INTERNATIONAL CIVIL AVIATION ORGANIZATION

REPORT OF THE TWELFTH MEETING OF THE ATM SUB-GROUP OF APANPIRG (ATM/SG/12)

BANGKOK, THAILAND, 23 – 27 SEPTEMBER 2024

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

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

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APPENDIXES TO THE REPORT

INTRODUCTION

Meeting

1.1   The Twelfth Meeting of the Air Traffic Management Sub-Group (ATM/SG/12) of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) was held from 23 to 27 September 2024 at the Kotiate Wing of the ICAO Asia and Pacific Regional Office, Bangkok, Thailand.

Attendance

2.1   The meeting was attended by 105 registered participants from 23 States, two Special Administrative Regions of China and four International organizations, including Australia, Bhutan, Brunei Darussalam, Cambodia, China, Hong Kong China, Macao China, Fiji, France, India, Indonesia, Japan, Lao People's Democratic Republic (PDR), Malaysia, Maldives, Mongolia, New Zealand, Pakistan, Philippines, Republic of Korea (ROK), Singapore, Sri Lanka, Thailand, United States, Viet Nam, IATA, ICCAIA, IFALPA, and ICAO.

2.2   A list of participants is provided at **Appendix A** to this Report.

Officers and Secretariat

3.1   Mr. Kuah Kong Beng, Director (Special Project), Civil Aviation Authority of Singapore presided over the ATM/SG/12 meeting as Sub-Group Chair.

3.2   Mr. Hiroyuki Takata, Regional Officer, ATM and Mr. Mior Adli Bin Mior Sallehhuddin, Regional Officer, ATM, ICAO Asia and Pacific Office, were the Secretaries for the meeting. They were assisted by Mr. Ying Weng Kit, ATM Officer, Mr. Tak Chuen Chui, AIM/ATM Officer and Dr. Prakayphet Chalayonnawin, Programme Analysis Associate, ATM.

3.3   The meeting was also supported by Mr. Manjunath Krishna Nelli, Regional Officer, ATM, Ms. Ying Zhang, Deputy Chief, Mr. Zhi Feng Xu, Regional Officer, ATM, Mr. Hyuk Jin Kwon, Regional Officer, ATM, Ms. Chen Yanru, Administrative Support and Programme Assistant of the ICAO Asia/Pacific Regional Sub-Office.

Language and Documentation

4.1   The ATM Sub-Group met as a plenary throughout the meeting. The working language of the meeting was English for all documentation and this Report. A total of 36 Working Papers (WPs), 14 Information Papers (IPs), two flimsies and four presentations were considered by the meeting.

4.2   The List of Working and Information Papers is attached at **Appendix B** to this Report (IP/01).

4.3   **DISCLAIMER:** The presentation of material in this report does not imply the expression of any opinion whatsoever on the part of ICAO, APANPIRG or the ATM Sub-Group of APANPIRG concerning the legal status of any country, territory, city or area of its authorities, or concerning the delimitation of its frontiers or boundaries.

Opening of the Meeting

> Chair of ATM/SG Sub-Group

5.1   Mr. Kuah Kong Beng welcomed participants to the meeting.

> ICAO Regional Office

5.2   On behalf of Mr. Tao Ma, Regional Director of the ICAO Asia and Pacific Office, Mr. Hiroyuki Takata welcomed all the participants to the meeting.

Draft Conclusions, Draft Decisions and Decisions of ATM/SG – Definition

6.1   The ATM Sub-Group recorded its actions in the form of Draft Conclusions, Draft Decisions and Decisions within the following definitions:

> a) **Draft Conclusions** of the ATM/SG relate to matters that are not just of a purely technical or operational nature, which need to be considered by APANPIRG;
>
> b) **Conclusions** of the ATM/SG relate to matters of a purely technical or operational nature, which APANPIRG had delegated authority to ATM/SG to act upon;
>
> c) **Draft Decisions** relate solely to matters dealing with the internal working arrangements of the ATM/SG, which need to be considered by APANPIRG; and
>
> d) **Decisions** of the ATM/SG that relate solely to matters dealing with the internal working arrangements of the ATM/SG, which APANPIRG had delegated authority to ATM/SG to act upon.

List of Draft Conclusions and Decisions

7.1   List of ATM/SG/12 Draft Conclusions

Draft Conclusion ATM/SG/12-1: Asia/Pacific Seamless ANS Plan	
What: That, given the urgency and priority of Air Navigation Service (ANS) planning and modernization and the lack of progress in implementing the Aviation System Block Upgrade (ASBU) Block 0, Asia/Pacific States are urged to review Version 4.0 of the Asia/Pacific Seamless ANS Plan.	Expected impact: ☒ Political / Global ☐ Inter-regional ☒ Economic ☒ Environmental ☒ Ops/Technical
Why: To incorporate changes from the GANP and regional requirements.	Follow-up: ☒Required from States
When: 27-Nov-24	Status: Draft to be adopted by PIRG
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Draft Conclusion ATM/SG/12-2: Regional Guidance for Space Object Launch and Re-Entry Coordination

What: That, 1. the Asia/Pacific Regional Guidance for Space Object Launch and Re-Entry Activities at **Appendix D** to the Report: 　　a) be uploaded to the Asia/Pacific Regional Office website, to replace the existing Asia/Pacific Planning Checklist for Ballistic Launch and Space Re-entry; 　　b) be referenced in the Asia/Pacific Seamless ANS Plan; and 2. the related ballistic launch and space re-entry guidance and performance expectations in the Asia/Pacific Seamless ANS Plan be updated accordingly.	Expected impact: ☐ Political / Global ☒ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To revise guidance to APAC States/Administration to outline consistent and repeatable coordination procedures to achieve timely and efficient collection and dissemination of space object launch and re-entry information that will assist with avoiding hazards to civil aircraft and minimise interference with the normal operation of such aircraft.	Follow-up: ☒Required from States
When: 27-Nov-24	Status: Draft to be adopted by PIRG
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Draft Conclusion ATM/SG/12-3: Agree on the adoption of FIXM Ver. 4.3.0 in Asia/Pacific Region as the standard format

What: That, from Q3 2026 FIXM ver. 4.3.0 would be adopted to support information exchange for: 1. FF-ICE/R1 services implementation; and 2. Cross-border ATFM operations.	Expected impact: ☐ Political / Global ☒ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To support the FF-ICE/R1 requirements to establish a common FIXM version for cross-border information exchange in the Asia/Pacific region.	Follow-up: ☒Required from States
When: 27-Nov-24	Status: Draft to be adopted by PIRG
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

7.2   List of ATM/SG/12 Conclusions

Conclusion ATM/SG/12-4: Amendment to the Asia/Pacific Regional Plan for Collaborative AIM	
What: That, the amendment to the Regional Plan for Collaborative AIM at **ATM/SG/12 WP/29 Attachment D** be adopted, and the amended Plan be posted on the ICAO Asia/Pacific Regional Office eDocuments webpage.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To ensure harmonisation with the Global Air Navigation Plan and Asia/Pacific Seamless ANS Plan.	Follow-up: ☒Required from States
When: 27-Sep-24	Status: Adopted by Subgroup
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Conclusion ATM/SG/12-5: Revised Guidance on the Issuance of SNOWTAM	
What: That, the revised EUR Doc 041 – Guidance on the Issuance of SNOWTAM (V.1.1) at **ATM/SG/12 WP/29 Attachment E** be uploaded on the ICAO Asia/Pacific Regional Office eDocuments webpage, to replace the existing.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To provide guidance to APAC States for the issuance of SNOWTAM associated with the new Global Reporting Format for runway surface conditions.	Follow-up: ☒Required from States
When: 27-Sep-24	Status: Adopted by Subgroup
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Conclusion ATM/SG/12-6: Proposal for annual Submission of changes to Asia/Pacific Search and Rescue (SAR) Plan		
What: That, States and Administrations are invited, if necessary, to submit proposals to APSAR/WG to incorporate amendments of related documents such as International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual into the Asia/Pacific Search and Rescue (SAR) plan where appropriate instead of waiting for the three years cycle.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical	
Why: To facilitate the updating of the Asia/Pacific SAR Plan on a flexible and nimble basis.	Follow-up: ☒Required from States	
When: 27-Sep-24	Status: Adopted by Subgroup	
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:		

7.3   List of ATM/SG/12 Draft Decisions

           Nil

7.4   List of ATM/SG/12 Decisions

Decision ATM/SG/12-7: Dissolution of the Space Vehicle Launch and Re-entry Coordination Small Working Group (SVLRC SWG)		
What: That, the Space Vehicle Launch and Re-entry Coordination Small Working Group (SVLRC SWG), having completed all tasks as per the Decision ATM/SG/10-8, be dissolved.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical	
Why: All tasks as per the Decision ATM/SG/10-8 were completed.	Follow-up: ☐Required from States	
When: 27-Sep-24	Status: Adopted by Subgroup	
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:		

Decision ATM/SG/12-8: Establish Procedures for GNSS and Data Link Disruption Ad Hoc Group	

What: That, ATM/SG establishes the Procedures for GNSS and Data Link Disruption Ad Hoc Group, to:
1. collect data on GNSS and data link disruption in APAC region; and
2. develop the procedures for GNSS and data link disruption that include (but not limited to) the need for:
    a) reporting process by airspace users to ATS units; and
    b) sharing of information between stakeholders.
	Expected impact:
	☐ Political / Global
	☐ Inter-regional
	☐ Economic
	☐ Environmental
	☒ Ops/Technical

Why: To provide regional guidance to APAC States/Administrations on the process for GNSS and data link disruption.	Follow-up: ☒Required from States
When: 27-Sep-24	Status: Adopted by Subgroup
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

REPORT ON AGENDA ITEMS

Agenda Item 1: Adoption of Provisional Agenda

Adoption of Agenda (WP/01)

1.1   The agenda (WP/01) was adopted by the meeting, which noted the Provisional Order of Discussion (OOD), and the Provisional List of Working and Information Papers (IP/01).

Agenda Item 2: Review of Related High Level Meetings

ATM/SG/11, APANPIRG/34 and AN-Conf/14 Outcomes (WP/02)

2.1   The meeting was reminded of the outcomes of the Eleventh Meeting of the Air Traffic Management Sub-Group (ATM/SG/11) of APANPIRG (Singapore, 02 to 06 October 2023) and informed of the relevant outcomes from the Thirty-Fourth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/34, Hong Kong, China, 11 to 13 December 2023) and the Fourteenth Air Navigation Conference (AN-Conf/14, Montreal, Canada, 26 August to 06 September 2024).

2.2   The ICAO Secretariat informed the meeting that relevant regional and guidance documents agreed at ATM/SG/11 had been uploaded to ICAO APAC eDocuments webpage.

High Level Recommendations Discussed at AN-Conf/14

2.3   The Meeting was informed of the high-level recommendations in the field of air navigation and safety discussed at the AN-Conf/14. These recommendations would be submitted for approval to the Council and, when applicable, for subsequent endorsement by the 42nd Session of the Assembly in 2025.

