



ICAO

International Civil Aviation Organization

The Eighth Meeting of the APANPIRG ATM Sub-Group

Video Teleconference, 23 – 27 November 2020

Agenda Item 3: Performance Frameworks and Metrics

FIT-ASIA AND RASMAG OUTCOMES

(Presented by the Secretariat)

SUMMARY

This paper presents outcomes relevant to the ATM/SG from the Future Air Navigation Services (FANS) Interoperability Team – Asia (FIT-Asia) and the Regional Airspace Safety Monitoring Advisory Group (RASMAG).

1. INTRODUCTION

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

1.2 The Twenty-Fifth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/25) was held from 27 to 30 October 2020 by Video Teleconference (VTC) from the ICAO Asia and Pacific Regional Office, Bangkok, Thailand.

1.3 A total of 117 participants attended RASMAG/25 from Australia, Bangladesh, Cambodia, China, Hong Kong China, India, Indonesia, Japan, Malaysia, Myanmar, Nepal, New Zealand, Philippines, Republic of Korea (ROK), Singapore, Sri Lanka, Thailand, United States of America (USA), Viet Nam, IATA, IFALPA and ICAO.

1.4 A total of 40 Working Papers (WPs), five Information Papers (IPs) and three flimsies were presented to the meeting.

2. DISCUSSION

FIT-Asia Meeting Outcomes

2.1 The improvement in the submission of Problem Reports (PRs) to the Central Reporting Agency (CRA) that 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.

2.2 The meeting was reminded of relevant Conclusions from APANPIRG and RASMAG. A total of 19 APAC Administrations had responded to the Performance-Based Communications and Surveillance (PBCS) survey in its four years of availability. Only six had provided their annual *Survey of the Status of Current and Planned Implementation of Performance-Based Horizontal Separation Minima* response for 2020 reporting to FIT-Asia/10:

Australia, China, Philippines, Singapore, Thailand, Viet Nam.

2.3 States that were known to have implemented, or intended to implement, performance based separations in the high seas airspace within their FIRs included India, Indonesia, Maldives, Myanmar, Philippines and Sri Lanka. States had been requested to notify the ICAO Asia/Pacific Regional Office so that a coordinated Proposal for Amendment (PfA) to Doc 7030 – *Regional Supplementary Procedures* (SUPPS) may be prepared. Following the receipt of information subsequent to the FIT-Asia/10 meeting, coordination had commenced on the inclusion of relevant provisions in SUPPS for Indonesia, Philippines and Sri Lanka.

2.4 Performance-Based Communications and Surveillance (PBCS) non-compliance report templates were intended for Air Navigation Service Providers (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 already 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	
What: That, the PBCS Non-Compliance Report Form Template at Appendix C to the Report be uploaded to the Asia/Pacific Regional Office website, to replace the previous template.	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: To include additional information, to harmonize with the template already adopted in the North Atlantic (NAT) Region, and to use MS Excel format to facilitate data handling by the RMA.	Follow-up: <input type="checkbox"/> Required from States
When: 30-Oct-20	Status: Adopted by Subgroup
Who: <input checked="" type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:	

RASMAG/25 Meeting Outcomes

2.5 RASMAG/25 had reviewed the Regional Monitoring Agencies Coordination Group’s (RMACG’s) results, which had been conducted by video teleconference during July and August 2020. The RMACG meeting had urged State CAAs to liaise with State Aircraft operators (e.g. military units) regarding the verification process and status of RVSM approvals in order to prevent their flight plans from being rejected by EUROCONTROL:

- i) for States that have RVSM approval processes for State Aircraft equivalent to civil aircraft’s, State CAAs were encouraged to share State Aircraft’s approval data or confirming the approval status upon queried by the designated RMA;
- ii) for all aircraft and operators with no RVSM approvals, State CAAs should inform operators not to file ‘W’ in item 10 of the ICAO flight plan.

2.6 RASMAG/25 endorsed the updated Reduced Vertical Separation Minimum (RVSM) Minimum Monitoring Requirement (MMR) in accordance with the following Conclusion:

Conclusion RASMAG/25-2: RVSM MMR Update	
What: That, the Reduced Vertical Separation Minimum (RVSM) Minimum Monitoring Requirement (MMR) update at Appendix D to the Report be utilized by Regional Monitoring Agencies (RMAs) and States as appropriate.	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: The Regional Monitoring Agencies Coordination Group (RMACG) had updated the MMR for RMAs/States to utilise.	Follow-up: <input type="checkbox"/> Required from States
When: 30-Oct-20	Status: Adopted by Subgroup
Who: <input type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:	

South Asia Indian Ocean Airspace

2.7 The 2019 RVSM risk estimate for SAIO airspace indicated that the TLS had not been met at **36.78 x 10⁻⁹** (Figure 1).

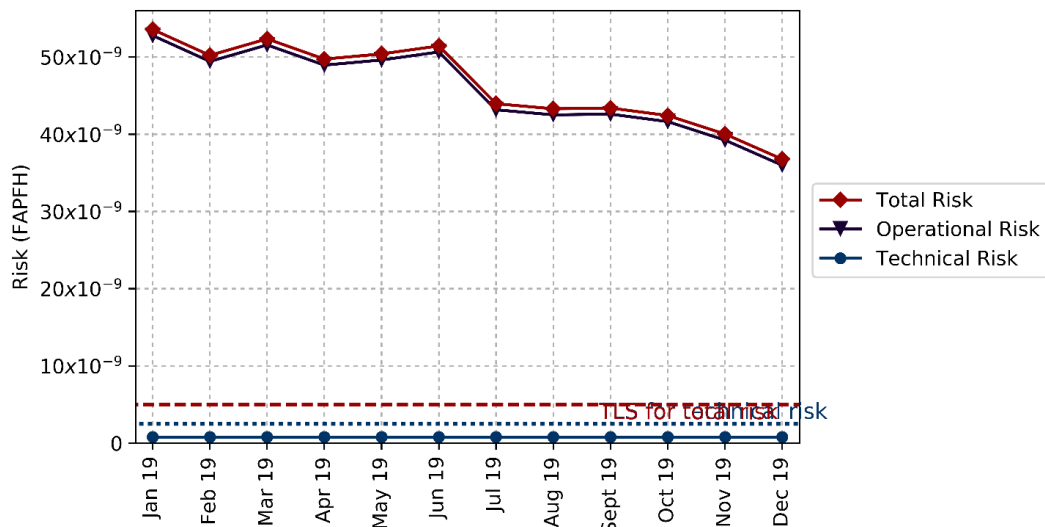


Figure 1: 2019 Vertical Risk Estimate for SAIO airspace

2.8 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%).

