INTERNATIONAL CIVIL AVIATION ORGANIZATION

TWENTY EIGHTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (APANPIRG/28)

Bangkok, Thailand, 11 to 14 September 2017

Agenda Item 3: **Performance Framework for Regional Air Navigation Planning and Implementation**

3.3: **RASMAG**

RASMAG/22 OUTCOMES

(Presented by the Secretariat)

SUMMARY

This paper presents the outcomes of the Twenty-Second Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/22) for review by APANPIRG/28.

1. INTRODUCTION

1.1 The Twenty-Second Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/22) was held from 10 – 13 July 2017 at Bangkok, Thailand.

1.2 A total of 51 participants attended RASMAG/22 from Australia, Bangladesh, China, India, Indonesia, Japan, Malaysia, New Zealand, Philippines, Republic of Korea (ROK), Singapore, Thailand, United States, Viet Nam, IATA, IFALPA and ICAO.

1.3 Mr. Robert Butcher, Safety Performance Analysis Manager, Safety and Assurance Group, Airservices Australia, chaired the RASMAG/22 meeting.

1.4 A total of 32 Working Papers (WPs), seven Information Papers (IPs) and four Flimsies were presented to RASMAG/22.

1.5 RASMAG/22 developed two Draft Conclusions to be considered by APANPIRG/28 (note: two other Draft Conclusions were forwarded to the ATM/SG and CNS/SG). RASMAG/22 also agreed to eight Conclusions under the delegated authority vested in the Subgroup by APANPIRG for Conclusions that were of a technical or purely operational nature. Notwithstanding the differentiation between the Conclusions and Decisions in draft and those already agreed by the Subgroup, all Draft Conclusions, Draft Decisions and Conclusions are provided in full at **Appendix 1**.

2. DISCUSSION

Relevant Meeting Outcomes (WP02)

2.1 With regard to the AKARA Corridor within the Incheon Flight Information Region (FIR) mentioned in WP02, the ROK provided a background, and stated that they would support ICAO to improve the ATM arrangement supporting this airspace (**Flimsy 2**). IATA stated that they were pleased with the work to try to improve safety in the area. WP12 provided more detailed analysis of the AKARA Corridor, while WP30 provided summary and possible recommendations for short-term actions to mitigate risk.

FIT-Asia/6 Meeting Outcomes (WP03)

2.2 The Sixth Meeting of the Future Air Navigation Services (FANS) Interoperability Team – Asia (FIT-Asia/6) was held in Bangkok, Thailand, from 03 to 05 July 2017. A total of 15 WPs, nine IPs, six presentations and one Flimsy were presented to the meeting.

2.3 All FIT-Asia administrations currently providing or expected to provide data link services were registered on the FIT-Asia Central Reporting Agency (CRA) website for data link problem reporting, which was an improvement since 2015. However, FIT-Asia/6 noted the implausibly low number of Problem Reports (PR), and urged all FIT-Asia States that were providing data link services to report PRs.

2.4 FIT-Asia/6 noted that a significant number of PRs could not be fully analysed as they had been provided to CRA in a block of reports, many of which were more than 30 days old; but Data Link Service Providers (DSPs) and many Air Navigation Service Providers (ANSPs) normally only retained their logs for approximately 30 days. It was also noted that it may take several days for the CRA to obtain logs or the permission to use them, and without the availability of logs most issues could not be investigated. RASMAG agreed to the following technical Conclusion:

Conclusion RASMAG/22-1: Timely Submission of Data Link Problem Reports to the CRA

2.5 It was noted that a significant number of failed or poorly configured automation system processes for the transfer of Controller-Pilot Data Link Communications (CPDLC) data authority continued to occur, as had also been the case for several years. The failure to transfer communications at FIR boundaries carried safety risks associated with a previous ATC sector/centre maintaining continuous CPDLC communications with an aircraft that had already entered the airspace of another ATC sector/centre. RASMAG/22 endorsed the following technical Conclusion, which was directed for endorsement to the ATM/SG/5:

Draft Conclusion RASMAG/22-2: Transfer of CPDLC Connections

2.6 Performance reports submitted by India, Indonesia and Singapore were measured against Required Communications Performance (RCP) 240 and Required Surveillance Performance (RSP) 180 expectations defined in Doc 9869 – Performance Based Communications and Surveillance (PBCS) Manual. China monitored performance against RCP400 and RSP400.

2.7 The Philippines updated progress of Manila FIR ADS-C/Controller Pilot Datalink Communication (CPDLC) implementation. An interim ATM system was operational, with a new integrated ATM system expected to be completed in September 2017 for cutover in February 2018. ADS-C/CPDLC trials had been conducted since July 2015, and would continue until full system capability. It was anticipated that ADS-C/CPDLC services would be available by mid-2018.

2.8 Communication Service Providers (CSPs) and aircraft operators had raised valid concerns around the difficulty, time and cost involved in establishing or modifying contractual arrangements between individual stakeholders related to PBCS. The ICAO Communications Panel – Operational Data Link working Group (CP-OPDLWG) had agreed to the concept of a PBCS charter listing requirements of each stakeholder to promote successful implementation of PBCS that would satisfy the intent of the Doc 9869 guidance. It was proposed that all stakeholders involved in PBCS operations would sign up to the charter which would, when finalized, be posted on the CRA website.

2.9 A survey planning chart to monitor the progress of implementation of performance-based separation circulated by State Letter had resulted in responses from only four Administrations. The lack of information from States together with the current poor performance of a considerable number of FIT-Asia States in pre-PBCS performance monitoring and reporting, and informal reports of inadequate preparation for the deferred PBCS implementation date of 29 March 2018, indicated the need for follow-up action, and for the results to be prepared for consideration if necessary by APANPIRG/28 in September 2017. RASMAG/22 agreed to the following technical Conclusion:

Conclusion RASMAG/22-3: Performance-Based Separation Implementation Survey

2.10 IATA presented issues and concerns regarding the implementation of PBCS, globally regionally, that required timely resolution before the planned implementation date and was supported by four APANPIRG/27 Conclusions.

2.11 The meeting noted a number of concerns by IATA on PBCS (especially lack of State readiness to issue operational approval for PBCS by 29 March 2018). An action item was noted for inclusion in the FIT-Asia Task List, relating to coordination with ICAO Headquarters and the ICAO NAT Region on the issues of operational approvals for legacy aircraft, the development of the proposed PBCS Charter, and any consideration being given to further deferment of the agreed latest implementation date.

2.12 The lack of responses to the survey discussed under FIT-Asia/6 WP/8, together with the items discussed under FIT-Asia/6 WP/9 and informal reports, indicated that few Asia/Pacific States had taken action to comply with *Conclusion APANPIRG/27-7: PBCS Operator Requirements*. Noting the potential ramifications for flights by aircraft registered in a State where the necessary PBCS operational approvals had not been issued, and the burden on the ATM systems of other States in cases where such aircraft would be separated by non-performance-based horizontal minima, RASMAG/22 endorsed the following Draft Conclusion, for APANPIRG/28's consideration:

Draft Conclusion RASMAG/22-4: PBCS Operational Approvals

That, noting the expected implementation of Performance-Based Communications and Surveillance (PBCS) provisions of ICAO Annexes, PANS and Guidance Material by not later than 29 March 2018, Asia/Pacific States are urged to:

1. Expedite the development and implementation of the PBCS authorization process;
2. Share information through the ICAO Asia/Pacific Regional Office on the availability of PBCS regulatory material and on the expected readiness of their aircraft operators; and
3. Monitor communications and surveillance performance against RCP240 and RSP180 specifications as described in Doc 9869 – *PBCS Manual* for all individual aircraft using datalink in their area of responsibility, and make the performance data available on request to all States of Registry.

2.13 FIT-Asia/6 was presented with an updated template for data link performance reporting to FIT-Asia, addressing an action item from the FIT-Asia Task List. It was noted that the template would continue to be useful to States monitoring and reporting data link performance in the pre-PBCS environment, pending the development of a new reporting template (FIT-Asia/6/WP/13). RASMAG/22 agreed to the following technical Conclusion:

Conclusion RASMAG/22-5: Data Link Performance Reporting Template and Guidance

2.14 FIT-Asia/6 had noted that PBCS implementation in High Seas airspace would require supporting procedures to be included in ICAO Doc 7030 – Regional Supplementary Procedures. RASMAG/22 agreed to the following technical Conclusion:

Conclusion RASMAG/22-6: PBCS-related Procedures in ICAO Document 7030

2.15 FIT-Asia/6 had identified the need for regional guidance and a template for performance analysis to be developed to take into account RCP240 and RSP180, and agreed to form a Small Working Group: ***Decision FIT-Asia/6-6: FIT-Asia PBCS Small Working Group***.

2.16 The meeting was reminded that the legacy Global Operational Data Link Document (GOLD) version 2 remained posted on the ICAO Asia/Pacific Regional Office website. This document had become redundant with the publication of Doc 10037 and Doc 9869. RASMAG/22 endorsed the following technical Conclusion, to be directed to the Communications, Navigation, Surveillance Subgroup (CNS/SG):

Draft Conclusion RASMAG/22-7: Withdrawal of the GOLD

RASMAG/MAWG/4 and RMACG/12 Reports (WP04)

2.17 WP04 provided information from the RASMAG Fourth Monitoring Agencies Working Group (MAWG/4) Meeting held in San Francisco, USA in December 2016 and the Twelfth Regional Monitoring Agencies Coordination Group (RMACG/12) Meeting held in Salvador, Brazil in May 2017.

2.18 Topics discussed by the MAWG/4 meeting included ICAO Document 10063 (*Manual on Monitoring the Application of Performance-Based Horizontal Separation Minima*), which had differences with the En-route Monitoring Agency (EMA) Manual; specifically, differences in the definition for a Large Lateral Deviation (LLD) and a Large Longitudinal Error (LLE), thus 10NM was proposed as a new LLD value. RASMAG/22 agreed to the following technical Conclusion:

Conclusion RASMAG22-8: Asia/Pacific Reporting of Large Lateral Deviations

2.19 MAWG/4 reviewed the assignment of PBCS oversight responsibility within the Asia/Pacific Region – as a result of this RASMAG/22 agreed to changes to EMA oversight responsibility, with AAMA would providing EMA oversight for the Port Moresby, Honiara, and Nauru FIRs, and may consider providing oversight of the Ujung Pandang and Jakarta FIR.

2.20 PARMO would provide EMA oversight of the Tahiti, Auckland and Nadi FIRs as agreed at the Thirty-First Meeting of the Informal South Pacific ATS Coordinating Group (ISPACG/31).

2.21 SEASMA and AAMA had agreed at RASMAG/22 that SEASMA would provide oversight of Ujung Pandang and Jakarta FIRs as the EMA.

2.22 MAWG/4 discussed the development of a 'virtual' monitoring organization and discussed the possibility of the current five Asia/Pacific RMAs and five EMAs to be consolidated into two organizations (RASMAG/22/WP31 refers).

AAMA Safety Report (WP05)

2.23 Australia presented the results of RVSM safety assessments undertaken by the Australian Airspace Monitoring Agency (AAMA) for the twelve month period ending 31 December 2016.

2.24 The report showed that for the Australian (Brisbane, Melbourne), Nauru, Papua New Guinea (Port Moresby) and Solomon Islands (Honiara) FIRs, the Target Level of Safety (TLS) was met with a risk assessment of **2.80 x 10^{-9}** (TLS, 5.0 x 10^{-9}).

2.25 Regarding Indonesian airspace, the TLS was reportedly met for the period (**4.12 x 10^{-9}**). However, the trend had been worsening towards the TLS (**Figure 1**).

