overall risk in 2020 exceeded the TLS. The total risk was the same value as 2019.

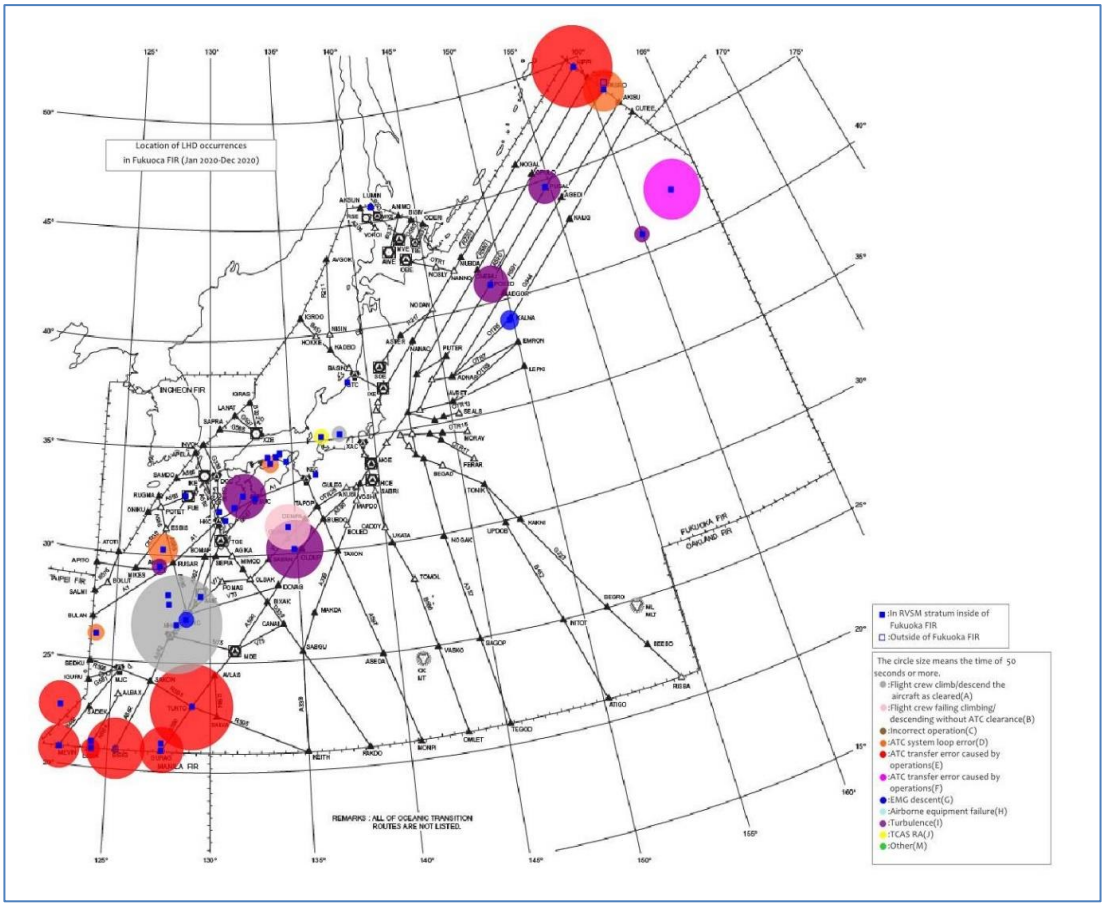

Figure 7: Japanese Airspace – Risk Bearing LHD

3.45 A total of eight category E LHDs had occurred at hot spot D, the FIR boundary between Manila and Fukuoka FIRs. Seven had occurred on transfer from Manila ACC to Kobe ACC or Fukuoka ATMC, and the remaining one LHD had occurred on transfer from Kobe ACC to Manila ACC.

3.46 In response to JASMA's invitation to the meeting, particularly IATA and IFALPA, to provide feedback on the increasing number of Category A LHDs, IFALPA agreed that decreasing opportunities for pilots to operate aircraft may have contributed. JASMA was also asked whether these events could be categorized by time of day, as fatigue may be a contributing factor due to some operators requiring pilots to fly longer than usual flight hours. JASMA agreed to provide IFALPA with further information, but noted it would take some time to prepare.

JASMA Horizontal Safety Report (WP/15)

3.47 Japan provided the horizontal risk assessment results of the Fukuoka Flight Information Region (FIR) conducted by the Japan Airspace Safety Monitoring Agency (JASMA).

3.48 The horizontal separations based on Performance-Based Navigation (PBN) both met the TLS, with 50NM lateral achieving **0.65×10^{-9}** and 30NM longitudinal estimated risk at **0.015×10^{-9}**. The 10-minute time-based risk also met TLS at **0.25×10^{-9}**.

3.49 There was a total of 24 Large Lateral Deviations (LLDs) and Large Longitudinal Errors (LLEs) reported to JASMA in 2020. Of these, 12 were Category H (*Turbulence or weather related causes leading to a deviation in the horizontal dimension* – 50%)

JASMA Safety Reporting Culture (WP/32)

3.50 The meeting was provided information on the safety reporting culture in Japan including reporting procedures, systems and information flow. The information was provided in response to ***Decision RASMAG/25-4: Safety Reporting Assessment***.

3.51 All ATC facilities were required to submit safety reports including LHD, LLD and LLE information to the Aviation Safety and Security Planning Department (ASSD) and Air Navigation Service Department (ANSD) of the Japan Civil Aviation Bureau (JCAB) headquarters through an online reporting system.

3.52 AIP Japan required that aircraft operators submit LHD reports to JASMA. A protocol was established for requesting supplemental information from aircraft operators or, if the aircraft operator could not be reached, through IATA with copy of the request to IFALPA.

3.53 This paper generated some wide-ranging discussion on safety reporting and safety culture, and several questions were raised on how safety-related behaviours could be evaluated. The meeting was informed that a safety culture survey may be conducted to measure the organization's safety behaviour. The meeting was also informed that RMAs/EMAs could try to assist by evaluating the reporting of occurrences at FIR boundaries. The meeting was further informed of CANSO guidance available on the following web-page:

https://canso.org/publication/safety-culture-definition-and-enhancement-process/

3.54 It was also noted that safety reporting and safety culture could be improved by easy-to-use online portals to make safety reporting easier for operational personnel, and through clear definition of what must be reported, and how it must be reported.

MAAR Vertical Safety Report (WP/11)

3.55 The Monitoring Agency for the Asian Region (MAAR) provided the results of the airspace safety oversight for RVSM operations in South Asia/Indian Ocean Airspace (SA/IO), Southeast Asia Airspace (SEA), and Mongolian Airspace during 2020.

South Asia Indian Ocean Airspace

3.56 The 2020 RVSM risk estimate for SAIO airspace indicated that the TLS had not been met at **15.67×10^{-9}** (**Figure 8**).

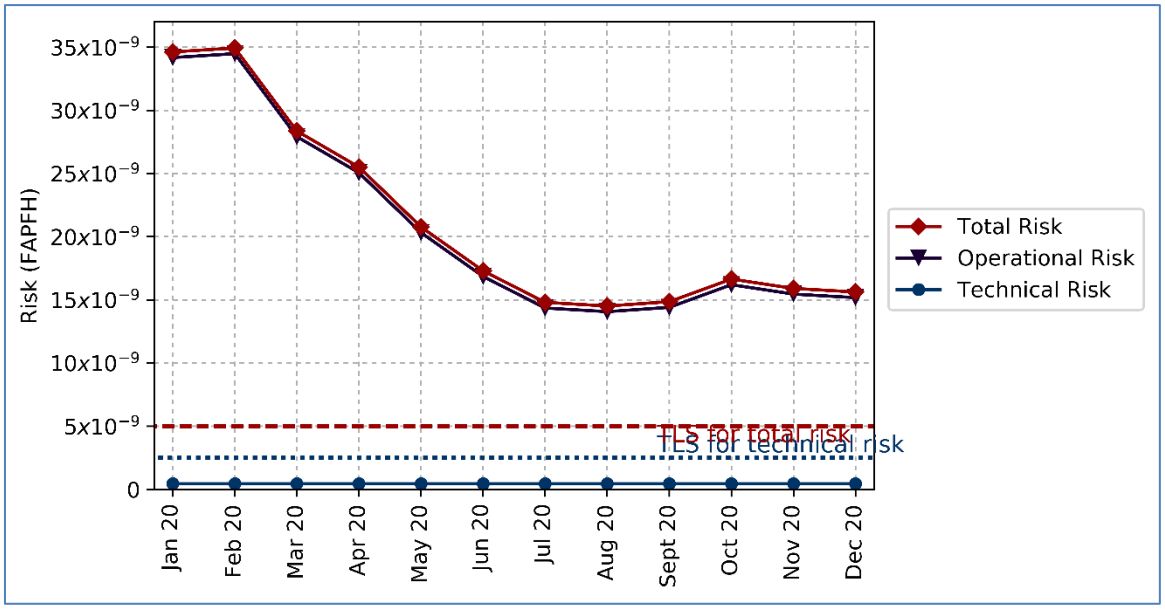

Figure 8: Trends of Risk Estimates for SA/IO Airspace.

3.57 As had been the case in previous years, the vast majority of the 152 LHD cases that had been reported were Category E events, with 138 (91%). The 65% reduction in numbers of LHDs from 434 in 2019 to 152 in 2020 reflected the 66% decrease in estimated annual flight hours.

3.58 LHD Hot Spot G (Sanaa/Muscat – Mumbai) and LHD Hot Spot F (Mogadishu – Mumbai) at the western boundary of Mumbai FIR remain as LHD hot spots since 2015. In 2020 the number of non-zero duration LHDs of these hot spots accounted for 62% of all non-zero-duration LHDs of the SA/IO airspace and the resultant operational risk of **11.17 x 10^{-9} FAPFH** accounted for 74% of the total operational risk of the SA/IO airspace.

3.59 The geographical location of all LHD hot spots in SA/IO airspace is shown in **Figure 9**.

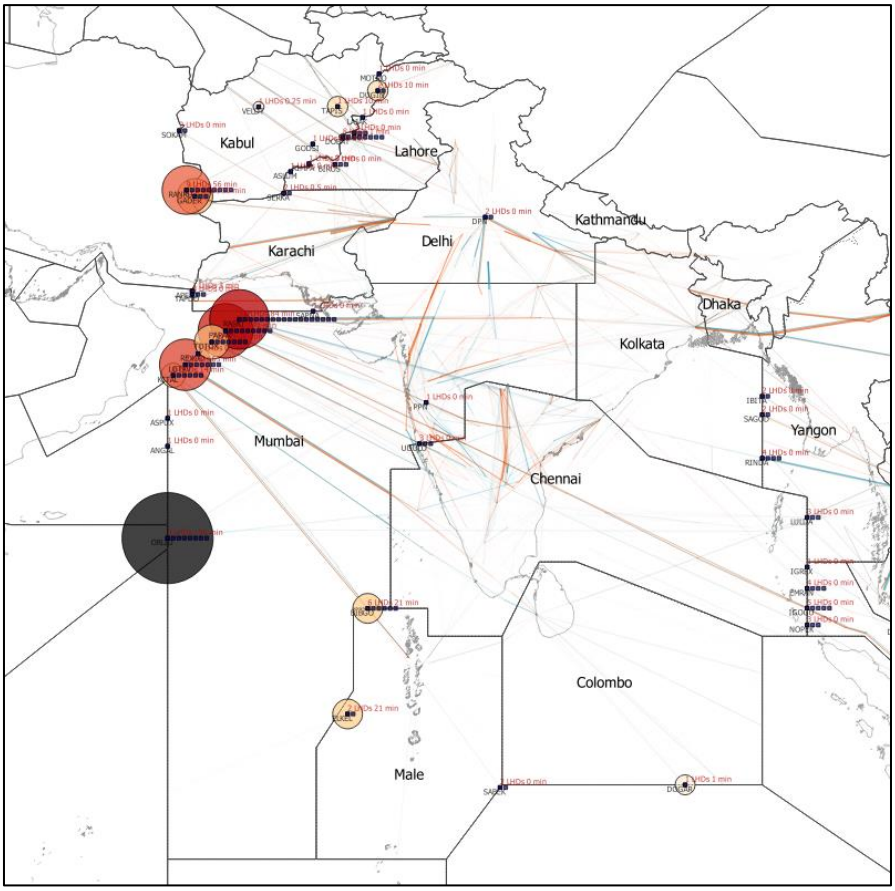

Figure 9: Geographical Location of All LHDs in SA/IO Airspace

3.60 The majority of LHDs at the western boundary of the Mumbai FIR were Category E, with sub-category being 'no or late FL revision' and 'negative transfer'. The poor communication services and lack of surveillance coverage at these interfaces worsened the situation. It was strongly recommended that an engineering solution such as AIDC (hard barrier) be implemented with the Mumbai FIR to mitigate the risk. The meeting was informed that Mumbai ACC had conducted AIDC trials with Muscat ACC and Mogadishu ACC in March 2021. Some minor systematic issues were found and remained to be resolved before the AIDC implementation could proceed to the next phase. Space-based ADS-B had been implemented to enhance surveillance capability, particularly in oceanic airspace.

3.61 The number of LHDs at **LHD Hot Spot A1 (Kolkata/Dhaka - Yangon) and LHD Hot Spot A2 (Chennai - Kuala Lumpur)**, first identified as hot spots in 2015, had been decreasing from 275 in 2018 to 24 in 2020. All reported LHDs in 2020 had 0-min duration, resulting in the operational risk of 0 FAPFH. The reduction of operational risk to 0 FAPFH was related to safety enhancement initiatives including ADS-B data sharing between Kolkata and Yangon, and AIDC between Chennai and Kuala Lumpur, as well as the reduction in traffic volume.

3.62 **LHD Hot Spot I (Karachi – Kabul)** was de-identified from being an LHD hot spot by RASMAG/25. In 2020, Kabul ACC identified and reported more of their operational risk from LHD occurrences within their own airspace and at the boundaries with Lahore FIR and Karachi FIR, as depicted in **Figure 10**. The number of LHDs and operational risk at GADER and RANRU, most of which were Category E, increased in 2020. Poor communication and surveillance coverage did not allow Kabul ACC to detect and resolve the issues before an aircraft passed the transfer-of-control point. This issue would be closely monitored together with the dynamic situation over the Kabul airspace in 2021.

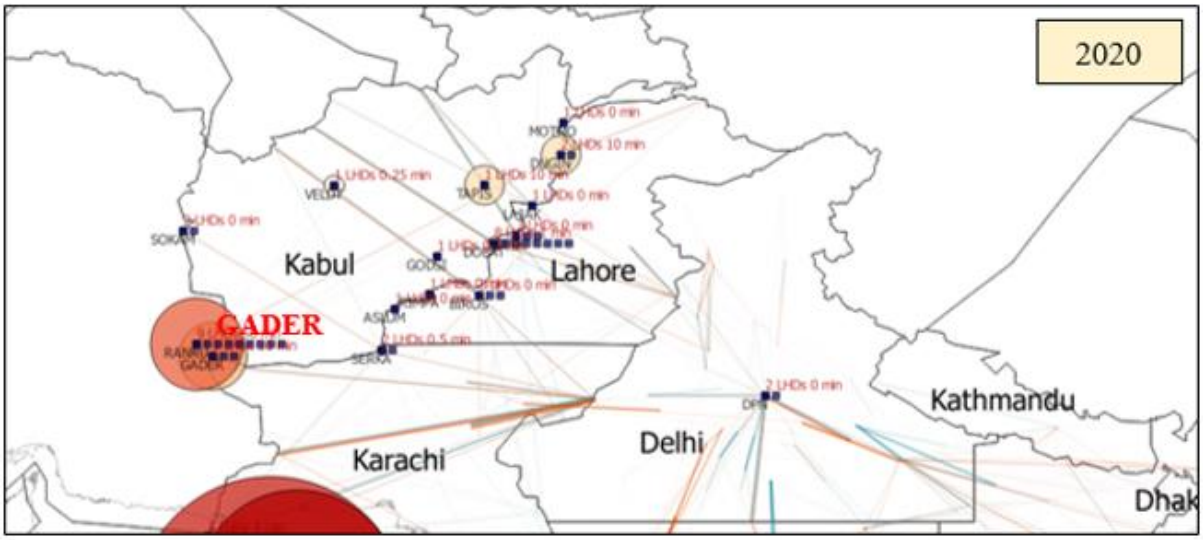

Figure 10: Kabul FIR LHDs

Southeast Asian Airspace

3.63 The 2020 RVSM risk estimate for SEA airspace indicated that the TLS for total risk had been met at **1.82 x 10^{-9}** FAPFH.

3.64 27 of the 39 reported LHDs in SEA airspace (69%) were classified as Category E, which contributed to most of the operational risk (1.35 x 10^{-9} FAPFH).

3.65 Even though the situation of **LHD Hot Spot D (Manila and all adjacent FIRs)** seemed to be improving, the majority of the reported LHDs and the operational risk of the SEA airspace still remained along the boundaries of Manila FIR. A total of 24 LHDs at Manila FIR boundaries accounted for 62% of the number of LHDs in the SEA airspace. The resultant operational risk of 1.05 x 10^{-9} FAPFH accounted for 74% of the operational risk of the SEA airspace. Two out of three long duration LHDs occurred at Manila FIR boundaries.

3.66 **Figure 11** illustrates the trend of LHDs being reported along Manila FIR boundaries together with the timeline of major safety improvement implementation by Manila ACC and the adjacent units. Since the transition to the new ATM centre in 2018, Manila ACC aimed to continually improve their communication and surveillance capabilities with ADS-C/CPDLC, AIDC and ADS-B technology.

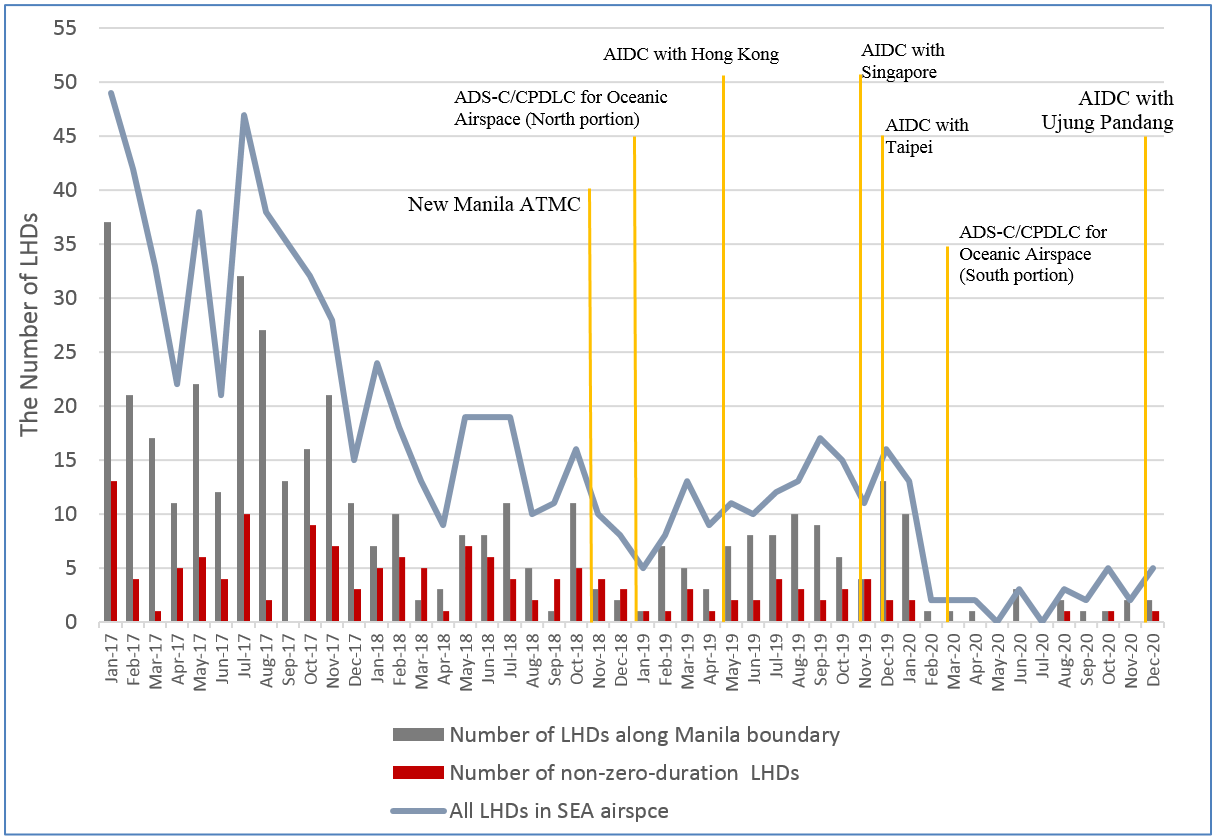

Figure 11: LHDs along Manila FIR Boundary 2017 to 2020

3.67 In 2019 Category F LHDs were an emerging issue at Manila boundaries where AIDC was implemented. There were a total of 9 Category F LHDs, and 7 out of 9 LHDs were due to AIDC failures. In 2020, the number of Category F LHDs slightly decreased from 9 to 6 LHDs. Those 6 LHDs were caused by the AIDC system failures and the unsuccessful transfer via AIDC. This issue should be followed up with relevant units and continuously monitored.