2.4   In reviewing AN-Conf/14-WP/75, Revision No. 1, the Committee noted that airspace disruptions had increased in recent years with airlines continuing to face challenges impacting efficient operations around airspace that were no longer available for civil aviation, sometimes for extended periods. As a result of the discussion, the Committee agreed on the following recommendation:

Recommendation 1.1/2: Resilience of the air navigation system

2.5   In considering the effects of global navigation satellite system (GNSS) radio frequency interference (RFI), the Committee:

a)   expressed significant concerns with the recent escalation of harmful interference to GNSS, the risk it poses to civil aviation, and the critical impact this has had on global operations, particularly on areas surrounding conflict zones;

b)   agreed on the importance of maintaining a sufficient network of conventional navigation aids, supported by very high frequency omnidirectional radio range (VOR), distance measuring equipment (DME) and instrument landing system (ILS) facilities, to ensure operational safety as well as sufficient airspace capacity during times of GNSS interference; and

c)   agreed on the following recommendation:

Recommendation 2.2/2: Addressing global navigation satellite system interference and contingency planning

2.6   The Committee reviewed AN-Conf/14-WP/10, regarding the proposed Project 30/10. This initiative aims to improve the operational efficiency of the global air navigation system by implementing longitudinal separations of 55.5 km (30 NM) or less in oceanic and remote airspace, and 19 km (10 NM) or less elsewhere. As a result of the discussion, the Committee approved the following recommendation:

Recommendation 3.1/1: Project 30/10 – Optimised implementation of longitudinal separation minima

2.7   In reviewing AN-Conf/14-WP/60, AN-Conf/14-WP/48 and AN-Conf/14-WP/70, the Committee noted the benefits of trajectory-based operations (TBO) in improving the predictability of aircraft movement and flight efficiency, as well as in increasing utilisation of available capacity and operator flexibility. As a result of the discussion, the Committee approved the following recommendation:

Recommendation 3.1/3: Enabling successful deployment of trajectory-based operations

2.8   The Committee, in recognising that expansion of free route airspace (FRA) initiatives across airspace boundaries should increase operational efficiency and contribute to reduced fuel consumption, agreed that the question of whether additional ICAO provisions and guidance material were necessary to facilitate harmonised FRA implementation should be referred to the appropriate expert group(s) for further consideration. The Committee approved the following recommendations:

Recommendation 3.1/4: Free route airspace

2.9   The Committee reviewed several working papers, including AN-Conf/14-WP/11, which outlined progress in developing global provisions for implementing Flight and Flow – Information for a Collaborative Environment (FF-ICE) services and proposed 2034 as the target date to cease FPL2012 operations. To support this, the importance of an inclusive, coordinated approach at national and regional levels was emphasised, along with collaboration among States and guidance from ICAO. As a result of the discussion, the Committee approved the following recommendations:

Recommendation 3.2/2: Transition to flight and flow – information for a collaborative environment services and cessation of ICAO 2012 flight plan by 2034

2.10   The relevant papers, reference documents and Draft Reports of the AN-Conf/14 could be accessed at: https://www.icao.int/Meetings/anconf14/Pages/default.aspx.

2.11   States/Administrations were strongly encouraged to proactively engage with the regional group related to the recommendation from AN-Conf/14.

Agenda Item 3: Performance Frameworks and Metrics

ANS USOAP Update (WP/03)

3.1   The Secretariat provided information on the ICAO Universal Safety Oversight Audit Programme (USOAP) Continuous Monitoring Approach (CMA). The paper discussed the Protocol Questions (PQs) used to assess State safety oversight systems and provide an annual update of ANS USOAP status.

3.2   The average ANS Effective Implementation (EI) of APAC region was 63.44%, as of September 2024. **Figure 1** illustrated the EI ratings for ANS-related PQs of the 37 APAC States that had been audited or received USOAP activity:
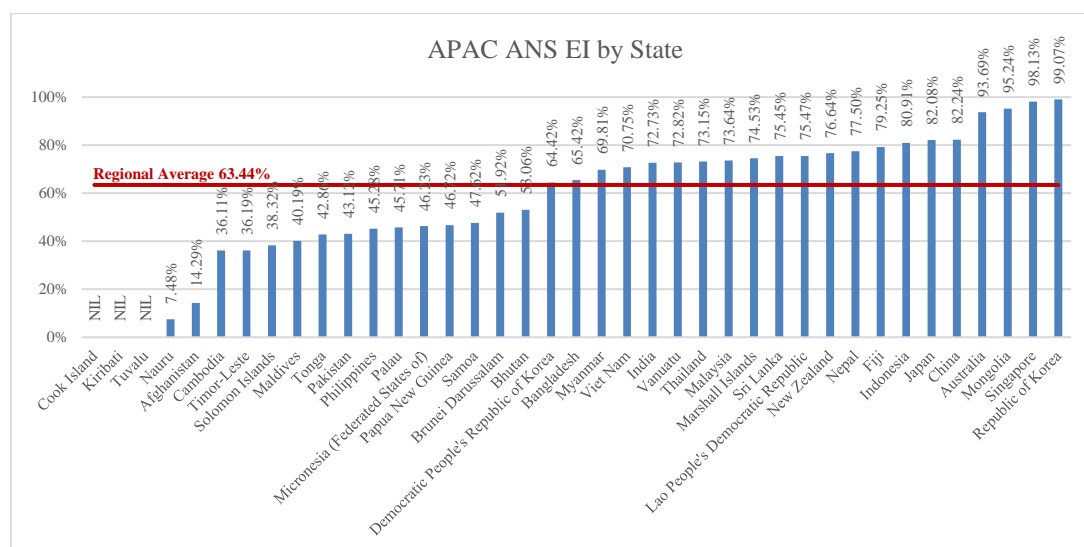
Figure 1: USOAP ANS EI Comparisons by State (September 2024)

3.3   The meeting was informed that the data source was the USOAP Continuous Monitoring Approach (CMA) Online Framework (OLF), which reflected the 2020 version of PQs and recent USOAP activities such as CMA Audit (CMAA), ICAO Coordinated Validation Mission (ICVM), and Off-Site Validation Activity (OSVA).

3.4   The meeting confirmed that the APAC EI was lower than the global average according to the summary of the global average level of ANS-related EI for the 187 States that had been audited or received a USOAP activity.

3.5   As of 04 July 2024, two CMAAs were completed and one ICVM were completed in the APAC region, with another one CMAA had been scheduled in October 2024. For 2025, five USOAP CMA activities had been scheduled in the APAC region: four CMAAs and one ICVM.

3.6   The ICAO Secretariat informed the Meeting that one of the AN-Conf/14 information sessions was about *USOAP CMA evolution update – an outlook for this triennium and beyond* (https://www.icao.int/Meetings/anconf14/Documents/Information%20Sessions/PPT05.pdf),   which provided information on 2024 PQ amendment and integration of State Safety Programme Implementation Assessment (SSPIA) into traditional activities.

3.7   The Chair encouraged States to participate in the USOAP CMA Workshops planned in 2025, that would provide States with updated information on the programme and provide hands-on training on the USOAP CMA OLF.

3.8   Pakistan expressed gratitude to ICAO for the Combined Action Team (CAT) Mission, which aided Pakistan's readiness for the ICVM conducted from 05 to 12 June 2024.

Updating the Asia/Pacific Seamless ANS Plan (WP/04)

3.9   ICAO presented the status of the Asia/Pacific Seamless ANS Plan, reporting, and implementation progress of air navigation improvements in the APAC region.

3.10   The meeting was informed about the Seamless ANS Plan-related discussion outcomes from the APANPIRG/34 meeting and the progress of the update of the Seamless ANS Plan. The guiding principles adopted by the ICAO Secretariat for updating the Seamless ANS Plan were:

   a)   refrain from introducing new regional elements, except where absolutely necessary;

   b)   focus on APAC Regional Prioritization of ASBUs; and

   c)   keep in mind the ICAO No Country Left Behind (NCLB) principle.

3.11   The process agreed by the APANPIRG/33 included:

   a)   secretarial review;

   b)   consultation with States/Administrations through the nominated Points of Contacts (POCs);

   c)   circulation to APANPIRG Sub-Groups; and

   d)   presentation of the final draft for APANPIRG/34 for adoption.

3.12   The meeting was informed that consultation with the States/Administrations could not be done in 2023. However, the draft Seamless ANS Plan was circulated to the Sub-groups of APANPIRG meetings (AOP, CNS and MET) and the comments received from AOP and MET Sub-groups were incorporated in the draft Seamless ANS Plan. CNS Sub-group reviewed the CNS-related Aviation System Block Upgrade (ASBU) elements through an ad hoc group and provided recommendations in 2024.

3.13   The meeting was informed that ICAO Secretariat carried out the following tasks in 2024 for updating the Seamless ANS Plan.

   a)   circulation of Draft Seamless ANS Plan V3.2.2 to POC for feedback from States: April 2024 (Completed);

   b)   deadline for feedback from States (by email): 10 June 2024 (feedback received from four States);

   c)   deadline for reporting of APAC Seamless ANS Plan V3.0 implementation by States through APAC Seamless ANS Reporting Tool Portal: 31 May 2024 (17 States provided either complete or partial status reports);

   d)   update draft Seamless ANS Plan to include feedback from States and analysis of Seamless ANS Plan implementation status and presentation to the Sub-groups of APANPIRG (AOP, CNS and MET): July 2024 (Completed);

   e)   update draft Seamless ANS Plan V3.5 to be submitted to ATM/SG/12 for review and approval: September 2024; and

   f)   final draft of Seamless ANS Plan V4.0 submission to APANPIRG/35 for endorsement.

3.14   The Meeting reviewed Seamless ANS Plan V3.5. Following the meeting discussion, the Secretariat prepared Seamless ANS Plan V3.6 for review by 08 October 2024 (**Appendix C** to the report).

3.15   The meeting adopted the following Draft Conclusion in order to update the Seamless ANS Plan, for APANPIRG/35's consideration.

Draft Conclusion ATM/SG/12-1: Asia/Pacific Seamless ANS Plan

That, given the urgency and priority of Air Navigation Service (ANS) planning and modernization and the lack of progress in implementing the Aviation System Block Upgrade (ASBU) Block 0, Asia/Pacific States are urged to review Version 4.0 of the Asia/Pacific Seamless ANS Plan.

3.16   The meeting was also informed about the Seamless ANS Plan Reporting Tool. States and Administrations were required to submit the implementation status through the tool by 31 May 2024. A total of 17 States/Administrations (41.5% of the APAC States/Administrations) had submitted some form of reporting on the new APAC Seamless ANS Reporting Tool. Among those 17 States/Administrations, only 11 States had submitted a comprehensive report. Hence, there was insufficient information to carry out an effective evaluation of the implementation progress.

3.17   The Meeting urged States/Administrations that had not submitted the Seamless ANS Plan implementation status to do so using the online reporting tool.

3.18   It was noted that APAC States/Administrations were required to submit the implementation status by 28 February of each year, effective from year 2025. The Meeting was informed that to enable the States/Administrations to report on the implementation status in 2025, the reporting tool in the current version and the APAC Seamless ANS Plan V3.0 would both be retained on the ICAO website for reference. After the approval and endorsement of APAC Seamless ANS Plan V4.0 by APANPIRG/35 in November later this year, the reporting tool would be updated to reflect the changes in Q2 of 2025.

