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International Civil Aviation Organization

The Combined Tenth Meeting of the South Asia/Indian Ocean ATM Coordination Group (SAIOACG/10) and Twenty—Seventh Meeting of the South-East Asia ATS Coordination Group (SEACG/27)

Video Teleconference, 29 March – 02 April 2021

Agenda Item 3: Review of Current Operations and Problem Areas

AIRSPACE SAFETY MONITORING

(Presented by the Secretariat)

SUMMARY

This paper presents outcomes of the Twenty-Fifth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/25).

1. INTRODUCTION

1.1 The Twenty-Fifth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/25) was held from 27 to 30 October 2021 by Video Teleconference from the ICAO Asia and Pacific Regional Office, Bangkok, Thailand. A total of 117 participants attended RASMAG/25 from 19 States/Administration, IATA, IFALPA and ICAO. A total of 40 Working Papers (WPs), five Information Papers (IPs) and three flimsies were presented to RASMAG/25.

1.2 RASMAG/25 Report is available on the ICAO APAC Regional Office website at: <https://www.icao.int/APAC/Meetings/2020%20RASMAG25/Final%20Report%20RASMAG25.pdf>
Note: airspace safety estimates in this report are measured in terms of fatal accidents per flight hour (fapth).

2. DISCUSSION

2.1 The Tenth Meeting of the FANS Interoperability Team-Asia (FIT-Asia/10) was held by Video Teleconference from 03 to 06 August 2020.

2.2 There was improvement in the submission of Problem Reports (PRs), which was noted at FIT-Asia/9 continued at FIT-Asia/10. A total of 66 PRs had been raised between July 2019 and June 2020, compared with 45 in the previous 12-month period. However, only six States had provided their annual survey response to FIT-Asia/10 in 2020: Australia, China, Philippines, Singapore, Thailand and Viet Nam.

2.3 Among recurrent problems reported were aircraft systems receiving, acknowledging then discarding messages ('Ack'n'toss'), up-linking of UM175 message resulting in aircraft downlink error message (PANS-ATM recommended against the use of UM175), continuing poor performance of High Frequency Data Link (HFDL), and delayed or withheld authorization from aircraft operators for the Central Reporting Agency (CRA) to access data link logs.

2.4 The meeting was informed by the Fit-Asia/10 meeting of an analysis of Latency Monitoring Reject messages received from Airbus aircraft operating in the Auckland Oceanic Flight

Information Region (FIR) during the period January 2019 – June 2020. On receipt of a Controller Pilot Datalink Communications (CPDLC) uplink message for which the latency exceeded the 300 second monitored value, Airbus aircraft did not present the message to the flight crew but instead sent a reject message in response.

2.5 ICAO provided an update to the FIT-Asia/10 on the status of Performance-Based Communication and Surveillance (PBCS) implementation among Asia/Pacific administrations, as reported using the APAC regional *Survey of the Status of Current and Planned Implementation of Performance-Based Horizontal Separation Minima* form.

2.6 Key analysis of the Required Surveillance Performance (RSP) aggregated data for the APAC Region indicated that performance requirements for RSP180 had not been met for Automatic Dependent Surveillance – Contract (ADS-C) messages delivered via High Frequency (HF), or messages delivered via Iridium and some Inmarsat paths.

2.7 Analysis of the Required Communications Performance (RCP) data indicated that requirements for RCP240 had not been met for Controller Pilot Datalink Communications (CPDLC) transactions delivered via High Frequency (HF) and mixed media, for CPDLC transactions delivered via Iridium paths in a few Asia/Pacific FIRs, and also some aircraft operators observed below the RCP240 95% requirements within multiple APAC Flight Information Regions (FIRs).

2.8 PBCS non-compliance report templates had been intended for ANSPs to inform the relevant Regional Monitoring Agency (RMA) of aircraft/aircraft operators where data link performance did not comply with specifications. A revised non-compliance report form template was proposed to FIT-Asia/10 in order to include additional information, to harmonize with the template adopted in the North Atlantic (NAT) Region, and to use MS Excel format to facilitate data handling by the RMA. RASMAG/25 agreed to the following Conclusion developed by the FIT-Asia/10:

Conclusion RASMAG/25-1: Revised PBCS Non-Compliance Report Form Template

That, the PBCS Non-Compliance Report Form Template at Appendix C to the RASMAG/25 Report be uploaded to the Asia/Pacific Regional Office website, to replace the previous template.

Vertical Safety Report

2.9 RASMAG/25 noted that the Regional Monitoring Agencies Coordination Group (RMACG, VTC, July – August 2020) had urged State CAAs to liaise with State Aircraft operators (such as military aircraft) regarding the verification process and status of RVSM approvals. Those aircraft with no RVSM approvals were strongly advised not to file ‘W’ in item 10 of the ICAO Flight Plan in order to prevent their flight plans from being rejected by EUROCONTROL.

2.10 RASMAG/25 had endorsed the updated Minimum Monitoring Requirements (MMR) in accordance with the following Conclusion:

Conclusion RASMAG/25-2: RVSM MMR Update

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

2.11 **Figure 1** is an Asia/Pacific RVSM TLS compliance overview, as at RASMAG/25:

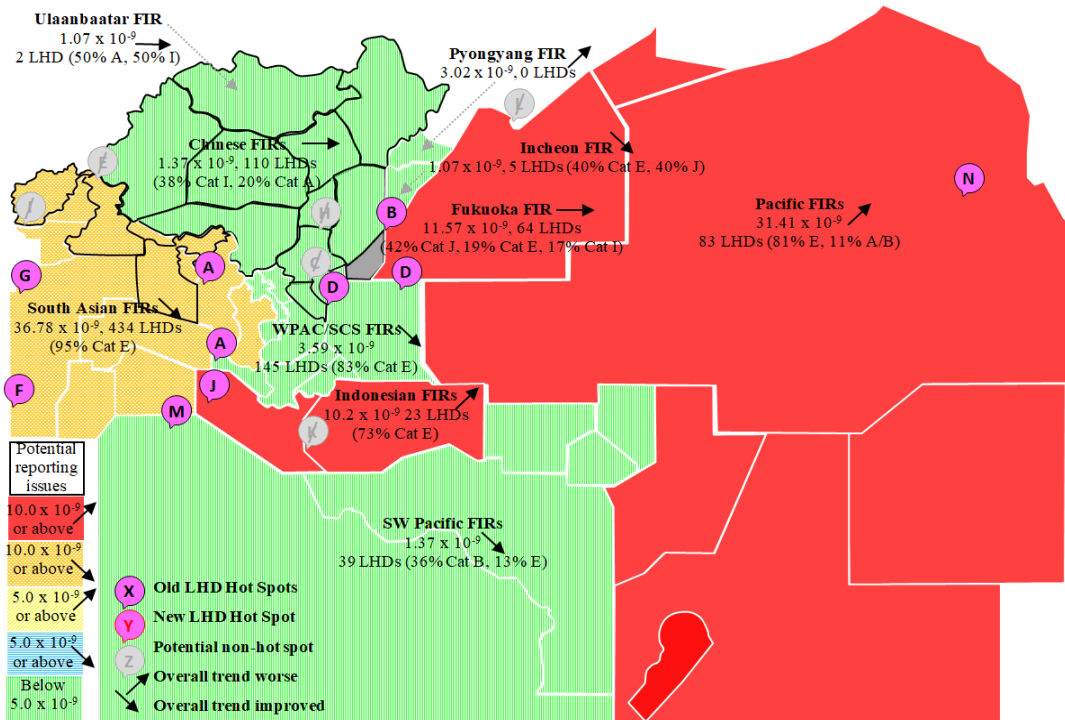


Figure 1: Asia/Pacific RVSM TLS subregion compliance reported to RASMAG/25

2.12

Table 1 summaries the following RMA airspace subdivision aspects:

RMA Airspace Subdivision	Safety trend	Notes
Chinese FIRs	No change	Potential ATC reporting issues
Incheon FIR(excl. AKARA)	Improving	AKARA would dramatically worsen
Indonesia FIRs	Worsening	Improving reporting
Fukuoka FIR	No change	Still affected by the Manila FIR
Pacific FIRs	Worsening	Dramatic increase in CAT E LHDs
Pyongyang FIR	Worsening	Insufficient traffic to judge compliance
South Asia Indian Ocean FIRs	Improving	Still has the second worst hot spots
Southwest Pacific FIRs	Improving	Best performing APAC airspace
Ulaanbaatar FIR	No change	Potential ATC reporting issues
W Pacific/Southeast Asia FIRs	Improving	Second best performing APAC airspace

Table 1: Airspace Vertical Safety Performance Overview

2.13

Table 2 provides a comparison of the APAC RVSM risk as a measure against the TLS by grouped FIRs, according to the RMA responsibilities for airspace. Over the past six years, APAC’s TLS compliance for RVSM had been poor overall, averaging 40% when measured by the grouped FIRs. However, of the 26 Flight Information Regions (FIRs) that achieved TLS, 13 FIRs had potential reporting issues. Therefore, the compliance rate may be significantly worse than reported.

2.14

Measures taken to improve adherence to the TLS in the past six years had yielded localised improvement, but overall had failed to produce a positive result for the APAC Region.

	2014	2015	2016	2017	2018	2019
FIRs	53%	32%	51%	16% (8 FIRs)	37% (18 FIRs)	53% (26 FIRs)

Table 2: Comparison of Regional RVSM TLS Achievement

Indonesian Safety Report

2.15 The 2019 RVSM risk estimates for the Jakarta and Ujung Pandang FIRs indicated that the TLS had not been met at 10.2×10^{-9} (**Figure 2**).

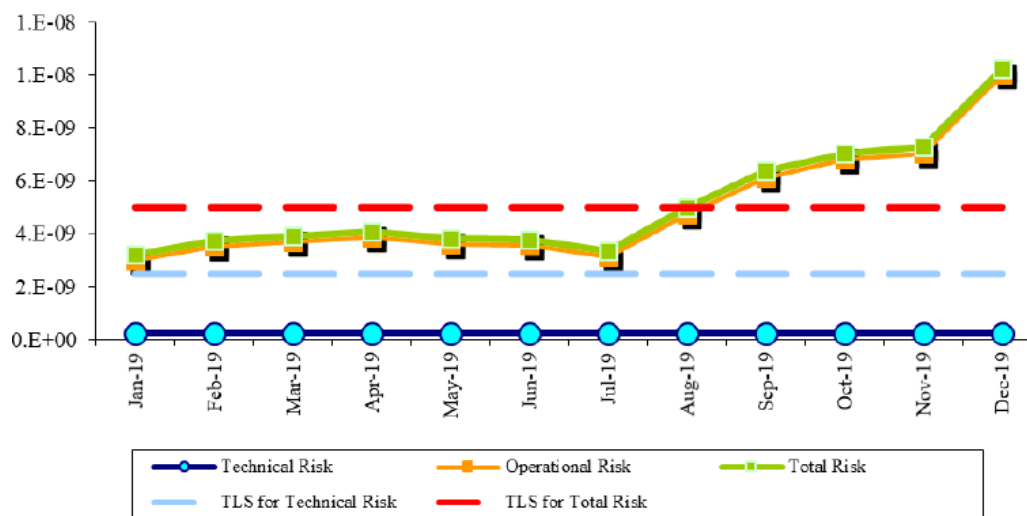


Figure 2: 2019 Vertical Risk Estimates for the Jakarta and Ujung Pandang FIRs

2.16 Since June 2019, there had been 21 non-zero-duration LHDs reported to AAMA within the Jakarta and Ujung Pandang FIRs (**LHD Hot Spot K**). AAMA commented that the increase in the RVSM risk estimate since RASMAG/24 ‘could be due to an enhanced reporting culture’. The majority of LHDs (24 of 33, 73%) in the Jakarta and Ujung Pandang FIRs were category E (*Coordination errors in the ATC-to ATC transfer or control responsibility as a result of human factors issues*). Indonesia informed the meeting that the status of Air Traffic Services (ATS) Inter-facility datalink Communication (AIDC) between Jakarta and Ujung Pandang was still ‘in progress’. AIDC:

- a) Had been installed at the Ujung Pandang ACC and implemented with Australia;
- b) Between Ujung Pandang and Manila had been trailed since April 2020, with implementation due at the end of 2020; and
- c) Would be installed in Jakarta ACC during December 2020 for operations between the Jakarta and Ujung Pandang ACCs.