3.68 ICAO noted that system alerts to ATC and robust procedures requiring voice coordination in the event of failure of AIDC message exchange were necessary for all AIDC implementations.

Mongolian Airspace

3.69 The 2019 RVSM risk estimate for Mongolian airspace indicated that the TLS had been met at **0.87 x 10^{-9}**. No LHD was reported in 2020 within or at the boundary of Mongolian airspace.

Safety Reporting

3.70 MAAR had received 2020 TSD from all States in a timely manner, and States cooperated in revising their data if any error was found.

3.71 MAAR proposed, that the APANPIRG ATM and Airspace Deficiency recorded against Afghanistan for failure to submit safety-related data be recommended for removal. However, ICAO noted that the current Air Navigation Services (ANS) situation in Afghanistan was highly uncertain, and that the continued provision of safety data was not currently assured. This was further discussed under Agenda Item 6 WP/37.

3.72 MAAR had observed some improvement in safety reporting culture since 2018, including increased reporting of LHDs within FIRs, reporting of own mistakes, and submission of 'nil reports' by a number of FIRs. However, it was noted that the low number of LHD reports and the numbers of 'nil' reports could arguably be an indicator of under-reporting rather than improvement in reporting culture.

SEASMA Safety Report (WP/17)

3.73 Singapore's South East Asia Safety Monitoring Agency (SEASMA) provided a horizontal safety assessment report for operations on ATS routes N892, L625, N884 and M767 within the South China Sea during 2020. This assessment was based on RNP10 performance and concluded that the TLS established for lateral and longitudinal separation standards were satisfied at **0.012×10^{-9}** and **0.375×10^{-9}** respectively.

3.74 There had been one Category D and two Category F LLE occurrences in 2020. The LLEs occurred at a FIR boundary, and were reported by both of the FIRs concerned. No LLDs were reported.

BOBASMA Horizontal Safety Monitoring Report (WP/14)

3.75 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 2020. The 50NM lateral and longitudinal risks remained below the Target Level of Safety (TLS) at **0.637515×10^{-9}** and **0.870503×10^{-9}**.

3.76 It was noted that due to the COVID-19 pandemic had resulted in the average number of flights in the three Indian FIRs concerned (Chennai, Kolkata, Mumbai) at 32% of the corresponding total in 2019, which had contributed to the substantial reduction in risk from the 2019 levels (**1.59×10^{-9}** and **4.97×10^{-9}**). No LLD or LLE were reported in 2020.

Identified Airspace Risk Occurrences in Indian FIRs (WP/10)

3.77 India presented the identified airspace risk occurrences in the four Indian FIRs as reported by ATC during the period 01 January to 31 December 2020, and the various mitigation measures taken by India.

3.78 A total of 111 LHD reports were filed by ATC centres in the four Indian FIRs and those adjacent to them and sharing a common boundary. 107 of the reported LHDs were Category E. 81 of the LHD reports were filed by Indian ATC, and the rest were filed by external ATC centres. The total duration of the 111 LHD reports was 401 minutes.

3.79 While the huge reduction in the number of LHD reports (down from 381 in 2019) could be attributed to the COVID-19 related reduction in air traffic, the location and LHD duration of the occurrences in 2020 were clearly symptomatic of the continuing hot spots in the airspace of the four Indian FIRs. As part of its efforts to reduce risks due to coordination errors and other near-boundary ATS incidents India planned to implement AIDC with all of the neighbouring FIRs.

3.80 This paper would be shared with the Middle East (MID) Region RMA by the RASMAG Chair.

PARMO Vertical Safety Monitoring Report (WP/12 and SP/2)

3.81 PARMO provided a vertical safety assessment for the Pacific RVSM airspace e and a portion of the Incheon FIR during 2020.

Pacific Airspace

3.82 The 2020 RVSM risk estimate for Pacific airspace indicated that the TLS had not been met at **22.04 × 10^{-9}** (**Table 7 and Figure 12**).

Pacific Airspace – estimated annual flying hours = 858,079 hours *(note: estimated hours based on Dec 2020 traffic sample data)*			
Source of Risk	**Risk Estimation**	**TLS**	**Remarks**
RASMAG 25 Total Risk	*31.41 × 10^{-9}*	*5.0 ×10^{-9}*	*Above TLS*
Technical Risk	0.08 × 10^{-9}	2.5 × 10^{-9}	Below Technical TLS
Operational Risk	21.96 × 10^{-9}	-	-
Total Risk	**22.04 × 10^{-9}**	5.0 × 10^{-9}	**Above TLS**

Table 7: Pacific Airspace RVSM Risk Estimates

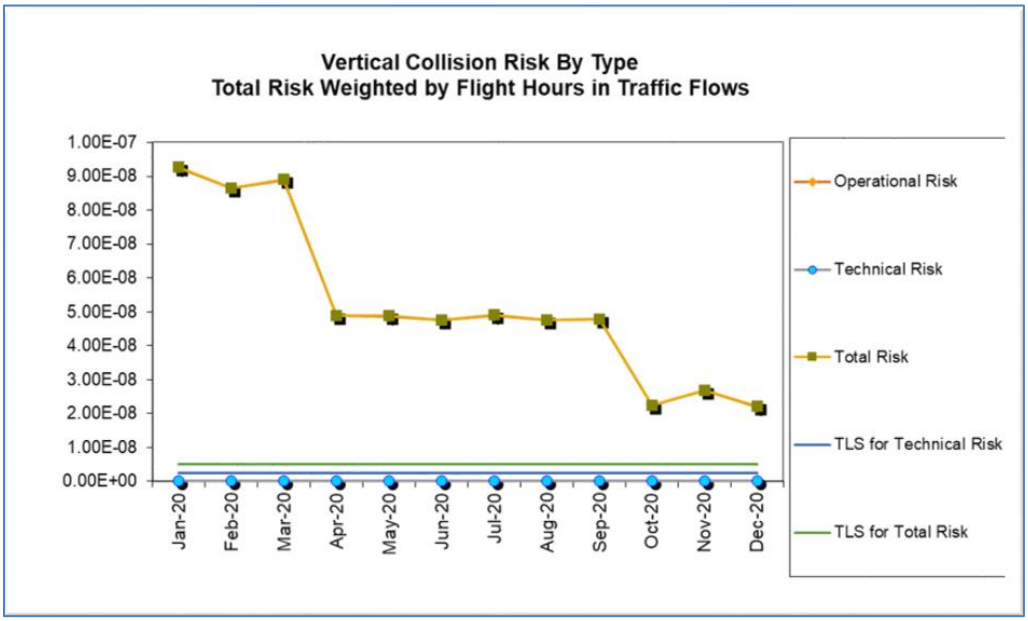

Figure 12: Pacific Airspace RVSM Risk Estimate Trends

3.83 Of the 51 LHDs, 27 were classified as Category E (53%, compared to 81% in 2019). There were also nine Category B *Flight crew climbing /descending without ATC clearance* errors LHDs (18%). The geographical location of reported Pacific LHDs is depicted in **Figure 13**.

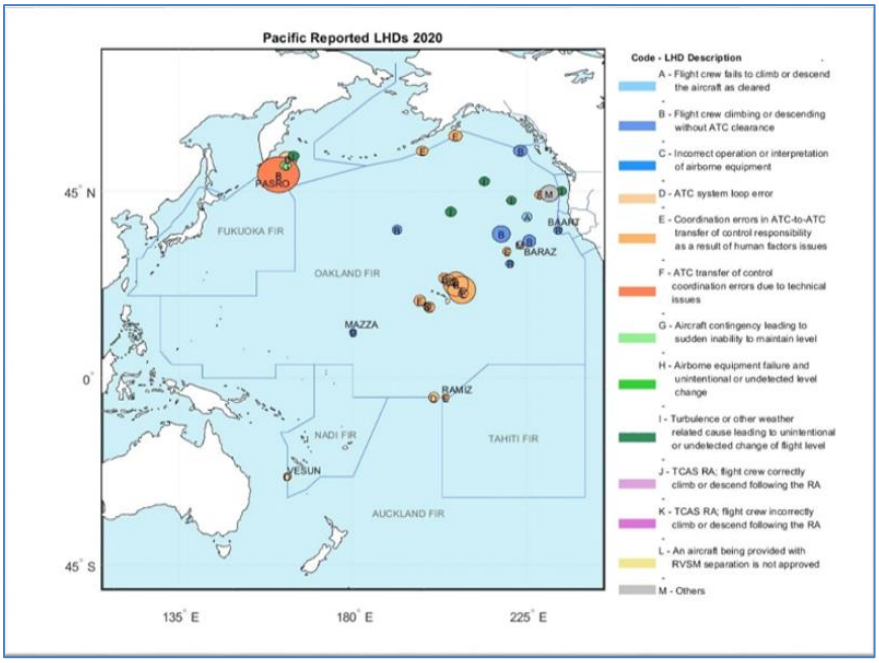

Figure 13: Location of Pacific LHDs, 2020

3.84 The longest reported LHD duration was 33 minutes, which was approximately 20 percent of the total LHD duration for 2020 in Pacific airspace.

3.85 A task force had been established to develop mitigations for the high number of reported Category E occurrences between Honolulu Control Facility (HCF) and Oakland Center. A summary of the task force progress was provided in **RASMAG/26 WP/12 Attachment**.

North East Asia Airspace

3.86 **Table 8** summarises North East Asia airspace RVSM risk estimates.

North East Asia Airspace – estimated annual flying hours = 77,954 hours ***(note: estimated hours based on Dec 2020 traffic sample data)***			
Source of Risk	**Risk Estimation**	**TLS**	**Remarks**
RASMAG 25 Total Risk	*1.07×10^{-9}*	*5.0×10^{-9}*	*Below TLS*
Technical Risk	0.23×10^{-9}	2.5×10^{-9}	Below Technical TLS
Operational Risk	0.00×10^{-9}	-	-
Total Risk	**0.23×10^{-9}**	5.0×10^{-9}	**Below TLS**

Table 8: North East Asia Airspace RVSM Risk Estimates

3.87 There were two LHDs reported in North East Asia airspace in 2020. Both were Category E (**Figure 14**).

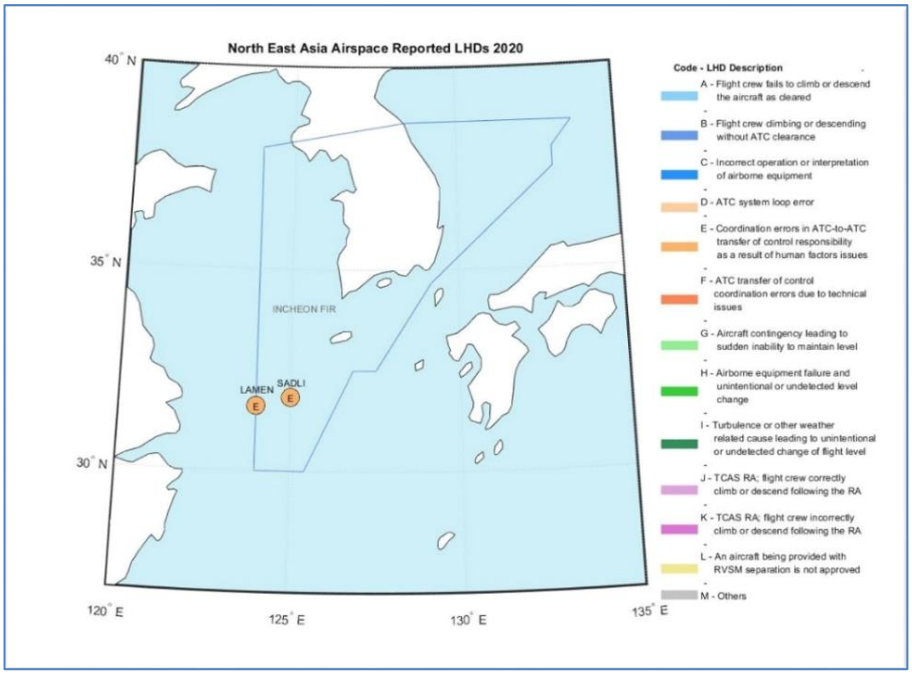

Figure 14: Location of North East Asia LHDs, 2020

PARMO Horizontal Safety Monitoring Report (WP/16 and SP/3)

3.88 PARMO submitted its horizontal safety monitoring report for 2020. The 30/50NM lateral, 30NM and 50NM longitudinal risks were both estimated to meet the TLS at **0.09×10^{-9}**, **4.08×10^{-9}** and **2.22×10^{-9}** respectively. Of the 74 reported LLDs and LLEs, 65 (88%) were Category E, while six (8%) were as a result of Category A root causes (*Flight crew deviates without ATC clearance in the horizontal dimension*). **Table 9** shows the trends in the number of reported LLDs by category for 2017 to 2020.

LLD Category	2017	2018	2019	2020
A	5	14	9	6
B	2	7	3	1
C	0	0	0	0
D	0	2	1	0
E	3	9	11	1
F	0	0	0	0
G	1	1	2	0
H	5	0	0	1
I	0	0	0	0
J	0	1	0	1
Totals	16	34	26	10

Table 9: Trends in reported LLDs by category, 2017 - 2020

3.89 The significant decrease in the overall number of LLDs and LLEs received by PARMO in 2020 was likely due to the COVID-19 pandemic-related reduction in air travel.

3.90 In response to a query, PARMO informed the meeting that while there was an increase in the percentage of Category A LLD occurrences, the actual numbers of LLDs were low (10 in 2010 compared to 26 in 2019).

3.91 During the presentation of this paper PARMO mentioned the use of a Lateral Infringement Distance (LID), that was to determine whether the magnitude of a deviation was contained by the aircraft navigational capability. If the LID was not exceeded it resulted in a zero duration occurrence. This process would be further discussed at the next MAWG meeting.

3.92 In response to a query on the planned finalization of a revised longitudinal monitoring methodology by the ICAO Separation and Airspace Safety Panel, the meeting was informed that PARMO did have a model that required identification of aircraft pairs but the traffic reductions caused by the pandemic had limited its effectiveness.

Central East Pacific Traffic Flow Assessment for Calendar Year 2020 (WP/13)

3.93 PARMO presented the 2020 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.

3.94 THE CEP traffic flow contained air traffic operations travelling in the east and west directions between mainland North America and Hawaii. **Figure 15** and **Table 10** show the location of the CEP route system structure and related statistics for observed air traffic during 2019 and 2020.

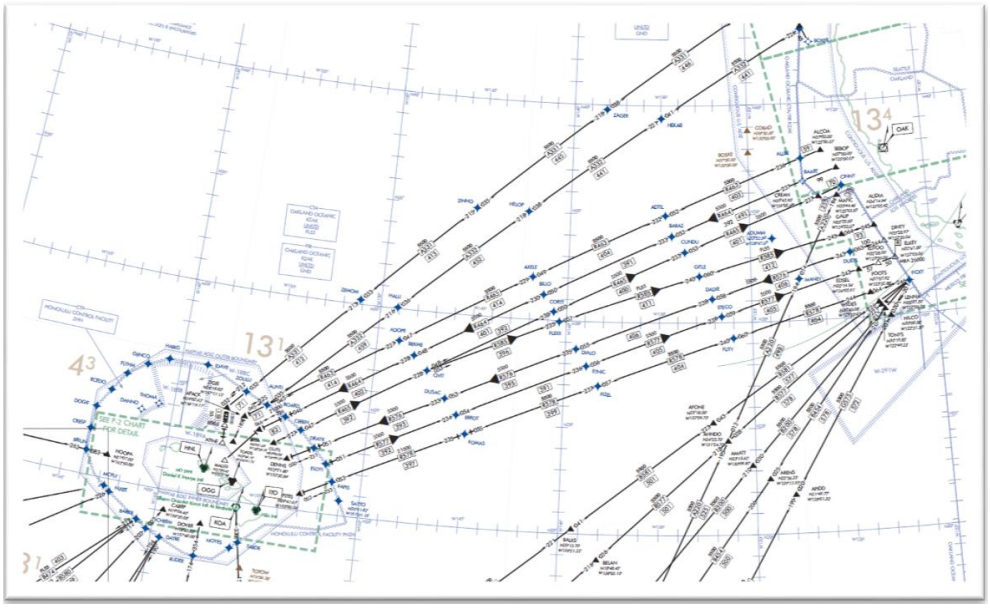

Figure 15: CEP route system

	2019	**2020**
Total flying hours	425,950	215,009
Number of Flights	115,543	63.661
Proportion Data Link Operations	69.1%	81.8%
Proportion HF (only) Operations	30.9%	18.2%
Proportion RNP4, RCP240, and RSP180 filing	31.4%	52.2%

Table 10: CEP Traffic Flow – 2019 vs 2020

3.95 From a total of 29 LHD occurrences, 21 were Category E and five were Category B. Total LHD duration was 97.1 minutes (**Table 11**).

	2019		2020	
Category	**No. LHD**	**Duration(min)**	**No. LHD**	**Duration (min)**
A	2	3	1	1
B	2	9	5	18
E	30	33	21	68.1
I	2	4	0	0
M	0	0	2	10
Total	**36**	**49**	**29**	**97.1**

Table 11:. Reported LHD Occurrences for CEP 2019 vs 2020

3.96 The overall vertical risk for the CEP in 2020 was **17.35×10^{-9} fapfh**, a value that exceeded the target level of safety (TLS). This represented a decrease from the risk reported in 2019 and 2018 for the CEP (59.9×10^{-9} and 99.1×10^{-9} fapfh respectively).

3.97 The meeting was informed of the establishment of a task force to further investigate these occurrences and determine remedial actions. Implementation of the En Route Automation Modernization (ERAM) system was planned by the end of 2025. In response to a query the meeting was informed there was currently no AIDC between the Honolulu Control Facility and Oakland Center.

APAC Consolidated Safety Report (WP/34 and SP/7)

Note: The Chair brought this WP forward from Agenda Item 5

3.98 MAAR presented a combined summary of the safety analysis results for the Asia/Pacific Region, on behalf of the Asia/Pacific RMAs and EMAs. The report was divided into the Pacific (PAC) area, and Asia area (**Figure 16**).

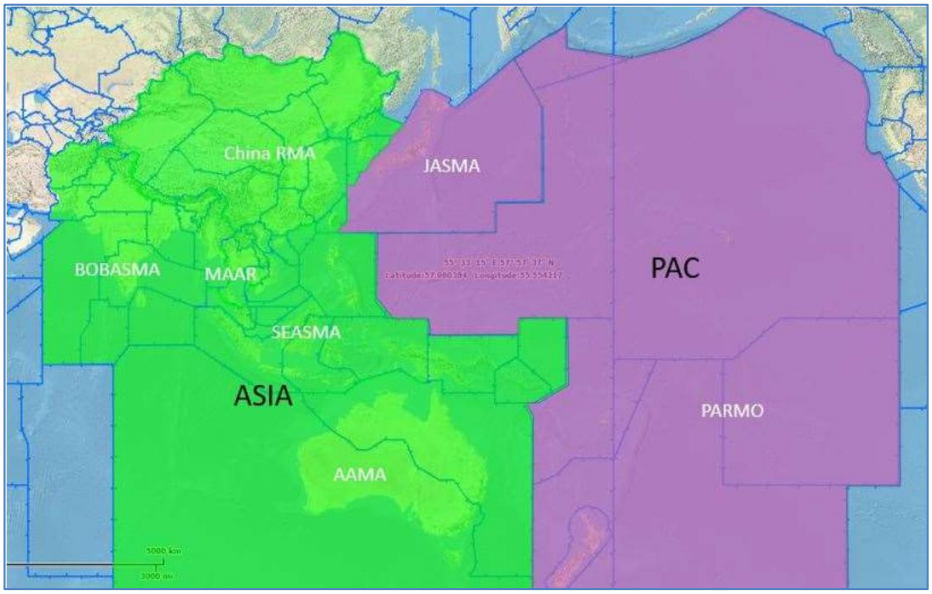

Figure 16: Asia and Pacific Safety Reporting Areas

Pacific Area Vertical Collision Risk

3.99 The estimated vertical collision risk for 2020 for the PAC area did not meet TLS. (**Table 12**). The overall risk vertical risk had been increasing from 2016 to 2020 due to improvements in reporting culture.