3.19   It was clarified that Phase II and Phase III operational requirements of Seamless ANS Plan V3.0 had been retained in V4.0. By continuing the existing tool based on V3.0, States/Administrations would be able to report on the implementation status, which would be valid for V4.0 reporting as well in future. ICAO also highlighted the slight change in the definition of high-density airports in the latest version of the Seamless ANS Plan.

FIT-Asia and RASMAG Outcomes (WP/05)

FIT-Asia/14 Meeting Outcomes

3.20   The Fourteenth Meeting of the FANS Interoperability Team-Asia (FIT-Asia/14) and the Twenty-ninth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/29) were held in Bangkok, Thailand, from 16 to 19 July 2024 and 19 to 22 August 2024 respectively.

3.21   The FIT-Asia meeting was reminded that APANPIRG/34 agreed on the following Conclusion proposed by RASMAG/28 - *Conclusion APANPIRG/34/8: Formal Service Arrangements with CRA*.

3.22   The United States informed the meeting that the Federal Aviation Administration (FAA) contract for Informal Pacific ATC Coordinating Group (IPACG), Informal South Pacific Air Traffic Services Coordinating Group (ISPACG), and North Atlantic (NAT) would be expanded to include FIT-Asia States without formal service arrangements with a Central Reporting Agency (CRA). The ICAO Secretariat stated that they would reach out to each State to assess the suitability of the United States' proposed arrangement.

3.23   The colour codes from Asia/Pacific Region Combined Performance-based Communication and Surveillance (PBCS) Monitoring Report used by FIT-Asia were slightly different to other FIT's therefore a correction was proposed to the templates to resolve this error. A revised yellow acceptable performance showing as between 99.0% and 99.89% was proposed (**Figure 2**).
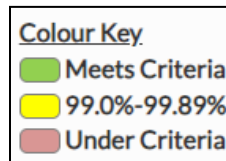
Figure 2: Revised Colour Key Code for Yellow Acceptable Performance

3.24   FIT-Asia meeting agreed to the revised colour key codes in the following files on the ICAO APAC eDocuments webpage shown below, and RASMAG agreed to the following Conclusion, drafted by FIT-Asia/14.

> ***Conclusion RASMAG/29-1: Revised colour key codes for Asia/Pacific PBCS reporting templates***
>
> *That, the following PBCS reporting templates and example were revised to correctly reflect the criteria colour key code for yellow acceptable performance and be uploaded to the Asia/Pacific Regional Office to replace the existing ones.*
>
> *1.   Data Link Performance Report Template – ANSP to FIT (RASMAG/29 Appendix C);*
>
> *2.   EXAMPLE - Data Link Performance Report Template – ANSP to FIT (RASMAG/29 Appendix D); and*
>
> *3.   Aggregated Regional Data Link Performance Report Template - FIT to RASMAG (RASMAG/29 Appendix E)*

3.25   During the discussion of the future direction of FIT-Asia, the Secretariat provided information on the history and progress of FIT-Asia. The number of WPs and IPs provided by States/Administrations, International Organizations, CRA, and Regional Monitoring Agencies (RMAs) at the previous FIT-Asia meetings were mainly WPs provided by States/Administrations for Data Link Performance Reports, and a few papers addressed technical matters at the FIT-Asia meetings by the champion States in the region.

3.26   The following were proposed by FIT-Asia/14:

   a)   the FIT-Asia meeting agreed to conduct a workshop/seminar in conjunction with the FIT-Asia meeting, at least in 2025, including subjects such as safety risk assessment for PBCS implementation, PBCS Charter, etc.

   b)   China, Japan, New Zealand, USA, Boeing, and Inmarsat expressed their support for the future seminar/workshop. Additionally, New Zealand expressed their willingness to support the PBCS implementation individually if a State required it, particularly in PBCS data analysis. Subsequently, States were encouraged to reach out to New Zealand.

RASMAG/29 Meeting Outcomes

3.27   The Monitoring Agency for the Asian Region (MAAR) presented a combined summary of the safety analysis results for the APAC region, on behalf of the Asia/Pacific RMAs and EMAs. The report was divided into the Pacific (PAC) area and Asia area. The full APAC consolidated Safety Report can be found in **ATM/SG/12 WP/05 Attachment A.**

3.28   The estimated vertical collision risk for 2023 for the PAC area did not meet the Target Level of Safety (TLS) (**Table 1**)**.**

Table 1: Pacific Area Vertical Collision Risk 2023

Pacific Area – annual flying hours = 3,462,071			
Source of Risk	**Risk Estimation**	**TLS**	**Remarks**
Vertical Technical Risk	0.22×10^{-9}	2.5×10^{-9}	Below Technical TLS
Vertical Operational Risk	10.55×10^{-9}	-	-
2023 Vertical Overall Risk	**10.77×10^{-9}**	5.0×10^{-9}	**Above TLS**

3.29   There was a total of 134 LHDs in the Pacific area in 2023 (increased from 118 in 2022), with a total duration of 362 minutes and 36 levels crossed. 33 of the occurrences were Category[1] A, B or C (25%), 64 were Category D, E or F (48%), zero were Category G or H, 20 in Category I (15%), 16 were Category J or K (12%), and one were Category L or M (1%).

3.30   The estimated vertical collision risk for 2023 for the Asia area met TLS (**Table 2**). The overall risk continued to decline since 2017 due to various safety improvement initiatives and was below the TLS. There was a total of 824 LHDs reported in the Asia area in 2023 (increased compared to 518 in 2022), with a total duration of 414.45 minutes and 237 levels crossed.

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[1] Categories of LHD events as recognised by RMAs were:

Category A: Flight crew fails to climb or descent the aircraft as cleared;

Category B: Flight crew climbing or descending without ATC clearance;

Category C: Incorrect operation or interpretation of airborne equipment;

Category D: ATC system loop error;

Category E: Coordination errors in ATC-to-ATC transfer of control responsibility as a result of human factors issues;

Category F: ATC transfer of control coordination errors due to technical issues;

Category G: Aircraft contingency leading to sudden inability to maintain level;

Category H: Airborne equipment failure and unintentional or undetected level change;

Category I: Turbulence or other weather-related cause leading to unintentional or undetected change of flight level;

Category J: TCAS RA – flight crew correctly climb or descend following the RA;

Category K: TCAS RA – flight crew incorrectly climb or descend following the RA;

Category L: An aircraft being provided with RVSM separation is not approved;

Category M: Others.

Table 2: Asia Area Vertical Collision Risk 2023

Asia Area – annual flying hours = 10,153,474 hours (38% increase from 2022)			
Source of Risk	**Risk Estimation**	**TLS**	**Remarks**
Vertical Technical Risk	0.56×10^{-9}	2.5×10^{-9}	Below Technical TLS
Vertical Operational Risk	2.84×10^{-9}	-	-
2023 Vertical Overall Risk	**3.40×10^{-9}**	5.0×10^{-9}	**Below TLS**

Process of Hot Spots for RASMAG

3.31   RASMAG agreed to adopt the application of the Hot Spot Management Process (RASMAG/MAWG/11 WP/06 Attachment 2) developed by the RASMAG MAWG (Monitoring Agency Working Group). The MAWG meeting agreed to allow the splitting of a hot spot into smaller areas depending on the FIR interfaces, the contributing factors, implementation of mitigation measures, etc. and decided to split Hot Spot B and Hot Spot D into smaller areas at the interface level.

3.32   RASMAG agreed to the changes to Guidance Material for the Continued Safety Monitoring of the Asia-Pacific RVSM Airspace version 3 and to be uploaded to the ICAO APAC eDocuments webpage to replace the previous version. The meeting agreed to the following conclusion:

> ***Conclusion RASMAG/29-2: Revised Guidance Material for the Continued Safety Monitoring of the Asia-Pacific RVSM Airspace***
>
> *That, the revised Guidance Material for the Continued Safety Monitoring of the Asia-Pacific RVSM Airspace, containing the Hot Spot Management process, WP/03 - Attachment 3, be uploaded to the Asia/Pacific Regional Office eDocuments webpage to replace the existing version.*
>
> *Review of Guidance Material for End-To-End Safety and Performance Monitoring of ATS Data Link Systems in the APAC region*

3.33   ICAO Secretariat, China, New Zealand and USA were tasked with RASMAG Task item RASMAG28/1 - Review and develop a Draft of a new version of Guidance Material for End-to-End Safety and Performance Monitoring of ATS Data Link Systems in the APAC Region in cooperation with CNS subject matter experts. Include region-specific matters from Appendix B to the GOLD Manual (to be removed from the Manual in 2020).

3.34   A working paper was submitted to FIT-Asia/14 held from 16 to 19 July 2024 and FIT-Asia/14 agreed to the Draft Conclusion FIT-Asia/14-1: Revised Guidance Material for End-to-End Safety and Performance Monitoring of ATS Data Link Systems in the APAC Region and Additional PBCS Guidance Material NAT Doc 011.

3.35   In addition, Boeing CRA submitted supplementary amendments after the FIT-Asia/14 meeting. Therefore, the updated Guidance Material for End-to-End Safety and Performance Monitoring of ATS Data Link Systems in the APAC Region, including all changes, were shown in RASMAG/29 WP/17 Attachment A. A summary of the proposed amendments, including reasons for each proposed amendment, was provided in RASMAG/29 WP/17 Attachment B, and the EUR NAT Doc 011 could be found in RASMAG/29 WP/17 Attachment C.

3.36   RASMAG agreed to the proposed changes, and to adopt the following Conclusion:

Conclusion RASMAG/29-3: Revised Guidance Material for End-to-End Safety and Performance Monitoring of ATS Data Link Systems in the APAC Region and Additional PBCS Guidance Material NAT Doc 011

That,

1)   *the revised Guidance Material for End-to-End Safety and Performance Monitoring of ATS Data Link Systems in the APAC Region at Appendix F to the RASMAG/29 report be uploaded to the Asia/Pacific Regional Office eDocuments webpage to replace the existing version; and*

2)   *the EUR NAT Doc 011 – PBCS Monitoring and Reporting Guidance, 1st Ed.- Amdt. 2. at RASMAG/29 WP/17 Attachment C be uploaded on the ICAO Asia/Pacific Regional Office eDocuments webpage.*

3.37   The Hot Spot Identification process was applied to Hot Spot B and D, and Table 10 in WP/05 summarised the current LHD Hot Spots including the smaller areas associated with Hot Spot B and D, the FIRs involved, the year of identification, and status remarks. The Chair encouraged States to implement mitigation to resolve the LHD Hot Spots.

ATM and Airspace Safety Deficiencies List

3.38   RASMAG reviewed the APANPIRG ATM and Airspace Safety Deficiency List and agreed to make the following recommendation to APANPIRG/35, as recorded in Appendix I to the RASMAG/29 Report. The meeting was informed that the deadline for submission of information on the reduction of the remaining monitoring burden must reach MAAR by 25 October 2024 in order to be processed in time for APANPIRG/35.

3.39   ICAO sent an email to French Polynesia on 21 August 2024 and requested for LHD, LLE and LLD data for 2023, to be submitted to ICAO and PARMO by 18 November 2024 to facilitate the withdrawal of the deficiency for APANPIRG's review.

   a)   To be retained in the Deficiencies list

       Safety Reporting Deficiencies

       •   **Afghanistan** (Failure to submit Kabul FIR Large Height Deviation (LHD) data).