2.17 **Figure 3** provides the location of all reported LHD occurrences for Jakarta and Ujung Pandang FIRs during 2019.

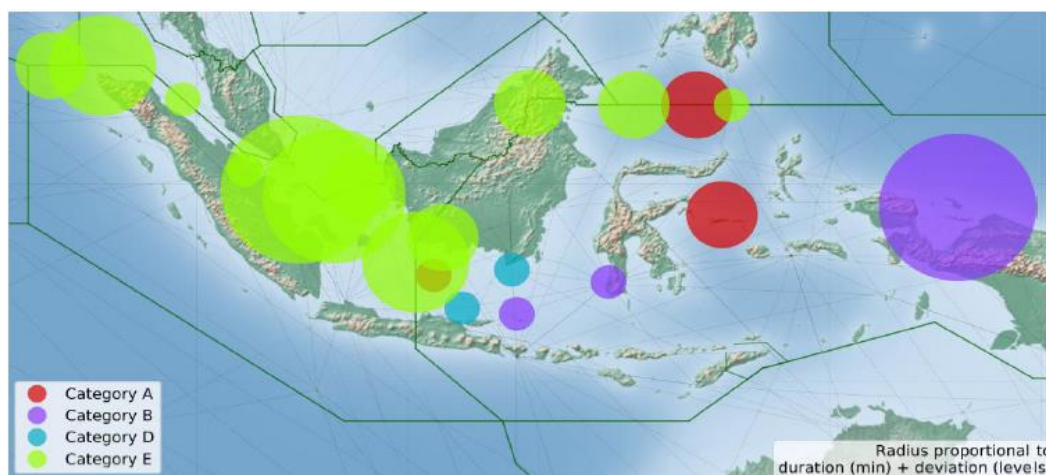


Figure 3: 2019 LHD Locations, Jakarta and Ujung Pandang FIRs, 2019

Chinese Airspace

2.18 The 2019 RVSM risk estimates for the Beijing, Guangzhou, Kunming, Lanzhou, Sanya, Shanghai, Shenyang, Urumqi and Wuhan FIRs indicated that the TLS had been met at 1.367×10^{-9} .

2.17 The risk estimates had resulted from 79 reported LHDs, including 30 Category I (Turbulence or other weather related cause, 38%) and 16 Category A (*flight crew failing to climb/descend the aircraft as cleared*, 20%). There were only four reported Category E events (5%).

2.18 China RMA noted the meeting that the earlier identified hot spots within Chinese airspace between the Urumqi and Lahore FIR (Pakistan), Guangzhou/Sanya and Hong Kong FIR and within the Guangzhou FIR had all shown significant improvement. There was a total of only one reported LHD for all three Hot Spots in 2019 at position PURPA on the China – Pakistan FIR boundary.

South Asian Indian Ocean Airspace

2.19 The Monitoring Agency for the Asian Region (MAAR) provided the vertical safety assessment for the RVSM operation in South Asia/Indian Ocean Airspace (SAIO), Southeast Asia Airspace (SEA), and Mongolian Airspace during 2019.

2.20 The 2019 RVSM risk estimate for SAIO airspace indicated that the TLS had not been met at 36.78×10^{-9} (Figure 4).

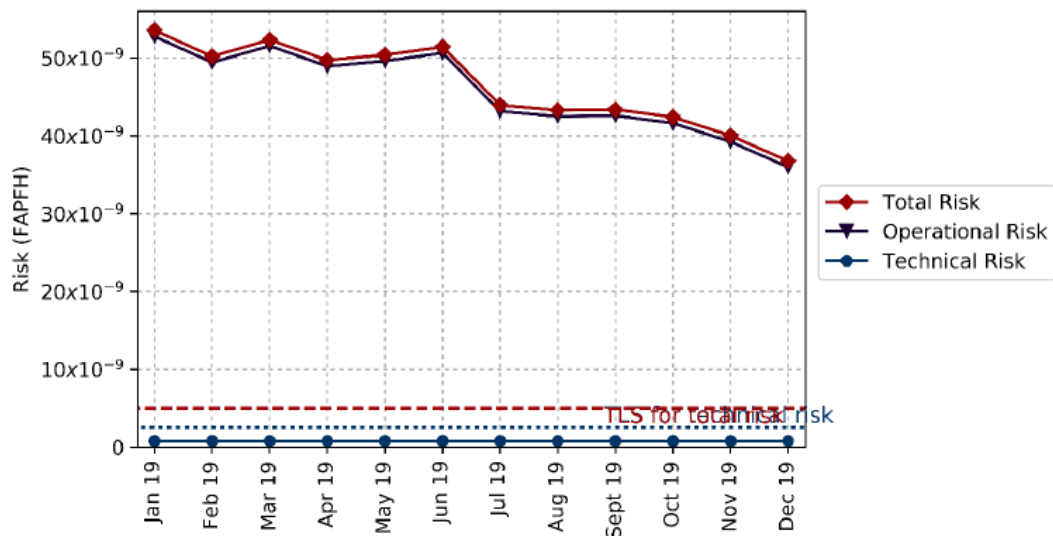


Figure 4: 2019 Vertical Risk Estimate for SAIO airspace

2.21 As had been the case in previous years, the vast majority of the 434 LHD cases that had been reported were Category E events, with 411 (95%).

2.22 LHD **Hot Spot F** (Mogadishu-Mumbai) and **Hot Spot G** (Sanna/Muscat-Mumbai) remained as LHD hot spots. In 2019, the operational risk of this hotspot accounted for 25.64×10^{-9} , which was 71% of the SAIO area’s total risk. The 2019 operational risk in SAIO airspace was dominated by LHDs at Mumbai-Muscat interface. Out of 16 long duration LHDs in SAIO airspace, 12 LHDs occurred at this interface, accounting for 38% of the total operational risk in this subregion.