2.9 LHD Hot Spot F (Mogadishu – Mumbai) and Hot Spot G (Sanaa/Muscat – Mumbai) remained as LHD hot spots. In 2019, the operational risk of this hotspot accounted for **25.65 x 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.

2.10 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.

2.11 In addition, the Pakistan airspace closure from 27 February to 16 July 2019 had contributed to the increase in LHDs, particularly at waypoint RASKI, PARAR and TOTOX (**Figure 2**).

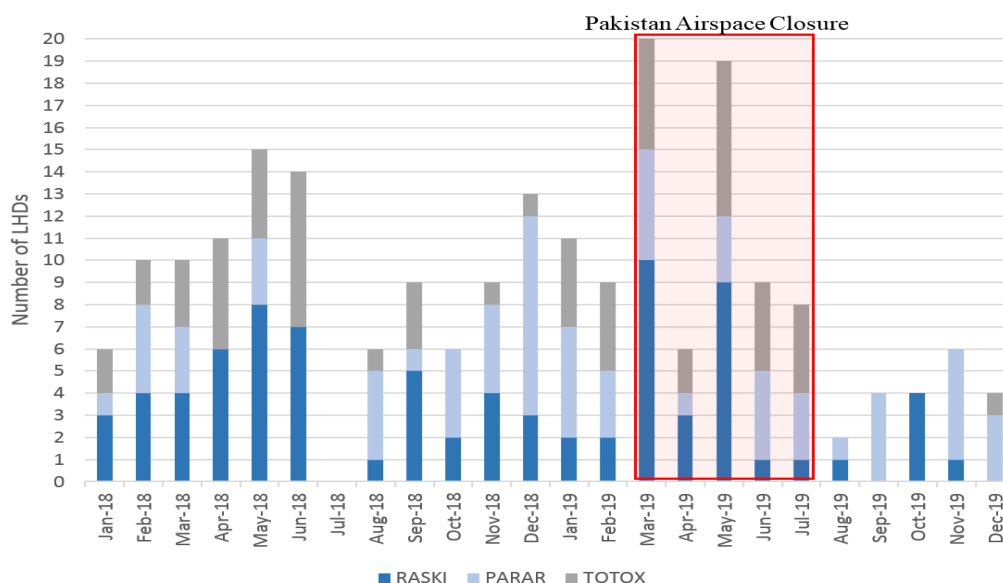


Figure 2: LHDs at RASKI, PARAR and TOTOX, January 2018 – December 2019

2.12 On-going improvements to AIDC capability were reported, including between:

- Chennai and Kuala Lumpur (implemented 15 May 2017 but further enhanced to include Transfer of Control and Acceptance of Control (TOC and AOC) messages;
- Chennai and Kolkata (Phase 2 trial operations were due to be implemented shortly);
- Mumbai and Muscat (discussion first commenced in 2018 but there had been no progress nor response from Muscat thus far); and
- Mumbai and Mogadishu (the final round of testing was planned to commence soon).

2.13 India confirmed that its Space-based ADS-B (SB ADS-B) capability would be operationalised on 01 January 2021, and that its SB ADS-B service volume extended to about 50NM outside the Indian FIRs. The 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.

2.14 The operational risk at Kolkata/Dhaka –Yangon and Chennai – Kuala Lumpur interfaces (Hot Spots A1 and A2) had 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) had been resolved with the implementation of a new procedure, which had been incorporated into a new ATS Letter of Agreement (LOA) signed between Bangladesh and India, effective March 2018.

2.15 ADS-B data sharing between Kolkata and Yangon Area Control Centres (ACCs) had also been implemented in June 2018, allowing controllers to detect and resolve any issues before an aircraft passed the Transfer of Control (TOC) points. This had successfully mitigated 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, MPEAK, IGOGU, NOPEK and MEMAK). At these interfaces, ADS-B data sharing had not yet been implemented.

2.16 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.

2.17 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*).

Southeast Asian Airspace

2.18 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 trend towards the TLS at the end of 2019 (**Figure 3**).

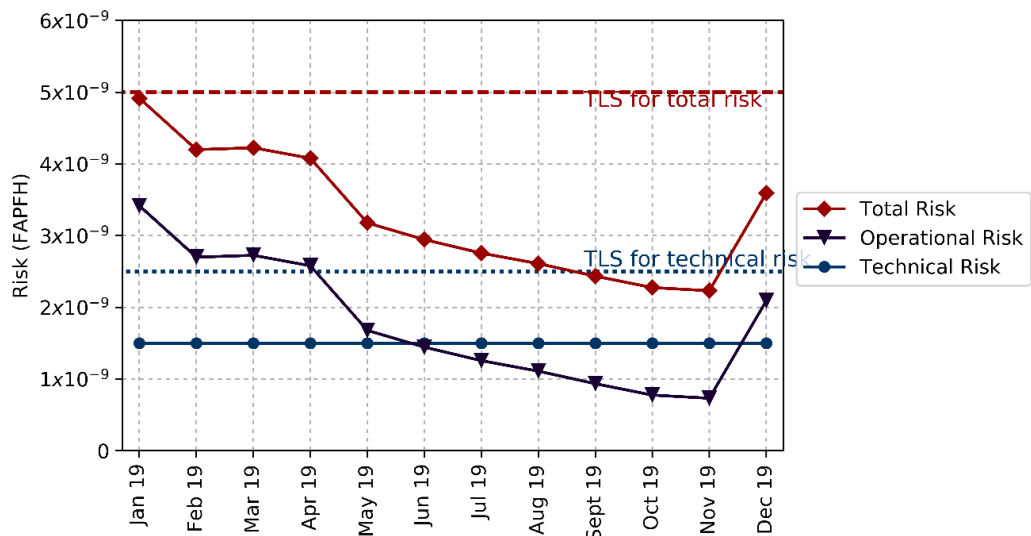


Figure 3: 2019 Vertical Risk Estimate for SEA airspace

2.19 Category E events once again formed the vast majority of occurrences, with 120 out of 145 attributed to this cause (83%). 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 4**.