       Long Term Height Monitoring Requirement Deficiencies

       •   **Afghanistan** (Remaining monitoring burden of 50%, RASMAG/29).

       •   **Nepal** (Remaining monitoring burden of 45%, RASMAG/29).

       ATS Datalink Deficiencies

       •   **India**: Post implementation monitoring not implemented (insufficient data/evidence).

   b)   Removal of Deficiency:

       Long Term Height Monitoring Requirement Deficiencies

       •   **Mongolia** (Remaining monitoring burden of 18%, RASMAG/29).

       •   **New Zealand** (Remaining monitoring burden of 11%, RASMAG/29).

       •   **Pakistan** (Remaining monitoring burden of 27%, RASMAG/29).

       •   **Papua New Guinea** (Remaining monitoring burden of 15%, RASMAG/29).

       •   **Solomon Islands** (Remaining monitoring burden of 0%, RASMAG/29).

ATS Datalink Deficiencies

- **Maldives:** It was confirmed that Maldives had disabled the ADS-C function from the ATM system due to an application issue, and CPDLC/HF is used beyond VHF coverage

c) Add new Deficiency:

Safety Reporting Deficiencies

- **French Polynesia** (Failure to submit Tahiti FIR Large Height Deviation (LHD) data).

Long Term Height Monitoring Requirement Deficiencies

- **India** (Remaining monitoring burden of 48%, RASMAG/29).

- **Philippines** (Remaining monitoring burden of 40%, RASMAG/29).

3.40   India informed the meeting that the data link data for the Mumbai FIR were now available. This significant development would enable India to share these crucial data sets with FIT-Asia and RASMAG for their comprehensive review next year.

Application of ATC Separation Standards (WP/06)

3.41   The Secretariat provided information on the Seamless ATM survey conducted to determine which Air Traffic Control (ATC) separation minima were being applied within the APAC region. The survey measured the minimum horizontal separation standard within State/Administration's FIR namely Category R, Category S and Category T airspace. The responses to the latest survey had decreased from 25 to 16 (compared to last reporting period).

3.42   The analysis of Q1 of the survey were presented separately for the three categories of airspaces namely Category R, Category S and Category T. The criteria used the analysis of Q1 were as follows:

a) Category R - Acceptable standard: ≤ 50 NM

b) Category S - Acceptable standard: 5 NM

c) Category T - Acceptable standard: 5 NM

3.43   In the analysis there were 11 States that utilised more than 5 NM in Category S airspace and three States that utilised more than 5 NM in Category T airspace.

3.44   The analysis Q2 of the survey looked at three categories of separations at inbound FIR TOC points shown below. After a review in 2023, the criteria for Category R → S TOC had been revised from 10 NM to 50 NM. The criteria used the analysis of Q1 were as follows:

a) Category R/S → R TOC - Acceptable standard: ≤ 50 NM

b) Category R → S TOC - Acceptable standard: ≤ 50 NM

c) Category S → S TOC - Acceptable standard: ≤ 10 NM

3.45   The highest non-compliant TOC points, belong to Category S → Category S TOC points. Even with surveillance coverage, the separation minimum of more than 10 NM was currently implemented at TOC points in the APAC region.

3.46   The paper also highlighted the Project 30/10, which was presented during AN-Conf/14. ICAO proposed Project 30/10 (AN-Conf/14 WP/10) as an initiative to focus attention and encourage implementation of longitudinal separations of 55.5 km (30 NM) or less in oceanic and remote airspace, and 19 km (10 NM) or less elsewhere. It was expected to be a regionally based, coordinated effort for seamless reduction of excessive separation minima where this has not already been achieved.

3.47   The meeting noted some omissions in Table 1 of WP/06, and the table was updated to indicate the responses received from Australia, Cambodia and China in 2023. ICAO received the survey response from Thailand for 2024 during the meeting, and it would be recorded for future meetings.

<u>Progress of the APAC Data Analytics Ad-Hoc Group (WP/07)</u>

3.48   The ATM/SG Data Analytics Ad Hoc Group (DAG) was established at the ATM/SG/11. To date, the ATM/SG DAG has convened three meetings: two online and one physical, and has agreed on the terms of reference and framework for measuring and reporting of eight key performance indicators (KPIs) under the Global Air Navigation Plan (GANP). The ATM/SG DAG has since commenced data sharing and analysis for the eight agreed KPIs.

3.49   Australia, China, Hong Kong China, Indonesia, Papua New Guinea, Philippines, Singapore, Sri Lanka, Thailand, and the United States participated in the first physical meeting held from 20 to 21 May 2024 in Singapore. The meeting discussed and agreed on the Terms of Reference and Task List, Framework for Measuring and Reporting of KPIs, Meeting Modality, and Role Assignment.

3.50   The terms of reference and task list of the ATM/SG DAG were included in the **ATM/SG/12 WP/07 Appendix A**.

3.51   The ATM/SG DAG members agreed to hold three meetings a year: one physical, and two online. The annual physical meeting would be held during April/May to ensure sufficient lead time to prepare the necessary working papers to update the annual ATM/SG meeting, usually held in September/October. Any ad-hoc meeting could be convened when necessary.

3.52   The ATM/SG DAG members agreed to the following role assignment, as shown in **Table 3** below.

Table 3: The ATM/SG DAG Role Assignment

Role	Responsible State(s)
Rapporteur	Ms. Carol Teo (Singapore)
Data Collation	China
Data analysis on Capacity KPIs (KPI09/10)	Australia
Data analysis on Efficiency KPIs (KPI02/13)	China
Data analysis on Predictability KPIs (KPI01/14)	Singapore
Data reporting	United States
Support and contribute	All Member States

3.53   ATM/SG DAG members agreed to measure and benchmark the eight KPIs in **Table** which can be derived from six data elements (**Figure 3**). These KPIs were consistent with the KPIs previously agreed by the informal working group and were the same KPIs in stage one of the ATM/PMF endorsed by APANPIRG. A data collection guide outlining the definitions and calculation methodologies for each KPI can be found in **ATM/SG/12 WP/07 Appendix B**.
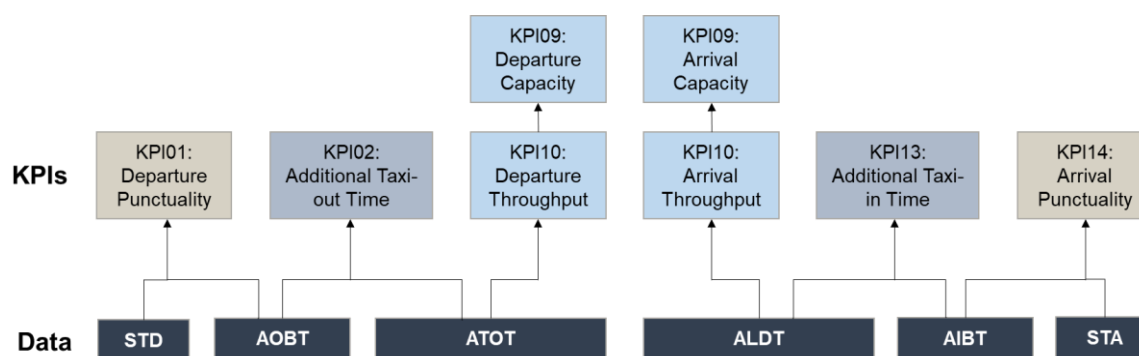
Figure 3: KPIs from Data Elements

Table 4: KPIs to be Reported by ATM/SG DAG

KPA	KPI	Variant	GANP KPI Code
Capacity	Airport peak capacity	Departure	KPI09-D
		Arrival	KPI09-A
Capacity	Airport peak throughput	Departure	KPI10-1D
		Arrival	KPI10-1A
Efficiency	Additional taxi-out time	Advanced	KPI02-2
Efficiency	Additional taxi-in time	Advanced	KPI13-2
Predictability	Departure punctuality	± 15 mins	KPI01-2A
Predictability	Arrival punctuality	± 15 mins	KPI14-2A

3.54   A data collation exercise was conducted for the eight KPIs identified. Individual member could decide which airport(s) to report on. Members States noted the benefits of including the busier airport(s), especially those facing capacity constraints and operations been integrated into regional flows.

3.55   ATM/SG DAG members agreed that data would not be shared beyond the ATM/SG DAG and any ICAO information/working papers by the ATM/SG DAG referencing this data would be cleared through individual member States/Administrations. To facilitate data sharing within this group, the ATM/SG DAG agreed that until a secure portal could be established, data sharing would be done via email exchanges. The use of less sensitive commercial data for DAG was discussed, and the DAG agreed as a viable option for further exploration.

3.56   ATM/SG DAG conducted an interim data analysis exercise to measure performance for three months from January to March 2024 as the foundation for the data collation and analysis process before advancing to a more in-depth exercise.

3.57   For capacity analysis, it was observed that while the majority of airports were operating below their peak capacities, there were a number of airports operating near to the peak capacity. Arrival capacity was determined based on a series of forecasted criteria whereas departure capacity was determined as a function of the runway layout and dependencies.

3.58   For efficiency analysis, it was observed that the advanced variant (computed with departure gate and runway data) produced a different additional taxi-in and taxi-out time as compared to the basic variant. The meeting concurred on a preference to adopt the advanced variant for this KPI, as it would take into account these varying distances and allow for a fairer comparison of additional taxi time taken for flights located at different gates.

3.59   For predictability analysis, it was observed that arrival on-time performance is poorer as compared to departures. This was due to observed higher occurrences of both early and late arrivals; departures, on the other hand, are rarely early. Such observation offered a good starting point to analyse the buffers built into the ATM system to identify areas where greater efficiency can be realised.

3.60   The Chair appreciated the contribution from the Ad Hoc Group and encouraged States to participate in the Group. The Chair expected a complete report to be presented in the next ATM/SG meeting. United States echoed the Chair's comment and stressed on the importance of data-driven improvement initiatives.

3.61   ROK indicated an interest in participating in the Ad Hoc Group, and ICAO APAC Regional Office indicated that an officer from ATM Section would join the Ad Hoc Group under Singapore's continuous leadership.

Proposed Regional Monitoring and Reporting Scheme for A-CDM Implementation (WP/08)

3.62   The ATFM/IR/SWG was formed at the Thirteenth Meeting of the Asia/Pacific Air Traffic Flow Management Steering Group (ATFM/SG/13, Bangkok, Thailand, 03 to 07 April 2023) and was tasked to develop an annual regional monitoring and reporting scheme for the elements of the Asia Pacific Airport Collaborative Decision Making (A-CDM) Implementation Plan.

3.63   Two online meetings were organised to formulate and consolidate the draft Regional Monitoring and Reporting Scheme. Representatives from China, Hong Kong China, India, Indonesia, Japan, Malaysia, Mongolia, New Zealand, ROK, Singapore, Thailand, Viet Nam, Airports Council International (ACI), Civil Air Navigation Services Organisation (CANSO) and International Air Transport Association (IATA) participated the meetings.

3.64   The members of the ATFM/IR/SWG agreed that the proposed scheme should include the following elements:

   a)   agreed basis for monitoring A-CDM implementation in the future;

   b)   traffic density for each particular reporting airport/ group of reporting airports; and

   c)   flexibility in reporting content where items could be categorised as "Required" or "Optional", with choice of "Not Applicable" as reporting response to cater for various scales and local needs of different airports in the region.

