International Civil Aviation Organization

Twenty Sixth Meeting of the Communications/ Navigation and Surveillance Sub-group (CNS SG/26) of APANPIRG

Video Tele-Conference, 5 – 9 September 2022

Agenda Item 2: Review outcomes of APANPIRG/RASG Chairpersons review, APANPIRG/32 meeting, DGCA/57 meeting, ATM Sub-group and other major meetings relevant to CNS Sub-group

AIR TRAFFIC MANAGEMENT AND AIRSPACE SAFETY MONITORING OUTCOMES

(Presented by the Secretariat)

SUMMARY

This paper presents key outcomes from the technical working groups established under the oversight of the Air Traffic Management and Regional Airspace Safety Monitoring Advisory Sub-Groups of APANPIRG, and other information relevant to CNS Sub-Group.

1. INTRODUCTION

1.1 The Ninth Meeting of the Air Traffic Management Sub-Group of APANPIRG (ATM/SG/9) was held from 01 to 05 November 2021.

1.2 ATM/SG/10, scheduled to be held from 17 to 21 October 2022, will consider outcomes from the following meetings:

- The First Meeting of the South Asia, Indian Ocean and Southeast Asia ATM Coordination Group (SAIOSEACG/1, 28 March to 01 April 2022);
- The Seventeenth Meeting of the Aeronautical Information Services (AIS) – Aeronautical Information Management (AIM) Implementation Task Force (AAITF/17, 20 to 24 June 2022); and
- The Air Traffic Flow Management (ATFM) and Airport Collaborative Decision-Making (A-CDM) Webinar and Twelfth Meeting of the ATFM Steering Group, which will be held from 12 to 16 September 2022.

1.3 The Twenty-Seventh Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/27) was held by video teleconference from 22 to 25 August 2022. RASMAG, being the responsible APANPIRG Sub-Group, also reviewed the outcomes of the Twelfth Meeting of the Future Air Navigation Services (FANS) Interoperability Team – Asia (FIT-Asia/12, 25 to 28 July 2022).

1.4 A summary of ICAO global activities in the field of Unmanned Aircraft Systems (UAS) is also provided.

2. DISCUSSION

ATM/SG/9

Election of Chair

2.1 Mr. Kuah Kong Beng, Director (Special Project), Civil Aviation Authority of Singapore, was re-elected to the Chair of ATM/SG.

RASMAG/26 Outcomes

2.2 RASMAG/26 had considered a request from the Regional Monitoring Agencies Coordination Group (RMACG) that all RMAs request clarification from their respective PIRGs on responsibilities of the RMA regarding verification of the approval status of State aircraft (military and other government aircraft performing non-commercial, sovereign functions) and their relation to civil authorities. The 'rogue' aircraft (those that included 'W' in flight plans but did not have matching Reduced Vertical Separation Minimum – RVSM - approval) that persistently remained on the list were mostly State aircraft. In order for the rogue State aircraft to be removed from the list either the State aircraft's approval data had to be provided to the designated RMA, or the State aircraft operator had to stop using 'W' in item 10 of the ICAO flight plan.

2.3 The following Draft Conclusion proposed by RASMAG/26 was not endorsed by the meeting.

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

That, States are urged to:

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

2.4 While noting the need for RVSM approval for all aircraft that included the RVSM indicator in flight plans, for the safety of operations in the airspace, the meeting considered that there would be considerable difficulty in sharing data on State aircraft outside the State. Items 1a. and 1b. of the Draft Conclusion were not supported by ATM/SG, but the remainder was acceptable.

2.5 APANPIRG/32 (30 November to 02 December 2021) subsequently adopted ***Conclusion APANPIRG/32-6: RVSM Approvals Data and Filing of RVSM Indicator in Flight Plans of State Aircraft***, which did not include items 1a and 1 b of the Draft Conclusion.

Seamless ANS Plan and Monitoring Update

2.6 The ATM/SG/9 meeting was informed of the current status of *Asia/Pacific Seamless Air Navigation Services (ANS) Plan* reporting, and the implementation progress of air navigation improvements in the APAC Region. Due to the lack of a current reporting system the ICAO Regional Office was not able to update the current implementation status; the reporting portal had not been updated to match the 6th Edition of GANP and the current Version 3.0 of the Seamless ANS Plan. Implementation status information provided in the paper was as of March 2019, and therefore unchanged since reported to ATM/SG/8 in 2020. The meeting was reminded of ***APANPIRG Conclusion 30/6 - ICAO HQ Support for Regional ANS Implementation***.

2.7 The meeting was also reminded that implementation of the ten priority regional targets for Phase I of the Seamless ANS Plan (November 2015 to November 2019) had in general not been achieved. There were now 16 priority ASBU Block 0 and 1 and regional elements.