Pacific Area – annual flying hours = 1,749,178 hours			
Source of Risk	**Risk Estimation**	**TLS**	**Remarks**
Vertical Technical Risk	0.14×10^{-9}	2.5×10^{-9}	Below Technical TLS
Vertical Operational Risk	16.57×10^{-9}	-	-
2020 Vertical Overall Risk	**16.71×10^{-9}**	5.0×10^{-9}	**Above TLS**

Table 12: Pacific Area Vertical Collision Risk 2020

3.100 The PAC vertical collision risk estimates had been above TLS and trending upwards each year from 2016 to 2019. In 2020 there was a significant fall in the risk estimate, reflecting the reduction in traffic volumes caused by the COVID-19 pandemic **(Table 13**)

Year	Vertical Overall Risk Estimate (x 10^{-9} FAPFH)	Remark
2020	16.71	Above TLS
2019	30.21	Above TLS
2018	19.40	Above TLS
2017	7.30	Above TLS
2016	5.01	Above TLS

Table 13: Pacific Area Vertical Collision Risk Estimates 2016 - 2020

3.101 There was a total of 91 LHDs in the Pacific area in 2020, with total duration 312.90 minutes and 82 levels crossed. 17 of the occurrences were Category A, B or C (19%), 48 were Category D, E or F (53%), and 16 were Category I (18%).

Pacific Area Horizontal Collision Risk

3.102 The estimated horizontal collision risk for 2020 for the PAC area met TLS in all longitudinal and lateral risk categories. The estimated risk for 10 minutes longitudinal separation in the Japan airspace improved from 20.10×10^{-9} in 2019 to 0.25×10^{-9} in 2020. (**Table 14**)

Pacific Area – annual flying hours = 939,628 hours			
2020 PAC Area	**Risk Estimation**	**Airspace**	**Remarks**
30NM Lateral Risk	0.09×10^{-9}	Pacific	Below TLS
50NM Lateral Risk	0.65×10^{-9}	Japan	Below TLS
30NM Longitudinal Risk	3.73×10^{-9}	Pacific and Japan	Below TLS
50NM Longitudinal Risk	2.22×10^{-9}	Pacific	Below TLS
10MIN Longitudinal Risk	0.25×10^{-9}	Japan	Below TLS
2019 PAC Area	**Risk Estimation**	**Airspace**	**Remarks**
30NM Lateral Risk	3.35×10^{-9}	Pacific	Below TLS
50NM Lateral Risk	1.45×10^{-9}	Japan	Below TLS
30NM Longitudinal Risk	4.10×10^{-9}	Pacific and Japan	Below TLS
50NM Longitudinal Risk	2.02×10^{-9}	Pacific	Below TLS
10MIN Longitudinal Risk	20.10×10^{-9}	Japan	Above TLS

Table 14: Pacific Area Horizontal Collision Risk 2019 - 2020

3.103 There was a total of 109 LLDs and LLEs in the Pacific area in 2020, with a total duration of 781 minutes and total horizontal deviation of 544NM. 70 of the occurrences were Category E (64%), 13 were Category A or B (12%), 10 were Category G (9%) and 14 were Category H (13%).

Asia Vertical Collision Risk

3.104 The estimated vertical collision risk for 2020 for the Asia area did not meet TLS. (**Table 15**). the overall risk continued to decline since 2017 due to various safety improvement initiatives, but remained above TLS.

Asia Area – annual flying hours = 5,404,154 hours			
Source of Risk	**Risk Estimation**	**TLS**	**Remarks**
Vertical Technical Risk	0.33×10^{-9}	2.5×10^{-9}	Below Technical TLS
Vertical Operational Risk	7.09×10^{-9}	-	-
2020 Vertical Overall Risk	**7.42×10^{-9}**	5.0×10^{-9}	**Above TLS**

Table 15: Asia Area Vertical Collision Risk 2020

3.105 The Asia vertical collision risk estimates had been above TLS each year from 2016 to 2019, and trending downwards since 2017. In 2020 there was a significant fall in the risk estimate, while still remaining above TLS, reflecting the reduction in traffic volumes caused by the COVID-19 pandemic **(Table 16**)

Year	Vertical Overall Risk Estimate (x 10^{-9} FAPFH)	Remark
2020	7.42	Above TLS
2019	12.88	Above TLS
2018	15.50	Above TLS
2017	27.30	Above TLS
2016	12.53	Above TLS

Table 16: Asia Area Vertical Collision Risk Estimates 2016 - 2020

3.106 There was a total of 340 LHDs reported in the Pacific area in 2020, with total duration 696 minutes and 26 levels crossed. 37 of the occurrences were Category A, B or C (11%), 225 were Category D, E or F (66%), and 36 were Category I (11%).

Asia Area Horizontal Collision Risk

3.107 The estimated horizontal collision risk for 2020 for the Asia area met TLS in all longitudinal and lateral risk categories. (**Table 17**)

Asia Area – annual flying hours = 746,276 hours		
2020 Asia Area	**Risk Estimation**	**Remarks**
30NM Lateral Risk	0.0004×10^{-9}	Below TLS
50NM Longitudinal Risk	0.85×10^{-9}	Below TLS
2019 Asia Area	**Risk Estimation**	**Remarks**
30NM Lateral Risk	0.0001×10^{-9}	Below TLS
50NM Longitudinal Risk	0.25×10^{-9}	Below TLS
2018 Asia Area	**Risk Estimation**	**Remarks**
30NM Lateral Risk	0.52×10^{-9}	Below TLS
50NM Longitudinal Risk	3.91×10^{-9}	Below TLS

Table 17: Asia Area Horizontal Collision Risk 2019 - 2020

3.108 There was a total of three LLDs and LLEs reported in the Asia area in 2020, with a total duration of nine minutes and total horizontal deviation of 0NM. There was one Category D occurrence, and two Category F.

Reporting Rate of LHDs, LLDs and LLEs

3.109 **Table 18** shows the number of LHD, LLD and LLE reports for 2016 to 2020, and the number of reports per flying hours. Total estimated flying hours decreased significantly due to the COVID-19 pandemic, from 15,677,369 in 2019 down to 7,234,881 in 2020 – an overall reduction of 54%. The total number of reports approximately halved, from 1094 in 2019 down to 548 in 2020.

3.110 The number of reports per flying hours in 2020 increased from 2019 in China, Indonesia, Japan, South Asia/Indian Ocean (marginally), South West Pacific and Pacific, leading to an overall reporting rate that was slightly improved from the 2019 reporting rate.

3.111 The number of reports per flying hours decreased in Republic of Korea and South East Asia. China, Republic of Korea and South East Asia were among the lowest recorded reporting rates for the region. Data was not available for DPR Korea or Mongolia.

Airspace	# Reports					1 Report : Flying Hrs				
	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
DPRK	0	0	0	0	0	-	-	-	-	-
Mongolia	0	4	1	2	0	-	1: 37,771	1: 158,891	1: 82,138	-
China	117	134	110	79	85	1: 20,413	1: 18,248	1: 22,229	1: 31,119	1: 26,867
ROK	6	5	12	34	5	1: 93,291	1: 117,090	1: 28,365	1: 18,959	1: 25,965
SEA	426	474	205	152	42	1: 5,884	1: 6,548	1: 17,757	1: 22,275	1: 25,106
Indonesia	32	34	23	37	18	1: 11,520	1: 10,842	1: 53,603	1: 33,321	1: 17,346
Japan	43	71	76	77	66	1: 33,834	1: 21,510	1: 20,632	1: 20,762	1: 14,737
SA/IO	778	935	681	439	152	1: 3,689	1: 3,166	1: 3,783	1: 7,955	1: 7,907
SW Pacific	52	51	53	101	46	1: 16,639	1: 17,572	1: 17,817	1: 9,335	1: 6,954
Pacific	33	42	43	173	134	1: 63,500	1: 54,191	1: 45,064	1: 10,139	1: 6,404
Total	**1,487**	**1,750**	**1,204**	**1,094**	**548**	**1: 8,905**	**1: 8,180**	**1: 12,332**	**1: 14,330**	**1: 11,712**

Table 18: Total LHD, LLD and LLE Reports, and Reports per Flying Hours, 2016 - 2020

Hot Spots

3.112 **Table 19** summarizes current LHD Hot Spots, the FIRs involved, the year of identification, and status remarks.

Hot Spot	Involved FIRs	Identified	Remarks
A1	Kolkata/Chennai/Dhaka-Yangon	2015	Cat. E LHDs reducing
A2	Chennai – Kuala Lumpur	2015	Cat. E LHDs reducing
B	Incheon (AKARA Airspace)	2015	Cat. E LHDs
D	Manila – all adjacent FIRs	2015	Cat. E LHDs reducing Cat F LHDs emerging
F	Mogadishu – Mumbai	2015	Cat. E LHDs
G	Sanaa/Muscat – Mumbai	2015	Cat. E LHDs (Sanaa improved)
J	Jakarta – Singapore/Kota Kinabalu	2018	Cat. E LHDs, minor and reducing
M	Colombo – Melbourne	2019	Proposed to re-classify as non-hot spot
N	Oakland USA – Hawaii CEP	2019	Cat. E LHDs increasing

Table 19: LHD Hot Spots in the Asia/Pacific Region

3.113 MAAR informed the meeting that information on Hot Spot G had been sent to the MID Region RMA, which was experiencing difficulty in establishing liaison with Muscat. India informed the meeting that both Mumbai and Delhi were in contact with Muscat, and MAAR would be kept informed of outcomes.

3.114 In response to the proposal to remove Hot Spot M, ICAO proposed that the current significant decrease in traffic may not provide sufficient evidence of sufficiently reduced risk, and that this and all other hot spots should be retained and this hot spot re-classified as 'reducing' until such time as traffic increased. It was also noted that a significant number of the occurrences at this hot spot were the result of Indian Navy flights not complying with ATC instructions, and that an identified mitigation strategy was to establish contact with the Indian Navy to resolve the matter. This mitigation had not yet been achieved. India informed the meeting that contact details for the Indian Navy could be provided if AAMA could provide the details of the occurrences. A formal letter on the subject should also be addressed to the Director General of Civil Aviation of India, with copy to BOBASMA.

3.115 Republic of Korea requested that PARMO and ICAO take into consideration the removal of Hot Spot B due to the previous unique airspace arrangement having been rectified, a direct speech circuit having provided between Incheon and Shanghai ACCs, and the establishment of a new ATS route parallel to A593. Republic of Korea noted the JASMA/ENRI vertical collision technical risk calculation based on fast time simulation data (WP/8) which indicated technical risk had decreased after phase 1 implementation, and this was evidence of AKARA airspace improvement. The meeting noted however that in addition to the previously mentioned effect of the current reduction in overall traffic levels, Phase 2 of the AKARA Corridor airspace project, which involved a number of changes to the ATS route structure, was also yet to be completed. This hot spot should be reviewed again in 2022, after implementation of Phase 2 of the project.

3.116 The Chair informed the meeting that the process of identification and monitoring of LHD hot spots had been developed informally over several years to facilitate the focus of RASMAG on areas requiring specific attention. The MAWG was invited to consider drafting a formalized process for this purpose, for consideration by RASMAG..

JASMA Safety Assessment of ADS-C CDP (IP/4)

3.117 JASMA presented the implementation process, including safety assessment, for the ADS-C Climb Descent Procedure (CDP) in the Pacific Ocean Airspace of the Fukuoka FIR.

Treatment of TCAS RA-related LHDs – Category J and K (IP/3)

3.118 The RASMAG Chair presented information on MAWG/8 review of each RMA's treatment of Airborne Collision Avoidance System (ACAS) Resolution Advisory (RA)-related LHDs, including list of current practices that would be further discussed at the next MAWG meeting.

Summary Report of Identified Airspace Risk and Mitigations (IP/5)

3.119 Singapore presented mitigations to reduce LHDs and Gross Navigation Error (GNE) occurrences, including discussion of airspace deviation errors, and people-related, process-related and equipment-related mitigations.

Update on Manila FIR after the AIDC Implementation and Lessons Learned (IP/6)

3.120 Philippines provided an update on AIDC implementation in the Manila FIR, problems encountered after implementation and the mitigations in place to prevent LHDs.

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

RASMAG Safety Bulletin Issue 02 (WP/18)

4.1 MAAR informed the meeting of the publication of RASMAG Safety Bulletin Issue 02. The Bulletin was designed to capture some guidance and recommendations provided in the second edition of ICAO Doc 10037 Global Operational Data Link (GOLD) Manual.

4.2 The original content of the bulletin had been presented to RASMAG/25 (RASMAG/25 IP/03 presented by PARMO) and, after consultation with RASMAG member States, monitoring agencies, International Organizations and ICAO was published on the ICAO Asia/Pacific Regional Office eDocuments web-page on 30 July 2021:

- https://www.icao.int/apac/pages/edocs.aspx
- https://www.icao.int/APAC/Documents/RASMAG%20Safety%20Bulletin%20-%20Issue%2002.pdf

4.3 A third issue of the Bulletin was expected in 2022. The meeting was invited to provide comment or feedback on potential topics for the next bulletin, and circulate the bulletin to States, ANSPs and relevant organizations.

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

Identification of Non-Approved Airframes Operating with RVSM Approval Status (WP/19)

5.1 The AAMA undertook a monthly check of flight plan data against the RVSM approval databases of all global RMAs. The meeting was informed of non-RVSM approved airframes operating with RVSM approval status in May 2021 and over a period of three months or more. 10 airframes were identified, including six from Australia, and one each from Greece, India, Papua New Guinea and United States. The airframe from India (IN320, Indian Navy, i.e. a State aircraft) and the airframe from Papua New Guinea (M2ZMY) had been operating in RVSM airspace without RVSM approval for 12 months or more.

5.2 The meeting noted that the Indian Navy aircraft had first been detected in 2016. AAMA would follow up on this matter. India informed the meeting that the identification used in the AAMA report (IN320) was not consistent with that used by the Indian Navy. AAMA subsequently confirmed the identification of the aircraft. Further coordination on this matter would be conducted offline. This would also be further examined by AAMA. Further analysis would also be undertaken to determine whether operations by this aircraft also a contributed to Hot Spot M.

JASMA Assessment of Non-RVSM Approved Aircraft (WP/20)

5.3 JASMA presented a list of operator-aircraft combinations operating within the RVSM airspace of Fukuoka FIR with no registration of RVSM in the approval databases as of June 2021. A total of 21 airframes were identified including one each from Canada, China, Indonesia and the Solomon Islands, two from Malaysia and 14 from USA. Almost all of the listed aircraft were identified only once in the period from January to June 2021.

5.4 USA informed the meeting that they would follow up and report back to JASMA.

MAAR Assessment of Non-RVSM Approved Aircraft (WP/21)

5.5 MAAR presented the result of an annual audit that detected 19 aircraft that operated in RVSM airspace without valid RVSM approvals in the RMA's database. The reduction from 26 in the previous year's audit was likely to be due to the reduction of flights during the COVID-19 pandemic. India had the highest number of aircraft on the list (12, all domestic flights and increased from eight reported to RASMAG/25). Others were Indonesia (four, decreased from 12), Australia (1, decreased from 2), and Malaysia (2).

5.6 Brunei Darussalam, Myanmar and Pakistan did not submit annual RVSM data snapshots. Myanmar and Viet Nam had not adopted the new F2 form, which included PBCS approvals information.

5.7 MAAR proposed that India should be added to the APANPIRG ATM and Airspace Safety Deficiencies List (Non-Provision of Safety Related Data) as the RVSM approval status of the 12 airframes detected had remained unverified for over six months. India informed the meeting that the interruption to the provision of RVSM approval data may have been due to changes in the POC arrangement, and that further enquiry would be made. India subsequently provided the required information to MAAR before the end of the meeting, and the Deficiency was not recorded.

5.8 MAAR also proposed that APANPIRG inform Brunei Darussalam, Myanmar and Pakistan that failure to submit the annual RVSM approval snapshot may result in Deficiency being recorded in 2022 if the problem persisted.

China RMA Assessment of Non-RVSM-Approved Aircraft (WP/25 and SP/5)

5.9 The meeting was informed of the monthly check of flight plan data against the combined RVSM approval database conducted by China RMA. Non-approved aircraft detected were from Australia (three), Hong Kong China (one), Indonesia (nine), Philippines (three), Republic of Korea (one) and USA (two).

PARMO RVSM Traffic Compliance Monitoring (WP/23)

5.10 An assessment of non-State-approved operators using the RVSM airspace in the Pacific and a portion of North East Asia overseen by PARMO for the period from December 2020. The assessment identified three aircraft; one each from Greece, Netherlands (Aruba) and Solomon Islands, which would be further investigated and appropriate parties queried if no additional information was obtained.

5.11 AAMA informed the meeting that the aircraft from Solomon Islands (H4ZYH) was now RVSM approved.

5.12 In response to the non-inclusion of registration marks in their TSD, Republic of Korea informed the meeting that following a update of their system it was expected that full information would be provided this year.

JASMA Assessment of Non-PBCS Approved Aircraft (WP/31)

5.13 JASMA presented a list of operator-aircraft combinations operating within the Pacific Ocean airspace of the Fukuoka FIR win no registration of PBCS approval. **Figure 17** represents the number of aircraft operating in the airspace, the percentage that included PBCS indicators in their flight plans, and the percentage that were confirmed to be PBCS approved, for the period from April 2020 to June 2021.

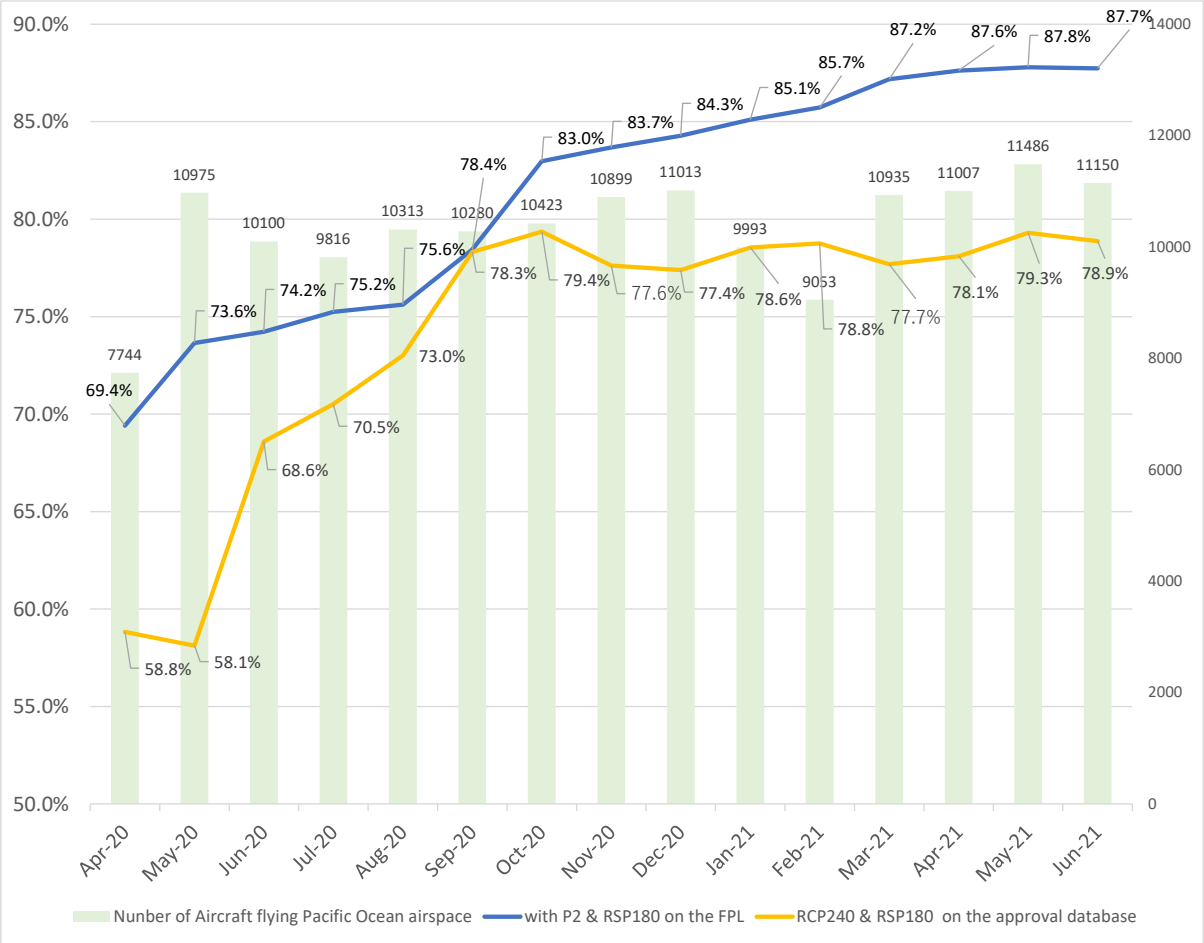

Figure 17: Aircraft filing PBCS indicators in flight plans versus PBCS-approved aircraft in the database – Fukuoka FIR

5.14 While the percentage of all flights in the Pacific Ocean airspace of the Fukuoka FIR that had filed PBCS indicators in flight plans increased to over 87% over the period, the percentage that were recorded in the database as PBCS-approved remained below 80%. Details were provided of the 203 airframes that had filed PBCS indicators but were not included in the PBCS approvals database.