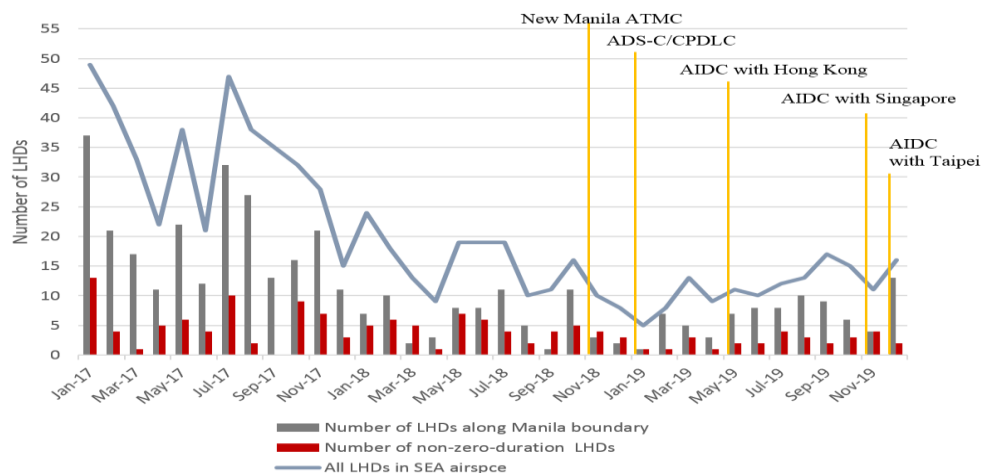


Figure 4: LHDs, Manila FIR Boundary, 2017 – 2019

2.20 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 involving the Manila FIR reported in 2019, seven of which were due to AIDC errors. The Philippines stated that this had been due to the ATM system failing to alert the controller in case of unsuccessful AIDC transfer, which was being addressed.

2.21 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 minimise human errors.

2.22 **Table 1** provides the status of Manila FIR AIDC implementation.

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 1: AIDC Implementation Status, Manila FIR

2.23 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 5**).

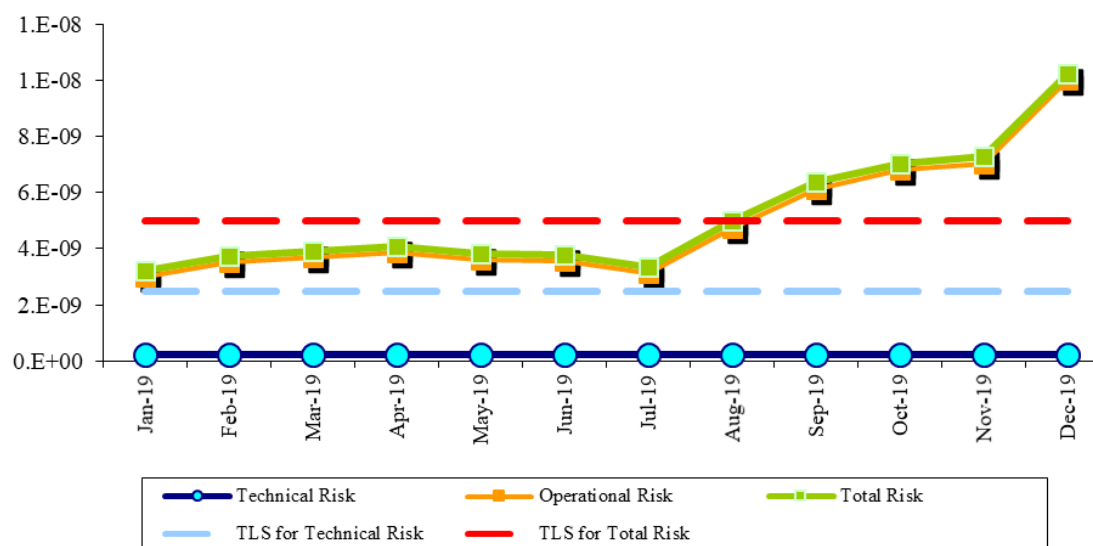


Figure 5: 2019 Vertical Risk Estimates for the Jakarta and Ujung Pandang FIRs

2.24 Since June 2019, there had been 21 non-zero-duration LHDs reported within the Jakarta and Ujung Pandang FIRs, which the meeting noted could be due to an enhanced reporting culture. The majority of LHDs (24 of 33, 73%) were Category E (*Coordination errors in the ATC-to-ATC transfer or control responsibility as a result of human factors issues*).

2.25 Indonesia informed the meeting that the status of AIDC between Jakarta and Ujung Pandang was still ‘in progress’, as AIDC:

- a) had been installed at the Ujung Pandang ACC and implemented with Australia;
- b) had been trialled since April 2020 between Ujung Pandang and Manila, 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.

2.26 Singapore had 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 Required Navigation Performance (RNP)10 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.

2.27 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 result 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.

Chinese Airspace

2.28 The 2019 RVSM risk estimates for the Beijing, Guangzhou, Kunming, Lanzhou, Pyongyang, Sanya, Shanghai, Shenyang, Urumqi and Wuhan FIRs indicated that the TLS had been met at **1.367 x 10⁻⁹**.

2.29 China had noted 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, after a Very High Frequency (VHF) station, an ADS-B station had been established at Taxkorgan in 2015 and another ADS-B station had been installed in 2017 at Shache airport.

Pyongyang FIR Airspace

2.30 The 2019 RVSM risk estimate for the Pyongyang FIR indicated that the TLS had been met at **3.02 x 10⁻⁹**, as no LHD had been reported during 2019. However, the technical risk exceeds the target level of technical risk of 2.5 x 10⁻⁹, which rarely occurs. China indicated that this would be further investigated.

Mongolian Airspace

2.31 The 2019 RVSM risk estimate for Mongolian airspace indicated that the TLS had been met at **1.07 x 10⁻⁹**.

Japanese Airspace

2.32 The vertical safety assessment for the Fukuoka FIR’s RVSM airspace by the Japan Airspace Safety Monitoring Agency (JASMA) during 2019. The 2019 RVSM risk estimate for the Fukuoka FIR indicated that the TLS had not been met at **11.57 x 10⁻⁹** (**Figure 6**).