National Air Navigation Plan Implementation Reporting

2.8 Information was provided on the need for States to develop a National Air Navigation Plan (NANP) as detailed in Section 9 of the Seamless ANS Plan and included among the *specific regional requirements* of the Regional Air Navigation Plan (ANP) Vol II. To align with other APAC plans that were subsidiary to the Seamless ANS Plan the Regional Office had developed a NANP reporting form. ICAO presented ***Draft Conclusion ATM/SG/9-X: National Air Navigation Plan Reporting Form***, to provide a standardized regional means for annual reporting on implementation of the Basic Planning Elements (BPE) of NANPs, as listed in ANP Vol II. China did not support the Draft Conclusion, and the meeting was therefore unable to reach consensus on this proposal.

2.9 ICAO reminded the meeting that ANP Vol II Part I Section III (relevant excerpt provided in Flimsy 01) placed a requirement on States to report their NANP implementation progress and the status of its applicable global and regional elements at least once each year. It was noted that other APANPIRG Sub-Groups were also monitoring the progress of this matter as they too had an interest in how NANP progress would be reported. The ATM/SG report to APANPIRG/32 included discussion of this matter, to ensure APANPIRG awareness of a regional reporting requirement that could not currently be met.

Application of ATC Separation Minimums

2.10 In discussing the poor response (12 Administrations) to the annual survey on ATC separation minimums that were being applied within the APAC Region the meeting was reminded that that responding to the survey required few resources, and was an important activity to understand whether service delivery in the region was matched with the capability of aircraft and ground systems. , as compared to the provisions of elements 7.34 and 7.35 of the Seamless ANS Plan

2.11 ATM/SG/9 agreed to Draft Conclusion ATM/SG/9-1, which was subsequently adopted by APANPIRG/32:

Conclusion APANPIRG/32-3: Implementation of Efficient ATS Horizontal Separation and Transfer of Control Aircraft Spacing

That, given the global priority to support airlines' recovery from the unprecedented negative economic consequences of the COVID-19 pandemic, and the suitable low traffic environment:

a) States/Administrations are strongly urged to review and update their National Air Navigation Plans (NANPs) to ensure that Air Navigation Service Providers (ANSPs) fully implement the horizontal separation and aircraft spacing elements in the Asia/Pacific Seamless ANS Plan V3.0; and

b) ICAO considers the need for seminars, workshops and other educational material to support this implementation.

ATFM/SG Outcomes

2.12 Noting the planned dissolution of the Asia/Pacific A-CDM Task Force (APA-CDM/TF), ATM/SG/9 agreed to Draft Decision ATM/SG/9-2, proposing a revision to the ATFM/SG Terms of Reference to include ongoing regional A-CDM activity. APANPIRG/32 subsequently agreed to the proposed dissolution of APA-CDM/TF, and adopted ***Decision APANPIRG/32-4: Revised ATFM/SG Terms of Reference***.

Missing Departure (DEP) Messages

2.13 ICAO provided an update on the issue missing DEP messages, as discussed at multiple meetings of the ATFM/SG and ATM/SG since and including ATFM/SG/8 (2018) and ATM/SG/7 (2019). The meeting was reminded of ***Conclusion APANPIRG/27/12: Origination and Distribution of Departure (DEP) Messages***, and ***Conclusion ATM/SG/7-5: ATS Message Reception and Handling***.

2.14 In discussing the ATS message addressing procedures provided in ICAO Doc 4444 – Procedures for Air Navigation Services - Air Traffic Management (PANS-ATM) 11.2.1.2.3.3 it was suggested that the additional addresses for movement messages highlighted in **ATM/SG/9 WP/12 Attachment A** as published in State Aeronautical Information Publications (AIPs) were compliant with PANS-ATM provisions. It was also suggested that the provisions in the PANS were potentially confusing and may require improvement, recognizing the importance of DEP message information in ATM. USA informed the meeting that they had substantial internal re-distribution requirements for FPL and associated ATS messages, but the only addressing requirement in AIP USA ENR 1.11 was [FIR location indicator]ZQZX for each FIR entered by a flight. ICAO mentioned that there were a number of other APAC States that had this level of capability.

2.15 ICAO informed the meeting that States were encouraged to submit working papers on the subject to the relevant technical panel meetings, in this case the ATM Operations Panel (ATMOPSP).

2.16 The meeting was further informed that the raising of APANPIRG Deficiencies had previously been considered for cases where non-compliant addresses were specified in State AIP, but this would only be the case if any State failed to correctly process messages that were correctly addressed to [FIR location indicator]ZQZX. It was noted that several States had amended their AIP Section ENR 1.11 to more closely comply with the PANS-ATM provisions

<u>SAIOSEACG/1</u>

2.17 SAIOSEACG was formed under ***Decision APANPIRG/32-5: Combining SAIOACG and SEACG Groups to form the South Asia, Indian Ocean and Southeast Asia ATM Coordination Group (SAIOSEACG)***, in recognition of the large cross-over of work between the two groups, and the resource challenges to States/Administrations in terms of participants' travel and attendance costs for two separate meetings.