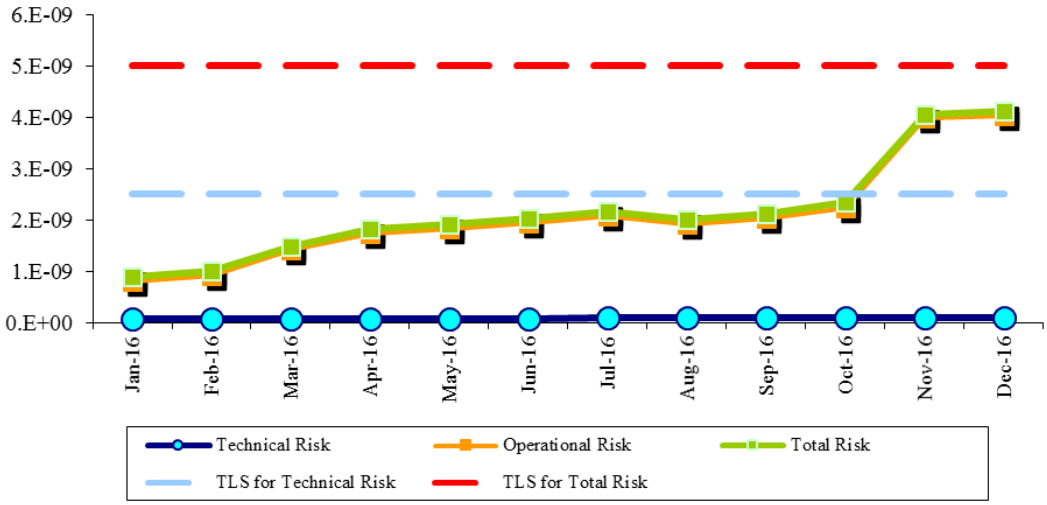


Figure 1: Indonesian FIRs RVSM Risk Estimate Trends (2016)

China RMA Safety Report (WP06)

2.26 China presented the airspace safety oversight results for RVSM in the airspace of Chinese FIRs and the Pyongyang FIR (DPRK) during 2016. The estimates of technical and total risks for the Chinese FIRs marginally met the TLS, with an overall risk estimate of **4.66 x 10^{-9}**. However, the current upward trend may breach the TLS in 2017, unless remedial action was taken.

2.27 **Figure 2** presents Chinese airspace collision risk estimate trends during 2016.

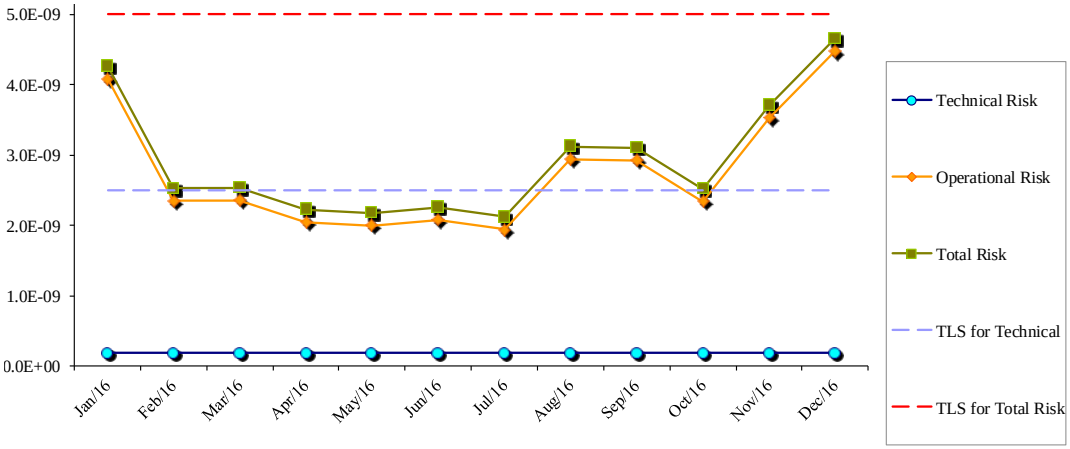


Figure 2: Chinese FIRs RVSM Risk Estimate Trends (2016)

2.28 The estimate by China RMA of the overall vertical collision risk for the Pyongyang FIR was **0.44 x 10^{-9}** fatal accidents per flight hour, meeting the TLS. This result represented a significant improvement on the 2015 risk estimate.

Progress made in China's LHD Reporting (WP07)

2.29 China discussed progress made in Large Height Deviation (LHD) reporting by ATS units and measures taken to make improvements during 2016. The measures included:

- the establishment of an LHD Scrutiny Group formally, with representatives from China RMA, ANSP, and the China airline pilots association;
- quarterly reports by the China RMA to the ANSP (Air Traffic Management Bureau, ATMB) and the Civil Aviation Administration of China (CAAC); and
- technical exchange meetings with DPRK.

2.30 China described its commitment to the 'Just Culture' principles, noting that there had been an obvious improvement in China in reporting. ICAO reiterated the importance of an 'aviation culture' that aligned with Asia/Pacific Seamless ATM Plan and was enshrined in the Global Aviation Safety Plan (GASP).

2.31 ICAO also noted that experience from developed nations had shown that educating operational personnel was not enough to achieve open reporting objectives. Emphasising that group punishment for an incident should never be acceptable as it deterred individuals from reporting a safety occurrence, RASMAG/22 agreed that States should enact policies and rules to ensure that open reporting was enhanced (Conclusion RASMAG/22-12 refers).

JASMA Vertical Safety Report (WP08)

2.32 Japan presented the results of the airspace safety assessment of the Fukuoka FIR by the JASMA. The report showed that the Fukuoka FIR did not meet the TLS, with the assessed risk calculated as **9.16 x 10^{-9}**. However this was a marked improvement from the 2015 result, which was 22.11 x 10^{-9}.

2.33 **Figure 3** presents Japanese airspace collision risk estimate trends during 2016.

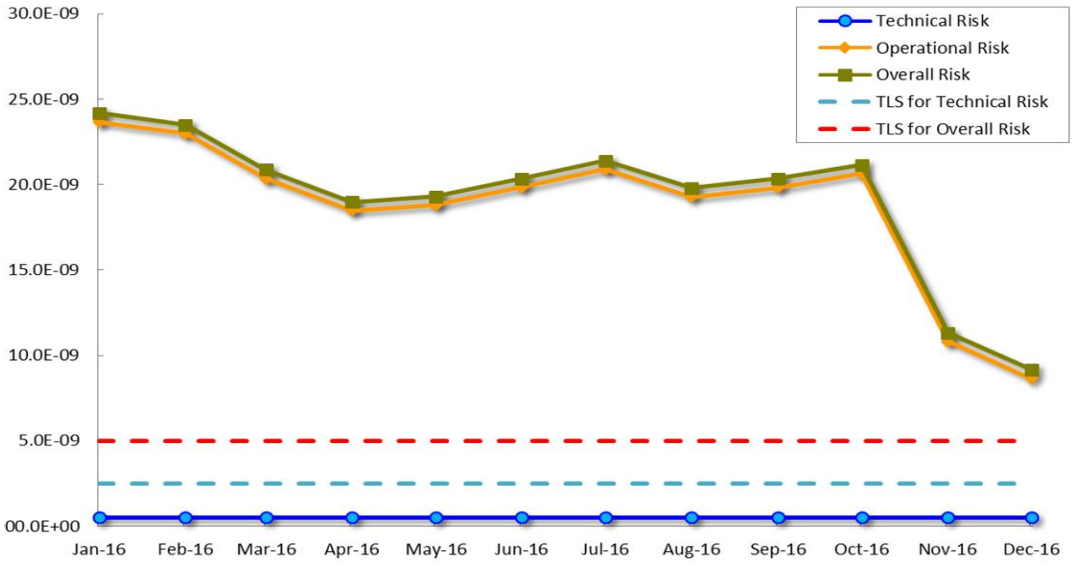


Figure 3: Fukuoka FIR RVSM Risk Estimate Trends

2.34 There were two main contributors to the estimated risk:

a) 19 Category I (Turbulence or other weather related cause) LHDs, which occurred primarily south and southwest of Japan (RASMAG21/WP30 also noted this); and

b) eight Category E LHDs, mainly on the FIR boundary with the Manila FIR.

2.35 Japan noted its *Standards for Air Traffic Control Procedures (II)-2(2)d*, required that a nominal vertical separation of 2,000ft is used when a pilot reports encountering turbulence above 'moderate' in RVSM airspace (thus RVSM was temporarily suspended when there were reports of severe turbulence).

MAAR Safety Report (WP09)

2.36 The Monitoring Agency for Asia Region (MAAR) provided the airspace safety oversight results for the RVSM operation in the Bay of Bengal Arabian Sea and Indian Ocean airspace (BOBASIO), Western Pacific/South China Sea (WPAC/SCS), and Mongolian airspace for 2016.

2.37 The BOB/South Asian RVSM airspace overall risk was estimated to be 27.75 x 10^{-9}, which did not meet the TLS by a substantial margin. **Figure 4** presents BOBASIO airspace collision risk estimate trends during 2016.

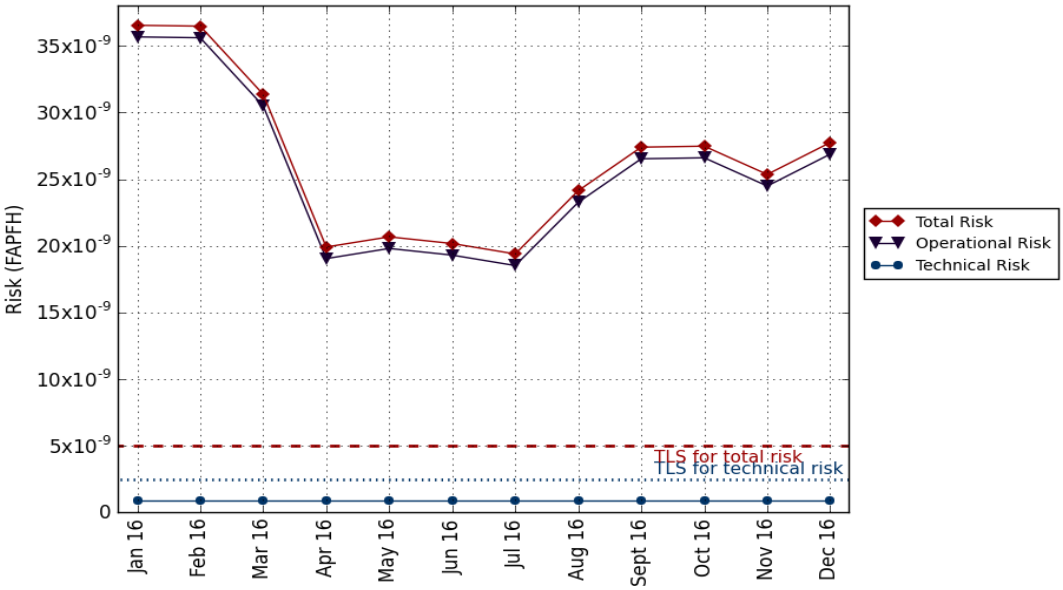


Figure 4: BOBASIO Airspace RVSM Risk Estimate Trends

2.38 Category E LHDs (*breakdown in coordination in the ATC to ATC transfer of control responsibility as a result of human factors issues*) remained the most prominent LHD category in the region, accounting for 725 risk-bearing incidents or approximately 96% of risk-bearing LHDs in BOBASIO airspace. The Transfer of Control (TOC) points between the Kolkata FIR and Dhaka/Yangon FIRs and the Chennai and Kuala Lumpur FIRs remained a hotspot in the region. Although 2016 operational risk in this hotspot had decreased from that of 2015, there were still several reports of LHDs in this hotspot. Regarding the interface between Malaysia and India, Malaysia commented that during a recent meeting, Malaysia and India agreed to exchange data on the 15th of every month, and a new Letter of Agreement (LOA) to minimise LHDs.

2.39 In addition, MAAR detected two significant hot spots on the western boundary of the Mumbai FIR, which interfaced with Mogadishu, Sana'a, and Muscat FIRs. These had been identified in 2015, but now the Muscat interface had much more prominence than the more southerly hot spot with Mogadishu.

2.40 India advised that new direct voice communication systems and AIDC were being implemented at Muscat and Mumbai ACCs. Muscat and Mumbai had also created additional ATC sectors, and regular meetings were now being conducted between the ATC units concerned.

2.41 The WPAC/SCS RVSM airspace total risk was estimated to be **9.44 x 10^{-9}**, which did not achieve the TLS. The 2016 result had deteriorated from 2015, which was largely due to a major increase in reported Category E events (251). These were concentrated around the boundary of the Manila FIR. This hot spot had also been identified in 2015; thus operational measures to reduce the overall risks had not been effective to date.

2.42 **Figure 5** presents WPAC/SCS RVSM collision risk estimate trends during 2016.