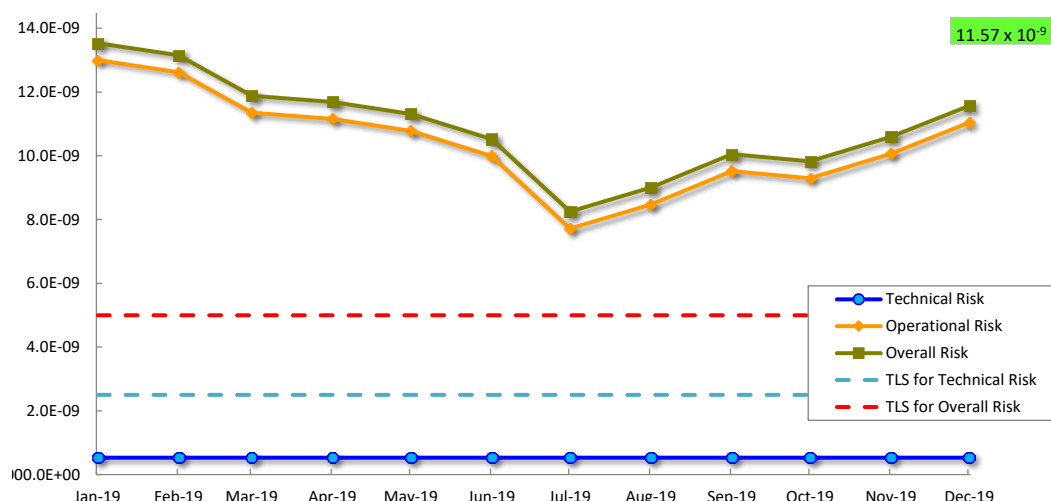


Figure 6: 2019 Vertical Risk Estimate for the Fukuoka FIR

2.33 With regard to the Category D (*ATC system loop error*) events, Japan 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 a number of these incidents were due to similar call signs.

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

2.35 Noting the grave safety risks from such occurrences, the meeting agreed to the following Draft Conclusion (to be reviewed by the ATM/SG/8 and the AOP/SG, **Attachment A** provides a copy of the AOP/SG WP on this matter).

Draft Conclusion RASMAG/25-3: Alphanumeric Call Sign Initiative	
<p>What: Noting:</p> <p>1) the extreme safety risks associated with pilot-ATC miscommunication and the number of Category D (ATC Loop Error) Large Height Deviations (LHDs);</p> <p>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</p> <p>3) alphanumeric call signs were a well-established call sign confusion mitigation, that:</p> <p>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.</p>	<p>Expected impact:</p> <p><input checked="" type="checkbox"/> Political / Global</p> <p><input type="checkbox"/> Inter-regional</p> <p><input checked="" type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Ops/Technical</p>
<p>Why: The Asia Pacific ANCS call-sign project had not been universally supported by aerodrome operators and ANSPs thus far.</p>	<p>Follow-up: <input type="checkbox"/> Required from States</p>
<p>When: 16-Dec-20</p>	<p>Status: Adopted by Subgroup</p>
<p>Who: <input checked="" type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other: RASG</p>	

2.36 There had been six LHDs at **Hot Spot D** at the FIR boundary between the Manila and Fukuoka FIRs during 2019, five of which occurred on transfer from Manila ACC to the Kobe ACC, and one occurred on transfer from Kobe ACC to Manila ACC. These LHDs were caused by a lack of the latest transfer information with the revised altitude. This represented a reduction compared to 2017 and 2018, as a result of measures taken by the Philippines.

2.37 At **Hot Spot L** on the FIR boundary between the Khabarovsk and Fukuoka FIRs, there had been three reported LHDs as a result of an incorrect transfer from the Khabarovsk ACC to the Sapporo ACC. There were two factors – no revised transfer information for an altitude change, and a misunderstanding of the transfer altitude.

2.38 Japan provided an overview of its investigation of the high number of Category J (*Aircraft Collision Avoidance System Resolution Advisory (ACAS RA) resolution advisory*) LHD events reported within the Fukuoka FIR. There had been 27 such events reported in 2019, about 42% of the total. Of these 27 reports, 20 were deemed to be ‘nuisance’ RAs, while 7 were confirmed as being genuine. The meeting discussed the identification of Category J events as LHDs, given that these were not taken into account in risk modelling or ATC separations as an independent safety net action using the command authority of a pilot to initiate a safe trajectory.

2.39 The horizontal separations based on Performance-Based Navigation (PBN) both met the TLS within the Fukuoka FIR, with 50NM lateral achieving 1.45×10^{-9} and 30NM longitudinal estimated risk at 0.015×10^{-9} . However, the 10-minute time-based risk did not meet the TLS at 20.1×10^{-9} , due to inaccurate trajectory data until a major programme update in June 2019; although the risk estimate was expected to be stable in 2020.

Incheon FIR

2.40 The 2019 RVSM risk estimate for the Incheon FIR (not including the AKARA - FUKUE Corridor) airspace indicated that the TLS had been met at 1.07×10^{-9} .

AKARA – FUKUE Corridor

2.41 The USA provided an RVSM safety report for the AKARA-FUKUE Corridor airspace containing ATS route A593 with crossing routes Y711 and Y722/B576 within the Incheon FIR. The AKARA corridor airspace involved four FIRs (Fukuoka, Incheon, Taipei and Shanghai) and four RMAs and had a unique, Annex 11 non-compliant arrangement, whereby two ATC units provided services within the same airspace. Due to enhanced reporting, there had been an increase to 29 LHDs, which had resulted in a 57% increase in the estimated vertical risk to 247.0×10^{-9} . (**Figure 7**). The risk estimate result exceeded the TLS by a factor of nearly 50 times, significantly more than an order of magnitude.

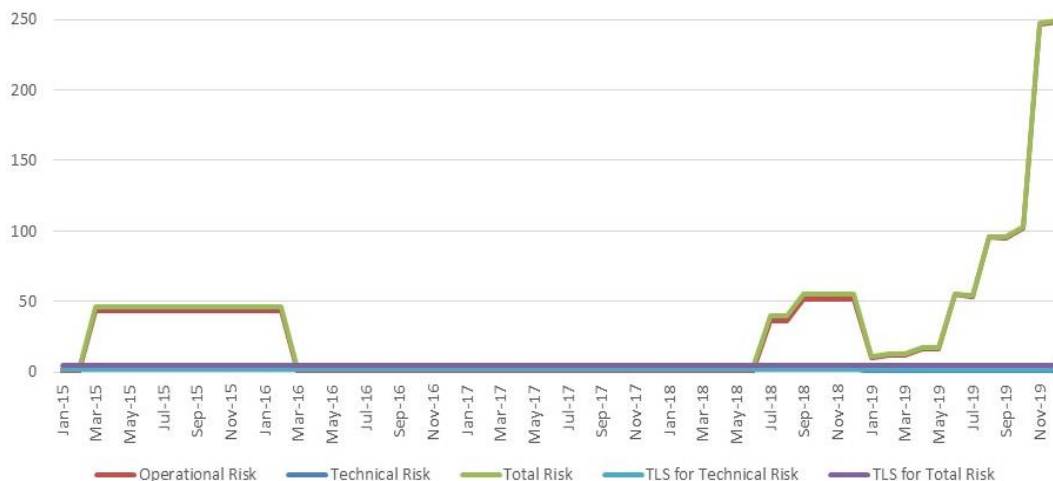


Figure 7: AKARA Twelve-month Rolling Vertical Collision Risk Estimates, 2015 – 2019

2.42 The numbers of reported LHDs within this airspace had been increasing rapidly, with only three in 2015 and 2016, and none in 2017. After discussions at RASMAG on the need for improved safety reporting, a major increase of 19 for 2018 was recorded, and again in 2019 29 LHDs were recorded, 16 of which were Category E (55%), seven were Category D (24%) and one each for Category A and Category B (7% together). Locations of the LHD events are indicated in **Figure 8**.