5.15 ICAO requested that Japan consider presenting a working paper to the next meeting of FIT-Asia. The Chair informed the meeting that RMACG would also deal with getting more PBCS information into the RVSM approvals database.

RMAs' 'W' Verification of State Aircraft (WP/24)

5.16 The RASMAG Chair presented a paper addressing an action item from the RMACG/14 meeting, which asked all RMAs to request clarification from their respective PIRGs on responsibilities of the RMA regarding verification of the approval status of State aircraft (military and other government aircraft performing non-commercial, sovereign functions) and their relation to civil authorities.

5.17 APAC RMAs currently conducted monthly or annual audits of the use of the 'W' designator in flight plans, including the flight plans of State aircraft, against the global snapshot of all RMAs' approval records. Aircraft that included 'W' in flight plans but did not have matching RVSM approval were generally called 'rogue' aircraft. The rogue aircraft that persistently remained on the list were mostly State aircraft. In order for the rogue State aircraft to be removed from the list either the State aircraft's approval data had to be provided to the designated RMA, or the State aircraft operator had to stop using 'W' in item 10 of the ICAO flight plan.

5.18 **Table 20** summarized the effects on stakeholders if the RMAs discontinued the process with respect to State aircraft:

Stakeholder	Pros	Cons
State CAA	No requirement to try to liaise with its State aircraft operators regarding their RVSM approval status, which can be viewed as going beyond their scope of responsibilities.	Increased risk in the oversight airspace if any rogue State aircraft enter the airspace.
ATSP	Simpler procedure as there is no need to re-confirm RVSM approval status of rogue State aircraft.	Increased risk in its airspace if any rogue State aircraft enter the airspace.
Civil aircraft operators	-	Increased risk of mid-air collision from being provided with 1,000 ft separation near rogue State aircraft that do not satisfy all RVSM safety requirements.
State aircraft operators	Less likely to be penalized by being treated as non-RVSM approved while they might genuinely satisfy all RVSM safety requirements	Increased risk of mid-air collision from being provided with 1,000 ft separation if they actually do not satisfy all RVSM safety requirements
RMA	Less workload associated with handling rogue State aircraft	-

Table 20: Effect of RMA discontinuance of auditing State aircraft RVSM compliance.

5.19 Providing additional information to the meeting, MAAR compiled a list of rogue State aircraft that had been detected by APAC RMAs and reported in the past RASMAG meetings (Flimsy 1).

5.20 In discussion the meeting noted that some States or their RMAs were not permitted to share RVSM approval data for State aircraft.

5.21 The meeting was invited to consider two options; drafting a Conclusion on the matter now for consideration by APANPIRG, or asking APAC RMAs to administer a short questionnaire to States' POCs on the matter of RMA responsibility in this regard. After considerable discussion, the meeting agreed to do both.

5.22 The meeting noted that technical Conclusions could be finalized by RASMAG, but in this case there was also a 'political' dimension that warranted the matter be discussed at APANPIRG/32. Accordingly, the meeting agreed to the following Draft Conclusion, which was initially presented in Flimsy 2:

Draft Conclusion RASMAG/26-3: RVSM Approvals Data and Filing of RVSM Indicator in Flight Plans of State Aircraft

That, States are urged to:

1. liaise with their State aircraft operators to:
    a. share State aircraft RVSM approval data with the designated RMA where State aircraft RVSM approval processes are implemented;
    b. confirm the RVSM approval status of State aircraft when queried by the RMA; and
    c. not file 'W' in item 10 of the ICAO flight plan of aircraft that are not approved for RVSM; and
2. respond to a survey on RMA and State responsibility on the matter of RVSM approvals of State aircraft.

PARMO RVSM Long Term Height Monitoring Burden (WP/28)

5.23 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 and global monitoring records as of 05 April 2021 were used to assess the monitoring burden.

5.24 The total number of airframes identified as being RVSM approved by a state of registry under PARMO responsibility was 539, with a resultant monitoring burden of 105, and a total of only two aircraft not successfully monitored within the past two years (or 1,000 flight hours, whichever was the longer).

5.25 Noting the use of space-based ADS-B to achieve this very low remaining burden the Chair enquired whether India could provide their space-based ADS-B data to MAAR for RVSM height monitoring. In response, India requested that MAAR provide details of the data that needed to be extracted. MAAR informed the meeting they had a standard template which they would send to India.

NAARMO Long Term Height Monitoring Burden (IP/2)

5.26 NAARMO provided an assessment of the monitoring burden associated with the LTHM requirements for airframes for which the NAARMO was the responsible RMA, using approvals and global monitoring records as of 05 April 2021. The total number of airframes identified as having a full RVSM approval from a state of registry under NAARMO responsibility was 22,453, with a resultant monitoring burden of 14,781 and a total of 774 aircraft not successfully monitored within the past two years or 1,000 flight hours.

Estimate of RVSM Long Term Height Monitoring Burden (WP/25)

5.27 AAMA presented the current monitoring burden for RVSM-approved aircraft registered by Australia, Indonesia, Papua New Guinea and Solomon Islands. The total number of RVSM-approved aircraft was 1,211 as at 10 September 2021, and the total monitoring burden was 363. The current outstanding burden was 68 aircraft including 39 from Australia (13.8%), 32 from Indonesia (42.2%), four from Papua New Guinea (30.8%) and one from Solomon Islands (50%).

5.28 Of the 39 airframes from Australia that were considered overdue, 20 were military and 19 were civil aircraft. Some of the military aircraft that were equipped with ADS-B were not transmitting geometric altitude in the ADS-B message, and therefore could not be monitored using AAMA's ADS-B Height Monitoring System (AHMS).

5.29 The outstanding burden of 32 Indonesian registered aircraft was an increase of eight from that reported in October 2020. A smaller number of flight hours and not operating outside Indonesian FIRs had contributed to the high outstanding burden.

China RMA LTHM Burden Estimate Update (WP/26)

5.30 China detailed its expected monitoring burden for aircraft registered and operated by China and DPR Korea to meet the LTHM requirement, based on the RVSM approvals database at the end of August 2021.

5.31 The total number of aircraft approved for RVSM by China was 4086, and the resultant monitoring burden was 626 airframes. The current outstanding monitoring burden was 51 airframes. China had monitored 24 aircraft from 12 operators equipped with Enhanced2 GPS-Monitoring Units E^{2}GMUs) and 3804 aircraft using the ADS-B monitoring system.

5.32 For DPR Korea, the total number of RVSM-approved airframes was four, all of which were overdue for monitoring. The last monitoring work for Air Koryo was done as early as 2018, meaning the two year monitoring requirement had been exceeded. China RMA was reaching out to Air Koryo to accomplish the required monitoring work. It was noted that Air Koryo aircraft were not ADS-B equipped.

JASMA LTHM Burden Estimate Update (WP/27)

5.33 JASMA presented the current monitoring burden for aircraft registered and operated by Japan to meet Annex 6 LTHM requirements, as of June 2021.

5.34 The total number of RVSM-approved airframes was 885, and the total monitoring burden was 167. The outstanding burden was 11 airframes (6.6%). Most of the airframes remaining to be monitored were operated by small operators, and may have flight hours that have not reached 1,000 hours in the recent two years. JASMA had been trying to survey flight hours of these operators, but few operators cooperated with the survey.

APAC Consolidated LTHM Compliance Status (WP/29 and SP/6)

5.35 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, which was based on RVSM approval data as of at 30 June 2021, yielded a remaining monitoring burden of 422 aircraft, which was a 5% increase since 2019.

5.36 MAAR had a total of 294 aircraft remaining to be monitored, which accounted for 70% of all aircraft remaining to be monitored in the APAC Region. Pakistan had the highest percentage of remaining monitoring burden at 61%.

5.37 A number of aircraft operators from India, Malaysia and Philippines had contacted MAAR regarding the use of the AEROTHAI EGMU service, but due to COVID-19-related travel restrictions the service was in hiatus. Some Indian and Afghanistan aircraft were EGMU monitored by MID RMA.

5.38 Nepal, Bhutan and Bangladesh, whose aircraft were regularly monitored by AHMS, had difficulties flying into AHMS coverage due to travel restrictions.

5.39 70 aircraft remained to be monitored by AAMA, accounting for 17% of the APAC remaining monitoring burden. Australia's remaining monitoring burden had decreased 13%. Indonesia had a 41% remaining monitoring burden.

5.40 46 aircraft remained to be monitored by China RMA, accounting for 11% of all remaining aircraft to be monitored in APAC – a 44% decrease since RASMAG/25.

5.41 11 aircraft remained to be monitored by JASMA, accounting for only 3% of all aircraft remaining to be monitored in the APAC Region. There was only 1 aircraft remaining to be monitored by PARMO, accounting for only 0.2% of the remaining regional monitoring burden.

5.42 **Table 21** lists the States having a remaining monitoring burden of 30% or more, which could be subject to an APANPIRG ATM and Airspace Safety Deficiency.

State	2019%	2020%
Pakistan (MAAR)	**46%**	**61%**
India (MAAR)	**46%**	**51%**
Solomon Islands (AAMA)	**0%**	**50%**
Philippines (MAAR)	**43%**	**48%**
Nepal (MAAR)	**45%**	**46%**
Afghanistan (MAAR)	**85%**	**42%**
Indonesia (AAMA)	**42%**	**41%**
Bhutan (MAAR)	**40%**	**40%**
Bangladesh (MAAR)	**14%**	**36%**
Malaysia (MAAR)	**26%**	**33%**
Papua New Guinea (AAMA)	**8%**	**31%**
Mongolia	**14%**	**30%**

Table 21: Remaining LTHM Monitoring Burden ≥30% or more

5.43 While RASMAG/23 agreed that States with a remaining burden 30% or more would be proposed to be added to the APANPIRG Deficiencies List, MAAR had observed that operators had been trying to fulfil their height monitoring requirements but could not do so due to the unavailability of EGMU services during the pandemic. It was therefore proposed that consideration of deficiencies be delayed until an alternative means of height monitoring became available.

5.44 The Chair noted that if the pandemic effects continued the monitoring burden may continue to become more serious. There were other ways to obtain height monitoring data, particularly from ANSPs, that may help to relieve the burden. RMAs were strongly encouraged to investigate available means to obtain data. MAAR was prepared to assist in this matter.

5.45 The meeting noted that the risks of not taking action to record Deficiencies could result in increased safety risks if and when some normal level of traffic resumed. It was therefore proposed that the meeting report include the statement that Deficiencies would be recorded by RASMAG/27.

Impact Assessment of the Removal of the 1,000-Flight Hour Portion of the RVSM Height Monitoring Requirement from ICAO Annex 6 (WP/33)

5.46 In response to *Action RMACG/16:6 All RMAs to provide data on operators who are taking advantage of the 1000 hours monitoring requirement*, Thailand/MAAR planned to assess the impact of the removal of the 1,000-flight hour portion of the ICAO height monitoring requirement, using a questionnaire.

5.47 As there were many States within MAAR's monitoring responsibility the questionnaire would be used to collect information regarding any aircraft operators currently fulfilling the LTHM requirement on the 1,000 flight-hour bases. The questionnaire, which would be administered via both an online form and an electronic form, was provided in **RASMAG/26 WP/33 Attachment**. If there were no major changes proposed, the questionnaire and the link to the online version (Google Forms) would be sent to all Points of Contact (POCs) of all States in September 2021. All MAAR States were requested to complete the questionnaire and send it back to MAAR by 31 October 2021.

5.48 China proposed that rather than removing the 1,000 flight-hour requirement there may be a case for it to be used as a lesser requirement or contingency arrangement, supported by other appropriate evidence. China agreed to make a proposal in this regard to RMACG.

Regional Airspace Safety Assessment

5.49 The meeting was informed that the working paper on the Regional Airspace Safety Assessment (nominally WP/35) had not been prepared, after discussion between the Chair and ICAO relating to the suitability of WP/34 *APAC Consolidated Safety Report* to fulfil this purpose. However, ICAO informed the meeting that this would be re-examined, and if considered necessary the Assessment would be drafted in consultation

Competent Airspace Safety Monitoring Organizations List (WP36)

5.50 The meeting updated the *RASMAG List Of Competent Airspace Safety Monitoring Organizations* (**Appendix E to the Report**).

5.51 In relation to the change of identification of *JASMA CRA function* to *CRA Japan*, the meeting was informed that this was only a correction of administrative details in the list, and not a reorganization. CRA Japan had been operating as CRA for over ten years.

Agenda Item 6: Air Navigation Services Deficiencies

ANS Deficiencies List (WP37)

6.1 The meeting reviewed the APANPIRG ATM and Airspace Safety Deficiency List and agreed to make the following recommendations to APANPIRG/31 also recorded in **Appendix F to this Report**:

a) deletion of the Deficiency for Fiji related to PRs not being provided to the Central Reporting Agency (CRA);

b) deletion (provisional) of the Deficiency for Afghanistan related to non-provision of safety related data; and

c) amendment of the Deficiency for India related to non-reporting of data link performance monitoring and analysis, to remove reference to Kolkata FIR.

Regarding the deletion of the Deficiency recorded against Afghanistan, ICAO informed the meeting there had been major disruption of Air Navigation Services (ANS) in Afghanistan, and the continued provision of safety data was not assured. MAAR informed the meeting that data had been received in 2020, and in 2021 each month up to August. The meeting agreed that if the provision of safety-related data did not continue in the next few months before APANPIRG/32 the Deficiency should be retained.

Agenda Item 7: Review and Update RASMAG Task List

RASMAG Terms of Reference and Task List (WP38)

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

Agenda Item 8: Any Other Business

ICAO 24-Bit Address Verification Using RVSM Approval Database (WP/39)

8.1 MAAR had started a trial process to verify ICAO 24-bit address and quality-check other parameters as a by-product. For height monitoring purposes the RVSM approval data contained ICAO aircraft addresses assigned to aircraft by State Civil Aviation Authorities.

8.2 Errors detected included mismatch of the aircraft address and the information in Item 18 of the flight plan, mismatched aircraft address due to incorrect address information in the RMA RVSM approval database, lag time in the provision of the combined snapshot when aircraft were transferred to a different State of Registry and assigned a new code, and mismatch of aircraft type designators between the flight plan and the RMA database.

8.3 MAAR had corrected information in its database, and coordinated with relevant RMAs and States to resolve issues. This verification process would continue as it would support future implementation of downlinked aircraft address for target identification in the APAC region.

8.4 ICAO informed the meeting that the ICAO Aircraft Address had a number of critical applications in Air Traffic Management systems. A paper on the MAAR activity in this regard should be submitted to the Surveillance Implementation Coordination Group (SURICG), which reported to the Communications, Navigation and Surveillance Sub-Group of APANPIRG (CNS SG).

ATM Points of Contact (WP/40)

8.5 Meeting participants were requested to review and updated the ATM Points of Contact as appropriate.

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

9.1 The venue and dates for the next MAWG meeting was tentatively planned as a Video Teleconference for early 2022.

9.2 Subject to the COVID-19 pandemic abating to allow travel, the RASMAG/27 meeting would be tentatively planned for the July – August 2022 period 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.	Ms. Amelia Gontar	Risk Intelligence Specialist Airservices Australia **AUSTRALIA**
2.		**BANGLADESH (1)**	
	2.	Mr. Md. Shamsul Haque	Deputy Director Civil Aviation Authority of Bangladesh **BANGLADESH**
3.		**CAMBODIA (1)**	
	3.	Mr. Oun Makara	Chief of Air Traffic Service Air Navigation Standard and Safety Department State Secretariat of Civil Aviation **CAMBODIA**
4.	**CHINA (4)**		
	4.	Mr. Jingwei Li	Senior Engineer Air Traffic Management Bureau of CAAC **CHINA**

	STATE/NAME		TITLE/ORGANIZATION
	5.	Mr. Yang Hong	Engineer China RMA **CHINA**
	6.	Mr. Yongyue Chen	Engineer China RMA **CHINA**
	7.	Ms. Huiyan Li	Engineer China RMA **CHINA**
5.	**HONG KONG, CHINA (2)**		
	8.	Ms. Susanna Lui	Acting Chief, Air Traffic Management Standards Civil Aviation Department, Hong Kong China **HONG KONG, CHINA**
	9.	Mr. Isaac Wong	Senior Air Traffic Management Standards Officer Civil Aviation Department, Hong Kong China **HONG KONG, CHINA**
6.	**FIJI (1)**		
	10.	Mr. Ilimeleki Navula	Controller Standards/SAR-ATM Fiji Airports **FIJI**

	STATE/NAME		TITLE/ORGANIZATION
7.	**INDIA (6)**		
	11.	Mr. Vikas Bhalla	General Manager Airports Authority of India (AAI) **INDIA**
	12.	Mr. A P Udayanarayanan	Jt.GM Air Traffic Control Airports Authority of India (AAI) **INDIA**
	13.	Ms. Purbita Thakur Sinha	Joint General Manager (ATM) Airports Authority of India (AAI) **INDIA**
	14.	Mr. Prashant Patel	Joint General Manager (ATM) Airports Authority of India (AAI) **INDIA**
	15.	Mr. Jayabalan Masivayana	Asst General Manager Airports Authority of India (AAI) **INDIA**
	16.	Mr. Jagadeesh Kumar Kondala	Manager ATM Airports Authority of India (AAI) **INDIA**
8.	**INDONESIA (19)**		
	17.	Mr. Iyan Andri Permadi	Air Navigation Inspector Directorate General of Civil Aviation **INDONESIA**

	STATE/NAME		TITLE/ORGANIZATION
	18.	Ms. Nurdini Tambunan	Air Navigation Inspector Directorate General of Civil Aviation **INDONESIA**
	19.	Ms. Annisa Dwi Kurniati	Air Navigation Inspector Directorate General of Civil Aviation **INDONESIA**
	20.	Ms. Emi Astuti	Air Navigation Inspector Directorate General of Civil Aviation **INDONESIA**
	21.	Ms. Henna Nurdiansari	CNS Inspector DGCA Indonesia, Directorate of Air Navigation **INDONESIA**
	22.	Mr. Adin Eka Fiyanzar	Air Navigation Inspector Directorate General of Civil Aviation **INDONESIA**
	23.	Mr. Jayardi Maulana Marsa	Flight Operation Inspector DGCA Indonesia, Directorate of Airworthiness and Aircraft Operations **INDONESIA**
	24.	Mr. Anggi Hafiz Al Hakam	Operation Inspector DGCA Indonesia, Directorate of Airworthiness and Aircraft Operations **INDONESIA**

	STATE/NAME		TITLE/ORGANIZATION
	25.	Mr. Alit Yuliawan Prihadhi	Manager of Compliance and Safety Information AirNav Indonesia **INDONESIA**
	26.	Mr. Christ Yonathan Walenta	Safety Compliance Junior Manager AirNav Indonesia **INDONESIA**
	27.	Mr. Hermanto Hermanto	Junior Manager of Safety Information AirNav Indonesia **INDONESIA**
	28.	Mr. Ronald Halasan Sibarani	Inspector of Safety AirNav Indonesia **INDONESIA**
	29.	Mr. Didik Agus Suryono	ACC Manager AirNav Indonesia **INDONESIA**
	30.	Mr. Tri Ardhi Yulianto	Planning Evaluation ACC Center Junior Manager AirNav Indonesia **INDONESIA**
	31.	Ms. Endang Setya Wahyuningrum	Air Traffic Controller AirNav Indonesia **INDONESIA**

	STATE/NAME		TITLE/ORGANIZATION
	32.	Mr. Andika Satriya Bagus Chandra	Air Traffic Controller AirNav Indonesia **INDONESIA**
	33.	Mr. Iksan Nur Aslam	Air Traffic Controller, Makassar Air Traffic Services Centre Airnav Indonesia **INDONESIA**
	34.	Mr. Raden Triaswanto	Safety, Security and Standard Manager, Jakarta Air Traffic Services Centre Airnav Indonesia **INDONESIA**
	35.	Mr. Agus Retno Utomo	Technical Safety and HSE Jr. Manager, Jakarta Air Traffic Services Centre Airnav Indonesia **INDONESIA**
9.	**JAPAN (5)**		
	36.	Mr. Kyotaro Harano	Director, Office of ATS International Affairs Japan Civil Aviation Bureau **JAPAN**
	37.	Mr. Yasuhiro Marutsuka	Special Assistant to the Director JASMA/Japan Civil Aviation Bureau **JAPAN**