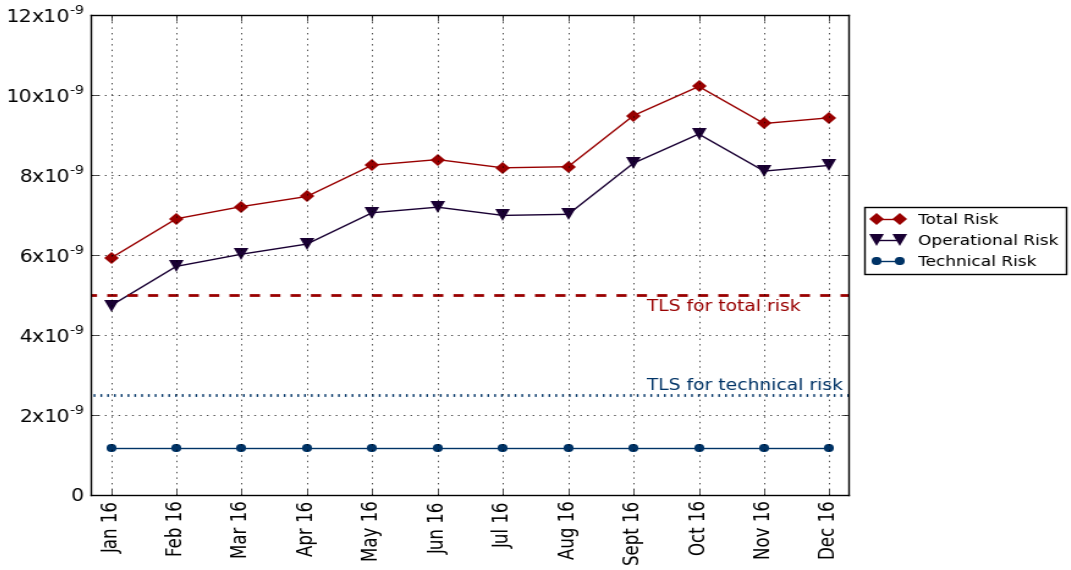


Figure 5: WPAC/SCS Airspace RVSM Risk Estimate Trends

2.43 Indonesia stated that direct speech circuits were being installed between the Ujung Pandang and Manila FIRs, instead of relying on normal telephone lines. The meeting discussed the ATC workload within these FIRs, which the Philippines advised was exacerbated by flight level restrictions, excessive airborne holding and spacing delays emanating from airspace west of the Manila FIR, and the fact that Manila currently only operated four ATC sectors. ICAO stated that the Philippines needed to take urgent action on improvements under its control, such as more ATC sectors and expedition of the ATC modernisation programme, which had been delayed.

2.44 ICAO urged States to conduct regular scrutiny meetings between adjacent ACCs to discuss matters such as LHDs, which should also involve airspace users. The meeting noted that IATA and IFALPA could play an active role in assisting ANSPs to identify appropriate responses to safety reports. RASMASG/22 agreed that Asia/Pacific RMAs should forward LHD information to IATA and IFALPA where it was clear that pilot/airline input would assist. The meeting agreed that the Asia/Pacific Region could develop a safety bulletin from the collaborative scrutiny, in conjunction with IATA and IFALPA.

2.45 The Philippines reiterated that many of the Category M events on the Singapore/Manila interface were due to inaccurate time estimates. Flimsy 3 provided a review of the LHD occurrences on the Singapore FIR boundary, many of which were caused by accumulated error in time estimates within operational limits of ATC and pilots. It was suggested that the RASMAG MAWG reassessed the risk associated with this type of occurrences to improve reporting criteria at its next meeting.

2.46 The Mongolian RVSM airspace risk was estimated to be **1.05 x 10^{-9}**, which met the TLS.

Non-Compliance with RVSM Safety Monitoring Requirements (WP10)

2.47 WP10 provided details of non-provision of safety related data by some States. MAAR recalled that APANPIRG had agreed that such States would be subject to the issuance of a Deficiency in accordance with *Conclusion 16/6 – Non Provision of safety related data by States.*

2.48 MAAR noted that the reporting problems had persisted over a long period, suggesting a systemic origin such as inadequate resources allocated to RVSM related responsibilities, and poor briefing procedures when there was a change in responsible personnel. To serve as a reminder for States, MAAR would report a list of non-compliant States to RASMAG until the issues were resolved.

PARMO Vertical Safety Report (WP11)

2.49 The Pacific Approvals Registry and Monitoring Organization (PARMO) presented a safety assessment of RVSM for the Pacific and the Republic of Korea's (ROK) airspace for 2016. The Pacific airspace total risk was estimated to be **2.12 x 10^{-9}**, which met the TLS.

2.50 The Incheon FIR RVSM total risk was estimated to be **5.30 x 10^{-9}**, which marginally did not meet the TLS (**Figure 6**). The analysis of risk included did not include the airspace referred to as the AKARA Corridor (ATS route A593).

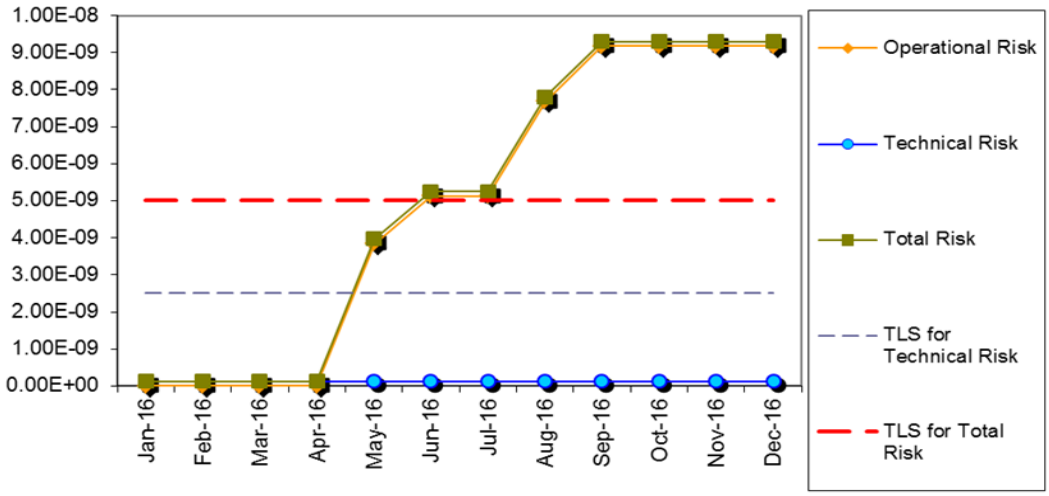


Figure 6: ROK Airspace (Excluding AKARA) RVSM Risk Estimate Trends

2.51 The ROK advised the meeting that AIDC had been implemented between Dalian Area Control Centre (ACC) in the Shenyang FIR and the Incheon ACC in November 2016, and this had resulted in a significant reduction of LHDs. IATA stressed that States had agreed to provide formal updates to RASMAG on actions to mitigate LHDs, together with results (note: Conclusion RASMAG/22-11 refers).

WP12 AKARA Safety Assessment

2.52 The Incheon FIR AKARA Corridor interface with Shanghai/Fukuoka/Taibei FIRs was identified by RASMAG/20 as an LHD Hot Spot with the PARMO, China RMA, JASMA, and MAAR as the RMAs assigned to this task. WP12 presented analyses of the AKARA corridor airspace using TSD and LHD reports for calendar years 2015 - 2016.

2.53 Vertical collision risk estimates for calendar years 2015 – 2016 for the AKARA corridor airspace are shown in **Figure 7**, which indicated the extreme sensitivity to any safety event; thus the results were volatile from year to year.

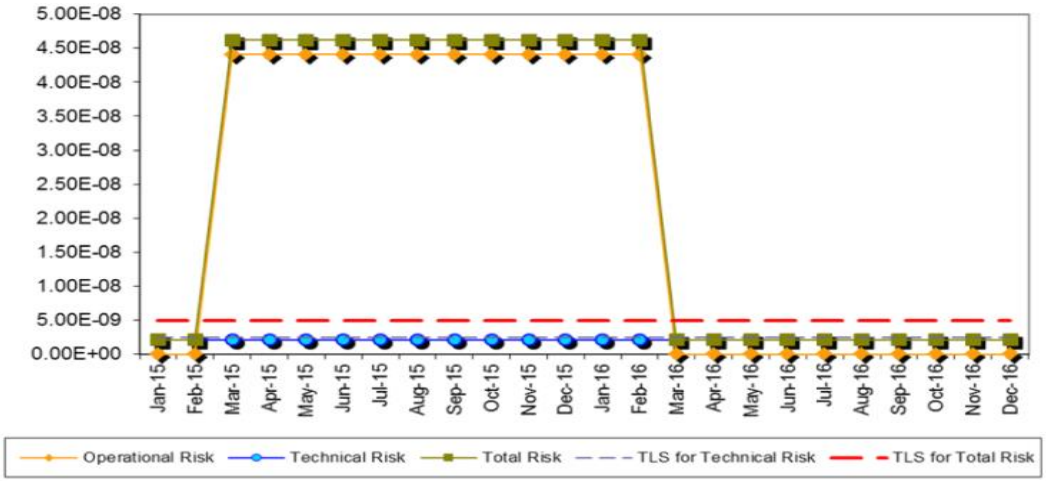


Figure 7: AKARA Corridor Vertical Collision Risk Estimates, 2015-2016

2.54 The vertical risk estimate from March 2015 to February 2016 was a very high value of **46.2 x 10^{-9}** fatal accidents per flight hour (fapfh), while December 2016 was **2.08 x 10^{-9}** fapfh. The late 2016 estimates were dominated by the technical risk, as there were no operational risk events reported in 2016. The maximum number of LHD minutes allowed in order to meet the TLS was only 0.125 minutes (approximately 7.5 seconds). This was due to the FLAS and the observed opposite direction and crossing vertical occupancy.

2.55 IFALPA asked about the vertical occupancy rate inside the AKARA Corridor (value = 1.5). PARMO commented that rates of this nature may be the highest in the world (Tasman Sea and SCS compared at 0.2). Air traffic operating on airway A593 was very concentrated between FL280 and FL310, and on crossing routes similarly concentrated at FL270/FL310.

BOBASMA Safety Report (WP13)

2.56 India presented the 2016 horizontal safety monitoring report of the Bay of Bengal Arabian Sea Monitoring Agency (BOBASMA). The safety assessment results confirmed that the TLS was met at **2.67 x 10^{-9}** (lateral), **4.45 x 10^{-9}** (50NM longitudinal) and **0.25 x 10^{-9}** (30NM longitudinal).

2.57 A total of 20 LLD and LLE reports were reported (up from eight in 2015), consisting of 18 Category E events (*Coordination errors in the ATC-unit-to-ATC-unit transfer of control responsibility*) and two Category A events (*Flight crew deviates without ATC Clearance*). BOBASMA commented that the 18 LLDs occurred at the boundary between Kolkata and Yangon FIRs due to the southwest and northeast monsoons, during heavy rain and thunderstorm activity.

2.58 India commented that the LLD that occurred between the Chennai FIR and the Kuala Lumpur FIRs was symptomatic of a need for better surveillance; there had been a discussion on this at the April 2017 tripartite meeting (India, Indonesia, and Malaysia) regarding data sharing but progress had been slow. India expressed a desire to implement data sharing with Indonesia and Malaysia in six to eight months.

JASMA Horizontal Safety Report (WP14)

2.59 Japan provided the results of the horizontal airspace safety assessment by JASMA of the time-based longitudinal, distance-based longitudinal and lateral collision risk within the Fukuoka FIR. The calculations yielded an overall safety estimate result of **0.029 x 10^{-9}** (50NM lateral) and **0.002 x 10^{-9}** (30 NM longitudinal), which achieved TLS.

PARMO Horizontal Safety Report (WP15)

2.60 The USA presented the horizontal safety monitoring report for the Anchorage and Oakland FIRs for 2016. The report contained a summary of LLD and LLE received by the PARMO.

2.61 Anchorage and Oakland oceanic airspace horizontal risk estimates all comfortably met the 5.0 x 10^{-9} TLS with lateral risk estimated at **2.70 x 10^{-9}** (30NM) and longitudinal risk at **2.22 x 10^{-9}** (50NM) and **4.08 x 10^{-9}** (30NM).

SEASMA Safety Report (WP16)

2.62 Singapore provided the horizontal safety assessment report from the South East Asia Safety Monitoring Agency (SEASMA) for operations on ATS routes N892, L625, N884 and M767 within the SCS in 2016. The assessment concluded that the TLS was conservatively satisfied for the lateral (**1.99 x 10^{-9}**) and longitudinal (**0.38 x 10^{-9}**) separation standards.