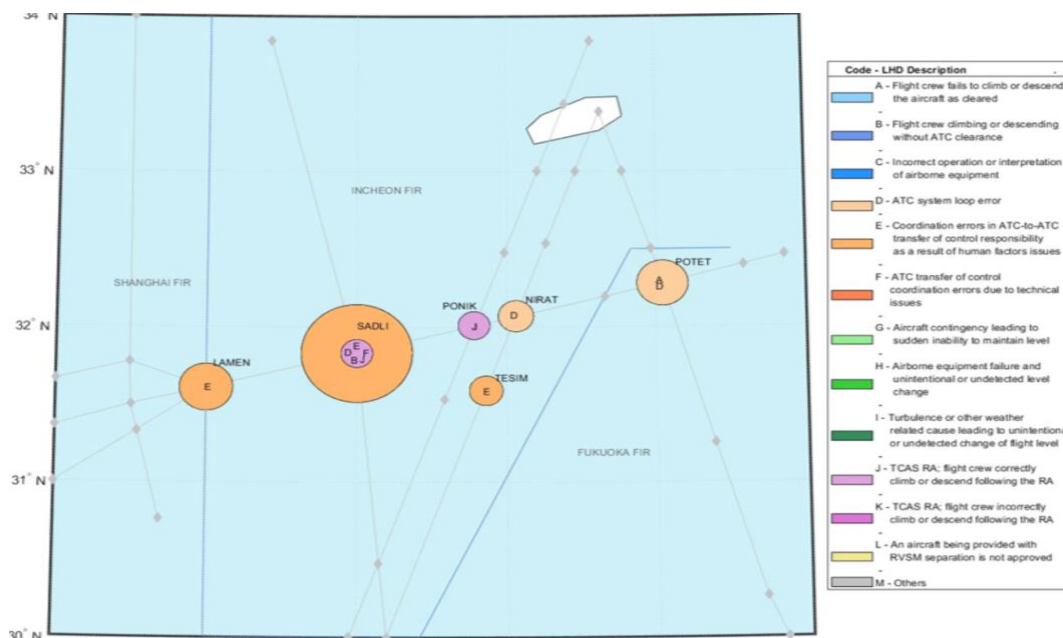


Figure 8: Locations of 2019 Reported AKARA Corridor LHDs

2.43 Due to the seven Category D events (*ATC Loop Error*), Japan had circulated an advisory to ATC, aircraft operators, IATA and IFALPA which emphasized the need to take particular care to avoid pilot – ATC miscommunication. Japan also stressed the importance of sharing safety reports.

2.44 ICAO thanked JASMA for their efforts to improve safety within this airspace. Noting that mitigations of this nature were insufficient to completely reduce risk due to the Annex 11 non-compliant airspace arrangements, ICAO stated that compliant operations must urgently replace the outdated current arrangement. In this regard, it was stressed that every day that States provided ATC services within the Corridor in accordance with the current arrangements, it exposed those States to unnecessary risk. Japan was urged to complete the process of updating its coordination agreement with the ROK as soon as possible, in order to facilitate a safe and orderly change so that only one ATC unit provided services within this airspace, which will have new additional ATS routes.

2.45 Moreover, the meeting noted that the lower traffic environment due to COVID-19 was probably an optimal time to consider change, and the need to assist airline recovery post-COVID-19 with greater efficiencies was also an important consideration. Japan and the ROK responded positively by agreeing that this was an ideal time to move forward with necessary ATS changes (traffic was reportedly only one quarter that of 2019 levels). The meeting requested ICAO HQ to convene a meeting of the Technical Working Group (TWG) to agree to the finalised changes and implementation timeline.

2.46 China RMA stated that it was a good idea to hold the meeting in the ICAO HQ, because China had established an authorised team to manage specific AKARA issues. China RMA did not have access to detailed information of these discussions; thus the China RMA could not comment on the process of discussions to resolve the AKARA – FUKUE Corridor at this meeting.

2.47 The ROK provided comprehensive information on its analysis process of the proposed changes to the AKARA – FUKUE Corridor arrangement, and its capability to provide ATS within the airspace concerned. The ROK noted that after a period of slow progress due to the COVID-19 pandemic, the States concerned had resumed negotiations. The ROK stressed that while the pandemic had temporarily reduced the air traffic volume, safety concerns may resurge at any time with an expected increase of traffic in the future. As such, ROK stated that they were convinced that a timely transition to the new ATS structure should occur now.

Southwest Pacific - Australian Airspace

2.48 The 2019 RVSM risk estimates for Brisbane, Honiara, Melbourne, Nauru and Port Moresby FIRs indicated that the Target Level of Safety (TLS) of 5×10^{-9} had been met at 1.37×10^{-9} .

Pacific Airspace

2.49 The 2019 RVSM risk estimate for Pacific airspace indicated that the TLS had not been met at 31.41×10^{-9} (Figure 9).