2.18 SAIOSEACG reports to ATM/SG. Secretariat support is provided by the Asia/Pacific Regional Sub-Office.

AAITF/17

AIS Workshop – WGS-84 and Data Accuracy

2.19 ICAO provided a briefing on ICAO global and regional provisions relating to the mandated use of the World Geodetic System – 1984 (WGS-84). Information included Annexes to the Convention on International Civil Aviation, Procedures for Air Navigation Services (PANS), data accuracy standards and requirements, global guidance in ICAO Doc 9674 *WGS-84 Manual*, regional planning, related APANPIRG ATM and Airspace Safety Deficiencies, and a proposed regional WGS-84 sampling program.

2.20 USA provided a detailed presentation on WGS-84 describing the WGS-84 Reference frame, Earth Gravitational Models 1996 and 2008 (EGM96 and EGM08) and their differences, and the World Magnetic Model.

2.21 The meeting was informed of the reasons for re-collection of WGS-84 data, the recommendation that data be revalidated each 5 years or after a major natural event or construction of critical airport elements, and the impact of non-maintained WGS-84 data on terminal procedures and aircraft Terrain Awareness Warning Systems (TAWS).

2.22 The information provided included discussion of the pros and cons of various methods of maintaining and revalidating data, and considerations to be taken into account when collecting, validating and publishing data.

2.23 In discussion of the outcomes from the workshop, AAITF/17 agreed to the following Draft Conclusion for consideration by ATM/SG/10:

Draft Conclusion AAITF/17-3: Revalidation of Coordinate Data

That, noting the factors that cause WGS-84 coordinate data to change over time, States are urged to ensure that all surveyed and calculated coordinate data published in AIP or used in Instrument Flight Procedure design is revalidated:

1. *each five years; or*
2. *after a major natural event such as an earthquake or volcanic eruption; or*
3. *following construction of critical airport elements,*

whichever is the sooner, by ground survey, Light Detection and Ranging (LIDAR) survey, or imagery collection.

Regional Implementation Status of AIM Performance Expectations

2.24 The performance improvement plan of the APAC Regional Plan for Collaborative AIM is arranged into three phases of implementation:

Phase I, expected to be implemented immediately, being performance expectations relating to ICAO Standards and Recommended Practices (SARPS) that have been in place for many years;

Phase II, expected to be implemented by 7 November 2019, in which legacy 'paper-based' products are transitioned into digital datasets of aeronautical information, in preparation for

Phase III, expected to be implemented by 27 November 2025, being best summarized as the exchange of aeronautical information in the SWIM environment.

2.25 **Figure 1** illustrates overall regional implementation of Phase II elements of the Regional Plan for Collaborative AIM; approximately 40% (39% in 2021). Combined progress towards implementation of Phases I and II was 50% (48% in 2021)

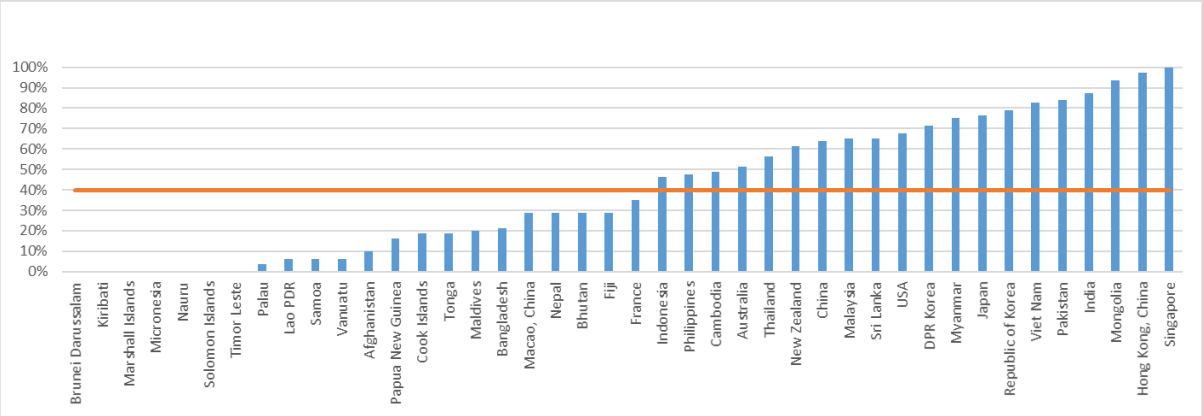

Figure 1: Regional Phase II Implementation Progress (updated 23 June 2022)

2.26 Regional implementation of Phase III elements, expected to be implemented by 2025, was approximately 13%. (12% in 2021)

ATFM/A-CDM Integration Workshop and ATFM/SG/12

ATFN/A-CDM Integration Workshop

2.27 The main objective of the integration workshop is to improve understanding by all stakeholders of the benefits A-CDM integration with ATFM can offer, and how this combined implementation could be achieved.