2.63 From one reported LLE in 2015, there had been a major increase in deviations reported in 2016 – 63 LLEs (19 Category B *Incorrect operation by flight crew or interpretation of airborne equipment*, three Category C *Flight crew waypoint insertion error*, four Category D *ATC System loop errors*, 26 Category E, one Category F and ten Category I), and three LLDs (one Category A and two Category E).

2.64 The three risk bearing LLDs in 2016 accounted for the uptick in lateral risk to **1.99 x 10^{-9}** in 2015. SEASMA commented that the increase LLE reports were due to the improved clarity of the definition of the various types of airspace deviation errors. The majority of the errors were from ATC coordination errors or inaccurate waypoint estimates caused by the frequent occurrence of [convective] weather phenomena in the SCS airspace, requiring aircraft to deviate from course.

2.65 SEASMA stated that the best strategies to prevent occurrence of Gross Navigation Errors (GNEs) were collated by ATC safety officers and shared between affected ATC units, as well as safety promotion, better tracking and monitoring of these errors, and airline action to complete the Air Navigation Investigation Form to identify actions that address safety issues. Moreover, SEASMA stressed the importance of AIDC implementation.

EMA Handbook and ICAO Doc 10063 Content Comparison (WP17)

2.66 The MAWG had been tasked with a comparison between the ICAO Document 10063 *Manual on Monitoring the Application of Performance-Based Horizontal Separation Minima* and the Asia/Pacific's regional guidance material, the *En-route Monitoring Agency Handbook*. The United States provided a comprehensive review to RASMAG/22, which agreed that ICAO Document 10063 could replace the EMA Handbook as guidance on implementation and maintenance of horizontal performance-based separations. RASMAG/22 endorsed the following technical Conclusion:

Conclusion RASMAG/22-9: EMA Handbook and ICAO Doc 10063 Content

AAMA Assessment of Non-RVSM Approved Aircraft (WP19)

2.67 Australia identified nine individual airframes in the data set assessment, with airframes from Indonesia (4), and Australia, India and New Caledonia (all one each) originating from the Asia/Pacific Region.

AAMA Monitoring Data of A320 ASE Performance (IP07)

2.68 Australia provided a data sample of the measured ASE performance for 107 RVSM approved A320 aircraft on the Australian civil aircraft register. At RASMAG/21, MAAR presented WP31, highlighting a deteriorating performance in 49 A320 aircraft over a number of years and a sudden change in ASE for 31 aircraft, presumably as a result of maintenance programs.

2.69 At RMACG/12, MAAR provided an update, with data showing a dispersion of ASE values for early series A320, and a significant shift in improved Altimetry System Error (ASE) that approximately took place approximately after serial number 4,900. Further information including corrective action undertaken by the manufacturer was provided to the meeting by the United States.

China RMA Assessment of Non-RVSM Approved Aircraft (WP20)

2.70 WP20 provided the results of a monthly comparison between the RMA approval databases and flight plans within the RVSM airspace of Chinese FIRs and the Pyongyang FIR. A major increase from the six airframes identified as non-RVSM in 2015 was noted, with 28 airframes originating from the Asia/Pacific (including eight from ROK, five from China, five from Viet Nam, three from the Philippines and two from India).

JASMA Assessment of Non-RVSM Approved Aircraft (WP21)

2.71 JASMA identified 11 airframes which had been flying within the Fukuoka FIR RVSM stratum with a 'W' on their flight plans, but without registration in the KSN database for more than two months. All but three of these aircraft were registered in the ROK.

Latest Monitoring Results from the Setouchi HMU (IP04)

2.72 Japan presented a summary of the latest results from the Setouchi Height Monitoring Unit (HMU) for the period between 16 March 2016 and 15 March 2017. During 2017 the B744-10 group's performance was noted as deteriorating once again, as it had in mid-2016 (before correction from September 2016). **Figure 8** provides the mean ASE observed for each aircraft group in feet (ft).

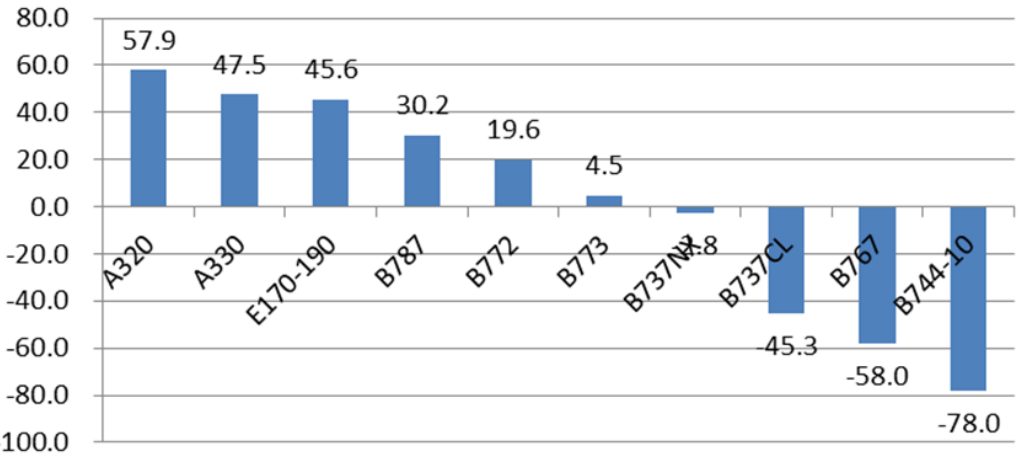


Figure 8: Setouchi HMU Mean Observed Aircraft Group

MAAR Assessment of Non-RVSM Approved Aircraft (WP22)

2.73 MAAR found a total of 163 aircraft registrations operating within RVSM airspace without proof of valid RVSM approval. Indian aircraft account for 77% of the total MAAR rogue list, and 19 of the 51 Indian rogue aircraft were also identified as rogue in RASMAG/21 (10 were also reported in RASMAG/20).

2.74 MAAR discussed the issue of 'unverified' status aircraft. MAAR stated that if they cannot confirm that these aircraft are non-RVSM approved then technically the RMA could not send this list to the States providing ATS service for these aircraft (see Draft Conclusion RASMAG/22-10).

Comparison of Average ASE by Aircraft Group (IP05)

2.75 Thailand presented a graph (**Figure 9**) comparing average aircraft group ASE and by RMA as a high-level summary of each group's performance in terms of ASE, based on global height monitoring data (the graph's circle area represents the number of aircraft monitored).

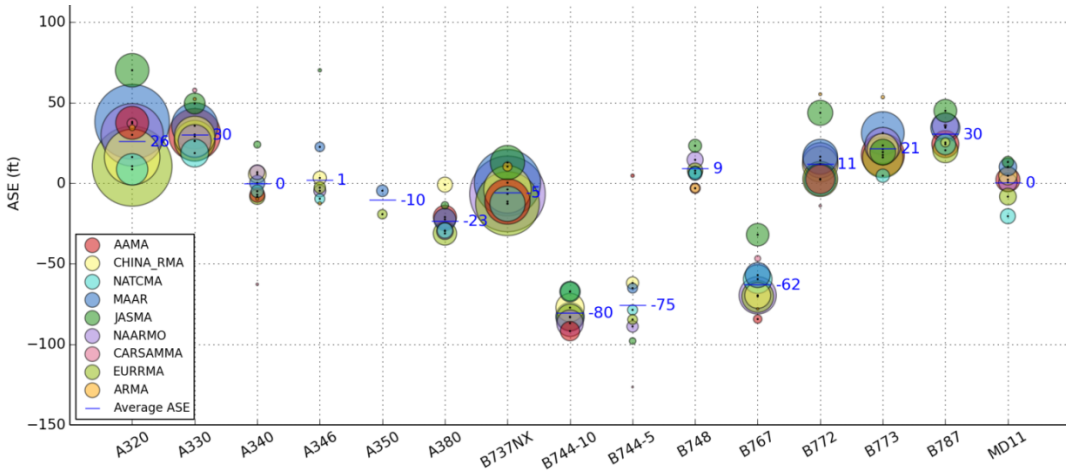


Figure 9: Aircraft Monitoring Group RMA Results, 2016

2.76 The United States commented that they were closely monitoring B744-10 and B744-5 performance as the number of these aircraft in the fleet reduced.

PARMO Assessment of Non-RVSM Approved Aircraft (WP23)

2.77 PARMO advised that a total of 22 airframes were observed within the PARMO area of responsibility for which RVSM approvals were not found, noting that transcription errors of aircraft registration often made identification of aircraft difficult.

Consolidated Asia/Pacific Safety Monitoring Report (WP29)

2.78 The United States provided a consolidated report of Asia/Pacific RMA and EMA data in response to an action item from the MAWG. While there was enhancements necessary in formatting and further analysis to highlight root causes of incidents, RASMAG/22 acknowledged the work as being very useful. RASMAG/22 also noted that this sort of deliverable would strengthen working relationships along the lines of the envisaged two 'virtual' Asia/Pacific monitoring agencies.

Regional Safety Monitoring Assessment (WP30)

2.79 **Figure 10** provided the Asia/Pacific regional RVSM TLS compliance for 2016:

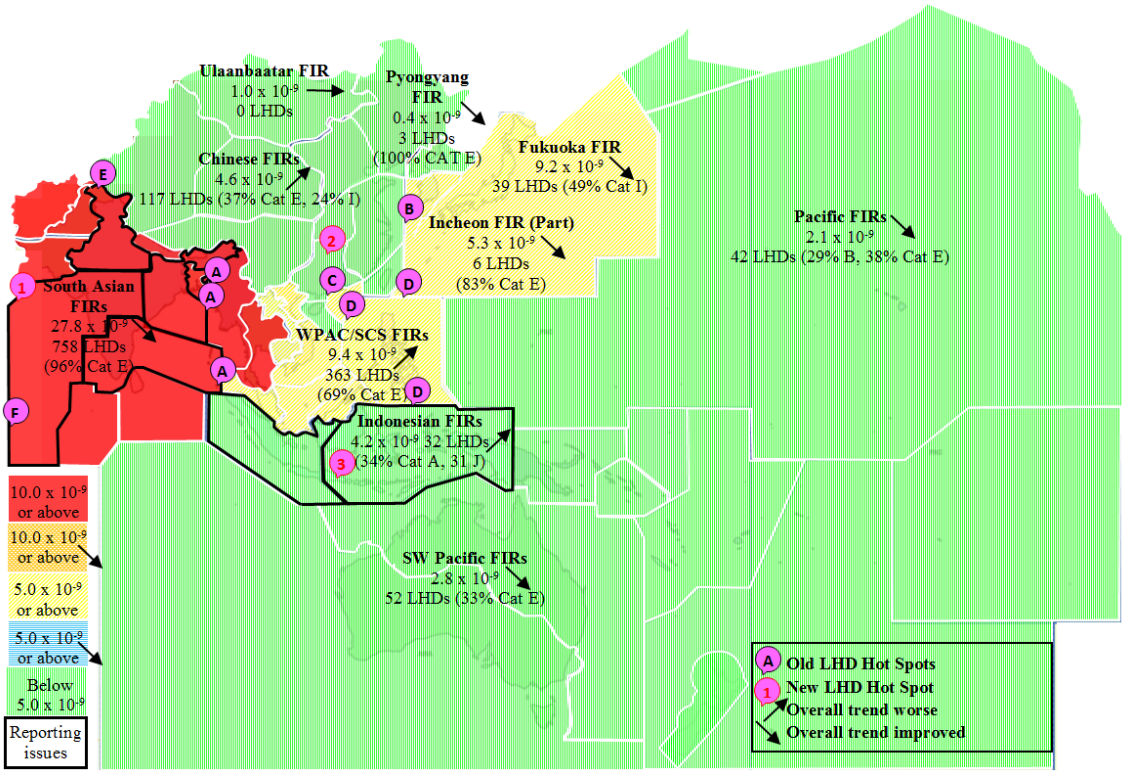


Figure 10: Asia/Pacific TLS compliance reported to RASMAG/22

2.80 **Figure 10** indicated the following sub-regional RVSM trends.