	STATE/NAME		TITLE/ORGANIZATION
	38.	Ms. Kyoko Sato	Special Assistant to the Director Japan Civil Aviation Bureau **JAPAN**
	39.	Mr. Kenichi Furukawa	Director Department of Research and Study Service Air Traffic Control Association Japan **JAPAN**
	40.	Mr. Koji Kato	Director Research & Planning Service Air Traffic Control Association Japan **JAPAN**
10.	**MALAYSIA (8)**		
	41.	Ms. Dayang Zarina Abang Alli Abd Rahman	Deputy Director (Operation) KLATCC Civil Aviation Authority of Malaysia **MALAYSIA**
	42.	Mr. Abdul Rali Kassim	Principal Assistant Director Air Traffic Management Division Civil Aviation Authority of Malaysia **MALAYSIA**
	43.	Ms. Farhana Mohamad Khairrudin	Senior Assistant Director Air Traffic Management Division Civil Aviation Authority of Malaysia **MALAYSIA**

	STATE/NAME		TITLE/ORGANIZATION
	44.	Ms. Nur A'Fifah Mansor	Senior Assistant Director Air Traffic Management Division Civil Aviation Authority of Malaysia **MALAYSIA**
	45.	Mr. Ahmad Shairazi Ahmad Samsuri	Senior Assistant Director KLATCC Civil Aviation Authority of Malaysia **MALAYSIA**
	46.	Mr. Perumal Subramaniam	Senior Assistant Director KLATCC Civil Aviation Authority of Malaysia **MALAYSIA**
	47.	Ms. Gillian Masudal	Senior Assistant Director KKATCC Civil Aviation Authority of Malaysia **MALAYSIA**
	48.	Mr. Naemul Helmi Mohd Napiah	Assistant Director Air Traffic Management Division Civil Aviation Authority of Malaysia **MALAYSIA**
11.	**NEW ZEALAND (1)**		
	49.	Mr. David Wills	Technical Specialist Telecommunications Civil Aviation Authority of New Zealand **NEW ZEALAND**

	STATE/NAME		TITLE/ORGANIZATION
12.	**PAKISTAN (3)**		
	50.	Mr. Zulfiqar Alam	Joint Director (ATS) Pakistan Civil Aviation Authority **PAKISTAN**
	51.	Mr. Ali Hasan	Senior Deputy Director (Air Traffic Services) PAKISTAN Civil Aviation Authority - Ops. Directorate **PAKISTAN**
	52.	Mr. Muhammad Asif	Senior Deputy Director (ATS) Pakistan Civil Aviation Authority – DAAR **PAKISTAN**
13.	**PHILIPPINES (6)**		
	53.	Mr. Joseph Tyrone R. Arias	ATMO V., ATMC, ACC Air Traffic Service Civil Aviation Authority of the Philippines **PHILIPPINES**
	54.	Mr. Edgardo I. Estrivo	ATMO V, ATMC, ACC Air Traffic Service Civil Aviation Authority of the Philippines **PHILIPPINES**

	STATE/NAME		TITLE/ORGANIZATION
	55.	Mr. Marianne Mamuad	ATMO V, ATMC, ACC Air Traffic Service Civil Aviation Authority of the Philippines **PHILIPPINES**
	56.	Ms. Judy Ann Basinal	Air Traffic Management Officer IV Civil Aviation Authority of the Philippines Air Traffic Service **PHILIPPINES**
	57.	Ms. Anna Liza D. Chiefe	ATMO III, ATMC, ACC Air Traffic Service Civil Aviation Authority of the Philippines **PHILIPPINES**
	58.	Ms. Arlene B. Gentica	ATMO V. SMS Air Traffic Service Civil Aviation Authority of the Philippines **PHILIPPINES**
14.	**REPUBLIC OF KOREA (7)**		
	59.	Mr. Young-Min Kim	Deputy Director Air Traffic Division, Korea Office of Civil Aviation (KOCA), Ministry of Land, Infrastructure and Transport (MOLIT) **REPUBLIC OF KOREA**

	STATE/NAME		TITLE/ORGANIZATION
	60.	Mr. Junho Lee	Assistant Director Ministry of Land, Transport and Maritime Affairs, Republic of Korea **REPUBLIC OF KOREA**
	61.	Ms. Sohyun Park	Assistant Director Air Traffic Division, Korea Office of Civil Aviation (KOCA), Ministry of Land, Infrastructure and Transport (MOLIT) **REPUBLIC OF KOREA**
	62.	Mr. Hyeong-cheol Kwon	Airspace and Flight Procedure ATMO, MOLIT, Republic of Korea **REPUBLIC OF KOREA**
	63.	Mr. Im Jaekyoung	Air Traffic Controller Air Traffic Management Ministry of Land, Infrastructure and Transport **REPUBLIC OF KOREA**
	64.	Mr. Jae-Hyun HAN	Director Korea Transport Institute **REPUBLIC OF KOREA**
	65.	Mr. Hyunsoo Cho	Researcher Korea Transport Institute **REPUBLIC OF KOREA**

	STATE/NAME		TITLE/ORGANIZATION
15.	**SINGAPORE (6)**		
	66.	Mr. Soon Kang (Thomas) Ng	Covering Head (ANS Safety & Security Branch) Civil Aviation Authority of Singapore (CAAS) **SINGAPORE**
	67.	Mr. Sivapirakasam R	Deputy Chief (Ops, Area) Civil Aviation Authority of Singapore (CAAS) **SINGAPORE**
	68.	Mr. Weng kit Ying	Principle ATC Manager Civil Aviation Authority of Singapore (CAAS) **SINGAPORE**
	69.	Mr. Marcus Ng	Senior Air Traffic Control Manger (ANS Safety & Security) Civil Aviation Authority of Singapore (CAAS) **SINGAPORE**
	70.	Mr. Han Jun Chew	ATC Manager Civil Aviation Authority of Singapore (CAAS) **SINGAPORE**
	71.	Mr. Andrew Wee	Deputy Director (Safety & Standards) Civil Aviation Authority of Singapore (CAAS) **SINGAPORE**

		STATE/NAME	TITLE/ORGANIZATION
16.		**SOMALIA (1)**	
	72.	Mr. Faisal Yusuf Ismail	AIS/AIM Inspector Somali Civil Aviation Authority (SCAA) **SOMALIA**
17.		**SRI LANKA (7)**	
	73.	Ms. Thilini Herath	Senior Civil Aviation Inspector – ATMSP Civil Aviation Authority of Sri Lanka **SRI LANKA**
	74.	Mr. Thilina Warnasinghe	Senior Civil Aviation Inspector Civil Aviation Authority of Sri Lanka **SRI LANKA**
	75.	Ms. Sarojanie S.A.N.	Civil Aviation Inspector – AIS Civil Aviation Authority of Sri Lanka **SRI LANKA**
	76.	Mr. Aruna Fernando	Senior Manager - Air Traffic Control (Planning & Standards) Airport and Aviation Services (Sri Lanka) Ltd. **SRI LANKA**
	77.	Ms. Madhusha Hettiarachchi	Manager - Air Traffic Controller Airport and Aviation Services (Sri Lanka) Ltd. **SRI LANKA**

	STATE/NAME		TITLE/ORGANIZATION
	78.	Ms. Priyasha Hettiarachchi	Air Traffic Controller Airport and Aviation Services (Sri Lanka) Ltd. **SRI LANKA**
	79.	Ms. Niluka Thilakarathne	Air Traffic Controller Airport and Aviation Services (Sri Lanka) Ltd. **SRI LANKA**
18.	**THAILAND (18)**		
	80.	Mr. Danupol Wetchasirikul	Airworthiness Officer The Civil Aviation Authority of Thailand **THAILAND**
	81.	Mr. Nawawit Lokniyom	Airworthiness Officer The Civil Aviation Authority of Thailand **THAILAND**
	82.	Mr. Nattapong Konthiang	Airworthiness Officer The Civil Aviation Authority of Thailand **THAILAND**
	83.	Ms. Thitibhorn Prathumchai	Air Navigation Services Officer The Civil Aviation Authority of Thailand **THAILAND**
	84.	Ms. Sataporn Chainarong	Air Navigation Services Standard Officer The Civil Aviation Authority of Thailand **THAILAND**

	STATE/NAME		TITLE/ORGANIZATION
	85.	Capt. Worratat Pingsuwan	Flight Operation Standards Officer The Civil Aviation Authority of Thailand **THAILAND**
	86.	Mr. Thapanapat Srimoonsang	Officer The Civil Aviation Authority of Thailand **THAILAND**
	87.	Ms. Saifon Obromsook	Engineering Manager (Safety Management System) Aeronautical Radio of Thailand Limited **THAILAND**
	88.	Ms. Rinthida Jorntes	Executive Safety Management System Officer Aeronautical Radio of Thailand Ltd. **THAILAND**
	89.	Ms. Chantima Sritiapetch	Senior System Engineer Aeronautical Radio of Thailand Ltd. **THAILAND**
	90.	Mr. Dolsarit Somseang	Senior Systems Engineer (Safety Management System) Aeronautical Radio of Thailand Ltd. **THAILAND**
	91.	Mr. Ponkrit Sawedsud	Safety Management Engineer Aeronautical Radio of Thailand Ltd. **THAILAND**

	STATE/NAME		TITLE/ORGANIZATION
	92.	Mr. Raksit Soontornmalai	Safety Management System Officer Aeronautical Radio of Thailand Ltd. **THAILAND**
	93.	Mr. Kongkiat Damraks	Head of Technical Training Department Technical Department Thai Airways International Public Company Limited **THAILAND**
	94.	Capt. Thammarat Thammalikhit	SMS Administrative Assistant Thai Airways International Public Company Limited **THAILAND**
	95.	Mrs. Roykrong Tulananda	Chief (Specialist), Investigation and Flight Data Analysis Department Operations Department Thai Airways International Public Company Limited **THAILAND**
	96.	Ms. Kaew Dhupagupta	Aircraft Engineer Thai Airways International Public Company Limited **THAILAND**
	97.	Ms. Benyalakshmi Siribhavanabhirajata	Safety Officer Thai Airways International Public Company Limited **THAILAND**

	STATE/NAME		TITLE/ORGANIZATION
19.	**UNITED STATES OF AMERICA (9)**		
	98.	Mr. Michael Watkins	Senior Air Traffic Representative, Asia Pacific Federal Aviation Administration Air Traffic Organization, System Operations **SINGAPORE**
	99.	Ms. Jennifer Kileo	Manager Federal Aviation Administration Aviation Safety Air Traffic Safety Oversight Service **UNITED STATES OF AMERICA**
	100.	Ms. Danielle Crudden	Air Traffic Safety Inspector Air Traffic Safety Oversight Service Federal Aviation Administration **UNITED STATES OF AMERICA**
	101.	Ms. Christine Falk	Research Analyst Federal Aviation Administration Separations Standards Analysis **UNITED STATES OF AMERICA**
	102.	Mr. Madison Walton, Jr.	Aviation Safety Inspector Oceanic Operations Federal Aviation Administration **UNITED STATES OF AMERICA**

	STATE/NAME		TITLE/ORGANIZATION
	103.	Mr. John Warburton	Manager, Separation Standards Analysis Enterprise Services Test & Evaluation Division Federal Aviation Administration **UNITED STATES OF AMERICA**
	104.	Ms. Rachel Stagliano	Mathematician Federal Aviation Administration Separations Standards Analysis **UNITED STATES OF AMERICA**
	105.	Ms. Marie Gale	Project Analyst Federal Aviation Administration Separation Standards Analysis Branch **UNITED STATES OF AMERICA**
	106.	Ms. Holly King	Supervisory Air Traffic Control Specialist Federal Aviation Administration **UNITED STATES OF AMERICA**
20.	**CANSO (1)**		
	107.	Mr. Poh Theen Soh	Director, Asia Pacific Affairs CANSO **SINGAPORE**
21.	**IATA (4)**		
	108.	Mr. Jose Fernandez	Assistant Director, Safety & Flight Operations International Air Transport Association (IATA) **SINGAPORE**

	STATE/NAME		TITLE/ORGANIZATION
	109.	Mr. Bin Hu	Manager, Operations Safety and Security International Air Transport Association (IATA) **SINGAPORE**
	110.	Mr. Yoshiki Imawaka	Executive Advisor IATA/All Nippon Airways (ANA) **JAPAN**
	111.	Mr. Chee Seng Seow	Deputy Chief Pilot A380 Singapore Airlines **SINGAPORE**
22.	**IFALPA (1)**		
	112.	Mr. Kanit Atisuthapoch	Captain IFALPA **THAILAND**
23.	**IFATCA (2)**		
	113.	Ms. Cheryl YC Chen	EVP IFATCA – Asia and Pacific **CANADA**
	114.	Mr. John Wagstaff	Representative IFATCA **CANADA**

	STATE/NAME		TITLE/ORGANIZATION
24.	**ICAO (5)**		
	115.	Mr. Shane Sumner	Regional Officer, Air Traffic Management ICAO Asia and Pacific Regional Office **THAILAND**
	116.	Mr. Hiroyuki Takata	Regional Officer, Air Traffic Management ICAO Asia and Pacific Regional Office **THAILAND**
	117.	Ms. Sunok LEE	Regional Officer, Air Traffic Management ICAO Asia and Pacific Regional Sub-Office **CHINA**
	118.	Mr. Han Chee Chew	Air Traffic Management Officer ICAO Asia and Pacific Regional Office **THAILAND**
	119.	Ms. Prakayphet Chalayonnawin	Programme Analysis Associate, Air Traffic Management ICAO Asia and Pacific Regional Office **THAILAND**

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International Civil Aviation Organization

Twenty-Sixth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/26)

Video Teleconference, 20 – 23 September 2021

LIST OF PAPERS

LIST OF WORKING PAPERS

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WP02	2	Relevant Meeting Outcomes	Secretariat
WP03	2	FIT-Asia Meeting Outcomes	Secretariat
WP04	2	RASMAG/MAWG and RMACG Reports	Thailand
WP05	3	RVSM Risk Assessment in the Brisbane, Honiara, Melbourne, Nauru and Port Moresby Flight Information Regions	Australia
WP06	3	China RMA Vertical Safety Report	China
WP07	3	JASMA Vertical Safety Report	Japan
WP08	3	JASMA AKARA Safety Improvement Update	Japan
WP09	3	2020 Analyses for the Incheon FIR AKARA Corridor Interface with Shanghai, Fukuoka and Taipei FIRs	USA
WP10	3	Identified Airspace Risk Occurrences within Indian Airspace	India
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WP12	3	PARMO Vertical Safety Monitoring Report	USA
WP13	3	Central East Pacific Traffic Flow Assessment for Calendar Year 2020	USA
WP14	3	BOBASMA Horizontal Safety Monitoring Report	India
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WP/19	5	Identification of Non-Approved Airframes Operating within RVSM Airspace	Australia
WP/20	3	JASMA Assessment of Non-RVSM Approved Aircraft	Japan
WP/21	5	MAAR Assessment of Non-RVSM Approved Aircraft	Thailand
WP/22	5	China RMA Assessment of Non-RVSM Approved Aircraft	China
WP/23	5	PARMO RVSM Traffic Compliance Monitoring	USA
WP/24	5	RMA's 'W' Verification of State Aircraft	Thailand

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WP/25		AAMA Estimate of RVSM Long Term Height Monitoring Burden	Australia
WP/26	5	China RMA LTHM Burden Estimate Update	China
WP/27	5	JASMA LTHM Burden Estimate Update	Japan
WP/28	5	PARMO RVSM Long Term Height Monitoring Burden	USA
WP/29	5	APAC Consolidated LTHM Compliance Status	Thailand
WP/30	5	Normalization of the AKARA Corridor	Republic of Korea
WP/31	5	JASMA Assessment of Non-PBCS Approved Aircraft	Japan
WP/32	5	JASMA Safety Reporting Culture	Japan
WP/33	5	Impact Assessment of the Removal of the 1,000 Flight Hour Portion of the RVSM Height Monitoring Requirement from ICAO Annex 6	Thailand
WP/34	5	APAC Consolidated Safety Report	Thailand
WP/35	5	Regional Airspace Safety Assessment *(TBC)*	Secretariat
WP/36	5	Competent Airspace Safety Monitoring Organizations List	Secretariat
WP/37	6	ATM and Airspace Deficiencies List	Secretariat
WP/38	7	RASMAG Terms of Reference and Task List	Secretariat
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IP/2	5	NAARMO Long Term Height Monitoring Burden	USA
IP/3	5	Treatment of TCAS RA-related LHDs (Category J and K)	Thailand
IP/4	5	JASMA Safety Assessment of ADS-C CDP	Japan
IP/5	5	Summary Report of Identified Airspace Risk and Mitigations	Singapore
IP/6	5	Update on Manila FIR after the AIDC Implementation and the Lessons Learned	Philippines

LIST OF PRESENTATIONS

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SP/1	3	RVSM Risk Assessment in the Brisbane, Honiara, Melbourne, Nauru, Port Moresby, Jakarta and Ujung Pandang FIRs (WP/5)	Australia
SP/2	3	PARMO Vertical Safety Monitoring Report (WP/12)	USA
SP/3	3	PARMO Horizontal Safety Monitoring Report (WP/16)	USA
SP/4	5	JASMA Assessment of Non-RVSM Approved Aircraft (WP/20)	Japan
SP/5	5	AAMA Estimate of RVSM Long Term Height Monitoring Burden (WP/25)	Australia
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Flimsy 2	2	Draft Conclusion – Non-RVSM State Aircraft	Secretariat
Flimsy 3	3	Analysis of Category A and B LHD Occurrences in the Brisbane, Honiara, Melbourne, Nauru and Port Moresby FIRs	Australia

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RVSM MONITORING GROUPS AND MINIMUM MONITORING REQUIREMENTS

AS OF: 25 June 2021

Version: 2021.0

1. UPDATE OF MONITORING REQUIREMENTS TABLE AND WEBSITE. As significant data is obtained, monitoring requirements for specific aircraft types may change. When Table 1 below, is updated, a letter will be distributed by the Regional Monitoring Agencies (RMAs) to the States concerned. The updated table will be posted on the RMA website being maintained by the International Civil Aviation Organization (ICAO). The secure website address is: http://portal.icao.int

2. INITIAL MONITORING. All operators that operate or intend to operate in airspace where RVSM is applied are required to participate in the RVSM monitoring program. Table 1 establishes requirements for initial monitoring associated with the RVSM approval process. In their application to the appropriate State authority for RVSM approval, operators must show a plan for meeting the applicable initial monitoring requirements.

3. AIRCRAFT STATUS FOR MONITORING. Aircraft engineering work that is required for the aircraft to receive RVSM airworthiness approval must be completed prior to the aircraft being monitored. Any exception to this rule will be coordinated with the State authority.

4. APPLICABILITY OF MONITORING FROM OTHER REGIONS. Monitoring data obtained in conjunction with RVSM monitoring programs from other regions can be used to meet regional monitoring requirements. The RMAs, which are responsible for administering the monitoring program, have access to monitoring data from other regions and will coordinate with States and operators to inform them on the status of individual operator monitoring requirements.

5. MONITORING PRIOR TO THE ISSUE OF RVSM OPERATIONAL APPROVAL IS NOT A REQUIREMENT. Operators should submit monitoring plans to the responsible civil aviation authority and the RMA that show how they intend to meet the requirements specified in Table1. Monitoring will be carried out in accordance with this table.

6. AIRCRAFT GROUPS NOT LISTED IN TABLE 1. Contact the RMA for clarification if an aircraft group is not listed in Table 1 or for clarification of other monitoring related issues. An aircraft group not listed in Table 1 will probably be subject to Category 2 monitoring requirements.

7. TABLE OF MONITORING GROUPS. Table 2 shows the aircraft types and series that are grouped together for operator monitoring purposes.

8. TABLE OF NON-GROUP AIRCRAFT: Table 3 shows the aircraft types and series that are Non-Group aircraft (i.e., Not certified under group approval requirements) for monitoring purposes.

9. TRAILING CONE DATA. Altimetry System Error estimations developed using Trailing Cone data collected during RVSM certification flights can be used to fulfill monitoring requirements. It must be documented, however, that aircraft RVSM systems were in the approved RVSM configuration for the flight.

10. MONITORING OF AIRFRAMES THAT ARE RVSM COMPLIANT ON DELIVERY. If an operator adds new RVSM compliant airframes of a type for which it already has RVSM operational approval and has completed monitoring requirements for the type in accordance with the attached table, the new airframes are not required to be monitored. If an operator adds new RVSM compliant airframes of an aircraft type for which it has NOT previously received RVSM operational approval, then the operator should complete monitoring in accordance with the attached table.