Review of Regional ATFM Framework and Guidance Material

2.28 A major review of the Regional Framework for Collaborative ATFM will be presented for consideration by the ATFM/SG/12 meeting. CNS SG is invited to note that the Framework includes information and regional performance expectations relating to the use of FIXM for the cross-border exchange of ATFM information, and the use of AFTN messaging where the exchange of information using FIXM is not yet enabled. The meeting is further invited to note the necessary close collaboration between ATFM/SG, the SWIM TF (APAC FIXM Extension development) and ACSICG (ATFM information exchange by AFTN).

RASMAG/27

FIT-Asia/12 Outcomes

2.29 Responding to the ***Conclusion RASMAG/26-1: FANS1/A CPDLC Latency Timer***, which introduced the use of a 300 second latency timer for Controller-Pilot Data Link Communications (CPDLC), New Zealand informed the meeting that the 300 second latency value had been used in the Auckland Oceanic FIR for four years. No significant issues had been found since implementation, and New Zealand considered their implementation had been successful. The meeting was also informed that the 300 seconds latency timer value had been implemented under trial for several years in the NAT Region, and was now formalized in the *North Atlantic Operations and Airspace Manual*.

2.30 RASMAG/27 agreed to the following Conclusion drafted by FIT-Asia/12:

Conclusion RASMAG/27-1: CPDLC Latency Monitor value

That, recognizing:

1. the need for aircraft to provide an appropriate indication when the age of the time stamp of a received CPDLC message exceeds a defined value (latency timer value), in accordance with ICAO Doc 9869 PBCS Manual safety requirement SR-15;

2. the need for a single, standardized global value.

The Asia-Pacific region adopts a latency timer value of 300 seconds for use in oceanic airspace.

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Regional Supplementary Procedures Update

2.31 The meeting was informed that the Proposal for Amendment (PfA) (Serial No. APAC-S 22/06-MID/ASIA 6) to ICAO Doc 7030 *Regional Supplementary Procedures* had been forwarded to ICAO Headquarters for review prior its circulation to all relevant States and International Organizations in order to reach Regional Air Navigation Agreement. The PfA formalized new or updated regional procedures for the implementation of performance-based separations supported by PBCS in the following FIRs: Chennai, Kolkata, Mumbai (India), Ujung Pandang (Indonesia), Manila (Philippines), Singapore, and Sanya (China).

Standardized Reporting Format and Date for Implementation Status

2.32 The Secretariat informed the meeting of a proposed a revised due date and standardised format for the various State reports of the implementation status of the SAR, Collaborative ATFM, Collaborative AIM and the ATM contingency plan. It was proposed to align the reporting dates of the mentioned implementation status reports to a common date of 28th February each year. It was further proposed that the reporting date for the annual PBCS-related Survey of Implementation Status of Performance-Based Horizontal Separation Minima be revised to the same date.

2.33 FIT-Asia/12 had discussed amending the annual PBCS survey form, used for State reporting of the implementation Status of performance-based horizontal separation minima and the PBCS action list for ANSPs. The survey form had remained unchanged since its introduction, and there were items in the form that did not reflect the current separation minima in PANS ATM (Doc 4444).

2.34 RASMAG/27 agreed to the following Conclusion drafted by FIT-Asia/12:

Conclusion RASMAG/27-2: Updated Reporting of PBCS Implementation Status and Performance Monitoring Data:

That:

1. *the revised Survey of the Status of Current and Planned Implementation of Performance-Based Separation Minima at **Appendix C to the report,** and the revised PBCS Action List for ANSPs at **Appendix D to the report** be uploaded to the ICAO Asia/Pacific Regional Office website to replace the existing; and*
2. *States are urged to submit the following to the Asia/Pacific Regional Office by not later than 28 February each year:*
   a) *the completed Survey of the Status of Current and Planned Implementation of Performance-Based Separation Minima form; and*
   b) *PBCS performance data for inclusion in the aggregated regional PBCS performance data report, using the Data Link Performance Report Template – ANSP to FIT provided on the ICAO Asia/Pacific Regional Office website.*

   Note 1: Non-FIT-Asia States may submit their PBCS performance data through the relevant FIT.

   Note 2: This Conclusion supersedes Conclusions RASMAG/22-3, 23-1, 23-2, 23-3.

Asia/Pacific Region Combined PBCS Monitoring Report

2.35 China had presented the aggregated regional data link performance monitoring report to FIT-Asia/12. **Table 1** summarised the aggregated regional performance measured against the Required Surveillance Performance (RSP) for Automatic Dependent Surveillance – Contract (ADS-C) in the Asia/Pacific Region. Overall ASP for the region had met the 95% criterion.