South Asia

2.81 The risk at Mogadishu – Mumbai interface significantly decreased, but remained an issue with nine LHDs reported at position ORLID (old **Hot Spot F**). However the operational risk and LHDs along the interface between Mumbai FIR and Muscat FIR increased, with 33 LHDs reported along this boundary (new **Hot Spot 1**).

2.82 According to MAAR, the western boundary of the Mumbai FIR accounted for 74% of total operational risk in South Asian airspace, with contributing factors for the Mogadishu interface including 'coordination difficulty', and poor communications and surveillance capability (however this should not be the case for the Muscat – Mumbai interface). Actions to address these trans-regional shortcomings should be prioritised, in conjunction with the ICAO MID Region.

2.83 The Kolkata/Chennai – Yangon FIR and Chennai/Kuala Lumpur FIR interfaces had been previously identified as old **Hot Spot A.** Although total operational risk decreased in 2016 with the LHDs being of short and moderate duration, the number of LHDs inevitably impacts on ATC workload and the overall risk is still one of the highest in the Asia/Pacific Region.

2.84 The implementation of AIDC had been previously urged as a high priority, but was not yet operational, and any operational measures that may have been used to minimize the incidence of LHDs had not proven to be effective. Therefore, a concerted effort to bring this situation to the attention of senior decision-makers in the affected States was considered necessary, so the monitoring agencies could be empowered to take appropriate action.

Southeast Asia

2.85 The Southeast Asian area has also not met the TLS, with a significant increase in LHD reports from 166 (of which 143 were Category E, *ATC transfer of control coordination errors due to human factors*) in 2015 to 363 (251 Category E) in 2016. This deteriorating situation was largely attributed to the poor performance of the Manila FIR; however RASMAG/22 noted that in Flimsy 1 the Philippines indicated that a significant proportion of incidents were caused by errors emanating from other FIRs.

2.86 The Philippines had reported an improvement plan to modernize their ATC system for some years, but this has not yet yielded any improvement in performance. As mentioned by RASMAG/21 when identifying old **Hot Spot D**, this problem should be highlighted to the Philippines' authorities, to ensure the highest priority was given to urgent improvement in equipment and human performance within the Manila FIR; otherwise temporary delegation of parts of the Manila FIR may be necessary to ensure safety.

East Asia

2.87 Chinese airspace met the TLS, although a new **Hot Spot 2** emerged within the Guangzhou FIR, and the overall conformance had deteriorated close to TLS, which would require concerted attention to manage.

2.88 The Hong Kong FIR – Guangzhou/Sanya FIRs interface (old **Hot Spot C**) LHDs were reported as being mainly due to a late revision of time or altitude. China advised that considerable attention was being paid to systems that supported enhanced human performance, including AIDC.

2.89 Regarding old **Hot Spot E** on the Urumqi FIR – Lahore FIR interface, China was continuing to work with Pakistan to improve the surveillance and communication situation and the number of LHDs had reduced.

2.90 Mongolian airspace achieved TLS, although no LHDs were reported.

2.91 The Pyongyang FIR airspace risk estimate achieved the TLS.

2.92 The Incheon FIR failed to meet the TLS. The results of a special safety assessment of the AKARA Corridor in the southern portion of the Incheon FIR, old **Hot Spot B**) revealed that due to the high opposite direction passing frequency, only one vertical deviation per annum of more than 0.125 minutes (approximately 7.5 seconds) would breach the TLS in the Corridor. Hence the safety assessment for the Corridor was 46.2×10^{-9} fatal accidents per flight hour (fapfh) from March 2015 until February 2016, which reduced to below TLS by December 2016 at 2.08×10^{-9}, highlighting the extreme sensitivity of the airspace to any LHD event.

2.93 In addition, RASMAG/22 noted operational factors associated with the AKARA Corridor which may contribute to a deviation should be taken into account when considering the probability and severity of any safety event for safety mitigation actions. RASMAG/22 noted the extreme lack of tolerance for any deviation in the AKARA Corridor and the associated operational latent factors, and that ROK, Japan, and China should establish safety mitigation measures in the airspace concerned until improvements to the safety of the airspace were possible and report the progress of such improvements to the ATM/SG.

2.94 Japanese airspace also failed to meet the TLS, although this was largely because of the LHDs on–the Manila FIR boundary (old **Hot Spot D**), and a number of severe turbulence events commonly reported southwest and south of the Japanese mainland (note: RASMAG/21 suggested an emphasis on special meteorological forecasting in that area was required so that appropriate avoidance action might be taken).

2.95 MAAR would complete a separate safety assessment for the Taibei FIR as it was not covered by the WPAC/SCS report.

Southwest Pacific

2.96 The Southwest Pacific achieved TLS, exhibiting a downward trend in reported LHDs.

2.97 Regarding Indonesian airspace, this met TLS but a new **Hot Spot 3** was identified near Surabaya, which could have been due to increased reporting.

Pacific

2.98 The Pacific easily met TLS, although two long duration events in April 2016 affected the result. The events occurred in the western part of the Oakland FIR with the aircraft operating from Palau to the Manila FIR without a flight plan and no ATC approval within Oakland oceanic airspace.

2.99 **Table 1** provides a comparison of Asia/Pacific RVSM risk as a measure against the TLS, either by RMA 'sub-region' (*APANPIRG Conclusion 20/4 − Asia/Pacific Performance Metrics* refers), or by FIRs. The result for 2016 had been an overall improvement to 51% conformance with TLS, but this was still far from acceptable, given significant 'hot spot' problem areas in much of South and Southeast Asia. RASMAG/22 noted that if possible, an individual FIR assessment of compliance would provide a better measure than these coarse metrics.

	RASMAG19	**RASMAG20**	**RASMAG21**	**RASMAG22**
RMA 'sub-regions'	22%	67%	33%	56%
FIRs	16%	53%	32%	51%

Table 1: Comparison of Sub-Regional and Regional RVSM TLS Achievement

Non-RVSM Approved Aircraft

2.100 **Table 2** compared the number of non-RVSM airframes reported by each RMA:

Report	**AAMA**	**China RMA**	**JASMA**	**MAAR**	**PARMO**	**Total**
RASMAG/18	98	43	47	118	15	321
RASMAG/19	90	33	40	130	19	312
RASMAG/20	8	45	15	234	26	328
RASMAG/21	5	6	15	106	11	143
RASMAG/22	7	40	11	163	22	243

Table 2: Trend of Non-RVSM Airframes Observed by Asia/Pacific RMAs

2.101 The highest number of aircraft from Asia/Pacific States that were observed for a significant length of time by the RMAs were as follows:

- AAMA: Indonesian registered aircraft PKCMU, PKCMV, PKCMW and PKELX;
- China RMA: ROK (8, including a number of multiple operations by A321 HL8074 – 307, B738 HL8052 – 182, B77L HL808046 – 88, and B738s HL8053 and HL8057 – 79 and 78 respectively), China (5), Viet Nam (5), Philippines (3), India (2), Singapore (2);
- JASMA: Republic of Korea registered aircraft HL8073, HL8052 (14 months), HL8053 (13 months), HL8057 (10 months), and HL8058 (10 months);
- PARMO: United States (seven, including SF34 N135GU, observed 13 times in the December 2016 TSD), Australia (5), Vanuatu (1), ROK (3) and China (2); and

- MAAR: Indian registered aircraft totalled 51 (down from 60 in 2015), but Indian aircraft accounted for 77% of the total 66 rogue aircraft registered in the MAAR area of responsibility and 19 of the 51 Indian rogue aircraft had been identified as rogue in RASMAG/21, **10** (VTAJY, VTAVG, VTIDP, VTIDQ, VTIDR, VTIDS, VTRSG, VTWGB, VTWGC, VTWGD) which had also been reported to RASMAG/20 (India was already on the List of Deficiencies regarding Annex 6);

2.102 Overall, the trend was now increasing again, despite a 56.4% reduction in observed non-compliant airframes from 2014 to 2015 due to the proactive work of State authorities, RMAs and the APANPIRG *Conclusion 24/26 Repetitive Non-RVSM Approved Aircraft Operating as RVSM Approved Flights* (**Figure 11**). All RMAs except JASMA had noted an increase, with China observing 34 more aircraft than 2015, and MAAR observing a major increase of 57 aircraft. The Chair confirmed that RMACG was also observing an increase again across the global RMA monitoring activity highlighting this as a global issue.

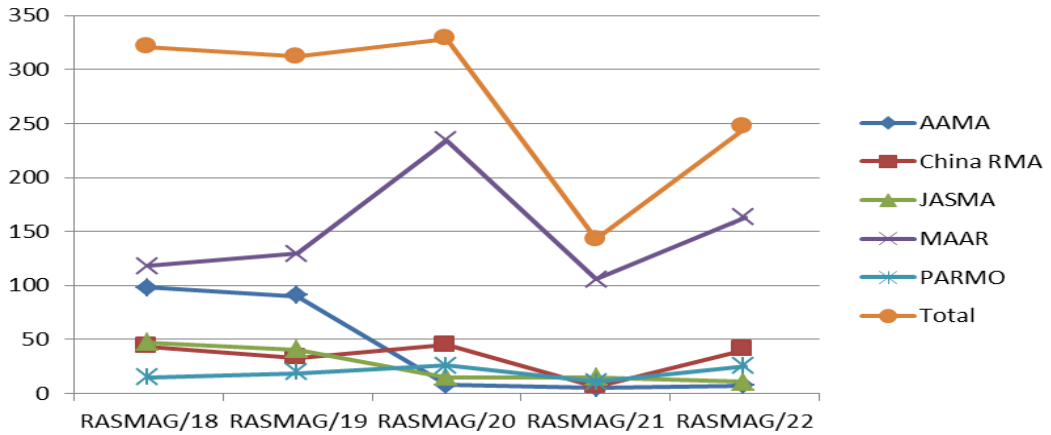


Figure 11: Trend of Non-RVSM Airframes Observed by Asia/Pacific RMAs

2.103 WP30 data indicated that the increase in non-RVSM airframes was not originating from a single source, but from many places around the world. RASMAG/22 considered it was necessary to direct the Asia/Pacific Air Navigation Planning and Implementation Regional Group's (APANPIRG's) attention to the main Asia/Pacific States concerned (China, India, Indonesia, Philippines, ROK and Viet Nam), or to additionally request the PIRGs from other concerned regions to be advised of the situation.

2.104 Given the gravity and the long-term problem posed by non-RVSM airframes, the following Draft Conclusion was intended to meet the aims of the RMA Coordination Group's (RMACG's) policy on this matter.

...there should be a more stringent stance taken by ANSPs, under the direction of State authorities, to ensure that more appropriate action was taken...

2.105 RASMAG/22 endorsed the following Draft Conclusion, for APANPIRG/28's consideration:

Draft Conclusion RASMAG/22-10: Management of Non-RVSM Aircraft

That, due to the continuing problem of non-Reduced Vertical Separation Minimum (RVSM) aircraft operating inappropriately within the RVSM stratum on a long-term basis:

(a) Asia/Pacific States should respond in a timely manner to Regional Monitoring Agency (RMA) recommendations; and

(b) Asia/Pacific States and Administrations should enact policies, legislation (including appropriate enforcement actions), and procedures to ensure such non-approved aircraft are identified and refused entry into the RVSM stratum unless specifically exempted, or they have Air Traffic Control (ATC) approval, and

(c) ICAO should survey Asia/Pacific States and Administrations to determine whether such policies, legislation and procedures to exclude non-RVSM aircraft have been implemented; and

(d) RMAs should treat aircraft with an unverified RVSM approval status by its State of Approval for more than one month, starting from the first RMA notification, as a non-RVSM approved aircraft and that information provided to relevant State authorities for appropriate action; and

(e) RMAs should be empowered by APANPIRG to have direct communication with transport ministries if required in the event of inadequate response by the State.

RMA Monitoring Burden

2.106 **Table 3** compares the outstanding monitoring burden reported by each RMA:

Report	AAMA	China RMA	JASMA	MAAR	PARMO	Total
RASMAG/20	113	105	14	176	20	428
RASMAG/21	85	72	14	172	20	363
RASMAG/22	82	68	18	148	6	322

Table 3: Outstanding Monitoring Burden of Asia/Pacific RMAs

2.107 **Table 3** indicates that all RMAs had been either reducing their monitoring burden or the burden was relatively stable, with the overall Asia/Pacific burden reducing by approximately 25% from 2015 (428 to 322).