2.23 The majority of LHDs between Muscat and Mumbai were Category E, with a sub-category of ‘No or Late FL revision’ and ‘Negative Transfer’. The poor communication services and lack of surveillance coverage at this interface worsened the situation, due to the slower identification that led to long-duration occurrences.

2.24 In addition, the Pakistan airspace closure from 27 February to 16 July 2019 contributed to the increase in LHDs particularly a waypoint RASKI, PARAR and TOTOX (**Figure 5**).

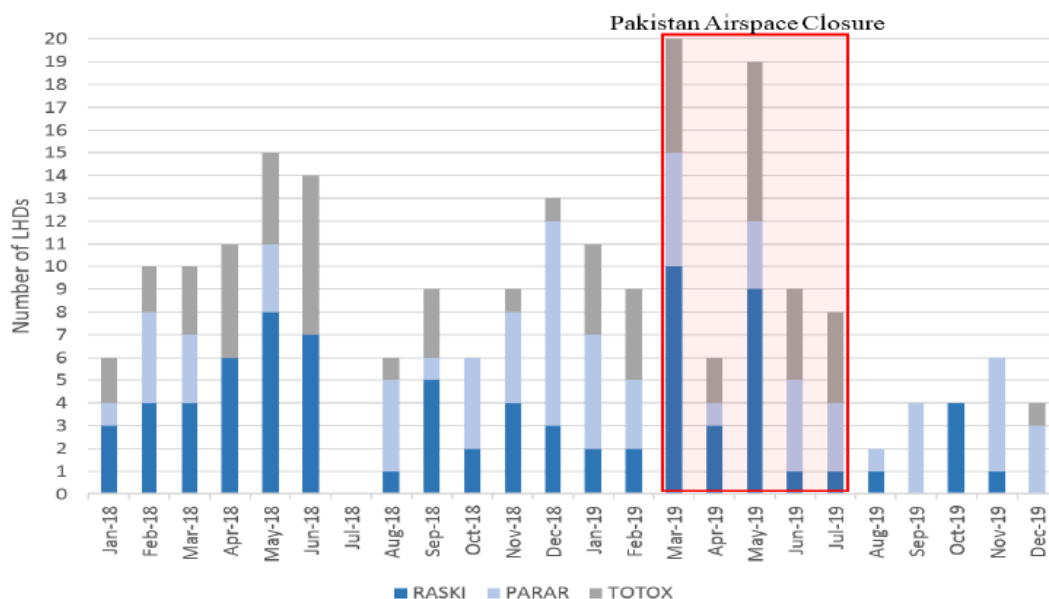


Figure 5: LHDs at RASKI, PARAR and TOTOX, January 2018 – December 2019

2.25 The geographical locations of the SAIO LHDs indicated that there had been an increase in reporting within Indian airspace, particularly between the Chennai and Mumbai FIRs (**Figure 6**). However, the Delhi and Kolkata FIRs did not appear to demonstrate the same level of LHD reporting, with Delhi reporting an implausible three LHDs internally and Kolkata an even less plausible single LHD over continental airspace over the entire year.

2.26 ICAO strongly urged BOBASMA to take the lessons of improvement from Chennai and Mumbai, and urgently conduct an intensive education programme with follow up in Delhi and Kolkata ACCs.

2.27 The operational risk at Kolkata/Dhaka – Yangon and Chennai – Kuala Lumpur interfaces (**Hot Spots A1 and A2**) decreased from 2017 to 2019. The LHDs over waypoint APAGO and CHILA involved Dhaka, Kolkata and Yangon FIR. The ambiguity on handling of eastbound traffic between Dhaka FIR and Kolkata FIR (as well as coordination with Yangon FIR) was resolved by the implementation of a new procedure, which was developed by Bangladesh, India and Myanmar at the BIMT/4 ATM Coordination meeting in August 2016. This procedure was incorporated into a new ATS Letter of Agreement (LOA) signed between Bangladesh and India effective March 2018.