ACTUAL SURVEILLANCE PERFORMANCE - FIR AGGREGATE (ALL MEDIA TYPES)						
Region	Asia-Pacific Region					
Performance Criteria	RSP180					
Time Period	2021 January-June			2021 July-December		
Colour key: Meets criteria / 99.0%-99.9% / Under criteria	Message Counts	Criteria		Message Counts	Criteria	
		95%	99.90%		95%	99.90%
FIR		% < = 90sec	% <= 180sec		% < = 90sec	% <= 180sec
PAZA	1196520	98.89%	99.70%	1217086	98.72%	99.62%
RJJJ	1514208	98.30%	99.64%	1781319	98.39%	99.62%
KZAK	3436520	98.94%	99.69%	4305637	98.56%	99.53%
NFFF	98541	98.89%	99.54%	109885	99.19%	99.69%
NTTT	23879	99.72%	99.88%	42068	99.77%	99.89%
NZZO	151438	99.04%	99.80%	145725	99.13%	99.83%
YBBB	392893	99.49%	99.84%	518548	99.66%	99.89%
YMMM	346329	99.01%	99.52%	383003	99.50%	99.80%
VCCF	256657	98.69%	99.71%	251687	98.89%	99.91%
VECF				315611	98.67%	99.56%
VOMF	126634	98.52%	99.43%	148693	98.59%	99.46%
WSJC	205191	99.19%	99.85%	251035	99.23%	99.85%
ZLLL	142990	98.80%	99.70%	208842	98.80%	99.60%
ZWWW	75034	98.90%	99.70%	101660	98.80%	99.60%
VVTS	177227	98.73%	99.80%	188140	98.85%	99.83%
VYYF	172414	98.89%	99.56%	166438	98.99%	99.63%
RPHI	221669	99.29%	99.83%	273277	99.25%	99.83%
WAAF	66829	99.31%	99.75%	84031	99.38%	99.79%

Table 1: Asia/Pacific Region ASP (RSP180)

2.36 **Table 2** summarised the aggregated regional communications performance measured against Required Communications Performance (RCP) for CPDLC. Overall ACP for the region met the 95% criterion.

ACTUAL COMMUNICATION PERFORMANCE - FIR AGGREGATE (ALL MEDIA TYPES)										
Region	Asia-Pacific Region									
Performance Criteria	RCP240									
Time Period	2021 January-June					2021 July - December				
Colour key: Meets criteria / 99.0%-99.9% / Under criteria	Message Counts	ACP Criteria		ACTP Criteria		Message Counts	ACP Criteria		ACTP Criteria	
		95%	99.90%	95%	99.90%		95%	99.90%	95%	99.90%
FIR		% <= 180sec	% <= 210sec	% <= 120sec	% <= 150sec		% <= 180sec	% <= 210sec	% < = 120sec	% <=150sec
PAZA	74627	98.79%	99.27%	98.51%	98.96%	75692	98.88%	99.20%	98.76%	99.15%
RJJJ	30889	99.69%	99.83%	99.72%	99.79%	37089	99.70%	99.82%	99.71%	99.80%
KZAK	192490	99.28%	99.51%	99.51%	99.75%	236799	98.97%	99.29%	99.22%	99.52%
NFFF	2185	99,67%	99.72%	99.86%	99.81%	3148	99.68%	99.71%	99.84%	99.77%
NTTT	730	100.00%	100.00%	100.00%	100.00%	1329	99.69%	100.00%	99.77%	100.00%
NZZO	3431	99.76%	99.88%	99.88%	99.91%	3222	99.78%	99.87%	99.90%	99.93%
YBBB	11591	99.42%	99.33%	99.60%	99.57%	14683	99.62%	99.39%	99.77%	99.58%
YMMM	13777	99.32%	99.36%	99.47%	99.51%	14850	99.48%	99.50%	99.60%	99.66%
VCCF	8037	98.68%	99.70%	99.26%	99.91%	8360	98.27%	99.57%	99.21%	99.89%
VECF						22069	99.49%	99.67%	99.49%	99.67%
VOMF	34545	99.74%	99.85%	99.85%	99.89%	56992	99.72%	99.82%	99.84%	99.89%
WSJC	14786	99.19%	99.45%	99.30%	99.46%	23916	99.16%	99.49%	99.26%	99.47%
ZLLL	1582	97.97%	98.04%	98.98%	99.11%	1759	98.06%	98.29%	98.69%	98.80%
ZWWW	147	97.27%	97.95%	98.63%	98.63%	80	100.00%	100.00%	100.00%	100.00%
VVTS	43261	95.94%	96.45%	99.43%	99.72%	44881	95.70%	96.30%	99.59%	99.77%
VYYF	47863	98.45%	98.73%	98.76%	99.05%	48746	98.67%	98.99%	99.07%	99.33%
RPHI	6412	98.48%	98.67%	99.02%	99.24%	12973	98.75%	98.91%	99.24%	99.41%
WAAF	11281	98.78%	98.99%	99.76%	99.80%	13841	99.27%	99.40%	99.85%	99.88%

Table 2: Asia/Pacific Region ACP (RCP240)

Asia/Pacific Consolidated Safety Report

2.37 The Monitoring Agency for the Asia Region (MAAR) presented a combined summary of the airspace safety analysis results for the Asia/Pacific Region, on behalf of the Asia/Pacific RMAs and Enroute Monitoring Agencies (EMA)s. The following information summarizes the Safety Report.