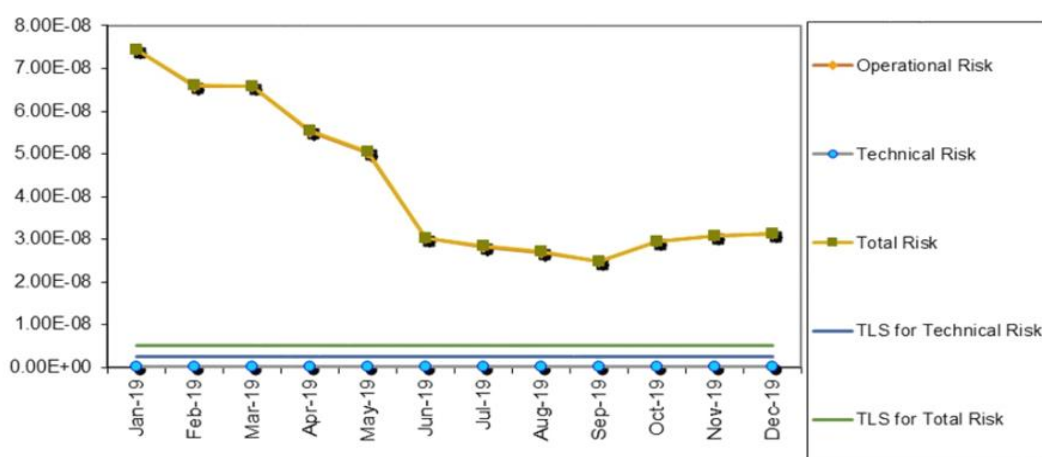


Figure 9: 2019 Vertical Risk Estimate for Pacific airspace

2.50 Of the 83 LHDs, 67 had been classified as Category E (81%). This was a change from previous years where air crew errors in Category A and B had been the top contributors. There had been an increase of 61 Category E LHDs from transfer errors between Honolulu Control Facility (HCF) and the Oakland Oceanic FIR within the Central East Pacific (CEP) traffic flow. Extra resources had been provided to the ATC units concerned to investigate the underlying causes and a task force had been established that included personnel from both facilities.

2.51 The USA described a number of improvements as a result of reported occurrences in 2019:

- AIDC had been implemented between the Anchorage Oceanic and Magadan FIRs;
- an ATC facility took action to organise a work group to examine ‘nuisance’ messages that may be disregarded by controllers as false alerts;
- an ATC facility conducted training for controllers on the use of HOLD messages in the automation system, and is now part of the annual refresher training; and
- the use of an ADS – Contract (ADS-C) Altitude Range Change (ARC) event contract to detect when an aircraft moves outside the prescribed altitude range.

2.52 The Pacific horizontal safety monitoring report for the 30/50NM lateral, 30NM and 50NM longitudinal risks were estimated to meet the TLS at 3.35×10^{-9} , 4.08×10^{-9} and 2.22×10^{-9} respectively.

Regional Airspace Safety Assessment

2.53 The following risk estimates were calculated for Asian and Australian airspace monitored by AAMA, MAAR, China RMA, SEASMA and BOBASMA in 2019:

- a) Vertical: RVSM operations were non-compliant with the TLS at **12.88 x 10⁻⁹** (a decrease from 12.53 x 10⁻⁹ (2016), 27.30 x 10⁻⁹ (2017) and 15.50 x 10⁻⁹ (2018); and
- b) Horizontal: all separations, including 30NM, were compliant with the TLS at **0.0001 x 10⁻⁹** (30NM lateral) and **0.25 x 10⁻⁹** (50NM longitudinal), an appreciable improvement since 2018 (0.52 x 10⁻⁹ and 3.91 x 10⁻⁹ respectively).

2.54 The following risk estimates were calculated for Pacific airspace monitored by JASMA and PARMO in 2019:

- a) Vertical: RVSM operations were non-compliant with the TLS at **30.21 x 10⁻⁹** (an increase from 5.01 x 10⁻⁹ (2016), 7.30 x 10⁻⁹ (2017) and 19.40 x 10⁻⁹ (2018); and
- b) Horizontal: all separations except for 10 minute longitudinal were compliant with the TLS at **3.35 x 10⁻⁹** (50NM 1.45 x 10⁻⁹, 50NM longitudinal 2.02 x 10⁻⁹ and 30NM longitudinal 4.10 x 10⁻⁹).

2.55 **Figure 10** is an Asia/Pacific RVSM TLS compliance overview, as at RASMAG/25:

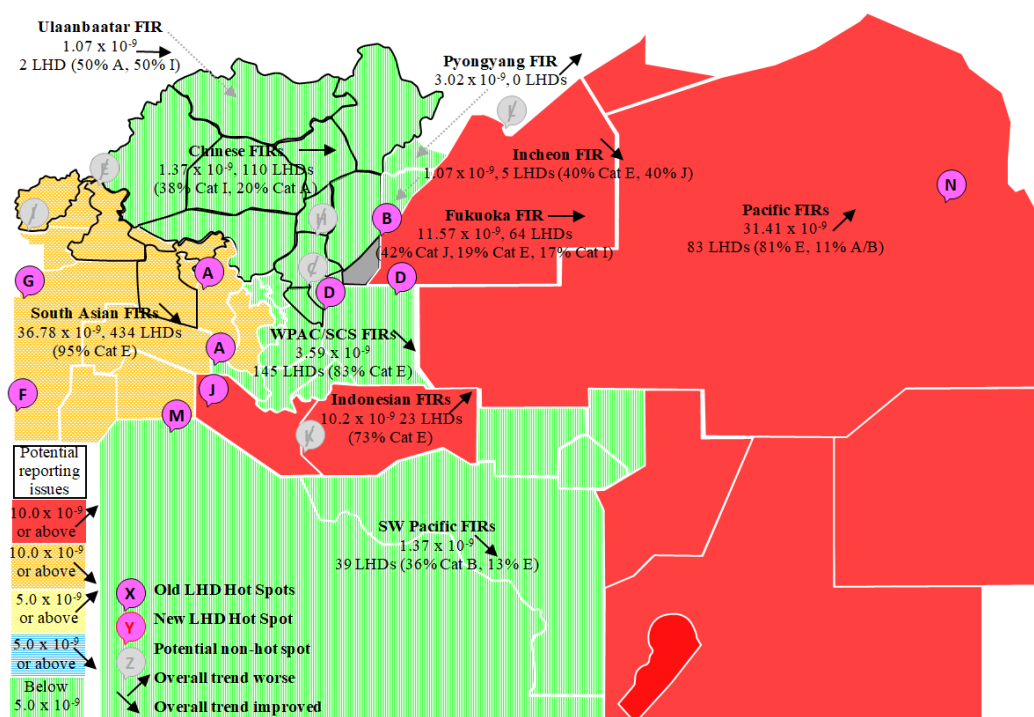


Figure 10: Asia/Pacific RVSM TLS subregion compliance reported to RASMAG/25

2.56 **Table 2** provides a comparison of Asia/Pacific Region (APAC) RVSM risk as a measure against the TLS by grouped FIRs, according to the RMA responsibilities for airspace. Over the past six years, the performance of APAC in compliance with the TLS for RVSM had been poor overall, averaging 40% when measured by the grouped FIRs. However, of the 29 FIRs that achieved TLS, 10 FIRs had potential reporting issues (discussed later in this paper).

2.57 Therefore, the compliance rate may be significantly worse than reported. In conclusion, measures taken to improve adherence to the TLS in the past six years have yielded localised improvements, but overall had failed to produce a positive result for the APAC Region as a whole.