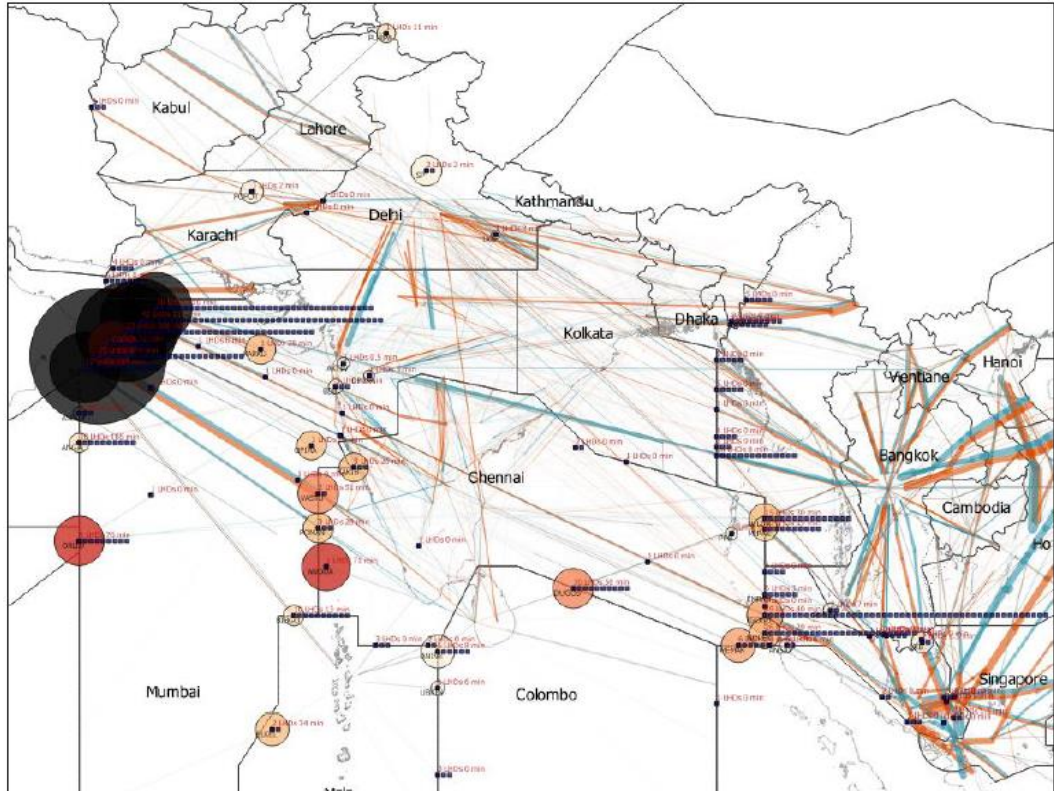


Figure 6: 2019 Geographical Locations of SAIO LHDs

2.28 ADS-B data sharing between Kolkata ACC and Yangon ACC had also been implemented in June 2018, allowing controllers to detect and resolve the risk at the interface between Kolkata and Yangon FIRs, with the operational risk decreasing from 2.04×10^{-9} in 2017, to 0.6×10^{-9} in 2018, and to 0.31×10^{-9} in 2019. On the other hand, the operational risk in 2019 had increased at Chennai-Yangon and Chennai-Kuala Lumpur interfaces (LULDA, MEPAK, IGOGU, NOPEK and MEMAK). At these interfaces, ADS-B data sharing had not yet been implemented.

2.29 For **Hot Spot I** (Karachi-Kabul), since the establishment of a new ATS route Z627 between the Tehran and Kabul FIRs in July 2019, there had been no reported LHD.

Southeast Asian Airspace

2.30 The 2019 RVSM risk estimate for SEA airspace indicated that the TLS had been met at 3.59×10^{-9} . However, there was an upward trends of the TLS at the end of 2019 (Figure 7).

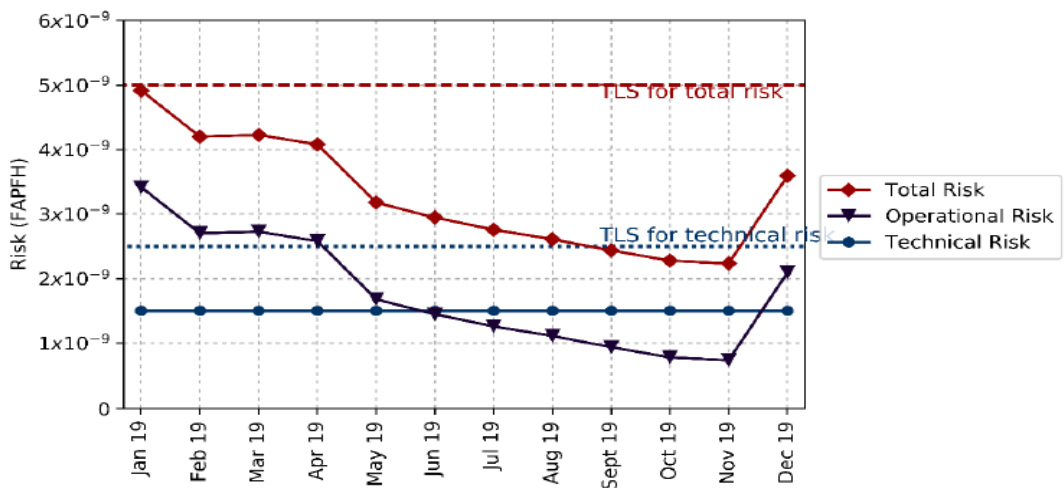


Figure 7: 2019 Vertical Risk Estimate for SEA airspace

2.31 Category E events once again formed the vast majority of occurrences, with 120 out of 145 attributed to this cause (83%).

2.32 Most of the LHDs and operational risk within SEA airspace was associated with **Hot Spot D** (Manila and all adjacent FIRs). From late 2018, the number of LHDs and operational risk in SEA airspace began reducing as the capabilities of the new ATM system were implemented, including enhanced VHF radio, radar and ADS-B coverage, and new ATC sectors. Furthermore, the ADS-C/CPDLC implementation in oceanic airspace, AIDC implementation with Hong Kong FIR, Singapore FIR and Taipei FIR commenced as indicated in **Figure 8**.