2.38 The report was divided into the Pacific (PAC) area, and Asia area (**Figure 2**).

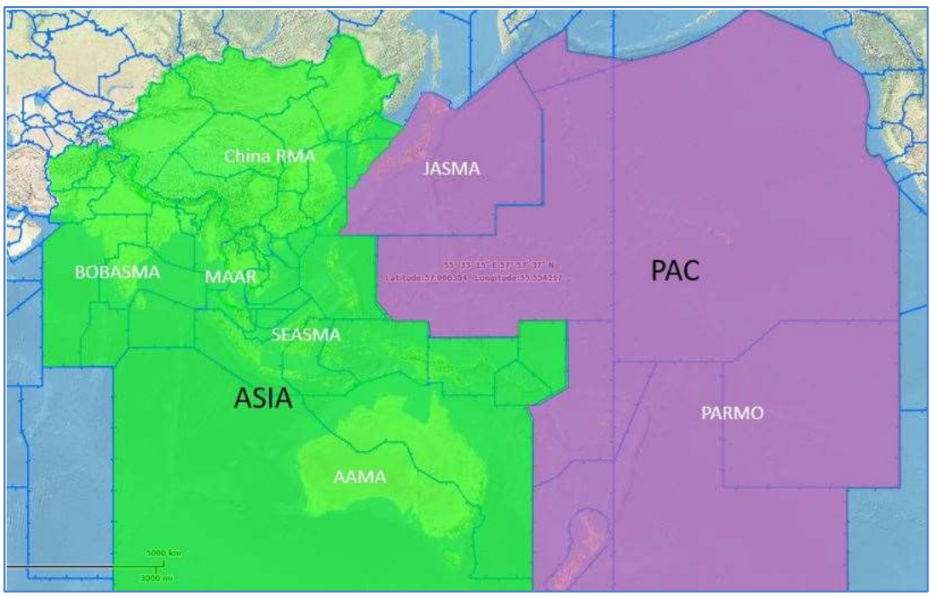

Figure 2: Asia and Pacific Safety Reporting Areas

2.39 The estimated **vertical collision risk for 2021 for the PAC area** did not meet TLS. (**Table 3**). The overall risk vertical risk had been increasing from 2016 to 2021 due to improvements in reporting culture.

Pacific Area – annual flying hours = 2,159,665			
Source of Risk	**Risk Estimation**	**TLS**	**Remarks**
Vertical Technical Risk	0.14×10^{-9}	2.5×10^{-9}	Below Technical TLS
Vertical Operational Risk	19.61×10^{-9}	-	-
2021 Vertical Overall Risk	**19.74×10^{-9}**	5.0×10^{-9}	**Above TLS**

Table 3: Pacific Area Vertical Collision Risk 2021

2.40 The PAC vertical collision risk estimates had been above TLS and trending upwards each year from 2016 to 2019. In 2020 there was a significant fall in the risk estimate, reflecting the reduction in traffic volumes caused by the COVID-19 pandemic, before resuming the upward trend in 2021. **(Table 4)**

Year	**Vertical Overall Risk Estimate (x 10^{-9} FAPFH)**	**Remark**
2021	19.74	Above TLS
2020	16.71	Above TLS
2019	30.21	Above TLS
2018	19.40	Above TLS
2017	7.30	Above TLS
2016	5.01	Above TLS

Table 4: Pacific Area Vertical Collision Risk Estimates 2016 – 2021

2.41 The estimated **horizontal collision risk for 2021 for the PAC area** met TLS in all longitudinal and lateral risk categories. (**Table 5**)

Pacific Area – annual flying hours = 939,628 hours			
2021 PAC Area	**Risk Estimation**	**Airspace**	**Remarks**
30NM Lateral Risk	1.74×10^{-9}	Pacific	Below TLS
50NM Lateral Risk	0.71×10^{-9}	Japan	Below TLS
30NM Longitudinal Risk	-	Pacific	Below TLS
30NM Longitudinal Risk	0.01×10^{-9}	Japan	Below TLS
50NM Longitudinal Risk	2.22×10^{-9}	Pacific	Below TLS
10MIN Longitudinal Risk	0.03×10^{-9}	Japan	Below TLS
2020 PAC Area	**Risk Estimation**	**Airspace**	**Remarks**
30NM Lateral Risk	0.09×10^{-9}	Pacific	Below TLS
50NM Lateral Risk	0.65×10^{-9}	Japan	Below TLS
30NM Longitudinal Risk	3.73×10^{-9}	Pacific and Japan	Below TLS
50NM Longitudinal Risk	2.22×10^{-9}	Pacific	Below TLS
10MIN Longitudinal Risk	0.25×10^{-9}	Japan	Above TLS