	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

2.58 **Table 3** provides a summary of the LHD Hot Spots.

Hot Spot	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 3: Comparison Summary of LHD Hot Spots

Assessment of Non-RVSM Approved Aircraft

2.59 **Table 4** 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 4: Trend of Non-RVSM Airframes Observed

2.60 Australia had identified two aircraft that operated for at least five months without RVSM approval – one from the United States (N91GT) and one from Indonesia (PKGHG).

2.61 China had identified 24 suspected non-approved airframes in its data assessment until August 2020. The airframes from Asia/Pacific RMAs included two from Indonesia (PKLPW and PKLPY), one from India (VTSGF), one from Hong Kong China (BLDR) and five from the United States (N704GT, N621UP, N845FD, N618GA, N656FN). The Region with the most airframes was Europe (EUR RMA, 8 airframes), and the largest number of movements by a single airframe came from Bermuda, United Kingdom (VPBIN).

2.62 Japan had provided its assessment of probable non-RVSM aircraft operating within the RVSM stratum without approval, including one airframe from the ROK (HL8094) and five from the United States (N992WS, N474JS, N101AR, N173KB and N509BC).

2.63 Thailand had identified that the highest number of non-compliant Asia/Pacific aircraft came from Indonesia (12 PKAZM, PKAZN, PKAZO, PKAZP, PKGTJ, PKLDY, PKLEI, PKLEJ, PKLPW, PKLPY, PKMYC, PKGHG), eight from India (VTEHB, VTFAE, VTIJG, VTIUK, VTIUM, VTMRF, VTSHG, VTIUN), two from Australia (VHCGO, VHINT) and the United States (N175J, N656FN), and one from Thailand (HSTYV).

2.64 The United States had provided an assessment of non-State-approved operators using the RVSM airspace overseen by the PARMO. A total of nine airframes were identified, eight from the USA (N280RA, N450LR, N595LA, N625BW, N828WG, N832LA, N906CL, N266JX) and one from Canada (CGSUR).

LTHM Burden Estimate Update

2.65 RASMAG/25 had reviewed the current Long Term Height Monitoring (LTHM) burdens. During 2019 – 2020, seven States had a remaining monitoring burden over 30% (**Table 5**).

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 5: State Monitoring Burden Comparison (red = liable for APANPIRG Deficiency)

2.66 However, with the unavailability of Enhanced Global Navigation Satellite System Monitoring Units (EGMU) services due to travel restrictions during the COVID-19 pandemic, the meeting agreed to delay the proposal of any new Deficiencies for States until RASMAG/26’s review.

Safety Reporting

2.67 The 2019 safety reporting rate for various airspace was reviewed by the meeting. The DPRK had very few flying hours, so the reporting rate could not be accurately assessed by this means. However, it was clear that Mongolia ATC was still having reporting issues with a ratio of one report every 82,138 hours filed. When comparing the reporting ratio from 2017 until 2019, the data also indicated that Indonesia, ROK, and the AKARA – FUKUE Corridor, Pacific and Southwest Pacific airspace all had indications of significantly improved safety reporting.

2.68 Thailand noted that measuring how well an organization reports hazards and incidents had been a challenge and the use of reported incident numbers as an 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 cultures. Notwithstanding this, the meeting noted that there were some signs of reporting culture improvement, including positive trends in India (Mumbai and Chennai ACCs). ACCs that had always submitted a NIL report for deviations were:

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

2.69 Thailand also clarified that controllers tended to report LHDs only when made by their neighbouring FIRs. In 2019, only 15% of all LHDs were reported by the AC that had made the error. ACCs with good reporting culture that submitted this type of LHD report were:

Singapore, Manila, Kota Kinabalu and Kuala Lumpur.

2.70 RASMAG/25 had determined that the following States had potential reporting issues:

- a) Afghanistan, which did not report any LHDs during 2020;
- b) India – Delhi and Kolkata FIRs (although Mumbai and Chennai had made distinct improvements); and
- c) Mongolia had a rate of reported LHDs per hour that was very low, many factors less than that expected.

2.71 **Table 6** provides an overview of the proportion of Category E (ATC – ATC Transfer Errors) over the period 2016 – 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 6: Category E Proportions of Reported LHDs, 2017 - 2019

2.72 **Table 6** indicates data for the period 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 areas that do utilise AIDC, Category E events normally constituted a much smaller proportion of between 19 – 44% (average 29%).

2.73 As China had not comprehensively implemented AIDC, the very low proportion of 7% Category E events on average had been noted by RASMAG/24 and RASMAG/25 as being implausibly 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 increase improve reporting culture that resulted in a steep increase in reports, China RMA was urged to consider steps to further strengthen its ‘Just Culture’ policies and effective implementation of those policies to support open reporting of safety occurrences.

2.74 RASMAG/25 reminded States, even those that had taken significant 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*.

2.75 Given that operational errors constituted by far the vast majority of safety risk in both the vertical and horizontal planes, the assurance of having an appropriate safety reporting culture was one of the most critical functions of airspace safety monitoring agencies. Yet, analysis of safety reporting culture, associated policies and the identification of potential missing reports remained almost non-existent in RMA/EMA safety reports. 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.

2.76 RASMAG/25 agreed to the following Decision on safety reporting.

Decision RASMAG/25-4: Safety Reporting Assessments	
What: 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.	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: Very few RMA and EMA safety reports include an analysis of reporting culture; yet this is demonstrably important to verify the validity of the data being used.	Follow-up: <input type="checkbox"/> Required from States
When: 30-Oct-20	Status: Draft to be adopted by Subgroup
Who: <input type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:	

Summary Report of Identified Airspace Risk Occurrences

2.77 Singapore had presented an analysis of LHDs and Gross Navigation Errors, the impact of COVID-19 on ATC operations, and associated mitigations. Examples of lessons learnt were the:

- a) use of available aide memoirs as reminders to controllers of any outstanding task such as checking for AIDC transfer failures at boundary points; and
- b) minimisation of last minute flight levels revisions near transfer boundaries.

2.78 Due to the reduction in air traffic as a result of the COVID-19 pandemic, key safety hazards were identified. Their corresponding mitigations for ATC were as follows:

- a) mental fatigue, reduced alertness and distractions were mitigated by merging ATC positions to increase the sector area and maintain a healthy level of stimuli;
- b) limited On-Job-Training (OJT) opportunities and challenges making realistic and accurate assessments of trainees’ competency were addressed through OJT revision and a validation assessment framework to allow the use of ATC simulators; and
- c) skill fade of controllers related to the handling of pre-COVID traffic volume and scenarios was managed with a revised programme for proficiency checks and continuous training (comprised of various exercises using pre-COVID traffic volume and complexity which are made available at all simulators).