3.65   The Regional Monitoring and Reporting Scheme was proposed to be implemented in two stages:

   a)   **First Stage**: All international airports in the APAC region were required to report implementation or planning for implementation status of A-CDM. Reporting for domestic airports in the region would be optional. First stage was targeted for three years or when acquired adequate information to proceed to Second Stage; and

   b)   **Second Stage:** International airports in the APAC region were required to report implementation or planning for implementation status of A-CDM. Reporting for domestic airports in the region would be strongly encouraged. Basis for monitoring and updated information regarding A-CDM implementation status would be published periodically.

3.66   The proposal of the reporting scheme, sample reporting form as well as the reporting flow chart were included in the **ATM/SG/12 WP/08 Appendix**. It was proposed that the reporting date to be 28th of February each year, and the year 2025 would be considered as a trial year to gather essential data and comments to kickstart the analysis process.

3.67   The meeting was emphasised on the implementation of A-CDM being mentioned in the Beijing Declaration and Delhi Declaration and thus requiring continuous monitoring on regional implementation. The Chair encouraged the meeting to include the proposed reporting scheme in the routine reporting for the year 2025.

Agenda Item 4: Air Navigation Service Deficiencies

Air Navigation Service Deficiencies List (WP/09)

4.1   ICAO presented the list of APANPIRG Air Navigation Deficiencies in the ATM and Airspace Safety fields. The meeting agreed to the following change proposals for consideration by APANPIRG/35 and recorded in **Appendix E** to the Report:

   a) Non-compliance with Aeronautical Information Publication (AIP) format standards of ICAO Annex 15:

      i)   Nauru's Deficiency deleted.

   b) Non-implementation of AIS Quality Management System as required in Annex 15, Chapter 3:

      i)   Philippines' Deficiency deleted.

   c) Non-implementation of the Asia/Pacific Air Navigation Plan Vol II, Part I, Section 3 – *Specific Regional Requirements* for implementation of the Asia/Pacific Search and Rescue (SAR) Plan:

      i)   Malaysia and Philippines' Deficiencies deleted.

4.2   The meeting noted the following proposals by RASMAG/29:

   a) Potential new Deficiencies:

      i)   Non-provision of safety-related data:

         • French Polynesia (due to the failure to submit Tahiti's LHD data for January to December 2023).

      ii) Long term height-keeping monitoring requirement (remaining burden more than 30%):

         • India (remaining monitoring burden of 48%, RASMAG/29).

         • Philippines (remaining monitoring burden of 40%, RASMAG/29).

   b) Deletions of Deficiencies:

      i)   Long term height-keeping monitoring requirement:

         • Mongolia, New Zealand, Pakistan, Papua New Guinea and the Solomon Islands.

      ii) ATS datalink:

         • Maldives.

4.3   The Chair congratulated States/Administrations that had been recommended to be withdrawn from the Deficiencies List and urged States/Administrations that had been recommended to be added to the Deficiencies List, as well as other States on the Deficiencies List, to take the necessary action for the removal of Deficiencies.

4.4   The Meeting was informed that Australia had disestablished all former restricted areas that were non-compliance with Annex 2 *Rules of the Air* requirements via the States legal instrument. All annotated restricted areas over non-territorial waters would be converted to a subset of a declared danger area by 28 November 2024. ICAO would continue to coordinate with Australia on how to address the Deficiency.

4.5   The Meeting noted that contingent upon the availability of additional flight plans and DEP messages data of flights originating from Maldives, from the neighbouring States, ATFM/SG would conduct a further assessment, and any amendment to the status of the Deficiency would be submitted to APANPIRG/35 for consideration.

Agenda Item 5: ATM Systems (Modernisation, Seamless ATM, CNS, ATFM)

Regional Air Navigation Plan Update (WP/10)

5.1   ICAO presented an update on the progress of incorporating coordinate data for Asia/Pacific FIRs and Search and Rescue Regions (SRRs) in the Regional Air Navigation Plan (ANP) Volume I. States should note that Doc 9673 did not provide a legal description of the FIRs in the first place, it was very important for States to understand that this process of checking, alignment and validation is crucial if they would like a formal basis for their FIRs.

5.2   The exercise to review the ANP with FIR and SSR coordinates should be based on ICAO historical records and not new proposal for changes. The PfA process for FIRs and SRRs was now the same process of approval in the ANP Volume I (approval of the Council). Some States had submitted major amendments to their FIRs during the review process. These would only be considered if it was change that only affected the national airspace and not the neighbouring airspace or if all parties agreed with the change proposal before submission to ICAO.

5.3   The Meeting noted 30 FIRs and 15 SRRs Proposal for Amendments (PfAs) were approved by the President of the Council and incorporated in the ATM Table I-1 of the eANP Volume I, and that there were issues in some areas affecting the resolution of FIRs/SRRs affecting progress and urged States to provide updates of any bilateral/trilateral discussion of unresolved FIR boundaries.

5.4   The Chair encouraged States that had not resolved FIRs/SRRs to address these issues through bilateral or multilateral meetings.

5.5   In response to a query raised, ICAO clarified that the attachment of background information of issues in various unresolved areas was no longer included in this year's Regional Air Navigation Plan Update due repeated information with no changes for many years. Interested participants may refer to previous year's meeting material for more information. The meeting also noted a suggestion to consider the inclusion of such history for future meetings.

5.6   Bhutan referred to their submission of FIR PfA back in 2018 and requested that the submission records should be included in **ATM/SG/12 WP/10 Appendix A**. Bhutan stressed the importance of consultation for changes to neighbouring FIR boundaries and requested to reinstate the deleted text concerning Bhutan in **ATM/SG/12 WP/10 Appendix B**. ICAO would discuss with Bhutan for the inclusion.

Main Outcomes of CNS SG/28 (WP/11)

5.7   ICAO provided an update on the main outcomes from the Twenty-Eighth Meeting of the Communications, Navigation and Surveillance Sub-group of APANPIRG (CNS SG/28, Bangkok, Thailand, 01 to 05 July 2024).

5.8   CNS SG/28 had endorsed ***Draft Decision CNS SG/28/02 (Decision SWIM TF/08/01) – Information Management Panel consider the adoption of SWIM Discovery Service as a Global Standard for Globally Interoperable Service Discovery*** and ***Decision CNS SG/28/03 (Decision SWIM TF/08/02) – Candidate Baseline SWIM Discovery Service Standard for APAC*** formulated by SWIM TF/8, for APANPIRG/35 adoption.

5.9   CNS SG/28 noted ATFM/SG/14 had agreed that Flight Information Exchange Model (FIXM) Version 4.3.0 should be formalised as an agreed-upon version to support information exchange between cross-border operational ATFM systems in System Wide Information Management (SWIM) environment, which was supported by the SWIM TF/9.

5.10   Singapore had informed CNS SG/28 regarding the progress of technical and regulatory studies concerning space-based VHF communications in the 117.975 – 137 MHz band. Two companies were working to launch prototype satellites with VHF payloads for proof of concept (PoC) demonstrations from 2023 to 2025 with the aim to provide global coverage for ATM space-based VHF communications and ADS-B surveillance services.

5.11   The ICAO Secretariat presented information about a survey conducted by the ICAO APAC Regional Office to assess the readiness of ANSP's Flight Plan (FPL) processing systems handling SELCAL32, through State Letter Ref. T 8/4.3: AP072/23(CNS) dated 6 June 2024. States that had not responded to the survey were encouraged to provide feedback to ICAO APAC Regional Office using the link provided in the State Letter.

5.12   CNS SG/28 adopted ***Conclusion CNS SG/28/08 (GBAS-SBAS ITF 06/01) – Guidance Document for Implementation of GBAS in the APAC Region***, which could be accessed at the CNS Section of the ICAO APAC eDocuments webpage.

5.13   The Meeting was informed that the revised draft (Edition 1.4) of the Air Traffic Management Automation System Implementation and Operations Guidance Document (ATMAS IGD) was adopted by ATMAS TF/5 by ***Conclusion ATMAS TF/05/01 – ATMAS IGD Edition 1.4***.

5.14   CNS SG/28 discussed the outcomes of the ICAO Workshop on the APAC Seamless ANS Reporting Tool (Bangkok, Thailand, 17 to 19 April 2024). The meeting recalled the ***Conclusion APANPIRG/34/1 – APAC Regional Seamless ANS Reporting Form 3.0 and Cloud-based Seamless ANS Implementation Progress Reporting*** and ***Conclusion APANPIRG/34/2 – ICAO HQ Support for Regional ANS Implementation*** for the reporting of Seamless ANS implementation progress through the reporting portal.

5.15   The meeting noted that the reporting tool was new and lacked essential notification features. The ICAO Secretariat was working with the ICAO HQ IT team to improve the reporting tool's capabilities, thus feedback from States/Administrations that used the tool was solicited to improve reporting tool capabilities.

5.16   With regards to the issue raised by Australia at the PBNICG/11 (refer WP/11 para 2.25), the Chair highlighted that the subject was discussed at the Separation and Airspace Safety Panel (SASP) 39th Working Group Meeting (SASP-WG/39, Montreal, Canada, 6 to 17 May 2024). The Meeting agreed to wait for further development from the SASP.

Air Traffic Flow Management Steering Group Outcomes (WP/12)

5.17   The Meeting was informed of the outcomes of the Meteorology/Air Traffic Management (MET/ATM) Seminar and the Fourteenth Meeting of the Air Traffic Flow Management Steering Group (ATFM/SG/14, Bangkok, Thailand, 22 to 26 April 2024). The Meeting included a joint plenary session with the Thirteenth Meeting of the Meteorological Requirements Working Group (MET/R WG/13).

5.18   The meeting was presented on the latest ATFM global development by Mr. Elie El Khoury, Regional Coordinator from Air Navigation Bureau, ICAO HQ with the details on upcoming ATFM provisions and ICAO provisions in a global manner.

5.19   A summary of the ATFM implementation status of APAC Administrations was provided, which reported against the performance objectives of the Regional Framework for Collaborative ATFM. Annual implementation status reports, due by 28 February 2024, were received from 27 APAC Administrations.

5.20   Based on reports received, States were assessed as having *Robust* (90-100%), *Marginal* (70-89%) or *Incomplete* (0-69%) implementation. Australia, China, Hong Kong China, Japan, ROK, Singapore, Thailand and United States were assessed as having Robust implementation. **Table 5** summarised the updated Asia/Pacific Region ATFM Implementation Status as of 28 February 2024.