11. FOLLOW-ON MONITORING. Monitoring is an on-going program that will continue after the RVSM approval process. Long term minimum monitoring requirements are established in the Annex 6 to the Convention on International Civil Aviation. On a regional basis, a programme shall be instituted for monitoring the height-keeping performance of aircraft operating in RVSM airspace in order to ensure that continued application of this vertical separation minimum meets regional safety objectives.

Table 1: MONITORING REQUIREMENTS TABLE (Civilian)

MONITORING IS REQUIRED IN ACCORDANCE WITH THIS TABLE

MONITORING PRIOR TO THE ISSUE OF RVSM APPROVAL IS **NOT** A REQUIREMENT

CATEGORY		GROUP DESCRIPTOR	MINIMUM MONITORING REQUIREMENTS
1	GROUP APPROVED: DATA INDICATES COMPLIANCE WITH THE RVSM MASPS	A124, A30B, A306, A310-GE, A310-PW, A318, A320, A330, A340, A345, A346, A380, A3ST, AVRO, B712, B727, B737C, B737CL, B737NX, B747CL, B74S, B744-5, B744-10, B748, B752, B753, B764, B767, B772, B773, B787, BD100, BE40, C25A, C25B, C510, C525, C560, C56X, C650, C680, C750, CARJ, CL600, CL604, CL605, CRJ7, CRJ9, DC10, E135-145, E170-190, E50P, E55P, F100, F900, FA7X, GALX, GLEX, GL5T, GLF4, GLF5, H25B-800, J328, LJ40, LJ45, LJ60, MD10, MD11, MD80, MD90, PC12, PRM1, T154	Operators of aircraft types contained in this category shall have a minimum of 2 airframes monitored every 2 years or 1,000 flight hours, whichever is longer calculated from the date of the last successful height monitoring. Operators with fleets consisting of aircraft from more than one Monitoring Group shall meet this requirement for each group in the fleet. In the event that an operator has a single airframe from a Group, then that aircraft shall be monitored every 2 years or 1,000 flight hours, whichever is longer calculated from the date of the last successful height monitoring.
2	GROUP APPROVED: INSUFFICIENT DATA ON APPROVED AIRCRAFT	Other group aircraft other than those listed above including: A148, A158, A20N, A337, A339, A350, A35K, AC90, AC95, AJ27, AN72, ASTR, ASTR-SPX, B701, B703, B731, B732, B37M, B38M, B39M, B744-LCF, B779, B78X, BCS1, BE20, BE30, C25C, C441, C500, C550-B, C550-II, C550-SII, C700, CRJ10, D328, DC85, DC86-87, DC91, DC93, DC94, DC95, EPIC, E120, E45X, EA50, E545-550, E290, E295, F2TH, F70, FA10, FA20, FA50, G150, G280, GL7T, GLF2, GLF2B, GLF3, GLF6, GLF7, H25B-700, H25B-750, H25C, HA4T, HDJT, IL62, IL76, IL86, IL96, L101, L29B-2, L29B-731, LJ23, LJ24, LJ25, LJ28, LJ31, LJ35-36, LJ55, MC21, MU30, P180, P180-II, PAY4, PC24, SB20, SBR1, SBR2, SF50, SU95, T134, T204, T334, TBM, WW24, YK42	Operators of aircraft types contained in this category shall have a minimum of 60% of airframes monitored every 2 years or 1,000 flight hours, whichever is longer calculated from the date of the last successful height monitoring, (the number of airframes to be monitored shall be rounded up to the nearest whole integer). Operators with fleets consisting of aircraft from more than one Monitoring Group shall meet this requirement for each Group in the fleet.
3	NON-GROUP	Aircraft types for which no generic compliance method exists: A225, AN12, AN26, B190, B462, B463, B74S-SOFIA, BA11, BE9L, FA6X, GSPN, H25A, L29A, PAY3, R721, R722, SJ30, STAR	Operators of aircraft types contained in this category shall have 100% of airframes monitored every 2 years or 1,000 flight hours., whichever is longer calculated from the date of the last successful height monitoring.

Table 2: MONITORING GROUPS FOR AIRCRAFT CERTIFIED UNDER GROUP APPROVAL REQUIREMENTS

Monitoring Group	A/C ICAO	Manufacturer Type	Additional Defining Criteria
A124	A124	AN-124 RUSLAN	
A148	A148	AN-148	
A158	A158	AN-158	
A30B	A30B	A300	
A306	A306	A300	
A310-GE	A310	A310	Series: 200, 200F, 300, 300F
A310-PW	A310	A310	Series: 220, 220F, 320, 320F
A318	A318	A318	
A320	A319	A319	
	A320	A320	
	A321	A321	
A20N	A19N	A319neo	
	A20N	A320neo	
	A21N	A321neo	
	A21N	A321LR	
	A21N	A321XLR	
A330	A332	A330	
	A333	A330	
A337	A337	AIRBUS BELUGA XL (A330-743L)	
A339	A339	A330-900neo	
	A338	A330-800neo	
A340	A342	A340	
	A343	A340	
A345	A345	A340	
A346	A346	A340	
A350	A359	A350-900	
		A350-900 ULR	

Monitoring Group	A/C ICAO	Manufacturer Type	Additional Defining Criteria
A35K	A35K	A350-1000	
A380	A388	A380	
A3ST	A3ST	A300	600R ST BELUGA
AC90	AC90	COMMANDER 690 COMMANDER 840 COMMANDER 900	
AC95	AC95	AERO COMMANDER 695	
AN72	AN72 AN74	ANTONOV AN-72 ANTONOV AN-74	
ASTR	ASTR	1125 ASTRA	S/n 1-78, except 73
ASTR-SPX	ASTR	1125 ASTR SPX, G100	S/n 73, 79-145 S/n > 145
AVRO	RJ1H RJ70 RJ85	RJ100 Avroliner RJ70 Avroliner RJ85 Avroliner	
B37M	B37M	Boeing 737 MAX 7	
B38M	B38M	Boeing 737 MAX 8	
B39M	B39M	Boeing 737 MAX 9	
B701	B701	B707	
B703	B703	B707	Series 320, 320B, 320C
B712	B712	B717	
B727	B721 B722	B727 B727	
B731	B731	B737	
B732	B732	B737	
B737CL	B733 B734 B735	B737-300 B737-400 B737-500	

Monitoring Group	A/C ICAO	Manufacturer Type	Additional Defining Criteria
B737NX	B736	B737-600	
	B737	B737-700	B737-700 including the BBJ
	B738	B737-800	B737-800 including the BBJ2
	B739	B737-900	
	B739	B737-900ER	
B737C	B737	B737-700	Series: 700C
B747CL	B741	B747-100	
	B742	B747-200	
	B743	B747-300	
B74S	B74S	B747SP	
	B74R	B747SR	
B744-5	B744	B747-400	5 inch Probes up to s/n 25350
	B74D		
B744-10	B744	B747-400	10 inch Probes from s/n 25351
	B74D		
B744-LCF	BLCF	B747-400	
B748	B748	B747-8	
B752	B752	B757-200	
B753	B753	B757-300	
B767	B762	B767-200	
	B763	B767-300	
B764	B764	B767-400	
B772	B772	B777-200	
	B772	B777-200ER	
	B77L	B777-F	
	B77L	B777-200LR	
B773	B773	B777-300	
	B77W	B777-300ER	
B779	B779	B777-9	

Monitoring Group	A/C ICAO	Manufacturer Type	Additional Defining Criteria
B787	B788	B787-8	
	B789	B787-9	
B78X	B78X	B787-10	
BCS1	BCS1	BOMBARDIER CS100	
	BCS1	AIRBUS A220-100	
	BCS3	BOMBARDIER CS300	
	BCS3	AIRBUS A220-300	
BD100	CL30	CHALLENGER 300	
	CL35	CHALLENGER 350	Begins at s/n 20501
BE20	BE20	200 KINGAIR	
BE30	BE30	B300 SUPER KINGAIR	
	B350	B300 SUPER KINGAIR 350	
BE40	BE40	BEECHJET 400	
		BEECHJET 400A	
		BEECHJET 400XP	
		HAWKER 400XP	
C441	C441	CONQUEST II	
C500	C500	500 CITATION	
	C500	500 CITATION I	
	C501	501 CITATION I SINGLE PILOT	
C510	C510	MUSTANG	
C525	C525	525 CITATIONJET	
		525 CITATIONJET 1	
		525 CITATIONJET PLUS	
	C25M	C525-M2	S/n 800 and on
C25A	C25A	525A CITATIONJET II	
C25B	C25B	CITATIONJET III	
		525B CITATIONJET III	
C25C	C25C	525C CITATIONJET IV	

Monitoring Group	A/C ICAO	Manufacturer Type	Additional Defining Criteria
C550-B	C55B	550 CITATION BRAVO	S/n 550-0801 and on
C550-II	C550	550 CITATION II	S/n 550-0001 to 550-0800
	C551	551 CITATION II SINGLE PILOT	
C550-SII	C550	S550 CITATION SUPER II	S/n starts with “S”
C560	C560	560 CITATION V	
		560 CITATION V ULTRA	
		560 CITATION V ENCORE	
		560 CITATION V ENCORE PLUS	
C56X	C56X	560 CITATION EXCEL	
		560 CITATION XLS	
		560 CITATION XLS PLUS	
C650	C650	650 CITATION III	
		650 CITATION VI	
		650 CITATION VII	
C680	C680	680 CITATION SOVEREIGN	
	C68A	680-A LATITUDE	“A” in s/n
C700	C700	700 CITATION LONGITUDE	
C750	C750	750 CITATION X	
CARJ	CRJ1	CRJ-100	
	CRJ2	CRJ-200	
	CRJ2	CRJ-440	
	CRJ2	CHALLENGER 800	
	CRJ2	CHALLENGER 850	
CRJ7	CRJ7	CRJ-700	
	CRJ7	CRJ-550	
CRJ9	CRJ9	CRJ-705	
	CRJ9	CRJ-900	
CRJ10	CRJX	CRJ-1000	

Monitoring Group	A/C ICAO	Manufacturer Type	Additional Defining Criteria
CL600	CL60	CL-600	S/n < 5000
		CL-601	
CL604	CL60	CL-604	S/n 5000-5700
		CL-601-3A	S/n 5001-5134
		CL-601-3R	S/n 5135-5300
CL605	CL60	CL-605	S/n > 5700
	CL60	CL-650	
DC10	DC10	DC-10	
D328	D328	328 TURBOPROP	
DC85	DC85	DC-8	
DC86-87	DC86	DC-8	
	DC87	DC-8	
DC91	DC91	DC-9	
DC93	DC93	DC-9	
DC94	DC94	DC-9	
DC95	DC95	DC-9	
EPIC	EPIC	Epic E1000	
E120	E120	EMB-120 Brasilia	
E135-145	E135	EMB-135	
	E145	EMB-145	
	E35L	EMB-135BJ Legacy 600/650	
E45X	E45X	EMB-145 XR	
E170-190	E170	E170	
	E170	E175	
	E75S	E170-200 short wing	
	E75L	E175 long wing	
	E190	E190	
	E190	E195	
E290	E290	E190-E2	

Monitoring Group	A/C ICAO	Manufacturer Type	Additional Defining Criteria
E295	E295	E195-E2	
	E295	E190-400	
E50P	E50P	PHENOM 100	
E545-550	E545	EMB-545 LEGACY 450	
	E545	EMB-545 PRAETOR 500	
	E550	EMB-550 LEGACY 500	
	E550	EMB-550 PRAETOR 600	
E55P	E55P	PHENOM 300	
EA50	EA50	ECLIPSE	
F100	F100	FOKKER 100	
F2TH	F2TH	FALCON 2000	
		FALCON 2000-EX	
		FALCON 2000LX	
		FALCON 2000-LXS	
		FALCON 2000-S	
F70	F70	FOKKER 70	
F900	F900	FALCON 900	
		FALCON 900DX	
		FALCON 900EX	
		FALCON 900LX	
FA10	FA10	FALCON 10	
FA20	FA20	FALCON 20	
		FALCON 200	
FA50	FA50	FALCON 50	
		FALCON 50EX	
FA7X	FA7X	FALCON 7X	
	FA8X	FALCON 8X	
G150	G150	G150	

Monitoring Group	A/C ICAO	Manufacturer Type	Additional Defining Criteria
G280	G250	G250	
	G280	G280	
GALX	GALX	1126 GALAXY	
		G200	
GLEX	GLEX	GLOBAL EXPRESS CLASSIC GLEX	EXPRESS
		GLOBAL XRS	S/n > 9158
		GLOBAL 6000	S/n > 9431, and 9313 and 9381
		GLOBAL 6500	S/n > 60001
GL5T	GL5T	GLOBAL 5000	
		GLOBAL 5000-GVFD	S/n > 9434, and 9386 and 9401
		GLOBAL 5500	S/n > 60001
GL7T	GL7T	GLOBAL 7500	
GLF2	GLF2	GULFSTREAM II (G-1159)	
GLF2B	GLF2	GULFSTREAM IIB (G-1159B)	
GLF3	GLF3	GULFSTREAM III (G-1159A)	
GLF4	GLF4	GULFSTREAM IV (G-1159C)	
		G300	
		G350	
		G400	
		G450	
GLF5	GLF5	GULFSTREAM V (G-1159D)	
		G500	
		G550	
GLF6	GLF6	G650	
GLF7	GA5C	G500 GVII	
	GA6C	G600 GVII	
H25B-700	H25B	BAE 125 / HS125	Series: 700A, 700B
H25B-750	H25B	HAWKER 750	

Monitoring Group	A/C ICAO	Manufacturer Type	Additional Defining Criteria
H25B-800	H25B	BAE 125 / HS125	Series: 800A, 800B
		HAWKER 800XP	
		HAWKER 800XPI	
		HAWKER 800	
		HAWKER 850XP	
		HAWKER 900XP	
		HAWKER 950XP	
H25C	H25C	HAWKER 1000	
HA4T	HA4T	HAWKER 4000	
HDJT	HDJT	HONDAJET HA-420	
IL62	IL62	ILYUSHIN-62	
IL76	IL76	ILYUSHIN-76	
IL86	IL86	ILYUSHIN-86	
IL96	IL96	ILYUSHIN-96	
J328	J328	328JET	
L101	L101	L-1011 TRISTAR	
L29B-2	L29B	L-1329 JETSTAR II	
L29B-731	L29B	L-1329 JETSTAR 731	
LJ23	LJ23	LEARJET 23	
LJ24	LJ24	LEARJET 24	
LJ25	LJ25	LEARJET 25	
LJ28	LJ28	LEARJET 28	
		LEARJET 29	
LJ31	LJ31	LEARJET 31	
LJ35-36	LJ35	LEARJET 35, 35A	
		LEARJET 36, 36A	
LJ40	LJ40	LEARJET 40	Begins at s/n 2001
	LJ70	LEARJET 70	Begins at s/n 2134

Monitoring Group	A/C ICAO	Manufacturer Type	Additional Defining Criteria
LJ45	LJ45	LEARJET 45	
	LJ75	LEARJET 75	Begins at s/n 456
LJ55	LJ55	LEARJET 55	
LJ60	LJ60	LEARJET 60	
MC21	MC21	IRKUT MC21-300	
MD10	MD10	MD-10	
MD11	MD11	MD-11	
MD80	MD81	MD-80	
	MD82	MD-80	
	MD83	MD-80	
	MD87	MD-80	
	MD88	MD-80	
MD90	MD90	MD-90	
MU30	MU30	MU-300 DIAMOND	1A
P180	P180	P-180 AVANTI	S/n < 1105 but not 1002
P180-II	P180	P-180 AVANTI II	S/n > 1104 and also 1002
	P180	P-180 AVANTI EVO	
PAY4	PAY4	PA-42 Cheyenne 400	Series: 1000 CHEYENNE
PC12	PC12	Pilatus PC-12	
PC24	PC24	Pilatus PC-24	
PRM1	PRM1	PREMIER 1	
SB20	SB20	SAAB 2000	
SBR1	SBR1	SABRELINER 40	
		SABRELINER 60	
		SABRELINER 65	
SBR2	SBR2	SABRELINER 80	
SF50	SF50	CIRRUS SF50	RVSM-capable s/n 8, 89, and 94 or above
SU95	SU95	SUKHOI SUPERJET 100-95	
T134	T134	TU-134	

Monitoring Group	A/C ICAO	Manufacturer Type	Additional Defining Criteria
T154	T154	TU-154	
T204	T204	TU-204 TU-214 TU-224 TU-234	
T334	T334	TU-334	
TBM	TBM7 TBM8 TBM9	TBM-700 TBM-850 TBM-900	 TBM8 with winglets, begins at s/n 1000
WW24	WW24	1124 WESTWIND	
YK42	YK42	Yakovlev YAK-42 Yakovlev YAK-40	

Table 3: Non-GROUP AIRCRAFT (i.e., Not certified under group approval requirements) (Civilian)

Non-Group Descriptor	A/C ICAO	Manufacturer Type	Additional Defining Criteria
A225	A225	ANTONOV AN-225	Non-Group
AN12	AN12	ANTONOV AN-12	Non-Group
AN26	AN26	ANTONOV AN-26	Non-Group
B190	B190	BEECH 1900	Non-Group
B462	B462	BAe-146-200	Non-Group
B463	B463	BAe-146-300	Non-Group
B74S-SOFIA	B74S	NASA B74SP with Sofia telescope	Non-Group: N747NA (s/n 21441)
BA11	BA11	BAC-111	Non-Group
BE9L	BE9L	Beechcraft King Air C90GT Beechcraft King Air C90GTI King Air Model 90 except F90 and F90-1	Non-Group

Non-Group Descriptor	A/C ICAO	Manufacturer Type	Additional Defining Criteria
FA6X	FA6X	Falcon 6X	Non-Group
GSPN	GSPN	GROB G-180 SPn Utility Jet	Non-Group
H25A	H25A	HS125-400, -600	Non-Group
L29A	L29A	L-1329 JETSTAR 6/8	Non-Group
PAY3	PAY3	PIPER Cheyenne 3	Non-Group
R721	R721	B-727-100: Re-engined	Non-Group
R722	R722	B-727-200: Re-engined	Non-Group
SJ30	SJ30	SWEARINGEN SJ-30	Non-Group
STAR	STAR	BEECH 2000 STARSHIP	Non-Group

Table 1: MONITORING REQUIREMENTS TABLE (Military)

MONITORING IS REQUIRED IN ACCORDANCE WITH THIS TABLE

MONITORING PRIOR TO THE ISSUE OF RVSM APPROVAL IS **NOT** A REQUIREMENT

CATEGORY		GROUP DESCRIPTOR	MINIMUM MONITORING REQUIREMENTS
1	GROUP APPROVED: DATA INDICATES COMPLIANCE WITH THE RVSM MASPS	C17, C130, KC135	Operators of aircraft types contained in this category shall have a minimum of 2 airframes monitored every 2 years or 1,000 flight hours, whichever is longer calculated from the date of the last successful height monitoring. Operators with fleets consisting of aircraft from more than one Monitoring Group shall meet this requirement for each group in the fleet. In the event that an operator has a single airframe from a Group, then that aircraft shall be monitored every 2 years or 1,000 flight hours, whichever is longer calculated from the date of the last successful height monitoring.
2	GROUP APPROVED: INSUFFICIENT DATA ON APPROVED AIRCRAFT	Other group aircraft other than those listed above including: A178, A400, C5, C550-552, E3, F18, KC2, KC46, KC39, P1, P8	Operators of aircraft types contained in this category shall have a minimum of 60% of airframes monitored every 2 years or 1,000 flight hours, whichever is longer calculated from the date of the last successful height monitoring, (the number of airframes to be monitored shall be rounded up to the nearest whole integer). Operators with fleets consisting of aircraft from more than one Monitoring Group shall meet this requirement for each Group in the fleet.
3	NON-GROUP	**Aircraft types for which no generic compliance method exists:** GLF5-AEW, GLEX-ASTOR **Aircraft types for which the compliance method is not known:** A30B-M, A310-M, A332-M, ASTR-M, B737-AWACS, C12, C21, C32, C35, C37, C40, C550-B-M, C9, CL60-M, E135-M, E4, E6, E8, E530, FA10-M, FA20-M, FA50-M, GLF3-M, GLF4-M, IL76-M, KC10, KC-390, KC46, P180-M, R135, VC25	Operators of aircraft types contained in this category shall have 100% of airframes monitored every 2 years or 1,000 flight hours., whichever is longer calculated from the date of the last successful height monitoring.