Table 5: Pacific Area Horizontal Collision Risk 2020 – 2021

2.42 There was a total of 137 109 LLDs and LLEs in the Pacific area in 2021 (increased from 109 in 2020), with a total duration of 664 minutes and total horizontal deviation of 597NM. 105 of the occurrences were Category E (77%), 11 were Category A or B (8%), 1 was Category G (< 1%) and 5 were Category H (4%).

2.43 The estimated **vertical collision risk for 2021 for the Asia area** met TLS. (**Table 6**). The overall risk continued to decline since 2017 due to various safety improvement initiatives, but remained above TLS.

Asia Area – annual flying hours = 5,021,298 hours			
Source of Risk	**Risk Estimation**	**TLS**	**Remarks**
Vertical Technical Risk	0.32×10^{-9}	2.5×10^{-9}	Below Technical TLS
Vertical Operational Risk	3.71×10^{-9}	-	-
2021 Vertical Overall Risk	**4.03×10^{-9}**	5.0×10^{-9}	**Below TLS**

Table 6: Asia Area Vertical Collision Risk 2021

2.44 The Asia vertical collision risk estimates had been above TLS each year from 2016 to 2019, but trending downwards since 2017. In 2020 there was a significant fall in the risk estimate, while still remaining above TLS, reflecting the reduction in traffic volumes caused by the COVID-19 pandemic **(Table 7**). The 2021 vertical collision risk estimate was below TLS.

Year	**Vertical Overall Risk Estimate (x 10^{-9} FAPFH)**	**Remark**
2021	4.03	Below TLS
2020	7.42	Above TLS
2019	12.88	Above TLS
2018	15.50	Above TLS
2017	27.30	Above TLS
2016	12.53	Above TLS

Table 7: Asia Area Vertical Collision Risk Estimates 2016 –2021

2.45 The estimated **horizontal collision risk for 2021 for the Asia area** met TLS in all longitudinal and lateral risk categories. (**Table 8**)

Asia Area – annual flying hours = 333,153 hours		
2021 Asia Area	**Risk Estimation**	**Remarks**
30NM Lateral Risk	0.0015	Below TLS
50NM Longitudinal Risk	1.02	Below TLS
2020 Asia Area	**Risk Estimation**	**Remarks**
30NM Lateral Risk	0.0004×10^{-9}	Below TLS
50NM Longitudinal Risk	0.85×10^{-9}	Below TLS
2019 Asia Area	**Risk Estimation**	**Remarks**
30NM Lateral Risk	0.0001×10^{-9}	Below TLS
50NM Longitudinal Risk	0.25×10^{-9}	Below TLS

Table 8: Asia Area Horizontal Collision Risk 2019 - 2021

2.46 **Table 9** summarizes current Large Height Deviation (LHD) Hot Spots, the FIRs involved, the year of identification, and status remarks.

Hot Spot	**Involved FIRs**	**Identified**
A1	Kolkata/Dhaka-Yangon	2015
A2	Chennai – Yangon/Kuala Lumpur	2015
B	Incheon (AKARA Airspace)	2015
D	Manila – all adjacent FIRs	2015
F	Mogadishu – Mumbai	2015
G	Sanaa/Muscat – Mumbai	2015
J	Jakarta – Singapore/Kota Kinabalu	2018

M	Colombo – Melbourne	2019
N	Oakland USA – Hawaii CEP	2019

Table 9: LHD Hot Spots in the Asia/Pacific Region

2.47 The meeting considered that all current hot spots should be retained due to the continuing reduced traffic resulting from the COVID-19 pandemic. T

2.48 CNS SG is invited to note that Air Traffic Services (ATS) Interfacility Data Communication (AIDC), while not a new technology, can be a significant mitigator of LHD incidents. However, there appeared to be cases where alerts to controllers when AIDC messaging had failed may have been either not presented, not seen, or not responded to. At the RASMAG/27 meeting IFATCA stressed the need for robust ATC training to ensure compliant use of new technology and application of contingency procedures when system operation failed.

ICAO Activities in the Field of Unmanned Aircraft

APAC Regional Guidance

2.49 The Asia/Pacific (APAC) Regional Guidance for the Regulation and Safe Operation of UAS within National Airspace, developed by the APAC UAS Task Force (APUAS/TF) and approved by ATM/SG/7, is available on the ICAO Asia/Pacific Regional Office eDocuments web-page (ATM Section) at:

https://www.icao.int/APAC/Pages/eDocs.aspx.