Table 5: Updated Asia/Pacific Region ATFM Implementation Status

Administration (Tier)	% of Implementation			Implementation Status
	2022	**2023**	**2024**	
Afghanistan (B)	*no report*	*no report*	*no report*	Did Not Report
Australia (A)	*no report*	*no report*	98	Robust
Bangladesh (B)	13	*no report*	6	Incomplete
Bhutan (A)	*no report*	21	21	Incomplete
Brunei Darussalam (B)	*no report*	*no report*	*no report*	Did Not Report
Cambodia (A)	82	95	89	Marginal
China (A)	*no report*	97	99	Robust
Hong Kong, China (A)	89	95	95	Robust
Macao, China (B)	*no report*	39	47	Incomplete
Cook Islands (B)	*no report*	*no report*	*no report*	Did Not Report
Fiji (B)	*no report*	0	16	Incomplete
France (French Polynesia) (B)	*no report*	40	40	Incomplete
DPR Korea (B)	*no report*	*no report*	*no report*	Did Not Report
India (A)	84	85	88	Marginal
Indonesia (A)	63	54	57	Incomplete
Japan (A)	*no report*	91	93	Robust
Kiribati (B)	*no report*	*no report*	*no report*	Did Not Report
Lao PDR (A)	*no report*	*no report*	*no report*	Did Not Report
Malaysia (A)	*no report*	36	37	Incomplete
Maldives (B)	*no report*	*no report*	20	Incomplete
Marshall Islands (B)	*no report*	*no report*	*no report*	Did Not Report
Micronesia (B)	*no report*	*no report*	*no report*	Did Not Report
Mongolia (A)	40	28	28	Incomplete
Myanmar (B)	*no report*	*no report*	30	Incomplete
Nauru (B)	*no report*	*no report*	*no report*	Did Not Report
Nepal (B)	*no report*	*no report*	39	Incomplete
New Caledonia (B)	*no report*	*no report*	43	Incomplete
New Zealand (A)	67	78	78	Marginal
Pakistan (B)	80	59	65	Incomplete
Palau (B)	*no report*	*no report*	*no report*	Did Not Report
Papua New Guinea (A)	*no report*	*no report*	*no report*	Did Not Report
Philippines (A)	*no report*	59	64	Incomplete
Republic of Korea (A)	87	93	97	Robust
Samoa (B)	*no report*	*no report*	*no report*	Did Not Report
Singapore (A)	97	99	99	Robust

Administration (Tier)	% of Implementation			Implementation Status
	2022	*2023*	**2024**	
Solomon Islands (B)	*no report*	*no report*	*no report*	Did Not Report
Sri Lanka (B)	*no report*	*no report*	25	Incomplete
Timor Leste (B)	*no report*	*no report*	*no report*	Did Not Report
Tonga (B)	*no report*	*no report*	*no report*	Did Not Report
Thailand (A)	90	91	91	Robust
Tuvalu (B)	*no report*	*no report*	*no report*	Did Not Report
United States (A)	*no report*	96	96	Robust
Vanuatu (B)	*no report*	*no report*	*no report*	Did Not Report
Viet Nam (A)	34	71	71	Marginal

5.21   The ATFM/SG/14 was informed of the progress update on:

a)   Bay of Bengal Cooperative ATFM (BOBCAT) operational status;

b)   Asia/Pacific Cross-Border Multi-Nodal ATFM Collaboration (AMNAC). It was highlighted that AMNAC had expanded its network with ROK as a Level 3 Member effective 01 January 2024, and to include India in the ATFM Daily Plan (ADP) Exchange to chart the path towards the implementation of cross-border ATFM capability in India; and

c)   North Asia Regional ATFM Harmonization Group (NARAHG).

5.22   The Meeting noted the update provided by the Chair of ATFM/SG regarding the conduct of APAC Bi-Weekly ATFM Web Conference via Microsoft Teams from 01 August 2024. The APAC ATFM Web Conference was held every two weeks at 0800 UTC.

5.23   The Meeting was informed that ATFM/SG/14 had agreed with the recommendation for FIXM Version 4.3.0 be used in cross-border ATFM-related information exchange.

5.24   ATM/SG/12 agreed to the merged Draft Conclusion as shown in WP/16.

Regional Supplementary Procedures Doc 7030 Update (WP/13)

5.25   The Secretariat informed the meeting that when New Zealand, jointly with several States, submitted a PfA to SUPPS for implementing ADS-B ITP and ADS-C CDP, ICAO Headquarters deemed parts of these proposals unnecessary. At the Tenth Meeting of the ATM Sub-Group of APANPIRG in October 2022, New Zealand sought clarification on separation minima requiring a supporting SUPPS procedure. Their Draft Conclusion was agreed upon and referred to ICAO for technical review.

Conclusion APANPIRG/33/5: Provide clear direction on Doc 7030 Regional SUPPs publication requirements

That, ICAO provides clear direction on which separation minima require Doc 7030 Regional SUPPS publication to provide consistency in the information published in the different regions.

5.26   The Meeting was informed that an amendment to the SUPPS was not required to support the implementation of any provisions in Annex 11, or any procedures or separation minima contained in the PANS-ATM, unless they specify that implementation was on the basis of regional air navigation agreement.

5.27 The Meeting was also informed that the Regional Office issued a State Letter following several months of coordination between the ICAO APAC Regional Office, the Air Navigation Bureau (ANB) at ICAO Headquarters, and the ICAO Europe/North Atlantic (EUR/NAT) Regional Office. This letter clarified the SARPS and PANS that require SUPPs support for implementation, and all the regional offices have a common understanding.

5.28 At the meeting, the progress of the 6th Edition of the Regional Supplementary Procedures (Doc 7030) was presented. The initial task involved aligning the areas of applicability of the air navigation plans (ANP) with the regional supplementary procedures. For the APAC region, the MID/ASIA and PACIFIC areas would be consolidated into one, and MID information would be removed to reflect the current extent of the Regional Office. To proceed, the new proposed amendment, which included the regional Traffic Information Broadcasts by Aircraft (TIBA) frequency (ATM/SG Task List 11/13), was to be reviewed by ICAO ANB and the Council once the 6th Edition of Doc 7030 became available.

Reporting of Global Navigation Satellite System (GNSS) Interference (WP/14)

5.29 Singapore highlighted the increased occurrences of GNSS interference globally and emphasised the importance of States/Administrations establishing procedures for pilots to report these events to air traffic services (ATS) units as soon as possible, as this would allow for quick notification to other airspace users through the publication of NOTAMs and the suspension of GNSS-dependent procedures and applications.

5.30 The meeting was informed that ICAO through State Letter Ref. T 8/5.10 – AP052/24(CNS) had provided the GNSS Interference Reporting Form for APAC, which could also be accessed at: https://www.icao.int/APAC/Meetings/Pages/2024-SRWG8.aspx.

5.31 ICAO supported Singapore's proposal for the reporting procedures information be published in the AIP, however, further consultation was required to determine the relevant Section of the AIP. The meeting agreed that this subject be discussed by the ICAO Aeronautical Information Services – Aeronautical Information Management Implementation Task Force (AAITF).

5.32 India informed the meeting that they had published a guidance material for reporting GNSS interference, which could be accessed from https://www.dgca.gov.in/digigov-portal/ under the menu Regulations and Guidance, sub-menu Circulars, Air Navigation Services.

5.33 ROK emphasised the need for States/Administrations to strengthen civil /military coordination to manage risks associated with GNSS interference, including the exchange of information and collaboration in addressing harmful effects on civil aviation detected or caused by military authorities.

Rationalization of Navigation Infrastructure (WP/15)

5.34 Civil aviation had a high dependence on GNSS for communications, navigation and surveillance (CNS). The rising prevalence of GNSS RFI, spoofing and jamming posed a significant risk to aircraft safety and operational efficiency. According to IATA's analysis of data from over 370,000 flights, many current GNSS aircraft receivers would take 30 minutes to recover from RFI, and others required a ground maintenance reset to regain normal functionality.

5.35 IATA proposed that States and ANSPs consider current and future risks associated with GNSS RFI when developing and reviewing plans for decommissioning conventional navigation aids, as well as re-evaluate existing ground-based navigation aids (GBNA) and establish a minimum operating network (MON) of GBNA that could guarantee continued flight safety in the event that GNSS was unreliable or unavailable. This involved retaining some essential GBNA beyond 2030 and actively collaborating with airspace users to establish regional MONs that could mitigate GNSS RFI risks.

5.36   The Chair acknowledged the significance of GNSS interference and its major impact on ATS and airspace users. As a result, it was advised that States/Administrations develop standard operating procedures for air traffic controllers to manage GNSS interference, as well as reporting processes for airspace users to the relevant ATS.

Progress update of the ICAO Asia Pacific Flight and Flow Information for a Collaborative Environment (FF-ICE) Ad-Hoc Group (WP/16)

5.37   The ICAO APAC FF-ICE Ad Hoc Group held its inaugural workshop with tabletop exercise (TTX) at the ICAO APAC Regional Office in Bangkok, Thailand from 18 to 21 June 2024. The workshop materials could be accessed at https://www.icao.int/APAC/Meetings/Pages/2024-FF-ICE-and-WS-with-TTX.aspx.

5.38   The workshop, through a series of presentations, discussions and a TTX, had taken the first step to achieving the deliverables of the ICAO APAC FF-ICE Ad Hoc Group.

5.39   During the ANSPs sharing segment, various States shared their plans for FF-ICE Release 1 (FF-ICE/R1) implementation, which were all in a phased approach with initial services starting around 2025-2030. The rest of the States were in various stages of planning and seeking guidance for their implementation of the FF-ICE/R1 services.

5.40   Building on this workshop, the ICAO APAC FF-ICE Ad Hoc Group has proposed a second workshop, tentatively in Q1 2025 to dive deeper into the regional operational requirements and procedures and discuss the documentation framework for the APAC FF-ICE/R1 implementation plan. The involvement of both operational and technical personnels in the second workshop would be crucial to provide States with a better understanding of the FF-ICE implementation requirements from an operational and systems perspective.

5.41   Since FF-ICE/R1 was a main building block of TBO, the second workshop aimed to discuss the APAC FF-ICE/R1 implementation plan including timelines and roadmap will be a key activity supporting future development, including planning towards TBO, of the APAC Seamless ANS Plan.

5.42   To ensure initial regional harmonisation as APAC States/Administrations plan for their FF-ICE/R1 implementation, the ICAO APAC FF-ICE Ad hoc Group recommended the regional adoption of FIXM Version 4.3.0 as the standard format in 2026 for the implementation of FF-ICE/R1 services.

5.43   ATM/SG also discussed the major issue of disjoint in the lack of collaboration between the operational domain and the technical domain and the lack of representation of airspace users in discussions.

5.44   The Meeting noted that for the next FF-ICE workshop, the discussion would include the procedure/process and requirements of technology, in addition, the air space users and other States were invited to participate in the workshop.

5.45   Furthermore, various meeting participants highlighted the necessity for cross-expertise collaboration for the ICAO forums, covering topics such as SWIM, FF-ICE, TBO and ATFM, which was essential to ensure effective implementation.

5.46   Some suggestions proposed were listed below:

a)   distill the major task into smaller tasks.

b)   ensure that the participation of both appropriate operational and technical personnel in the various ATM/CNS meetings of SWIM, TBO, FF-ICE and ATFM.

c)   cross collaboration between the various ATM/CNS meetings would be required following the example of SWIM TF and CRV OG collaboration.

d)   States to develop individual FF-ICE transition roadmaps.

e)   Ad hoc groups to evolve into implementation groups.