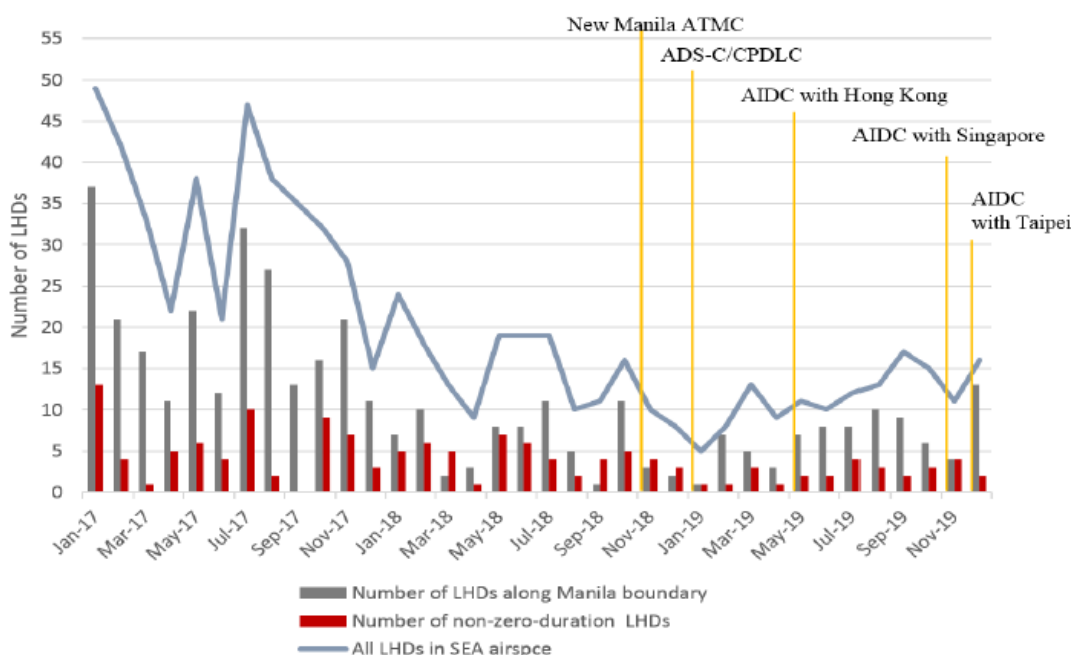


Figure 8: LHDs, Manila FIR Boundary, 2017 – 2019

2.33 However, the number of Category F LHDs (*Coordination errors in the ATC-to-ATC transfer of control responsibility as a result of equipment outage or technical issues*) had increased in SEA airspace. There were a total of nine Category F LHDs involved the Manila FIR reported in 2019, seven of which were due to AIDC errors. The Philippines stated that this was due to the ATM system failing to alert the controller in case of unsuccessful AIDC transfer, which was being addressed.

2.34 The Philippines presented updates on actions taken and planned measures to minimize the occurrence of LHD using the completed **FORM B** – LHD Preventive/Mitigation Measures.

2.35 The Philippines described various mitigation measures for LHDs such as meetings with stakeholders, training for operational staff, dissemination of information on flight plan formats, and improvements in the process of coordination between the ACC supervisors and debriefing with involved controllers post-incident. The Philippines noted that the new ATM system had special human machine features such as visual cues to minimize human errors.

2.36 **Table 3** provides the status of AIDC implementation in the Manila FIR.

Date	Adjacent Centre	Status
23 May 2019	Hong Kong ACC	Implemented
01 November 2019	Singapore ACC	Implemented
05 December 2019	Taipei ACC	Implemented
10 October 2019	Ujung Pandang ACC	Operational Trial
TBD	Kota Kinabalu ACC	Awaiting KK to upgrade ATM system
TBD	Ho Chi Minh	Awaiting response to continue technical testing as HCM is using old FPL format
TBD	Kobe ACC	Initiated contact, awaiting response
TBD	Japan ATMC	Initiated contact, awaiting response
TBD	Oakland ACC	Awaiting for migration from AFTN to AMHS for datalink connection

Table 3: AIDC Implementation Status, Manila FIR

2.37 With regard to Category D (*ATC system loop error*) event, the Japan Airspace Safety monitoring Agency (JASMA) had provided more detailed analysis to the meeting after ICAO asked whether English Language Proficiency (ELP) might be an issue. While acknowledging the potential role of ELP, Japan noted that some of these incidents were due to similar call signs.

2.38 In response to a query from ICAO, IATA clarified that its successful similar call sign initiative that had been implemented in the Middle East (MID) Region had not been able to progress in the APAC Region. One of the reasons for this was the reluctance of aerodrome operators to implement change until an automated tool was available to accommodate alphanumeric call signs.

2.39 Noting the grave safety risks from such occurrences, the meeting agreed to the following Draft Conclusion (which were subsequently endorsed by the ATM/SG/8 and the AOP/SG/4).

Draft Conclusion RASMAG/25-3: Alphanumeric Call Sign Initiative

Noting:

- 1) the extreme safety risks associated with pilot-ATC miscommunication and the number of Category D (*ATC Loop Error*) Large Height Deviations (LHDs);
- 2) APANPIRG Conclusion 27/15. ATMSG Conclusions 5-5 and 5-6 regarding the **Asia Pacific Alpha Numeric Call-Sign (ANCS)** call sign project; and
- 3) alphanumeric call signs were a well-established call sign confusion mitigation, that:

leading Air Navigation Service Providers (ANSPs) and aerodrome operators, in coordination with CANSO and ACI, were urged to consider a trial to identify and overcome any barriers for the implementation of alphanumeric call signs, with a view to developing a project for the Asia/Pacific (APAC) Region.

BOBASMA Horizontal Safety Report

2.40 BOBASMA, India presented a horizontal safety assessment for the Bay of Bengal/Arabian Sea Indian Ocean airspace during the period January to December 2019. The 50NM lateral and longitudinal risks remained below the Target Level of Safety (TLS) at 1.59×10^{-9} and 4.97×10^{-9} . Of the ten Large Lateral Deviations (LLDs) or Large Longitudinal Errors (LLEs) reported during 2019, eight were Category E LLDs (*Coordination errors in the ATC to ATC transfer of control responsibility as a result of human factors issues*).

2.41 India described on-going improvements to AIDC capability, including between:

- a) Chennai and Kuala Lumpur (implemented 14 May 2017 but further enhanced to include Transfer of Control and Acceptance of Control (TOC and AOC) messages;
- b) Chennai and Kolkata (Phase 2 trial operations were due to be implemented shortly);

- c) Mumbai and Muscat (discussion first commenced in 2018 but there had been no progress nor response from Muscat thus far; thus ICAO proposed to send a State Letter ABOUT THIS to the Sultanate of Oman via the MID Office); and
- d) Mumbai and Mogadishu (the final round of testing is planned to commence soon).

2.42 **Table 4** provides an overview of the proportion of Category E (Coordination Errors in the ATC-to-ATC Transfer of Control responsibility as a result of Human Factor Issues) over the period 2017 – 2019.

	SW Pacific	Indonesia	China	Japan	S Asia	SE Asia	Pacific	Incheon
2017	18%	44%	14%	30%	96%	69%	30%	60%
2018	26%	65%	3%	22%	95%	87%	22%	0%
2019	13%	72%	5%	19%	95%	83%	81%	40%
Ave.	19%	60%	7%	24%	95%	80%	44%	20%

Table 4: Category E Proportions of Reported LHDs, 2017 – 2019

2.43 **Table 4** indicates data for the 2017 – 2019 showing that for areas that do not generally use AIDC, Category E LHDs constituted 60% - 95% of the total (78% average), whereas in area that do utilize AIDC, Category E events normally constituted a much smaller proportion of between 19 - 44% (average 29%).