2.108 The MAAR burden still constituted about 46% of the Asia/Pacific's total, so it was clear that the States it served needed to take increased action to ensure aircraft were monitored in accordance with Annex 6 requirements. It was noted that Thailand had greatly improved its height-keeping monitoring performance since 2015, from 43% to 25% resultant burden.

2.109 **Table 4** indicates the States that had relatively high remaining monitoring burdens over 25%, which are marked in red. States failing to meet their monitoring obligations with a burden of 50% or more airframes should be considered for remedial action (see 'APANPIRG Deficiencies').

State	2015%	Requirement	Burden	2016%
Pakistan (MAAR)	**64%**	40	27	**68%**
Bangladesh (MAAR)	**65%**	18	11	**61%**
Indonesia (AAMA)	**48%**	120	67	**56%**
Malaysia (MAAR)	**44%**	45	20	**44%**
Nepal (MAAR)	-	5	2	**40%**
Philippines (MAAR)	**31%**	52	18	**35%**
Myanmar (MAAR)	**46%**	10	3	**30%**
Thailand (MAAR)	**43%**	102	25	25%
Bhutan (MAAR)	**75%**	4	3	0%
DPRK (China RMA)	**60%**	4	0	0%
Solomon Is. (AAMA)	**100%**	1	0	0%
Tonga (PARMO)	**100%**	4	0	0%

Table 4: Comparison of State Monitoring Burden

Regional Horizontal TLS Compliance

2.110 The following Asia/Pacific EMAs reported horizontal risk assessments as follows, which all met the TLS of 5.0×10^{-9} (**Table 5**):

ATC Separation	EMA	2015 Estimated Risk	2016 Estimated Risk
50NM Lateral	BOBASMA	1.70×10^{-9}	2.67×10^{-9}
	JASMA	0.49×10^{-9}	0.03×10^{-9}
	SEASMA	0.66×10^{-9}	1.99×10^{-9}
30NM Lateral	PARMO	0.51×10^{-9}	2.70×10^{-9}
50NM Longitudinal	BOBASMA	3.97×10^{-9}	4.45×10^{-9}
	PARMO	2.32×10^{-9}	2.22×10^{-9}
	SEASMA	0.38×10^{-9}	0.38×10^{-9}
30NM Longitudinal	BOBASMA	0.14×10^{-9}	0.25×10^{-9}
	JASMA	0.04×10^{-9}	0.002×10^{-9}
	PARMO	3.74×10^{-9}	4.08×10^{-9}

Table 5: Comparison of Horizontal Risk Assessments

2.111 The application of all horizontal standards met the TLS. However the trend for the Indian/Bay of Bengal airspace was increasing towards the TLS, and should be closely monitored.

Safety Reporting

2.112 RASMAG/22 analysis suggested that the Asia/Pacific had a wide range of reporting cultures, although the ratio of LHDs/flight hours could not be viewed as a direct indicator in isolation, as some operating environments were more complex and others more prone to air safety incidents. BOBASIO airspace was an example of the latter, which had doubled the number of LHD reports; yet there was evidence that many more deviations had not been reported, as noted by RASMAG/21.

2.113 RASMAG/22 discussed the effect of reports deemed to be 'non-risk bearing' being hidden from scrutiny or not even reported by ATC in the case of some States, because the error was detected by ATS surveillance (some of which were 'zero duration', being detected before an FIR boundary). ICAO recalled that all deviations, whether deemed to be 'risk bearing' or not, were reportable incidents, and that such occurrences should be analysed for root cause and mitigation, as they may be contributors to a serious safety event in the future. RASMAG/22 agreed to the following Decision:

Decision RASMAG/22-11: State Assessment of Airspace Risk

2.114 Comparative analysis of FIR boundary reports between adjacent States also indicated a lack of reporting in Indonesian airspace beyond the vicinity of Jakarta and Surabaya.

2.115 Pyongyang FIR reported three LHDs, which indicated the collaborative work with the China RMA was yielding important improvements in data collection.

2.116 The Japanese reporting ratio was quite low at 1:37,304; and Mongolian airspace had no LHDs reported during 2016. It was noted that PARMO reported LHDs on the Fukuoka FIR, which did not appear on the JASMA assessment.

2.117 RASMAG/22 agreed that it was appropriate to remind States, even those which had taken significant positive steps to improve reporting, to continually monitor their reporting culture and systems to optimise reporting. Experience from developed nations had shown that educating operational personnel was not enough to achieve the open reporting objective of the 'aviation culture' described in the Asia/Pacific Seamless ATM Plan. Noting that punitive action against a group for an incident is <u>not</u> acceptable; RASMAG/22 agreed that States should enact policies to ensure that there was a safe airspace safety reporting culture in place.

2.118 RASMAG/22 agreed to the following technical Conclusion (the results of the survey would be presented to RASMAG/23, the RASG-APAC/7 and APANPIRG/29; however initial results from the survey are provided at **Attachment A**):

Conclusion RASMAG22-12: Airspace Safety Reporting Policy Survey

APANPIRG Deficiencies

2.119 Regarding the list of APANPIRG Air Navigation Service (ANS) Deficiencies in the ATM field relating to data link performance monitoring and analysis, RASMAG/22 agreed to propose to APANPIRG/28 that the following current Deficiency be deleted, as recommended by FIT-Asia/6:

China - *Post-implementation monitoring not implemented - Problem Reports not provided to CRA.*

2.120 RASMAG/22 agreed to propose to APANPIRG/28 that the following current Deficiencies be modified, as recommended by FIT-Asia/6:

Indonesia – *Post implementation monitoring not implemented* – Performance monitoring and analysis was conducted, but problem reports were not provided to the CRA.

Sri Lanka – *Post implementation monitoring not implemented* – Problem reports were not provided to CRA, performance monitoring and analysis was not reported to FIT, but Sri Lanka was now registered with a competent CRA.

Viet Nam – *Post implementation monitoring not implemented*. Performance monitoring and analysis was not reported to FIT, but problem reports had been submitted to CRA.

2.121 RASMAG/22 agreed to propose to APANPIRG/28 that the following new Deficiencies be recorded, as recommended by FIT-Asia/6:

India- *Performance monitoring and analysis was reported for the Chennai FIR*, but was not reported for the Kolkata and Mumbai FIRs.

2.122 **Table 4** indicated that the following States should be recommended for the issuance of an APANPIRG Deficiency, for not meeting the requirements of Annex 6 (paragraph 7.2.7), in respect of a monitoring burden of more than 50% or more airframes remaining to be monitored:

- Bangladesh;
- Indonesia; and
- Pakistan.

2.123 RASMAG/22 also agreed to propose the following States to be added to the APANPIRG List of Deficiencies in the ATM/AIS/SAR fields, related to *Conclusion 16/6 – Non Provision of safety related data by States*:

- Bangladesh (was on the Deficiencies List previously);
- Lao PDR; and
- Maldives.

2.124 The APANPIRG ANS Deficiencies List, including proposals from RASMAG/22 and the ATM/SG/5, was presented as a consolidated list under APANPIRG/28/WP07.

2.125 RASMAG/22 noted the following States may be added to the APANPIRG List of Deficiencies in 2018 if there were continuing problems with *Conclusion 16/6 – Non Provision of safety related data by States* compliance:

- Afghanistan;
- Malaysia;
- Pakistan;
- Philippines; and
- Thailand.

Competent Airspace Safety Monitoring Organizations List Review (WP31)

2.126 ICAO presented the RASMAG *List of Competent Airspace Safety Monitoring Organizations* for review and update (**Attachment B**).

RVSM Seminar

2.127 An RVSM Seminar was held in conjunction with RASMAG/22 from 06 to -07 July 2017. The Seminar was hosted by AEROTHAI of Thailand, and was attended by 50 participants, including representatives from EUROCONTROL and the MID RMA (Bahrain).

Election of Chairs

2.128 As Mr. Butcher was retiring in 2017, an election was held for the new RASMAG Chairperson and also a RASMAG Vice-Chairperson, in the event that the Chairperson was not available for any reason.

2.129 Ms. Saifon Obromsook, Engineering Manager of AEROTHAI and MAAR was nominated by Australia as Chairperson of RASMAG, which was seconded by China, India, Indonesia, Singapore and the United States. As there were no other nominations, Ms. Saifon Obromsook was duly elected as the new Chairperson of RASMAG, for the period 2018 – 2021 (inclusive).

2.130 Mr. John Warburton, Operations Research Analyst, Federal Aviation Administration was nominated by Australia for the position of Vice-Chairperson of RASMAG, which was seconded by India, Japan and Thailand. As there were no other nominations, Mr. John Warburton was duly elected as the new Vice-Chairperson of RASMAG, for the period 2018 – 2021 (inclusive).

2.131 The next RASMAG meeting was tentatively planned to be held in June or July 2018 at Bangkok, Thailand.

2.132 The venue and dates for the next MAWG meeting would be advised by the RASMAG Chair, but was tentatively planned during the week of 22 or 29 January 2018 and hosted by the AAMA in Canberra, Australia.

2.133 The FIT-Asia/6 meeting noted the range of issues that needed to be discussed and/or clarified before the PBCS implementation date (29 March 2018), and that FIT-Asia was not scheduled to meet until after that date. It was agreed that an additional meeting should be held in late 2017.

3. ACTION BY THE MEETING

3.1 The Meeting is invited to:

a) note the information in this paper;

b) endorse Draft Conclusion RASMAG/22-4: PBCS Operational Approvals (paragraph 2.12);

c) note the lack of conformance with the TLS in Indonesian, Japanese, BOB/South Asian, WPAC/SCS and ROK RVSM airspace (2.25 – 2.51);

d) urge the concerned States to address the safety risks identified for the AKARA Corridor (2.52 – 2.55);

e) endorse Draft Conclusion RASMAG/22-10: Management of Non-RVSM Aircraft (2.105); and

f) discuss any other relevant matters.

— — — — — — — —

Appendix 1: List of RASMAG/22 Conclusions and Decisions

List of RASMAG/22 Draft Conclusions

<table>
<tr><td colspan="3">Draft Conclusion RASMAG/22-4: PBCS Operational Approvals</td></tr>
<tr><td colspan="2">What: That, noting the expected implementation of Performance-Based Communications and Surveillance (PBCS) provisions of ICAO Annexes, PANS and Guidance Material by not later than 29 March 2018, Asia/Pacific States are urged to:
1. Expedite the development and implementation of the PBCS authorization process;
2. Share information through the ICAO Asia/Pacific Regional Office on the availability of PBCS regulatory material and on the expected readiness of their aircraft operators; and
3. Monitor communications and surveillance performance against RCP240 and RSP 180 specifications as described in Doc 9869 – PBCS Manual for all individual aircraft using datalink in their area of responsibility, and make the performance data available on request to all States of Registry.</td><td>Expected impact:
☒ Political / Global
☒ Inter-regional
☒ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To ensure that communication and surveillance requirements are continuously met and inform States of approval, FIT-Asia, RASMAG and APANPIRG accordingly.</td><td colspan="2">Follow-up: ☒Required from States</td></tr>
<tr><td>When: 14-Sep-17</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: States of approval</td></tr>
</table>

<table>
<tr><td colspan="2">Draft Conclusion RASMAG/22-10: Management of Non-RVSM Aircraft</td></tr>
<tr><td>What: That, due to the continuing problem of non-Reduced Vertical Separation Minimum (RVSM) aircraft operating inappropriately within the RVSM stratum on a long-term basis:

(a) Asia/Pacific States should respond in a timely manner to Regional Monitoring Agency (RMA) recommendations; and

(b) Asia/Pacific States and Administrations should enact policies, legislation (including appropriate enforcement actions), and procedures to ensure such non-approved aircraft are identified and refused entry into the RVSM stratum unless specifically exempted, or they have Air Traffic Control (ATC) approval, and

(c) ICAO should survey Asia/Pacific States and Administrations to determine whether such policies, legislation and procedures to exclude non-RVSM aircraft have been implemented; and

(d) RMAs should treat aircraft with an unverified RVSM approval status by its State of Approval for more than one month, starting from the first RMA notification, as a non-RVSM approved aircraft and that information provided to relevant State authorities for appropriate action; and</td><td>Expected impact:
☒ Political / Global
☒ Inter-regional
☒ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
</table>