Table 2: MONITORING GROUPS FOR AIRCRAFT CERTIFIED UNDER GROUP APPROVAL REQUIREMENTS (Military)

Monitoring Group	A/C ICAO	Manufacturer Type	Additional Defining Criteria
A178	A178	Antonov A178	
A30B-M	A30B	A300	B2-100 (Zero-G)
A310-M	A310	A310	MRT, MRTT
A332-M	A332	KC30-A KC45-A Voyager KC2, KC3	MRTT
A400	A400	A400M	
ASTR-M	ASTR	1125 ASTRA	NAV&COM
C12	BE20	C-12	
C130	C130	C-130 Hercules	Series: H only
	C30J	C-130J Hercules	
C17	C17	C-17 Globemaster III	
C21	LJ35	C-21	
C32	B752	C-32	Series: A, B
C40	B737	C-40 Clipper	
C5	C5	C5 Galaxy	
C550-552	C550	552 CITATION II (USN)	
C550-B-M	C550	550 CITATION BRAVO	
C550-M	C550	550 CITATION II	
C35	C560	560 CITATION V UC-35	
C37	GLF5	C-37 TP102D	Series: A, B Series: C
CL60-M	CL60	CL604	MPA
E135-M	E135	EMB-135	MRT
E3	E3TF	E-3 Sentry	

Monitoring Group	A/C ICAO	Manufacturer Type	Additional Defining Criteria
	E3CF		
E4	B742	E-4	
E6	E6	E-6 Mercury	
B737-AWACS	E7A	B737	B737 AEW&C
E8	B703	E-8 J-Stars	
E530	E530	TEXTRON AIRLAND SCORPION	
FA10-M	FA10	FALCON 10	MRT
FA20-M	FA20	FALCON 20	EW/ELINT, MRT, EXP
FA50-M	FA50	FALCON 50	MPA/SAR
F18H	F18H	McDonnell-Douglas F/A 18 F/A-18 Hornet	
GLF3-M	GLF3	C-20	Series: A, B, C, D, E
GLF4-M	GLF4	C-20 S102B TP102	Series: F, G, H
IL76-M	IL76	IL-76	MRT, T
KC2	KC2	KAWASAKI KC2 C-2 RC-2 XC-2	
KC10	DC10	KC-10 Extender KDC-10 DC-10	
KC46	KC46	Boeing KC46 Boeing KC-46 Pegasus Boeing KC46A or B767-2C	
KC135	B703 K35E K35R	KC-135 Stratotanker KC-135 Stratotanker C-135 Stratotanker	

Monitoring Group	A/C ICAO	Manufacturer Type	Additional Defining Criteria
KC39	KC39	Embraer KC390	
P1	P1	Kawasaki P-1	
P180-M	P180	P-180 AVANTI	
P8	P8	B738-ERX	BOEING P8 POSEIDON
R135	R135	RC-135	
VC25	B742	VC-25	

Abbreviations:

EW/ELINT	Electronic Warfare/Electronic Intelligence
EXP	Experimental
MPA	Maritime Patrol Aircraft
MRT	Multi Role Transporter
MRTT	Multi Role Transporter and Tanker
SAR	Search and Rescue
T	Transporter

Table 3: Non-GROUP AIRCRAFT (i.e., Not certified under group approval requirements) (Military)

Non-Group Descriptor	A/C ICAO	Manufacturer Type	Additional Defining Criteria
GLEX-ASTOR	GLEX	Raytheon Sentinel aka RAF's ASTOR (Airborne Stand-Off Radar)	Non-Group
GLF5-AEW	GLF5	GULFSTREAM G550	Non-Group : AEW

Abbreviations:

AEW	Airborne Early Warning

AKARA Corridor Phased Implementation

RASMAG/26 Breakout Discussion

21 September 2021 (0100 - 0150 UTC)

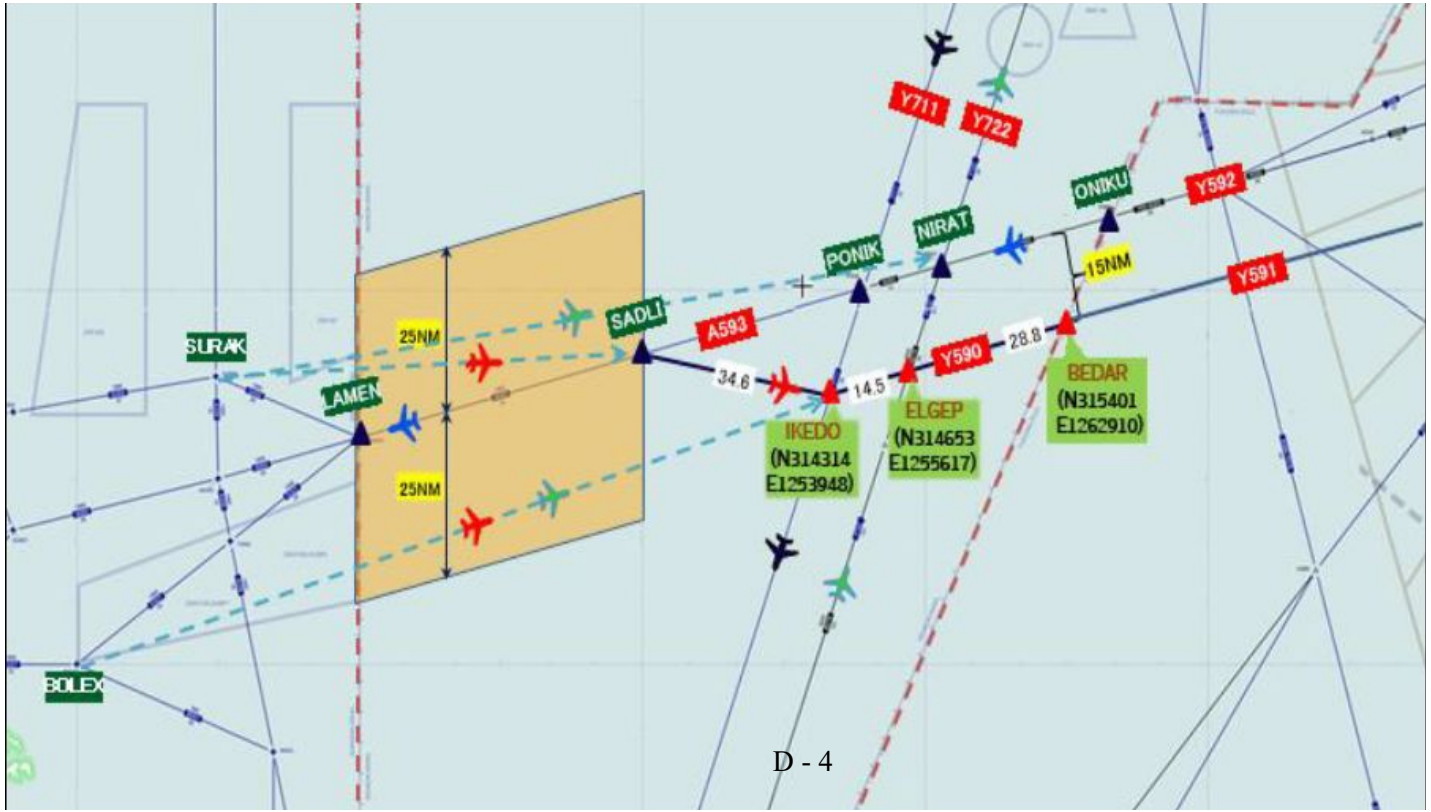
Objectives

- To clarify some details of the phased implementation in AKARA Corridor
- To clarify the set of actions to be taken by States involved in order to move forward

Phase 1 : Commenced 25th March 2021

- New eastbound unidirectional ATS route (Y590/Y591) connecting Incheon FIR and Fukuoka FIR
- Single ATC unit at intersection points
- Direct-Speech Circuit (DSC) installed between Incheon ACC and Shanghai ACC. (Fukuoka ACC and Incheon ACC -> AIDC)
- No change in FLAS/FLOS

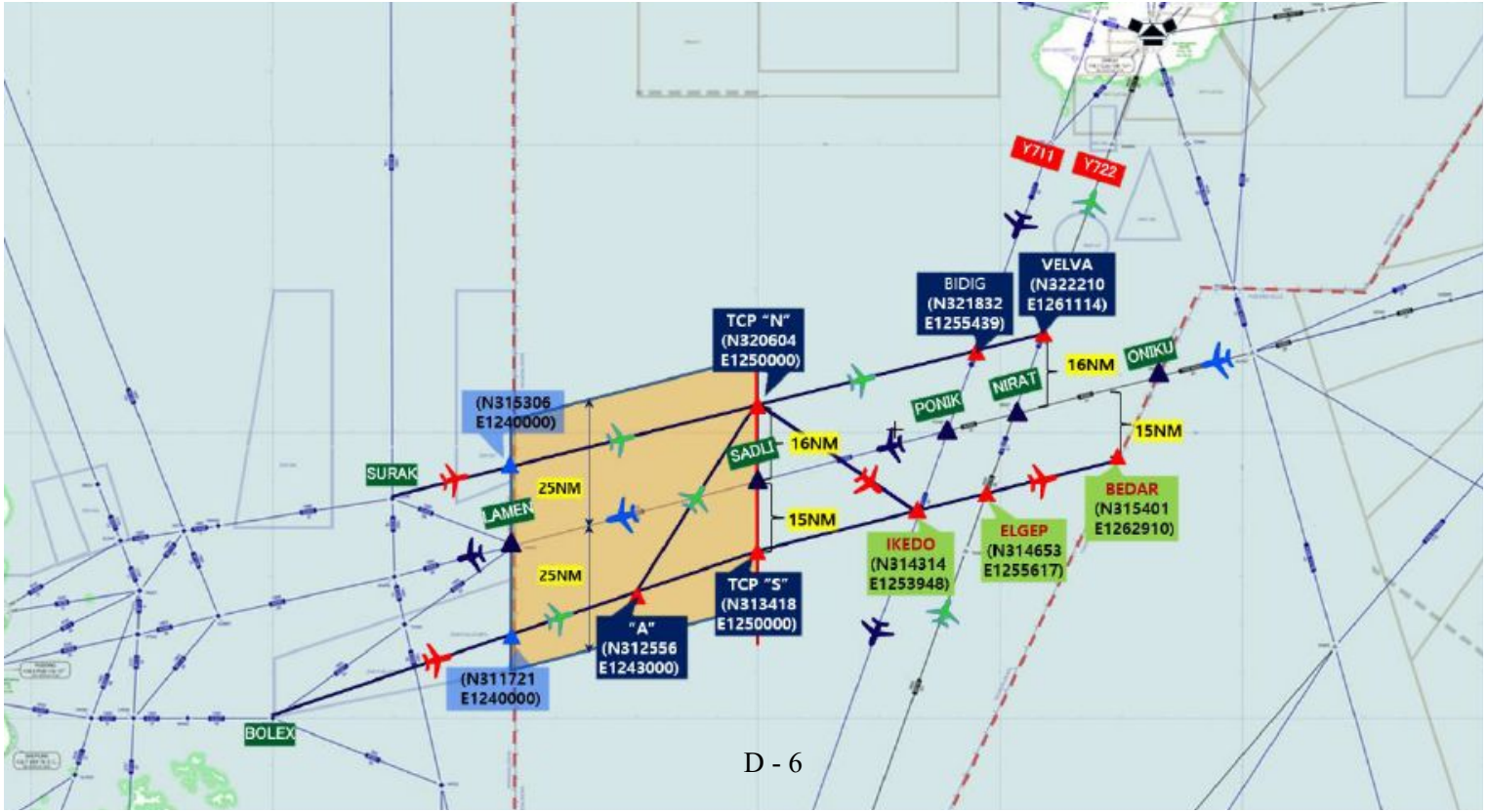
Phase 1


Y711
Y722
ONIKU
Y592
NIRAT
PONIK
15NM
Y591
SADLI
A593
SURAK
25NM
34.6
14.5
Y590
28.8
AMEN
IKEDO
(N314314
E1253948)
ELGEP
(N314653
E1255617)
BEDAR
(N315401
E1262910)
25NM
BOLEX

Phase 2: No planned date yet

- Triple route system (agreed by all parties involved)
- Change from Phase 1 to Phase 2 is mostly between China and ROK.

Phase 2


Y711
Y722
BIDIG
(N321832
E1255439)
VELVA
(N322210
E1261114)
TCP "N"
(N320604
E1250000)
ONIKU
16NM
NIRAT
PONIK
15NM
(N315306
E1240000)
SADLI
16NM
SURAK
25NM
LAMEN
15NM
BEDAR
(N315401
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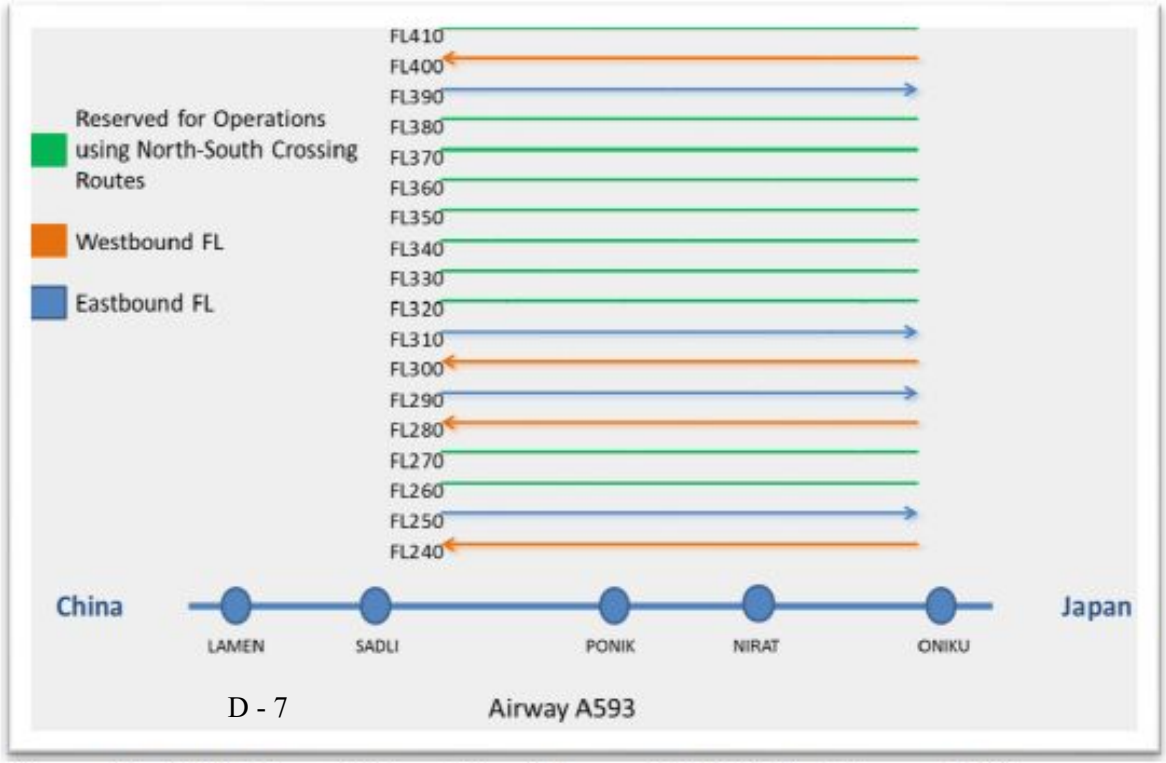
IKEDO
(N314314
E1253948)
ELGEP
(N314653
E1255617)
25NM
TCP "S"
(N313418
E1250000)
"A"
(N312556
E1243000)
(N311721
E1240000)
BOLEX

Current FLAS

Of Airway A593

- FLAS remains unchanged currently. Each FL is specifically reserved for each traffic flow.
- Phase 1 implementation leads to FL 240, 280, 300, and 400 not being used on Y590/591.



D - 7

Airway A593

FLAS Removal

- The current FLAS implementation posts risk to Fukuoka FIR for the need to transition aircraft into and out of FLAS.
- The removal of FLAS would post some risk on Incheon FIR due to the complex route structure and heavy traffic during normal situation.
- **Japan** proposed to consider the removal of FLAS.
- **ICAO, China and IFALPA** supported the FLAS removal.
- **IATA** supported the proposal to eliminate FLAS and stated that the elimination of FLAS will not only reduce the safety risks in the AKARA area but it will also increase the efficiency and flexibility of the aircraft operations.
- **IFATCA** is in favour of FLAS removal, but only if the appropriate conflict resolution tools are available to the controller and supported by effective procedures and the airspace structure.
- **ROK** reminded the meeting that FLAS could be utilized in complex airspace like as AKARA airspace (approximately 1,000 traffic per day during normal situation in 2019). FLAS utilization or removal should be considered based on various factors, for example, route structure, traffic volume, workloads, etc. (Ref. the ICAO Asia/Pacific Seamless ANS Plan)

FLAS Removal

Pros

- Increased FL usage and hence efficiency.
- No need to transition aircraft into and out of FLAS.
- Technical risk would decrease due to less passing frequency.

Cons

- More ATC workload to plan and de-conflict at intersecting waypoints.
- Operational risk may increase due to the crossing track confliction near the FIR boundary.

Moving Forward

- ROK is re-configuring their control sectors in the area into Jeju North sector, Jeju South High sector and Jeju South Low sector. The high and low sectors are divided at FL335. This new arrangement will be effective on 23rd September 2021.
- The States concerned are currently under discussion for Phase 2 implementation. The result and target date will be shared as soon as consented between States concerned.
- In response to Japan's proposal to remove FLAS, the ROK confirmed the meeting that the assessment of the FLAS could not take place during Phase 1. The meeting could not come to a conclusion during the breakout session; therefore, the timeframe of the assessment will later be discussed among the States concerned.

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.

(RASMAG/26 update 23 September 2021)

Organisation *(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 Amelia Gontar, Risk Intelligence Specialist Safety and Risk Airservices Australia Email: amelia.gontar@airservicesaustralia.com; or aama@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

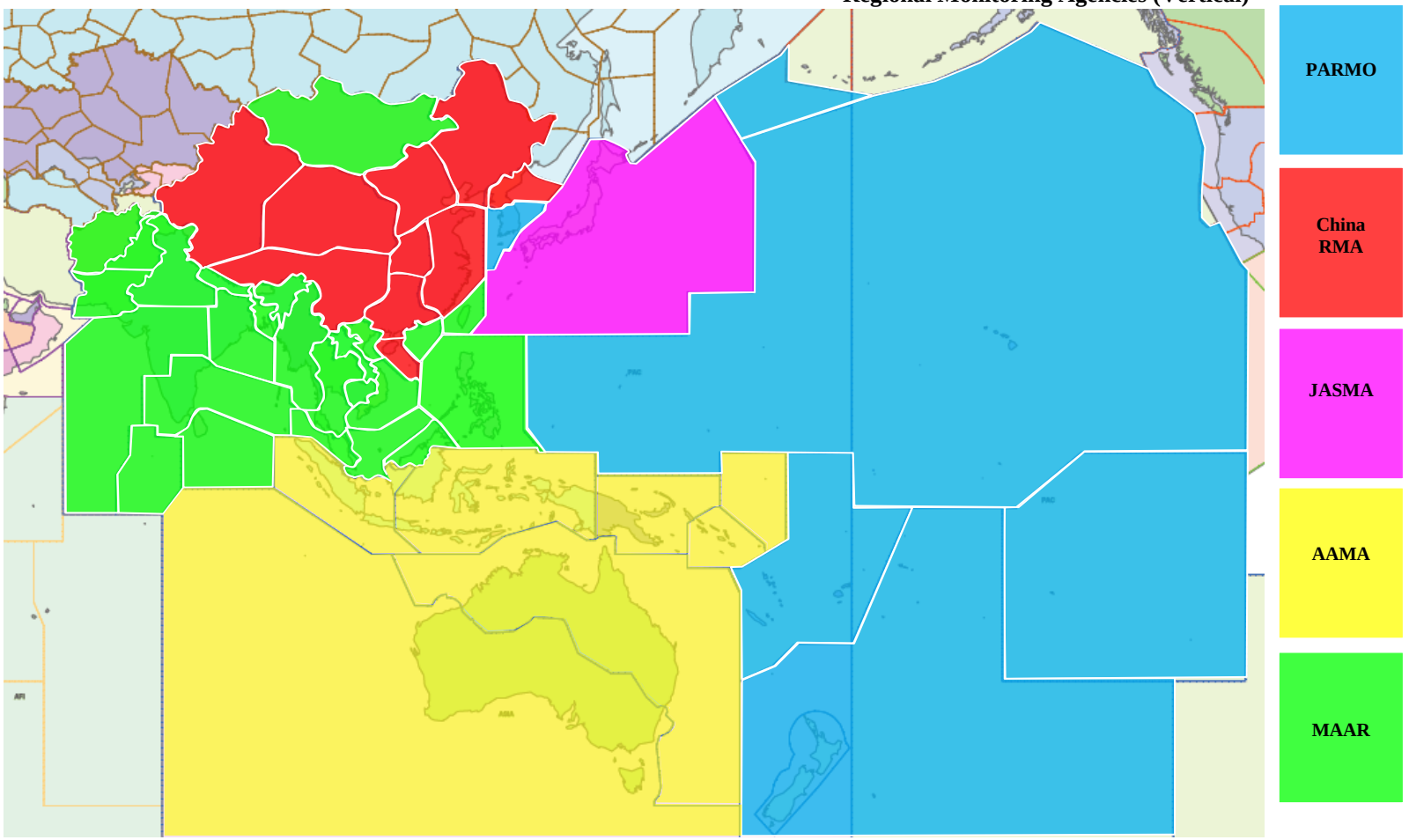
China RMA - **Air Traffic Management Bureau, (ATMB) of Civil Aviation Administration of China (CAAC)** http://www.chinarma.cn Mr.Yongyue Chen (Monsoon), Coordinator of China RMA, ADCC, ATMB of CAAC email: rmachina@rmachina.cn	China	RMA & EMA	Current	RMA for: Beijing, Guangzhou, Kunming, Lanzhou, Pyongyang, 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. A. P. Udayanarayanan Joint General Manager (ATM) 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) Mr. Yasuhiro MARUTSUKA, Special Assistant to the Director, Flight Procedures and Airspace Program Office, Japan Civil Aviation Bureau, email : marutsuka-y0799@mlit.go.jp : ~~hqt-JASMA@ml.mlit.go.jp~~ hqt-JASMA@gxb.mlit.go.jp : jasma-hq@jasma.jp ~~CRA function:~~ Central Reporting Agency Japan (CRA Japan) Mr. Hiroyuki WADA, Special Assistant to the Director, Air Navigation Services Planning Division, Civil Aviation Bureau, MLIT email: wada-h22t5@mlit.go.jp	Japan	RMA~~,~~ and EMA ~~and CRA~~ CRA	Current Current	Fukuoka FIR