2.44 India confirmed that its Space-based ADS-B service volume extended to about 50NM outside the Indian FIRs. Then meeting discussed the possibility of SB ADS-B data being used for safety monitoring purposes, and for operational data sharing with adjacent ANSPs where terrestrial surveillance was not available.

2.45 The meeting was provided a brief analysis of airspace risk occurrences within Indian airspace during 2019 and described the mitigation actions undertaken. India stated that there had been 18 LHDs within Mumbai FIR with duration equal to or greater than 30 minutes (and one LHD of 32 minutes within the Chennai FIR). The meeting was noted with concern the lack of progress in AIDC implementation with Muscat.

SEASMA Horizontal Safety Report

2.46 Singapore’s South East Asia Safety Monitoring Agency (SEASMA) provided a safety report for operations on ATS routes N892, L625, N884 and M767 within the South China Sea during 2019. This assessment was based on RNP10 performance and concluded that the TLS established for lateral and longitudinal separation standards were satisfied at **0.012 x 10⁻⁹** and **0.38 x 10⁻⁹** respectively.

2.47 The lateral risk within the South China Sea Airspace had reduced significantly in 2019 due to there being zero LLD occurrences during 2019.

2.48 The number of LLEs had reduced from 19 in 2018 to seven in 2019. Various mitigating measures implemented by States had contributed to the reduction in numbers of errors. Category F Coordination errors in the ATC-to-ATC transfer of control responsibility as a results of equipment outage or technical issues had replaced Category E LLEs as the top cause on the Manila – Singapore FIR boundary, due to the implementation of AIDC between the two ANSPs. SEASMA stressed that continual safety promotion, procedure review and system improvement had also positively contributed to the reduction in these errors.

Safety Reporting

2.49 MAAR had noted that measuring how well an organization reports hazards and incidents had been a challenge and the use of reported incident numbers as indicator of reporting culture had limitations, due to many factors apart from the maturity of reporting cultures. Low number of reported incidents could be a result of the improvement in safety level or a result of poor reporting culture.

2.50 MAAR had clarified that controllers tend to report LHDs only when affected by mistakes made by their neighboring FIRs. In 2019, only 15% of all LHDs were reported by the ACC that had made the error. ACCs with good reporting culture that submitted his type of LHD report were:

Singapore, Manila, Kota Kinabalu and Kuala Lumpur.

2.51 RASMAG/25 had noted that the following States had potential reporting issues:

- a) Afghanistan, which did not report any LHDs during 2020;
- b) China, which had reported an implausibly low percentage of Category E event (73% during 2018 and 7% in 2019);
- c) India – Delhi and Kolkata FIRs (although Mumbai and Chennai had made distinct improvements); and
- d) Mongolia had a rate of reported LHDs per hour that was very low, many factors less than that expected.

2.52 Notwithstanding the potential safety reporting issues noted, the MAAR advised that there were some signs of reporting culture improvement, including positive trends in India. Area Control Centers (ACCs) that had always submitted a NIL report were:

Phnom Penh, Hong Kong, Vientiane, Taipei, Hanoi, Ho Chi Minh, Dhaka, Karachi and Ulaanbaatar.

2.53 AAMA had also noted that Indonesia had probably improved its safety reporting culture.

2.54 As China had not comprehensively implemented AIDC, the very low proportion of 7 % category E events on average was plausibly low at 3% during 2018 and 7% in 2019, thus indicating a possible safety reporting issue within Chinese airspace. Noting China RMA's past work to improve reporting culture that resulted in a steep increase in reports, China RMA is urged to consider steps to further strengthen its 'Just Culture' policies and effective implementation of those policies to support open reporting of safety occurrences.

2.55 It was always difficult to compare reporting rates between States. However, the methods used to analyse the data had successfully highlighted poor reporting in the past, and after action by States the reporting had changed dramatically.

2.56 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', as described in the *Asia/Pacific Seamless ATM Plan*.

2.57 In order to be more proactive, ICAO recommended that RMAs and EMAs better analyse safety data to identify potential under-reporting and undertake safety culture surveys and audits to monitor safety reporting culture.

2.58 RASMAG/25 had agreed to the following Decision on safety reporting, as part of RMA/EMA safety reports.

Decision RASMAG/25-4: Safety Reporting Assessments

That, RMAs and EMAs will include within their vertical and horizontal safety reports to RASMAG an assessment of the safety reporting culture of the States concerned (including ‘Just Culture’), and specifically, whether safety reports for events such as LHDs were consistently being made by pilots and ATC.

Hot Spot Summary

2.59 **Table 5** provides a summary of the Hot Spots.

ID	Involved FIRs	Identified	Remarks
A1	Kolkata/Chennai/Dhaka – Yangon	2015	Potential non-hot spot
A2	Chennai – Kuala Lumpur	2015	LHDs increased
B	Incheon	2015	AKARA Corridor
D	Manila – all adjacent FIRs	2015	LHDs reduction
F	Mogadishu – Mumbai	2015	LHDs reducing
G	Sana`a/Muscat – Mumbai	2015	Cat. E LHDs (Sana`a improved)
J	Jakarta – Singapore/Kota Kinabalu	2018	Minor, Cat. E LHDs
M	Colombo - Melbourne	2019	Potential non-hot spot
N	Oakland USA – Hawaii CEP	2019	Cat. E LHDs

Table 5: Comparison Summary of LHD Hot Spots

Non-RVSM Approved Aircraft

2.60 **Table 6** compared the number of non-RVSM airframes reported by each RMA annually:

Report	AAMA	China RMA	JASMA	MAAR	PARMO	Total
RASMAG/20	8	45	15	234	26	328
RASMAG/21	5	6	15	106	11	143
RASMAG/22	7	40	11	163	25	246
RASMAG/23	5	20	9	43	38	115
RASMAG/24	5	4	17	34	1	61
RASMAG/25	2	24	6	26	9	67