(e) RMAs should be empowered by APANPIRG to have direct communication with transport ministries if required in the event of inadequate action by the State.	
Why: The actions taken to prevent non-RVSM aircraft from inappropriately operating within the RVSM stratum have not proved to be effective; thus the Regional Monitoring Agencies (RMAs) needed to have greater empowerment, and States need to enact stronger measures.	Follow-up: ☒Required from States
When: 14-Sep-17	Status: Draft to be adopted by PIRG
Who: ☐Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other: RMAs	

7.2 List of Draft Decisions
Nil.

List of Conclusions

Conclusion RASMAG/22-1: Timely Submission of Data Link Problem Reports to the CRA	
What: That, States are urged to ensure that data link problem reports are submitted to the Central Reporting Agency (CRA) as soon as possible after the problem becomes apparent, ideally not more than seven days after the occurrence.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To ensure problem reports are received in sufficient time for the CRA to gain access to relevant ANSP and aircraft data that is only stored for limited periods	Follow-up: ☐Required from States
When: 13-Jul-17	Status: Adopted by Subgroup
Who: ☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Conclusion RASMAG/22-3: Performance-Based Separation Implementation Survey	
What: That, 1. All APAC States are urged to complete a Survey on Performance-Based Separation Implementation and return the completed survey to the ICAO APAC Regional Office by not later than 18 August 2017; and 2. The Performance-Based Separation Implementation Survey form be uploaded to the ICAO Asia/Pacific Regional Office website, for annual reporting by all APAC States by not later than 30 April each year.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To permit FIT-Asia, RASMAG, APANPIRG and States to understand the status of regional implementation of performance-based separation and PBCS	Follow-up: ☒Required from States
When: 13-Jul-17	Status: Adopted by Subgroup

Who:	☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:

Conclusion RASMAG/22-5: Data Link Performance Reporting Template and Guidance	
What: That, the revised Data Link Performance Reporting Template and Guidance at **RASMAG/22/WP03 Attachment C** replaces the Data Link Performance Reporting Template on the ICAO Asia/Pacific Regional Office Website.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To update the performance reporting form, and to include qualitative information on performance issues identified, the results of analysis of the issues and rectification action taken.	Follow-up: ☐Required from States
When: 13-Jul-17	Status: Adopted by Subgroup
Who: ☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Conclusion RASMAG/22-6: PBCS-related Procedures in ICAO Document 7030	
What: That, the templates for Proposals for Amendment to ICAO Document 7030 – Regional Supplementary Procedures at **RASMAG/22/WP03 Attachments D and E** be made available on the ICAO Asia/Pacific Regional Office website, for use by States or groups of States implementing horizontal separations dependent on Performance-Based Communications and Surveillance (PBCS).	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To provide States and Groups of States with templates for Proposals for Amendment to Document 7030, facilitating the implementation of performance-based separation dependent on PBCS.	Follow-up: ☐Required from States
When: 13-Jul-17	Status: Adopted by Subgroup
Who: ☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Conclusion RASMAG22-8: Asia/Pacific Reporting of Large Lateral Deviations	
That, in accordance with the revised definition of Large Lateral Deviation (LLD) contained in ICAO Doc 10063, that the Asia/Pacific Region endorse a new criterion of 10NM for the reporting of LLDs in relation to navigation errors relative to the implementation of reduced horizontal separation minima.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Doc 10063 has determined that the criterion for when a lateral navigation error is to be reported as an LLD should be determined on a regional basis. Currently Asia/Pacific uses a value of 15NM. Given the new lateral minima below 30NM (23NM), RASMAG has reviewed this value, and has endorsed a proposal to amend the criterion to 10NM, which aligns to other global regions such as the NAT.	

When: 13-Jul-17	Status: Adopted by Subgroup
Who: ☐Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:	

Conclusion RASMAG/22-9: EMA Handbook and ICAO Doc 10063 Content	
What: En-route Monitoring Agencies performing horizontal plane performance monitoring in the Asia/Pacific Region should adopt ICAO Document 10063 *Manual on Monitoring the Application of Performance-based Horizontal Separation Minima*, as guidance material, and replace the EMA Handbook with ICAO Document 10063 (ICAO to remove the EMA Handbook from the APAC website).	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: The majority of the differences between the EMA Handbook and ICAO Doc 10063 are due to changes taken place since the EMA Handbook was drafted and an attempt to generalize terms for global standardization. ICAO Doc 10063 is more comprehensive than the EMA Handbook, and ICAO Document 10063 contains more references to ICAO Annexes, Standards and Recommended Practices and guidance material where applicable.	Follow-up: ☐Required from States
When: 13-Jul-17	Status: Adopted by Subgroup
Who: ☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Conclusion RASMAG22-12: Airspace Safety Reporting Policy Survey	
What: That, due to the continuing incidence of inconsistent airspace safety reporting, ICAO should survey States and Administrations to determine if policies and rules are enacted to ensure: (a) personnel who report airspace safety incidents are <u>not</u> subjected to punitive action (except for personnel who did <u>not</u> report incidents, or whose wilful actions negatively impacted or had the potential to negatively impact airspace safety); and (b) managers are not rewarded specifically for the level of reported incidents (or for performance indicators or targets using reported incidents as a metric).	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: It is necessary to determine which States had systems in place to ensure a 'safe' reporting environment under 'Just Culture' principles, due to the continuing incidence of inconsistent airspace safety reporting.	
When: 13-Jul-17	Status: Adopted by Subgroup
Who: ☒Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:	

List of Decisions

<table>
<tr><td colspan="3">Decision RASMAG/22-11: State Assessment of Airspace Risk</td></tr>
<tr><td colspan="2">What: That, States are urged to provide to each RASMAG a summary report of the identified airspace risk occurrences as analysed by the State, and any safety mitigation measures and their effectiveness that have been introduced as a result of that analysis.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To ensure a feedback mechanism between the RMA, State and RASMAG is implemented to provide a greater understanding of regional airspace risk and actions being taken by the States.</td><td colspan="2">Follow-up: ☒Required from States</td></tr>
<tr><td>When: 13-Jul-17</td><td colspan="2">Status: Adopted by Subgroup</td></tr>
<tr><td colspan="3">Who: ☒Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:</td></tr>
</table>

SURVEY: AIRSPACE SAFETY REPORTING

STATES/ADMINISTRATIONS	PROTECTION FOR PERSONNEL REPORTING[i] (A)	PUNITIVE ACTION FOR PERSONNEL NOT REPORTING[ii] (B)	SAFETY INCIDENTS[iii] (C)	POINT OF CONTACT(S)	REMARKS
Cook Islands	No	Yes	No	John Hosking Email: john.hosking@cookislands.gov.ck	**A)** Currently reviewing Safety Oversight Policy and this issue will be included in the review **B)** **Civil Aviation Act 2002** Section 60. Failure to notify accident or incident - (1) Every person commits an offence who, without reasonable excuse, fails to comply with any of subsections (1) to (3) of section 82 (which subsections relate to the notification of an accident or incident). (2) Every person commits an offence who, without reasonable excuse, fails to comply with a request for additional information made under subsection (5) of section 82. (3) Every person who commits an offence against subsection (1) or subsection (2) is liable, - (a) In the case of an individual, to a fine not exceeding $1,500; or (b) In the case of a body corporate, to a fine not exceeding $7,500. **Civil Aviation Rules Part 12 Accidents, Incidents and Statistics – – 12.3 Definitions** **Airspace Incident** means an incident involving deviation from, or shortcomings of, the procedures or rules for- (1) Avoiding a collision between aircraft; or (2) Avoiding a collision between aircraft and other obstacles when an aircraft is being provided with an Air Traffic Service: **12.55 Notification of incident** (a) A holder of a certificate issued by the Director under the Act and the following Parts must notify the Authority as soon as practicable of any associated incident if the certificate holder is involved in the incident and the incident is a serious incident or is an immediate hazard to the safety of an aircraft operation: (b) A person who is involved in an incident that is a serious incident or an immediate hazard to the safety of an aircraft operation must notify the Authority of the incident as soon as practicable if the person - (1) operates, maintains, services, or does any other act in respect of an aircraft, aeronautical product, or aviation related service; and (2) is not employed by, or associated with, the holder of a

STATES/ADMINISTRATIONS	PROTECTION FOR PERSONNEL REPORTING[i] (A)	PUNITIVE ACTION FOR PERSONNEL NOT REPORTING[ii] (B)	SAFETY INCIDENTS[iii] (C)	POINT OF CONTACT(S)	REMARKS
					certificate referred to in paragraph (a); or (d) The notification of an incident required by paragraphs (a), (b), (c) and (e) must be conveyed by a means acceptable to the Authority and contain, where ascertainable, information in accordance with the following: (1) for an airspace incident, Appendix A (a): **C)** Currently reviewing Safety Oversight Policy and this issue will be included in the review
Japan	**Yes**	**Yes**	**No**	Mr. Masaki Kobayashi (ATC Div.) Email: kobayashi-m46z5@mlit.go.jp	**A)** The SSP document stipulates that a person who submits a voluntary report according to the service provider's SMS or voluntary reporting system is subject to protection. A reporter of mandatory report who violates law/regulation is subject to special provision that is aimed at promoting safety rather than punishment. Excerpt from the SSP document: • Special provisions for voluntary reporting system: Civil Aviation Authority shall operate Voluntary Reporting System, in order to widely collect the information related to civil aviation that is difficult to grasp in mandatory reporting system. This system shall be implemented based on the following idea. (A) – (C) Omitted. (D) Civil Aviation Authority shall not require, regarding the information where the names etc. of individuals and companies are specified, among the information collected in this system, to provide the said information to the main operation body, without direct access. Additionally, even though the violations regarding the said information are acknowledged, Civil Aviation Authority shall not use the said information as the grounds of adverse dispositions, etc. • Special provisions for voluntary reports under SMS: Civil Aviation Authority shall, when applying these special provisions, basically intend to communicate with the service providers. (A)Special provisions in the cases where the information related to the voluntary report etc. established under SMS is obtained Civil Aviation Authority shall not use the information that has been gained through safety data collection and processing systems that are established under SMS within the service providers as the grounds of administrative guidance, such as adverse dispositions, reprimand or any other similar administrative guidance, even though the said information contains the one related to violations of the information related to confidential report, voluntary report or any other similar report to these. • Special provisions for mandatory reports that give signs of violation of law/regulation: (2) Special provisions for the service providers

STATES/ADMINISTRATIONS	PROTECTION FOR PERSONNEL REPORTING[i] (A)	PUNITIVE ACTION FOR PERSONNEL NOT REPORTING[ii] (B)	SAFETY INCIDENTS[iii] (C)	POINT OF CONTACT(S)	REMARKS
					Special provisions shall be established as listed below, for the service providers, regarding the events accompanying certain violations (excluding aviation accidents), by admitting to take internal remedies after the adjustment with Civil Aviation Authority, in order to support the service providers for the establishment of SMS. 1-2 Omitted. **B)** The SSP document stipulates that a person who conceals an occurrence that is subject to mandatory report is not covered by the special provision of SSP (cf.Q1). Thus, the person is subject to administrative or adverse disposition for the occurrence that was revealed. Excerpt from the SSP document: (2) Special provisions for service providers 1. Omitted. 2. Exceptions In the cases where the service provider falls under any of the following, special provisions shall not be applied. (A) In the case where it committed the said violations intentionally. (B) In the case where it concealed the said violations. (C) In the case where it repeated the said violations. **C)** There is no such scheme that rewards managers for the level of reported incidents and no written policies and rules for it.
Singapore	**Yes**	**No**	**No**	Mr. Ying Weng Kit Email: ying_weng_kit@caas.gov.sg	**A)** Extract from ANS Group Safety Policy:"Staff will not be subjected to punitive actions unless there was unacceptable behavior such as gross negligence, wilful violation or recklessness". See attached "ANS Group Safety Policy" **B)** Nil **C)** The organization does not reward in any form to managers for any level of reported incidents. Note: ANS Group Safety Policy Safety is our priority. It is the trademark of our professionalism. It underpins our daily operations, and is manifested in the smallest working habits of all staff. Everyone in the ANS Group plays an active part to achieve a safe outcome in an increasingly complex operational environment. The ANS Group is committed to: • deliver high safety performance in the provision of air navigation services by ensuring that appropriate resources are allocated and that our staff are equipped with the relevant skills; • cultivate a positive and just safety culture so as to encourage open reporting and continuous learning. Also, staff will not be subjected to

STATES/ADMINISTRATIONS	PROTECTION FOR PERSONNEL REPORTING[i] (A)	PUNITIVE ACTION FOR PERSONNEL NOT REPORTING[ii] (B)	SAFETY INCIDENTS[iii] (C)	POINT OF CONTACT(S)	REMARKS
					punitive actions unless there was unacceptable behaviour such as gross negligence, wilful violation or recklessness; • establish safety processes including safety reporting procedures for the purpose of effective safety management through continuous monitoring and regular review; • provide a high level of availability of equipment and systems and accuracy of aeronautical information so as to support the safe provision of air navigation services.
Thailand	**No**	**No**	**No**	Mr. Buntoeng Megchai Email: Buntoeng.m@caat.or.th	

[i] Protection for Personnel Reporting Airspace Safety Incidents or Concerns:
Does your State/Administration have in place written policies and rules to ensure that personnel who report airspace safety incidents are not subjected to punitive action, except in the case of Q2?