5.47   ATM/SG/12 agreed to the following Draft Conclusion which was merged from the two separate draft conclusions from WP/12 and WP/16 respectively:

Draft Conclusion ATM/SG/12-3: Agree on the adoption of FIXM Ver. 4.3.0 in Asia Pacific Region as the standard format

That, from Q3 2026 FIXM ver. 4.3.0 would be adopted to support information exchange for:

1.   FF-ICE/R1 services implementation; and

2.   Cross-border ATFM operations.

Towards Harmonised Realisation of the ICAO Global Trajectory based Operations (TBO) Concept in the Asia and Pacific Regions (WP/17)

5.48   The paper provided an update on the APAC TBO Pathfinder Project, which was initiated by the Asia Pacific Air Navigation Service Provider (ANSP) Committee (AAC). The project's goal was to harmonise implementation planning for the ICAO global TBO concept in the APAC region. It aimed to accelerate the development and deployment of key TBO components like SWIM and FF-ICE/R1. Additionally, the project sought to advance future releases of FF-ICE and the Connected Aircraft concept through discovery methods such as tabletop exercises, laboratory demonstrations, and trials.

5.49   A summary of the work done by the three workgroups (WGs):

WG1: Focused on effective communication with TBO stakeholders to modernise air navigation in the APAC region. They developed a draft education framework covering the TBO concept, benefits, implementation requirements, stakeholder discussions, the airline's perspective, and lessons from past trials.

WG2: Identified operational values for the APAC region in preparation for the FF-ICE/R1 lab demonstration in June 2025. They worked on operational scenarios, discussed tiered participation levels, and shared examples of SWIM connectivity and FF-ICE/R1 service implementation.

WG3: Discussed metrics for evaluating TBO benefits, agreeing to use and customise GANP KPIs. They decided to analyse historical data to identify inefficiencies and explore data sharing for end-to-end trajectory analysis, starting with a small sample from recent months.

5.50   In the APAC region, varying readiness levels were anticipated, with a key focus on managing air traffic in a mixed-mode environment. States and regions prioritised accelerating the planning and implementation of mature TBO technical enablers while ICAO continued work on harmonising these implementations at both regional and global levels.

5.51   Moreover, numerous participants underscored the critical need for a comprehensive regional roadmap for TBO. They strongly advocated for its integration into the 2026 update of the Seamless ANS Plan, emphasising that such a roadmap is essential for ensuring cohesive and efficient implementation across the region.

5.52   India expressed interest in joining the project and would consult with its relevant authority/ANSP before confirming participation.

Cross-Border Direct Routing Operations (DRO) between Indonesia and Singapore (WP/18)

5.53   The paper detailed the joint efforts of Indonesia and Singapore in implementing cross-border DRO based on the Free Route Operations (FRTO) concept. The goal was to improve flight efficiency and allow airspace users to choose preferred routes, marking an initial move towards TBO.

5.54   The development of FRTO was essential for achieving flexible trajectories in the ICAO ASBU. FRTO allowed airspace users to plan their own routes instead of following fixed ATS networks. With FF-ICE/R1 services starting in November 2024 and regional SWIM implementation expected by 2030, it was timely for APAC States/Administrations to consider FRTO to benefit from future ATM digitalisation and transformation.

5.55   Indonesia and Singapore initiated a trial operation, which reaffirmed several benefits such as reduced operational costs and flight times, increased passenger and cargo capacities, lower fuel consumption and carbon emissions, and enhanced customer service.

5.56   Then, Indonesia and Singapore collaborated on cross-border DRO on ATS route G579, conducting an operational trial from 21 March to 04 September 2024, which showed a 30% utilisation rate. Following the trial, the cross-border DRO was jointly implemented on 05 September 2024. Both States planned to enhance engagement with operators and explore further cross-border DRO opportunities.

5.57   The cross-border DRO between Indonesia and Singapore was a key step in improving regional air traffic management. This initiative, along with multilateral projects like the Southeast Asia-Oceania Free Route Airspace, aims to enhance safety and efficiency. Active collaboration could help the Asia/Pacific region to achieve the ICAO's vision of TBO and support the goal of net-zero carbon emissions by 2050.

5.58   The Chair advocated for enhanced collaboration with neighbouring FIRs. He emphasised the importance of learning from successful cross-border initiatives, particularly citing the cooperation between Indonesia and Singapore. This example served as a powerful reminder of the benefits that could be achieved through effective partnership and coordination across borders.

5.59   IATA also expressed their appreciation for the extensive coordination and collaboration efforts that were instrumental in successfully completing the FIR realignment. They highlighted the importance of these joint efforts in achieving such a significant milestone.

The Long-Term Vision for the Future Air Traffic Systems of Japan (CARATS) (IP/02)

5.60   Japan informed the meeting that the Japan Civil Aviation Bureau (JCAB) established a study group in 2010 to tackle the increasing demands for higher flight volumes, enhanced user convenience, and greater environmental sustainability. This initiative resulted in the creation of the "Long-term Vision for the Future Air Traffic Systems," known as "CARATS." Japan has since provided updates on several key areas: SWIM implementation, domestic airspace reconstruction, CPDLC area expansion towards TBO, FRA expansion, effective route provision around airports, and future transformations.

Research and Application of Air-to-Ground Data Link Technology for Transmitting Turbulence Information (IP/03)

5.61   China informed the meeting about a mechanism for sharing turbulence information with pilots, using Henan as an example. In Henan, turbulence data was sent to a local system and then relayed to the service provider, who delivered it to the aircrew via ACARS. This process aimed to enhance ATC services and safety levels. The information paper highlighted those various aspects of verifying turbulence information transmission via air-ground data link had been optimised from both ATC and pilot perspectives.

Updates on ATM Activities in Vietnam (IP/14)

5.62   This information paper presented an overview of recent developments in the field ATM in Viet Nam including areas of modernisation of ATM systems, infrastructure development, airspace, ATS routes and flight procedure optimisation, human resource development, cooperation on ATFM and revision of ATC Letter of Agreements (LOAs), cooperation on ATFM and operational trial with Level 3 nodes, revision of ATC LOAs and separation standards, AIM and Viet Nam's preliminary USOAP audit results.

Agenda Item 6: ATM Coordination (Meetings, Route Development, Contingency Planning)

Regional ATM Contingency Planning and Contingency Operations Update (WP/19)

6.1   The secretariat presented information on ATM contingency planning in the Asia/Pacific Region, including an update of State-reported implementation of the performance expectations of the Asia/Pacific Regional ATM Contingency Plan. A brief outline of ATM contingency operations in the APAC Region since the last report to ATM/SG/11 was also provided.

6.2   Regional ATM Contingency Plan Monitoring and Reporting status report forms were received from the following States/Administrations (**Table 6**).

        2024 - Australia, Bangladesh, Cambodia, China, Hong Kong China, Macao China, Fiji, Indonesia, Japan, Malaysia, Mongolia, Nepal, New Zealand, Pakistan, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand, United States, Viet Nam.

Table 6: Reported ATM Contingency Plan Implementation Status

Administration	% Implementation	Implementation Status
Afghanistan	*no report*	Did Not Report
Australia	94 ↓	Robust
Bangladesh	29 ↓	Incomplete
Bhutan	18	Incomplete
Brunei Darussalam	*no report*	Did Not Report
Cambodia	74 ↑	Marginal
China	94	Robust
Hong Kong, China	94 ↑	Robust
Macao, China	79 ↑	Marginal
Cook Islands	*no report*	Did Not Report
DPR Korea	*no report*	Did Not Report
Fiji	65 ↓	Incomplete
France (French Polynesia)	29	Incomplete
India	*no report*	Did Not Report

Administration	% Implementation	Implementation Status
Indonesia	97	Robust
Japan	74 ↓	Marginal
Kiribati	*no report*	Did Not Report
Lao PDR	*no report*	Did Not Report
Malaysia	84 ↑	Marginal
Maldives	3	Incomplete
Marshall Islands	*no report*	Did Not Report
Micronesia	*no report*	Did Not Report
Mongolia	63 ↑	Incomplete
Myanmar	60	Incomplete
Nauru	*no report*	Did Not Report
Nepal	47 ↑	Incomplete
New Caledonia	29	Incomplete
New Zealand	95 ↑	Robust
Pakistan	80 ↑	Marginal
Palau	*no report*	Did Not Report
Papua New Guinea	26	Incomplete
Philippines	72 ↓	Marginal
Republic of Korea	79 ↓	Marginal
Samoa	*no report*	Did Not Report
Singapore	91	Robust
Solomon Islands	*no report*	Did Not Report
Sri Lanka	70 ↑	Marginal
Timor Leste	*no report*	Did Not Report
Tonga	*no report*	Did Not Report
Thailand	94	Robust
Tuvalu	*no report*	Did Not Report
United States	82	Marginal
Vanuatu	*no report*	Did Not Report
Viet Nam	81 ↓	Marginal

6.3   The meeting was reminded that the ICAO APAC Regional Office was expected to annually report the receipt, or non-receipt, of completed Contingency Plan Monitoring and Reporting Forms, in accordance with the performance expectations of the Regional ATM Contingency Plan, for consideration for addition to the APANPIRG ANS Deficiencies List.

6.4   The current Kabul FIR Contingency Operations was introduced by the ICAO Secretariat. Recognising that ATS routes through the Kabul FIR were integral to major traffic flows between South Asia/Southeast Asia and Europe and that most airspace users who would typically transit the Kabul FIR had chosen to reroute, ICAO acknowledged the efforts of States that managed the increased traffic on alternative routes through their FIRs, especially India, Pakistan, and the Middle East (MID) region States.

6.5   The meeting was informed that the ICAO APAC/MID ATM Contingency Planning Workshop took place in June 2024. Throughout the workshop, ICAO and subject matter experts from States, ANSPs, airspace users, and International Organizations delivered an overview of relevant ICAO provisions, examined the current regional ATM Contingency Framework, and explored case studies on ATM contingency planning, meteorological phenomena impacting ATM operations, and other related topics.

6.6   The workshop facilitated discussions on enhancing contingency management and improving regional plans based on the draft APAC Regional Contingency Framework. This framework, developed by AAC Work Stream 3 and ICAO ANB, was tentatively adopted with updates to the Regional ATM Contingency Plan. ICAO expressed their appreciation for the effort by the AAC Work Stream 3, recognising the significant progress made. It was currently under review by ICAO ANB and Regional Offices for harmonisation.

6.7   The meeting agreed to the process proposed by the ICAO Secretariat for updating the contingency framework/plan. Nevertheless, any delay in the unified framework by ICAO could result in setbacks for the entire process.

> a)   the framework would be reviewed and amended by ICAO ANB and Regional Offices to create a harmonised global framework.
>
> b)   the Regional Plan would be amended by the ICAO Secretariat based on the updated framework.
>
> c)   both the framework and the regional plan would be discussed at ATM/SG/13.
>
> d)   both the framework and the regional plan would be proposed at APANPIRG/36.

6.8   The Chair and the ICAO Secretariat praised the AAC Work Stream 3 and the leadership of the United States for their diligent work and significant efforts in accomplishing their tasks.

SAIOSEACG Meeting Outcomes (WP/20)

6.9   ICAO Regional Sub-Office presented the outcomes of The Third Meeting of the South Asia, Indian Ocean and Southeast Asia ATM Coordination Group (SAIOSEACG/3, Bangkok, Thailand, from 16 to 19 April 2024).