Table 6: Trend of Non-RVSM Airframes Observed by Asia/Pacific RMAs

Regional Horizontal TLS Compliance

2.61 The Following Asia/Pacific En-Route Monitoring Agency (EMAs) reported horizontal risk assessments as follows, which all met the TLS of 5.0×10^{-9}

ATC Separation	EMA	2018 Estimated Risk	2019 Estimated Risk
50NM Lateral	BOBASMA	2.05×10^{-9}	1.59×10^{-9}
	JASMA	0.05×10^{-9}	1.45×10^{-9}
	PARMO	-	-
	SEASMA	0.52×10^{-9}	0.012×10^{-9}
30NM Lateral	PARMO	0.16×10^{-9}	3.35×10^{-9}
50NM Longitudinal	BOBASMA	4.21×10^{-9}	4.97×10^{-9}
	PARMO	2.22×10^{-9}	-
	SEASMA	0.38×10^{-9}	0.38×10^{-9}
30NM Longitudinal	BOBASMA	-	-
	JASMA	0.001×10^{-9}	0.015×10^{-9}
	PARMO	4.08×10^{-9}	4.08×10^{-9}

Table 7: Comparison of Horizontal Risk Assessments

APAC Consolidated LTHM Burden Estimate Update

2.62 Thailand presented an overview of Long Term Height Monitoring (LTHM) compliance status in the Asia/Pacific Region, including assessment of Asia Pacific RMAs: Australian Airspace Monitoring Agency (AAMA), CHINA RMA, JASMA, Monitoring Agency of the Asian Region (MAAR) and PARMO. The assessment, which was based on RVSM approval data as at 30 October 2020, yielded a remaining monitoring burden of 379, a 20% increase from 2018:

- China RMA (22%), JASMA (2%), and PARMO (3%) States had reduced their remaining their monitoring burden, with China having the biggest improvement; and
- MAAR (54%) and AAMA (19%) States had an increased remaining monitoring burden, mainly due to aircraft being unable to be monitored using Enhanced Global Navigation Satellite System Monitoring Units (EGMUs).

2.63 The MAAR had a total of 206 aircraft to be monitored. The total number of aircraft remaining to be monitored in the APAC Region had risen by 20% to 379, with Afghanistan being the highest at 85%.

2.64 As Malaysia’s remaining monitoring burden had significantly dropped to below 30%, MAAR proposed to remove it from the APANPIRG List of Deficiencies for LTHM compliance.

2.65 During 2019 – 2020, seven States – Afghanistan, Bhutan, India, Indonesia, Nepal, Pakistan and the Philippines had a remaining monitoring burden over 30% (**Table 8**). However, with the unavailability of EGMU services due to travel restrictions during the COVID-19 pandemic, MAAR proposed to delay proposing new Deficiencies for States until RASMAG/26’s review.

State	2017%	2018%	MMR	Burden	2019%
Afghanistan (MAAR)	38%	36%	13	11	85%
Pakistan (MAAR)	69%	56%	28	13	46%
India (MAAR)	30%	25%	245	106	46%
Nepal (MAAR)	0%	0%	11	5	45%
Philippines (MAAR)	30%	26%	70	30	43%
Indonesia (AAMA)	42%	21%	57	24	42%
Bhutan (MAAR)	0%	0%	5	2	40%
Malaysia (MAAR)	38%	40%	72	19	26%
Myanmar (MAAR)	36%	0%	6	1	17%
Bangladesh (MAAR)	44%	14%	14	2	14%

Table 8: State Monitoring Burdens (red = liable for APANPIRG Deficiency)

ATM and Airspace Safety Deficiencies List

2.66 The meeting reviewed the APANPIRG Deficiency List and agreed to make the following recommendations as:

- a) deletion of the Deficiency for Myanmar related to PRs not being provided to the Central Reporting Agency (CRA);
- b) deletion of the Deficiency for Bangladesh, Bhutan, French Polynesia, Lao People’s Democratic Republic (PDR) and Pakistan related to non-provision of the annual RVSM approval snapshot;
- c) deletion of the LTHM Deficiency for Malaysia; and
- d) amendment of the LTHM Deficiency for Pakistan to reflect the remaining monitoring burden of 46% and for Afghanistan for failing to submit the annual RVSM approval snapshot for 2018 and 2020.

2.67 In addition, MAAR requested that APANPIRG/31 inform Nepal of its non-compliance status in regard to the failure to submit the annual RVSM approval snapshot in 2020, which may result in an inclusion in the APANPIRG Lis of Deficiencies in 2021 if not rectified.

Production of the Asia/Pacific Region Combined PBCS Monitoring Report

2.68 The USA had presented a recommended process for the production of the Asia/Pacific Region Combined Performance Based Communications and Surveillance (PBCS) Monitoring Report, proposing the retention of a PBCS Report format harmonized with other ICAO regions, and the biennial rotation of the report generation responsibilities amongst States and Monitoring Agencies. It had been noted that the consolidated performance report format currently used by FIT-Asia was also used in the North Atlantic (NAT) Region, and was also used by informal Pacific groups.

2.69 Rotating responsibility for the production of the report would assure that, over time, multiple States and organizations would gain the knowledge and develop the skillset to improve system performance. Ideally, a biennial rotation would allow for the outgoing State/Agency to assist the incoming organization in the first year, followed by independent production in the second year.

2.70 RASMAG/25 had agreed to the following Decision:

Decision RASMAG/25-5: Rotational Responsibility for the Production of the Combined PBCS Monitoring Report

That, FIT-Asia will produce an annual Combined PBCS Monitoring Report, as follows:

- 1) responsibility for the report production will rotate biennially amongst volunteer States,
- 2) reporting Agencies, or other relevant stakeholders; the State, Reporting Agency or other stakeholder releasing responsibility for production of the report will assist the new report producer in the first year of their responsibility; and
- 3) until a report format is codified in ICAO documentation, producing organizations must assure the report content, format, and quality are consistent with similar reports in other ICAO regions.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) note the PBCS-related and RASMAG Decisions;
- c) discuss the elevated vertical safety risks in APAC Region;
- d) discuss the safety reporting issues identified by RASMAG as appropriate; and
- e) discuss any other relevant matters as appropriate.

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