Monitoring Agency for the Asia Region (MAAR) **Aeronautical Radio of Thailand LTD** (AEROTHAI) http://www.aerothai.co.th/maar Mr. Theeravut Sungseemek 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/ Christine Falk Federal Aviation Administration Separation Standards Analysis Branch Safety Analysis Subject Matter Expert parmo@faa.gov	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
South East Asia Safety Monitoring Agency (SEASMA) - Civil Aviation Authority of Singapore (CAAS) Mr. Ying Weng Kit Principal Air Traffic Control Manager (ANS Safety & Security), Air Navigation Services Group Email: ying_weng_kit@caas.gov.sg; https://www.caas.gov.sg/operations-safety/airspace/south-east-asia-safety-monitoring-agency	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

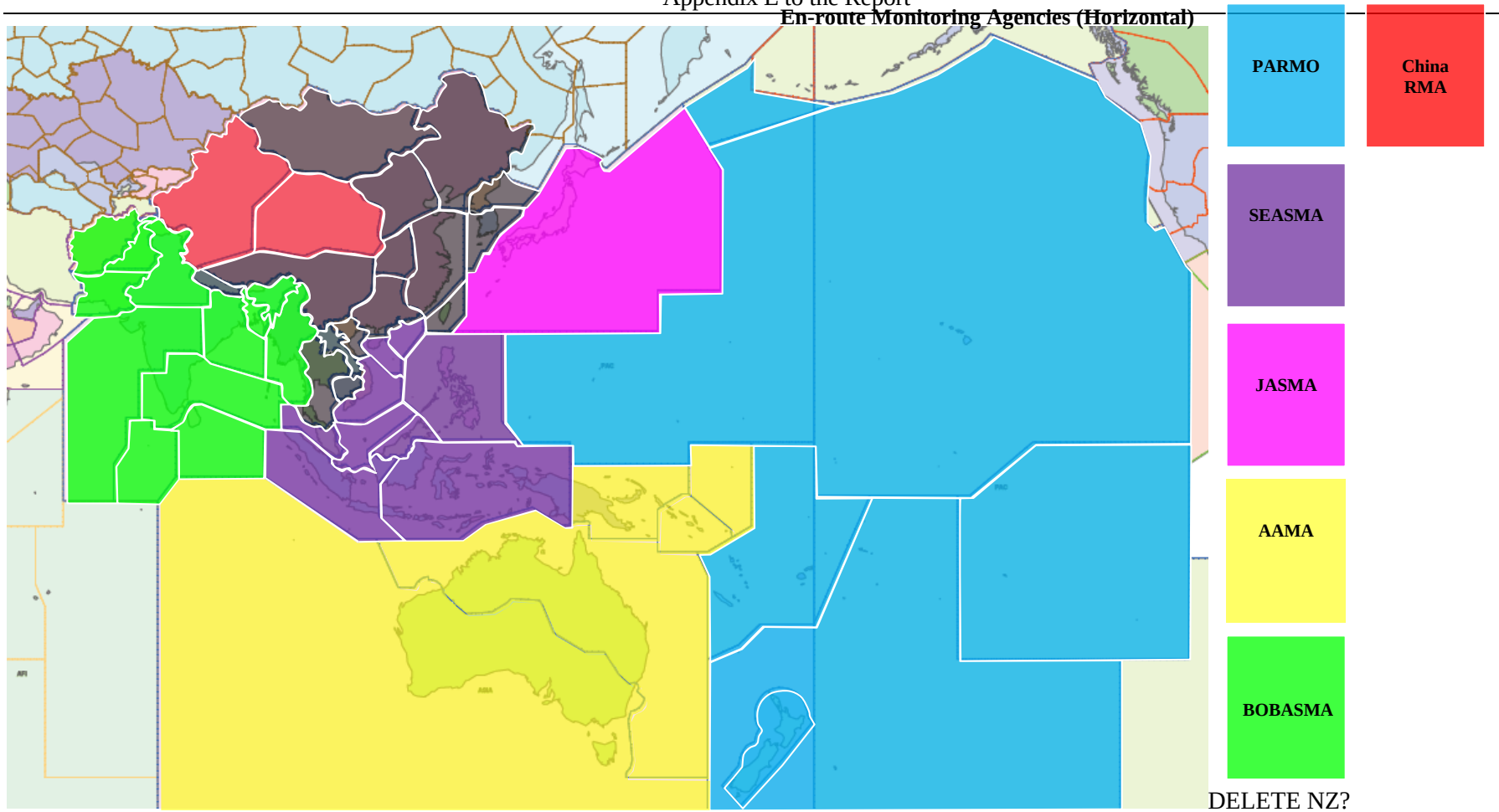
FIT-ASIA ICAO Asia and Pacific Regional Office Email: apac@icao.int; ssumner@icao.int; Mr. Kwek Chin Lin Chair, FIT-Asia Email: kwek_chin_lin@caas.gov.sg.	FIT-Asia States	FIT	Current	FIRs in the Asian Region not covered by IPACG/FIT and ISPACG/FIT
Mr. Bradley Cornell, Boeing Engineering email: Bradley.D.Cornell@Boeing.Com	Boeing USA	CRA	Current	FIRs in the Asian Region not covered by IPACG/FIT, ISPACG/FIT, JASMA or SEASMA
IPACG/FIT ~~To be advised (FAA)~~ ~~email: to be advised~~ Mr. Hiroyuki WADA~~, JCAB Co-Chair,~~ IPACG/FIT Co-Chair (JCAB) email : wada-h22t5@mlit.go.jp; Mr. John Roman IPACG/FIT Co-Chair (FAA) Email: john.roman@faa.gov	Japan and USA	FIT & CRA	Current	North & Central Pacific (Oceanic airspace within Fukuoka FIR, and Anchorage & Oakland FIRs)

ISPACG/FIT Mr. Mat Fraser Airways New Zealand ISPACG Co-Chair Email: mathew.fraser@airways.co.nz Mr. Ahmad UJsmani, FAA ISPACG Co-Chair Email: ahmad.usmani@faa.gov Mr. Bradley Cornell, Boeing Engineering ISPACG/FIT Chair email: Bradley.D.Cornell@Boeing.Com Mr. Michael Matyas Boeing Engineering ISPACG lead Email: michael.matyas@boeing.com	ISPACG States Boeing USA Boeing USA	FIT&CRA FIT CRA	Current	South Pacific FIRs and members of the Informal South Pacific ATS Coordination Group (ISPACG)

Regional Monitoring Agencies (Vertical)

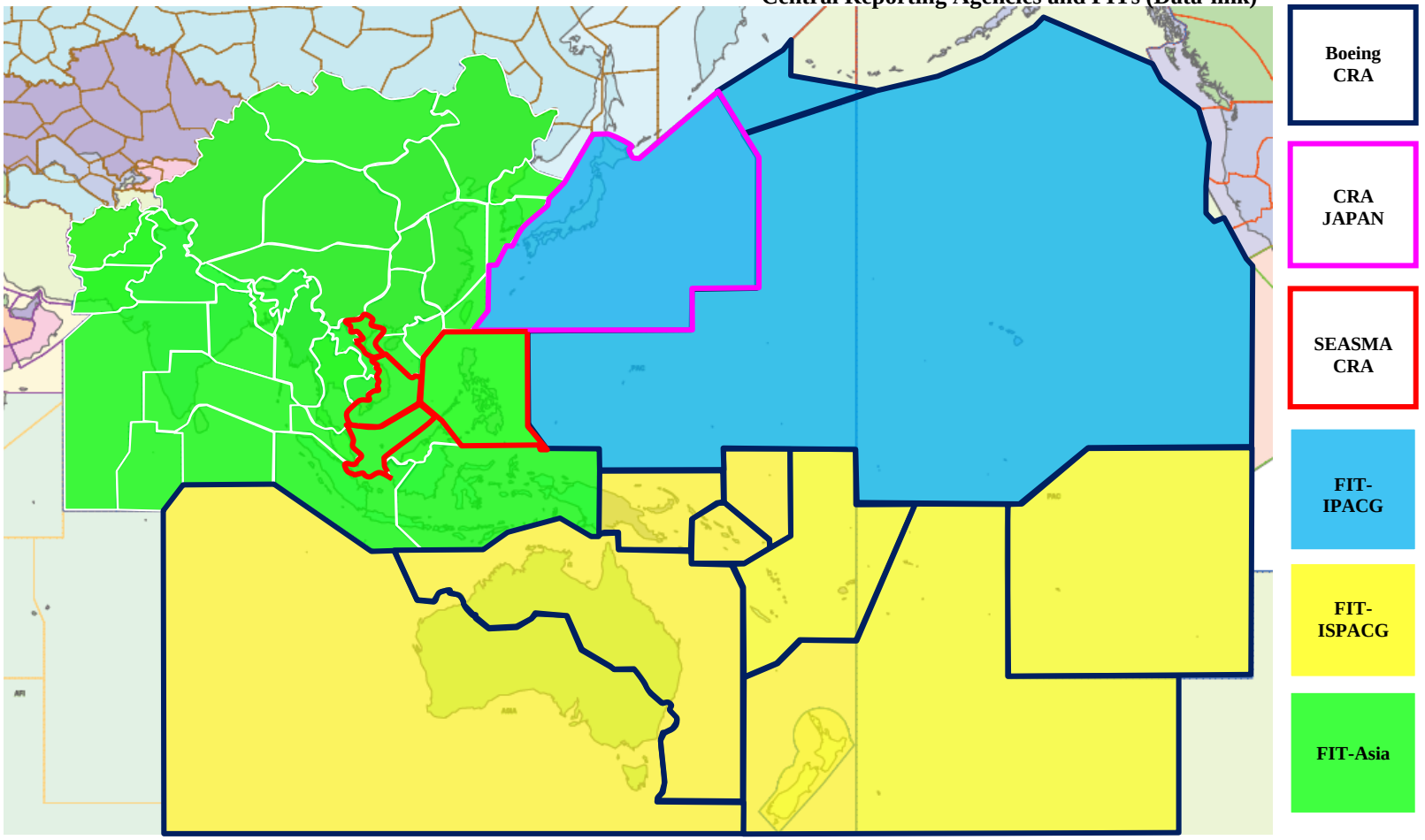


En-route Monitoring Agencies (Horizontal)



DELETE NZ?

Central Reporting Agencies and FITs (Data-link)



ATM and Airspace Safety Deficiencies List (Updated 23 September 2021)

	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~~ RASMAG/26 supported deletion of this deficiency provided Afghanistan continued to provide monthly data in September and October 2021, noting the significant disruption to ANS in Afghanistan since mid-August 2021	~~Afghanistan~~	~~RASMAG26~~	~~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.)					
Afghanistan	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/ 23	Remaining monitoring burden of ~~85% (RASMAG/25)~~ 42% (RASMAG/26)	Afghanistan	RASMAG24	A
	Data Link Performance Monitoring and Analysis Requirements of Paragraph 2.28 and/or 3.3.5.2 of Annex 11 not met					
~~Fiji~~	~~Post implementation monitoring not~~	~~25/06/2018~~	~~Problem reports not provided to~~	~~Fiji~~	~~TBD~~	~~A~~

	Deficiencies			Corrective Action		
States/facilities	**Description**	**Date first reported**	**Remarks**	**Executing body**	**Target date**	**Priority ****
	~~implemented~~		~~CRA. RASMAG24~~			
India	Post-implementation monitoring not implemented	13/07/2017	Performance monitoring and analysis was reported for the Chennai FIR, but was not reported for ~~the Kolkata and~~ Mumbai FIRs.	India	TBD	A
Maldives	Post-implementation monitoring not implemented	29/5/2015	Problem Reports not provided to CRA. Performance monitoring and analysis not reported to FIT.	Maldives	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 23 September 2021)

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
22/3	India would provide information on progress to the CNS/SG/21 and ATM/SG/5 on data sharing with Indonesia and Malaysia and the proposed Nicobar ADS-B station.	RASMAG26	India	Closed	
22/5	ICAO emphasised that projects supporting necessary safety enhancements such as ADS-B needed to be supported by governments, and that Bangladesh should report the situation to the CNS/SG when implementation was complete.	2021	Bangladesh	Closed	
22/8	MAWG to discuss the measure used to determine overall Asia/Pacific TLS compliance and make recommendations to RASMAG/23 (*APANPIRG Conclusion 20/4 − Asia/Pacific Performance Metrics* refers) related to Hot Spots	RASMAG/26 APANPIRG/32	MAWG	Open	RASMAG/26 update Ref Secretariat review of Regional Safety Assessment
23/7	IFALPA requested more information about the Category A and B LHDs and communication failures, which the RMAs agreed to share	RASMAG25	RMAs	Closed	
24/1	It was suggested that IATA work with their equivalents in the AFI Region to assist the ARMA to receive more pilot reports of LHD events.	RASMAG/25	IATA	Closed	
24/2	The utilisation of ICAO standard separations should be considered urgently as a safety measure to reduce workload in addition to providing benefits for capacity and the environment	01 January 2020	Philippines	Closed	
24/3	Remind French Polynesia about the provision of TSD to PARMO.	01 August 2019	ICAO	Closed	
24/4	ICAO stressed that ROK was primarily responsible for monitoring of safety within the Incheon FIR, so	RASMAG/25	China RMA, and JASMA, MAAR, PARMO	Closed	Ongoing while multiple ATS providers worked within the Incheon FIR

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
	this was appropriate, and emphasized the need for China RMA, JASMA, and PARMO to share safety reports in the area, and with ROK.				
24/5	Organise a meeting on implementation of AIDC between India and Oman	RASMAG26	India, Oman, ICAO	~~Open~~ Closed	Coordination between India and Oman is occurring, and AIDC testing is under way.
24/6	RMAs to log onto the Knowledge Sharing Network (KSN) and add records to the Repository of actions to improve ASE performance	Ongoing	RMAs	Closed	
24/7	LHD/LLD/LLE Taxonomy to be placed on RMA websites	31 August 2019	RMAs	Closed	
24/8	Review of RASMAG24 (1) Safety Bulletin, (2) Guidance Material for the Continued Safety Monitoring of the Asia-Pacific RVSM Airspace.	19 July 2019	All	Closed	
24/9	Review of the updated version of the GOLD (Doc 10037)	01 September 2019	PARMO, IFALPA	Closed	
25/1	RMAs to check that all States to adopt the new F2 Form and States to explicitly check YES or NO in field 15 (RSP180 Approval) and 18 (RCP240 Approval).	~~RASMAG/26~~ RASMAG/27	All RMAs to check Myanmar Viet Nam	Open	RASMAG/26 update para 5.7 *Myanmar and Viet Nam had not adopted the new F2 form, which included PBCS approvals information.*
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).	~~01 December 2020~~ ATM/SG/9	ICAO	Open	RASMAG/26 update ATM/SG/8 was informed of RASMAG/25 advice. Draft Conclusion RASMAG/26-1 to also be discussed and endorsed at ATM/SG/9

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
25/3	The meeting discussed the identification of Category J events as LHDs, given that these were not taken into account in risk modelling or ATC separations as an independent safety net action using the command authority of a pilot to conduct a safe trajectory, bearing in mind the Aircraft Collision Avoidance System (ACAS) Resolution Advisory (RA) and ATC essential traffic information. The issue of 'nuisance' RAs was also discussed, as these were the majority of Category J LHDs. The meeting agreed that the RASMAG Chair would further discuss this at the MAWG. RASMAG/25/WP08	RASMAG/26 MAWG/9	RASMAG Chair	Open	
25/4	The meeting discussed the need for more systematic and efficient incident sharing mechanisms, as RMAs were not always able to source data in time. The RASMAG Chair agreed to discuss this at the next RASMSAG-MAWG. RASMAG/25/WP14	RASMAG-MAWG ??	RASMAG Chair	~~Open~~ Closed	RASMAG/26 WP/4
25/5	The 2019 RVSM risk estimate for the Pyongyang FIR indicated that the TLS had been met at **3.02 x 10^{-9}**, as no LHD had been reported during 2019. However, the technical risk exceeds the target level of technical risk of 2.5 x 10-9, which rarely occurs. China RMA indicated that they will further investigate this. RASMAG/25/WP06	RASMAG/26	China RMA	~~Open~~ Closed	RASMAG/26 WP/6 Technical Risk 1.04 x 10^{-9}
26/1	Noting that there were cases where some States were using a process other than direct operational approvals to enable aircraft operators to file PBCS indicators in flight plans, ICAO undertook to study how information on such State regulatory	RASMAG/27	ICAO, States?	Open	RASMAG/26 Report para. 2.8

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
	processes could be obtained				
26/2	JASMA noted that five LHDs at SADLI did not appear to have been included in the PARMO report. China RMA informed the meeting that the data would be shared with JASMA and PARMO. Republic of Korea also requested the data be shared with them (China RMA also agreed that information on this area should be shared), and advised that they would share relevant data with China RMA, JASMA and PARMO.	RASMAG/27	China RMA JASMA Republic of Korea PARMO	Open	RASMAG/26 Report para. 3.40
26/3	In response to JASMA's invitation to the meeting, particularly IATA and IFALPA, to provide feedback on the increasing number of Category A LHDs, IFALPA agreed that decreasing opportunities for pilots to operate aircraft may have contributed. JASMA was also asked whether these events could be categorized by time of day, as fatigue may be a contributing factor due to some operators requiring pilots to fly longer than usual flight hours. JASMA agreed to provide IFALPA with further information, but noted it would take some time to prepare	MAWG/9	JASMA	Open	RASMAG/26 Report para. 3.46 JASMA will provide information on Cat. A LHDs to IATA and IFALPA, and will also provide information to MAWG/9.
26/4	It was also noted that a significant number of the occurrences at this hot spot (*Hot Spot M*) were the result of Indian Navy flights not complying with ATC instructions, and that an identified mitigation strategy was to establish contact with the Indian Navy to resolve the matter. This mitigation had not yet been achieved. India informed the meeting that contact details for the Indian Navy could be provided if AAMA could provide the details of the occurrences. A formal letter on the subject should	MAWG/9	BOBASMA AAMA	Open	RASMAG/26 Report para 3.114 AAMA to write to DGCA India to obtain contact details for Indian Navy AAMA to provide details of occurrences

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
	also be addressed to the Director General of Civil Aviation of India, with copy to BOBASMA.				
26/5	The Chair informed the meeting that the process of identification and monitoring of LHD hot spots had been developed informally over several years to facilitate the focus of RASMAG on areas requiring specific attention. The MAWG was invited to consider drafting a formalized process for this purpose, for consideration by RASMAG	RASMAG/27	MAAR	Open	RASMAG/26 Report para 3.116
26/6	APAC RMAs to administer a short questionnaire to States' POCs on the matter of RMA responsibility in this regard (sharing of RVSM approval data for State aircraft)	31 March 2022	All APAC RMAs	Open	RASMAG/26 Report para 5.21 Subject to APANPIRG/32 adoption of Draft Conclusion RASMAG/26-3 MAAR to prepare draft questionnaire for review at MAWG/9