ANS Deficiencies List

2.79 The meeting reviewed the APANPIRG ANS Deficiency List and agreed to make the following recommendations to APANPIRG/31:

- a) deletion of the Deficiency for Myanmar related to PRs not being provided to the CRA;
- b) deletion of the Deficiency for, Bhutan and Lao People’s Democratic Republic (PDR) related to non-provision of the annual RVSM approval snapshot;
- c) deletion of the Deficiency for Bangladesh, French Polynesia and Pakistan related to non-provision of the TSD and LHDs;
- d) deletion of the LTHM Deficiency for Malaysia; and
- e) 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 snapshots for 2018 and 2020.

Production of the Asia/Pacific Region Combined PBCS Monitoring Report (WP40)

2.80 USA presented a recommended process for the production of the Asia/Pacific Region Combined 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.

2.81 It was 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 FIT-IPACG and FIT-ISPACG. 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, the proposed 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. The meeting agreed to the following Decision:

Decision RASMAG/25-5: Rotational Responsibility for the Production of the Combined PBCS Monitoring Report	
<p>What: That, FIT-Asia will produce an annual Combined PBCS Monitoring Report, as follows:</p> <ol style="list-style-type: none"> 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. 	<p>Expected impact:</p> <p><input type="checkbox"/> Political / Global</p> <p><input type="checkbox"/> Inter-regional</p> <p><input type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Ops/Technical</p>
<p>Why: To improve PBCS system performance within APAC and other ICAO Regions</p>	<p>Follow-up: <input type="checkbox"/> Required from States</p>
<p>When: 30-Oct-20</p>	<p>Status: Adopted by Subgroup</p>
<p>Who: <input type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: FIT-Asia</p>	

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- b) note the information contained in this paper;
- c) discuss the elevated vertical safety risks at identified RVSM Hot Spots as appropriate;
- d) note the reduction in reported non-RVSM airframes operating within RVSM airspace;
- e) discuss and endorse **Draft Conclusion RASMAG/25-3: Alphanumeric Call Sign Initiative**;
- f) discuss the safety reporting issues identified by RASMAG/25 as appropriate; and
- g) discuss any other relevant matters as appropriate.

.....



ICAO

The Fourth Meeting of the Aerodromes Operations and Planning Sub-Group (AOP/SG/4)

10 to 13 November 2020

Agenda Item 4: Provision of AOP in the Asia/Pacific Region – Certification and Operations of Aerodromes

ALPHANUMERIC CALL SIGN INITIATIVE

(Presented by ICAO)

SUMMARY

This paper provides information on the safety requirement for alphanumeric call sign use in radio communication, and the need for support by aerodrome and aircraft operators.

1. INTRODUCTION

1.1 The root cause for a significant number of airspace incidents, including Large Height Deviations (LHDs) and runway conflicts had been identified for many decades as radiotelephony call sign confusion, when a pilot incorrectly responds to an Air Traffic Control (ATC) instruction to another aircraft, or in some cases, when an air traffic controller provides an incorrect instruction to an aircraft with a similar call sign to that intended.

1.2 IATA had been actively promoting the use of alphanumeric call signs globally, due to the safety implications. As a result of a major alphanumeric call sign trial in the Middle East (MID) Region led by Emirates Airlines, the MID Region had widely implemented alphanumeric call signs.

1.3 With the support of IATA, the Asia Pacific Alphanumeric Call Sign project had been agreed at ATMSG/4 and endorsed at APANPIRG 27 through conclusion 27/15.

Conclusion APANPIRG/27-15: Use of Alphanumeric Call Signs for Scheduled Airline Operations	
What: That, ICAO conducts a Survey of Asia Pacific States to ascertain the status of capability to accept / process alphanumeric ATC call-signs for scheduled airline operations. Region.	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: To determine the ability of Asia/Pacific States to accept and process alphanumeric call-signs.	Follow-up: <input type="checkbox"/> Required from States
When: 1-Aug-17	Status: Adopted by PIRG
Who: <input type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other: RASG	

1.4 During the IATA MID trial and from the APAC survey, some of the implementation challenges were:

- the possible need for software changes, in order to show both the commercial call sign visible to passengers and the alphanumeric call sign used by ATC, pilots and airport operational staff (such as gate operators); and
- a split between ATC call sign and commercial flight number.

1.5 Regarding airport systems, there was no single solution. When individual airports were reviewed, it became apparent that flight numbers were used in a plethora of interfaced systems beyond the obvious, such as the arrival and departure information boards and web sites. One example of a system that wasn't immediately obvious requiring adaptation was the parking stand guide in system at Dubai airport.

2. DISCUSSION

2.1 The Twenty-Fifth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/25) was held from 27 to 30 October 2020 by Video Teleconference (VTC) from the ICAO Asia and Pacific Regional Office, Bangkok, Thailand.

2.2 With regard to ATC 'loop error' LHD events, Japan had provided a detailed analysis to the meeting regarding of these incidents were due to similar call signs.

2.3 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 Asia/Pacific (APAC) Region. One of the reasons for this had been the reluctance of aerodrome operators to implement change until an automated tool was available to accommodate alphanumeric call signs.

2.4 Noting the grave safety risks from such occurrences, the RASMAG/25 meeting agreed to the following Draft Conclusion (to be reviewed by the ATM/SG/8 and the AOP/SG).

Draft Conclusion RASMAG/25-3: Alphanumeric Call Sign Initiative	
<p>What: 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.</p>	<p>Expected impact: <input checked="" type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input checked="" type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical</p>
<p>Why: The Asia Pacific ANCS call-sign project had not been universally supported by aerodrome operators and ANSPs thus far.</p>	<p>Follow-up: <input type="checkbox"/> Required from States</p>
<p>When: 30-Oct-20</p>	<p>Status: Adopted by Subgroup</p>
<p>Who: <input checked="" type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other: RASG</p>	

2.5 For aerodrome operators, from the MID Region’s experience, the suggested course of action is to target the interface point at which the airport systems ingest the flight information. At this interface a process is required that translates an alphanumeric call sign into commercial flight numbers. The interface process could be an information technology ‘translator application’ or simply a person with a spreadsheet manually translating (most commonly at seasonal schedule submission). Once translated, all airport downstream systems will only deal with the commercial flight number. Hence no further adaptation is required.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information in this paper;
- b) discuss and endorse Draft Conclusion RASMAG/25-3 for APANPIRG/31 to consider; and
- c) discuss any other related matter.

.....