[ii] Punitive Action for Personnel Not Reporting Airspace Safety Incidents or Concerns:
Does your State/Administration have in place written policies and rules to ensure that personnel who do not report airspace safety incidents that they are aware of or whose wilful actions negatively impacted or had the potential to negatively impact airspace safety are subjected to appropriate corrective action?

[iii] Management Airspace Safety Incidents and Key Performance Indicators:
Does your State/Administration have in place written policies and rules to ensure that managers are not rewarded specifically for the level of reported incidents (or for performance indicators or targets using reported incidents as a metric)?

APANPIRG Asia/Pacific Airspace Safety Monitoring

RASMAG LIST OF COMPETENT AIRSPACE SAFETY MONITORING ORGANIZATIONS

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 organizations. 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. RVSM, RNAV10, RNP4);
- 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.

(Last updated 30 August 2012)

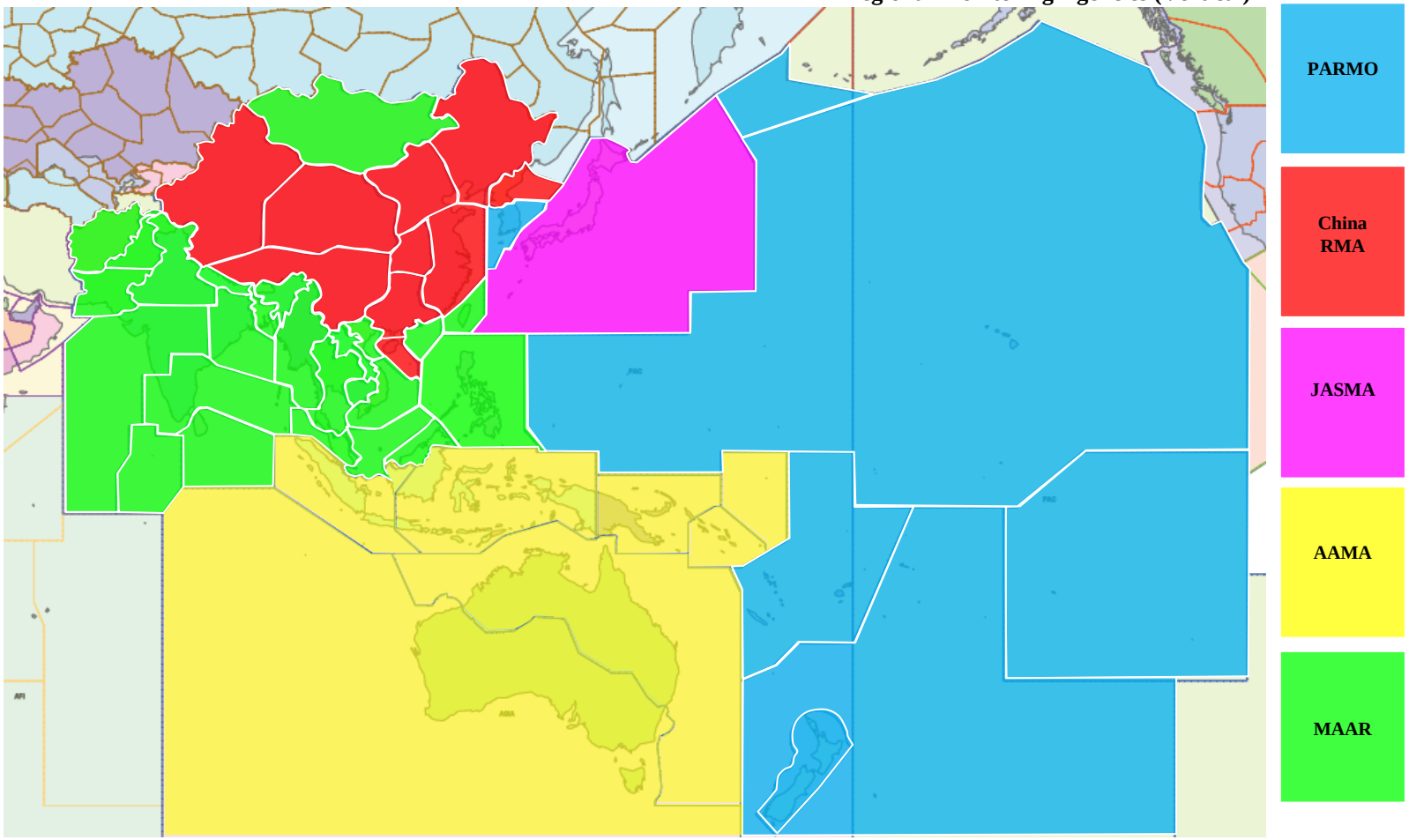
Organisation *(including contact officer)*	**State**	**Competency**	**Status**	**Airspace assessed (FIRs)**
Australian Airspace Monitoring Agency (AAMA) - Airservices http://www.airservicesaustralia.com/organisations/aama/default.asp Ms. Mu Yan, Safety Performance Analysis Manager, Safety Assurance Branch Safety and Assurance Group Airservices Australia email: mu.yan@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 and Nauru FIRs

Organisation *(including contact officer)*	State	Competency	Status	Airspace assessed (FIRs)
China RMA - **Air Traffic Management Bureau, (ATMB) of Civil Aviation Administration of China (CAAC)** http://www.chinarma.cn Ms. Susan Jun Zhao, Coordinator of China RMA, ADCC, ATMB of CAAC email: rmachina@rmachina.cn	China	RMA	Current	Beijing, Guangzhou, Kunming, Lanzhou, Pyongyang, Sanya, Shanghai, Shenyang, Urumqi, and Wuhan 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) Mr. Masaki Kobayashi, Special Assistant to the Director, Flight Procedures and Airspace Program Office, Japan Civil Aviation Bureau, email: hqt-JASMA@ml.mlit.go.jp CRA function: Mr. Hiroyuki TAKATA, Special Assistant to the Director, Air	Japan	RMA, EMA and CRA	Current	Fukuoka FIR

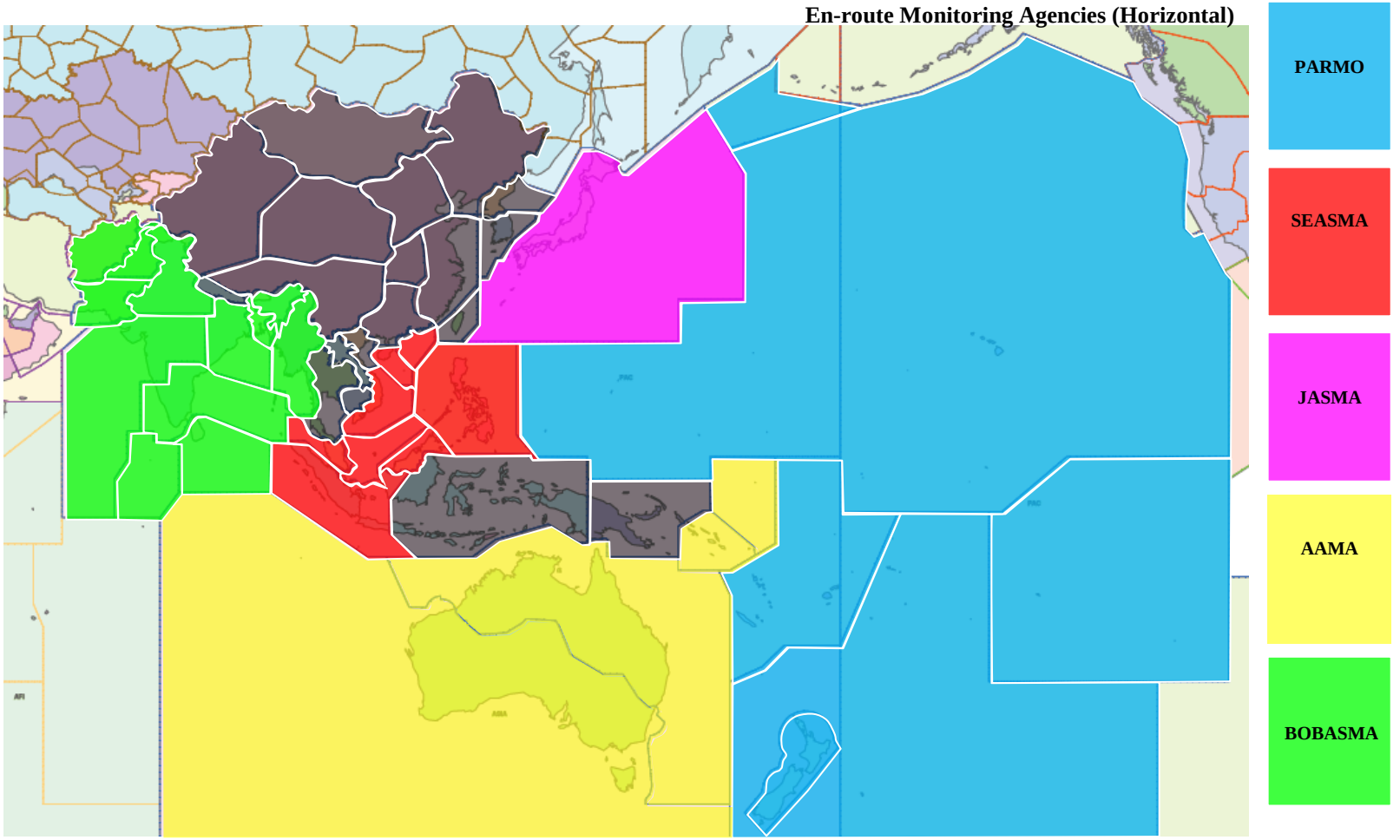
Organisation *(including contact officer)*	State	Competency	Status	Airspace assessed (FIRs)
Navigation Services Planning Division, Civil Aviation Bureau of Japan email: takata-h2ik@mlit.go.jp web site: http://www.jasma.jp				
Monitoring Agency for the Asia Region (MAAR) **Aeronautical Radio of Thailand 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, New Zealand, Tahiti FIRs EMA for Anchorage Oceanic, Oakland Oceanic
South East Asia Safety Monitoring Agency (SEASMA) - Civil Aviation Authority of Singapore (CAAS) Ms Valerie Sim, Air Traffic Manger (ANS Safety & Security), Air Navigation Group Email: Valerie_sim@caas.gov.sg	Singapore	EMA and CRA	Current	EMA for Hong Kong, Ho Chi Minh, Kota Kinabalu, Kuala Lumpur, Manila, Jakarta, Sanya, Singapore and Ujung Pandang FIRs CRA for Singapore, Viet Nam

Organisation *(including contact officer)*	State	Competency	Status	Airspace assessed (FIRs)
				and Philippines
FIT-ASIA Mr. Bradley Cornell, Boeing Engineering email: Bradley.D.Cornell@Boeing.Com	Boeing USA	FIT	Current	FIRs in the Asian Region not covered by IPACG/FIT and ISPACG/FIT
IPACG/FIT Mr. Natsuki IBE, JCAB Co-Chair, email: ibe-n24hy@mlit.go.jp and To be advised (FAA Co-Chair) email: to be advised	Japan and USA	FIT & CRA	Current	North & Central Pacific (Oceanic airspace within Fukuoka FIR, and Anchorage & Oakland FIRs)
ISPACG/FIT Mr. Bradley Cornell, Boeing Engineering email: Bradley.D.Cornell@Boeing.Com	Boeing USA	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)



Central Reporting Agencies and FITs (Data-link)