2.50 The regional guidance provides background information, principles and regulatory considerations for the development of State regulations for the operation of UAS within national airspace systems. The guidance supports the relevant elements of the Asia/Pacific Seamless Air Navigation Services (ANS) Plan.

ICAO UAS Toolkit, UAS Regulatory Guidance, UTM Framework and Webinars.

2.51 The ICAO UAS Toolkit is a repository of information provided by ICAO, its member States and other experts on the management of UAS that fall outside the scope of SARPS and PANS developed for Remotely-Piloted Aircraft Systems (RPAS) operations. The Toolkit provides background information, best practices, information on UAS regulations, training, education and authorization, and examples of current State regulations.

2.52 The UAS Toolkit is available at:

https://www.icao.int/safety/UA/UASToolkit/Pages/default.aspx.

2.53 The UAS Advisory Group of the RPAS panel also developed the *ICAO Model UAS Regulations*, which provide a template for member States to implement or to supplement their existing UAS regulations. The ICAO Model UAS Regulations are available at:

https://www.icao.int/safety/UA/Pages/ICAO-Model-UAS-Regulations.aspx

2.54 The *Unmanned Aircraft Systems Traffic Management (UTM) – A Common Framework with Core Principles for Global Harmonization Edition 3* document provides a framework and core capabilities of a typical UTM system. Its aim is to provide an overarching framework for such systems, and proposes a common set of guiding principles and enabling actions.

2.55 The UTM framework document is available at:

https://www.icao.int/safety/UA/Documents/UTM%20Framework%20Edition%203%20Post%20Editorial.pdf

2.56 The ICAO COVID-19 Series of webinars includes recorded webinars on the following UAS-related topics:

- Enabling UAS Operations (link);
- Enabling UAS Operations Part II – Panel Discussion (link);
- Introducing ICAO UAS Model Regulations (link);
- UAS Beyond Visual Line of Sight Operations – for Regulators (link); and
- ICAO UAS Traffic Management (UTM) Framework (link).

ICAO Unmanned Aviation Symposia

2.57 ICAO has conducted symposia on RPAS and/or UAS each year since 2016. The most recent DRONE ENABLE symposium, DRONE ENABLE 4, was held by virtual means from 13 to 15 and 20 to 21 April 2021. Recordings of the symposium presentations are available at:

www.icao.tv/drone-enable

ICAO Unmanned Aviation 2022 Symposia

2.58 The *ICAO RPAS Symposium – Unmanned Aviation 2022* will be held at ICAO Headquarters, Montreal, Canada, from 07 to 09 November 2022. The theme of the symposium is *To Certify or Not to Certify*.

2.59 The symposium will be one of the premier RPAS events worldwide, focusing on the technology, operation, and certification of RPAS. It will bring together a wide-ranging audience and key stakeholders, including: civil aviation authorities (CAAs), academia, industry, government, as well as interest groups. Participants will have the perfect opportunity for learning about the regulatory framework being developed and how it will be implemented by experts actively involved in the work. Networking opportunities will abound with the global audience.

2.60 Further information is available at:

https://www.icao.int/Meetings/RPAS2022/Pages/default.aspx

2.49 The ICAO DRONE ENABLE Symposium 2022 will also be held at ICAO Headquarters, from 14 to 16 November 2022. The symposium will bring together key stakeholders and will focus on the complex issues presented by UTM which need to be addressed collectively in order to integrate UAS into the global aviation system. The symposium will be an opportunity for networking, collaboration and coordination between civil aviation authorities, industry and both new and existing stakeholders as we move forward in this dynamic field. It also provides a unique opportunity to progress a comprehensive and harmonized regulatory framework to support UAS activities. Further information is available at:

https://www.icao.int/Meetings/DRONEENABLE2022/Pages/default.aspx

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) Note the information provided on:

i. ATM/SG/9 and subsequent APANPIRG Conclusions (NANP reporting form, ATS horizontal separation, Decision APANPIRG/32-4, missing DEP messages);

ii. SAIOSEACG/1;

iii. AAITF/17 (WGS-84 and ***Draft Conclusion AAITF/17-3***, AIM Phase II and III implementation progress);

iv. ATFM/SG/12 (A-CDM integration, review of the regional ATFM framework document, collaboration between ATFM/SG, SWIM TF and ACSICG); and

v. RASMAG/27 (Conclusions RASMAG/27-1 and 27/2, aggregated regional data link performance, Asia/Pacific consolidated airspace safety report, and the significance of AIDC as a mitigator of LHD incidents;

b) Take advantage of the large volume of guidance on UAS, and participate in the ICAO Unmanned Aviation 2022 symposia; and

c) Discuss any other relevant matters, as appropriate.

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