6.10   The key outcomes of the two Small Working Groups subordinated to the SAIOSEACG, namely the South China Sea Traffic Flow Review Group (SCSTFRG) and the Bay of Bengal Traffic Flow Review Group (BOBTFRG), were also mentioned.

6.11   With respect to the four SCSTFRG priority areas, it had been highlighted that the SCSTFRG Priority 4 (optimisation of FLAS/FLOS operation) could not be considered as an isolated project; it had significant interconnectivity with the SCSTFRG Priority 1, 2 and 3 (reduction of longitudinal separation on primary routes). Reducing longitudinal separation would enhance route capacity and improve airspace efficiency.

6.12   Regarding the BOBTFRG, the meeting noted that despite available capabilities, some States/Administrations still applied conservative separation standards than specified in regional planning expectations, contributing to the growing congestion. Noting the objectives and the tasks under the BOBTFRG, the group prioritised implementation timelines for the improved horizontal separation standards according to demonstrated performance capabilities.

Asia Pacific Region ATS Route Catalogue (WP/21)

6.13   ICAO shared the latest review of the Asia/Pacific Region ATS Route Catalogue, emphasising key developments in regional airspace management. Version 23.2 currently included 41 ATS routes, with two new proposals and eight routes classified as archived. Notably, the BOB01 route, now designated as RNP10 Route P632, had benefited from strong collaboration between among stakeholders like Bangladesh, India and IATA, and showcased significant environmental benefits, including a reduction in carbon emissions. Additionally, newly added proposals to the catalogue, such as PAK 01 and AFG 03, had been reported, further enhancing connectivity across the region.

6.14 ICAO expressed gratitude to all States/Administrations for their efforts in advancing the implementation of route proposals. Looking ahead, enhancing coordination, addressing airspace constraints, and exploring alternative variations for partial benefits remain crucial. Future discussions will focus on routes passing through restricted areas to ensure continued progress in airspace management across the APAC region.

<u>Progress Update of the Space Vehicle Launch and Re-Entry Coordination Small Working Group (SVLRC SWG) (WP/22)</u>

6.15 The meeting recalled *Decision ATM/SG/10-8* regarding the formation of the Space Vehicle Launch and Re-entry Coordination Small Working Group (SVLRC SWG) to:

a) study global practices and procedures for the coordination of space vehicle launch and re-entry activities, with a view to making recommendations for best practices to be adopted in the Asia/Pacific Region;

b) consolidate and update Asia/Pacific regional guidance material on space vehicle launch and re-entry coordination and response; and

c) recommend consolidated guidance and performance expectations for inclusion in the 2023 update of the Asia/Pacific Seamless ANS Plan.

6.16 The SVLRC SWG presented the Final Draft Version 1.0 of the Asia/Pacific Regional Guidance for Space Object Launch and Re-entry Activities Coordination, which was intended to replace the current Asia/Pacific Planning Checklist for Space Launch and Space Re-Entry Operations published on the ICAO APAC eDocument webpage, for review by the Meeting.

<u>Space Vehicle Launch and Re-Entry Coordination Small Working Group (SVLRC SWG) (Flimsy 1)</u>

6.17 Flimsy 1 was provided to supplement WP/22, incorporating ICAO Secretariat's clarifications based on ICAO Annex 15 and PANS-AIM, and editorial amendments to the Final Draft Version 1.0 of the Asia/Pacific Regional Guidance for Space Object Launch and Re-entry Activities Coordination.

6.18 A Draft Conclusion would be proposed to APANPIRG/35 to support formal adoption of the updated regional guidance and reference in the Asia/Pacific Seamless ANS Plan. The Meeting adopted the following Draft Conclusion:

Draft Conclusion ATM/SG/12-2: Regional Guidance for Space Object Launch and Re-Entry Coordination

1. That, the Asia/Pacific Regional Guidance for Space Object Launch and Re-Entry Activities at **Appendix D** to the Report:

    a) be uploaded to the Asia/Pacific Regional Office website, to replace the existing Asia/Pacific Planning Checklist for Ballistic Launch and Space Re-entry;

    b) be referenced in the Asia/Pacific Seamless ANS Plan; and

2. the related ballistic launch and space re-entry guidance and performance expectations in the Asia/Pacific Seamless ANS Plan be updated accordingly.

6.19   As the SVLRC SWG had completed its tasks, ICAO proposed the dissolution of the SVLRC SWG, which was subsequently adopted by the ATM/SG.

Decision ATM/SG/12-7: Dissolution of the Space Vehicle Launch and Re-entry Coordination Small Working Group (SVLRC SWG)

That, the Space Vehicle Launch and Re-entry Coordination Small Working Group (SVLRC SWG), having completed all tasks as per the Decision ATM/SG/10-8, be dissolved.

6.20   The Chair and ICAO Secretariat commended the SVLRC SWG for their hard work and substantial effort in completing its tasks.

North Pacific (NOPAC) Route System Redesign (WP/23)

6.21   This working paper was a testament to the joint effort of JCAB, FAA, and IATA in the NOPAC Redesign Project, which aimed at improving efficiency in the NOPAC Route System. The new ATS routes, with 23 NM lateral separation minima, were a result of this collaborative effort. In Phase 2, ATS routes were compressed into smaller airspace, allowing more UPRs (**Figure 4**). Despite the benefits, controllers faced challenges with data link outages. The paper also called for contingency procedures for lateral PBCS minima during connectivity issues.
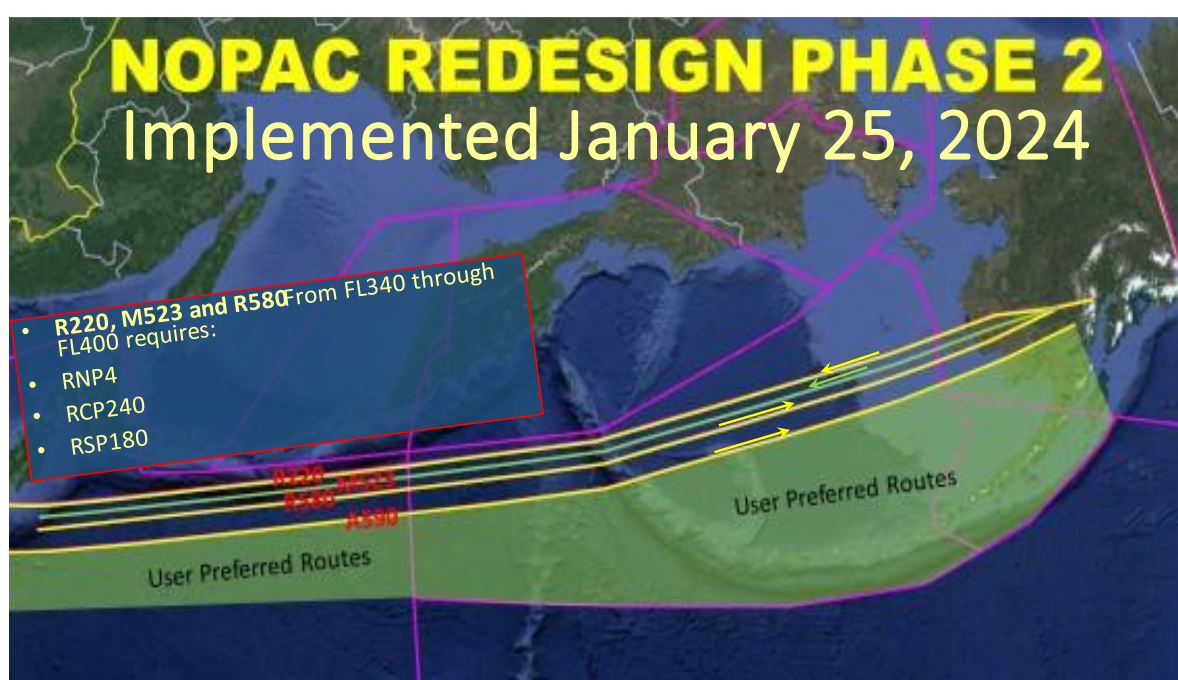
Figure 4: NOPAC Redesign Phase 2

6.22   JCAB, IATA, and the FAA had worked for years on the NOPAC Redesign Project, ensuring operators meet RCP 240, RSP 180, and RNP 4 requirements. Around 95% of NOPAC aircraft were PBCS/RNP 4 approved. Despite challenges like COVID-19 and data link issues, the project had moved into Phase 2. Reliable data link connections are crucial as traffic levels exceed pre-COVID-19 levels. Controllers need better data link reliability to manage oceanic airspace efficiently.

6.23   When data link connectivity was lost, controllers had to revert to larger separation minima, which was challenging for aircraft on parallel routes with 23 NM lateral separation. This introduced higher risks due to multiple altitude and route changes. In the Northern Atlantic, some FIRs had contingency procedures allowing the continuation of 23 NM separation during outages, as reverting to larger minima was riskier. No new aircraft pairs were allowed to enter oceanic airspace with reduced minima during outages.

6.24   One of the most significant connectivity problems was caused by VHF Data Link (VDL) to Satellite (SAT) transition issues. Anchorage's multiple VDL stations provided extensive VDL coverage in their oceanic FIR, leading to frequent VDL to SAT transitions, which contributed to poor performance and connectivity issues The NOPAC Redesign Project faced challenges but showed that collaboration is key to enhancing airspace capacity in the APAC region. JCAB and the FAA worked on implementing reduced separation minima and better ATS routes, sharing their progress to improve airspace efficiency.

6.25   Recognising the necessity for a comparable mechanism as highlighted in two GNSS interference working papers (WP/14 and WP/15), the Chair suggested forming an ad hoc group. Consequently, the following Decision was reached during the meeting.

Decision ATM/SG/12-8: Establish Procedures for GNSS and Data Link Disruption Ad Hoc Group

That, ATM/SG establishes the Procedures for GNSS and Data Link Disruption Ad Hoc Group, to:

1.   collect data on GNSS and data link disruption in APAC region; and

2.   develop the procedures for GNSS and data link disruption that include (but not limited to) the need for:

  a)   reporting process by airspace users to ATS units; and

  b)   sharing of information between stakeholders.

6.26   The following States/Administrations and International Organizations expressed interest supporting the Ad Hoc Group:

China, Indonesia, Japan, New Zealand, Philippines, Republic of Korea, Singapore, Thailand, United States, IATA, ICAO, ICCAIA, and IFALPA

6.27   The United States graciously accepted the role of Rapporteur.

6.28   The following States/Administrations expressed interest in considering participating in the Ad Hoc Group:

Australia, Hong Kong China, India and Malaysia.

6.29   The meeting also agreed the terms of reference and task list should be discussed at the first meeting of the Ad Hoc Group.

Offset Climb/Descent Procedures in Oceanic Airspace of Fukuoka FIR (WP/24)

6.30   The meeting was informed that the JCAB implemented reduced separation minima in oceanic airspace, with 30 NM longitudinal, 15 NM during climb/descent, and 23 NM lateral separations. To enhance safety and efficiency, they introduced an offset climb/descent procedure to resolve altitude conflicts and began trialling a 12 NM lateral separation using ATS data link services in June 2024.

6.31   The offset climb/descent procedure enabled aircraft to achieve the desired altitude by deviating from the initially cleared route, following instructions from the controller. Pilots could request this when a substantial altitude change was not approved, and controllers could also recommend it. This procedure was applicable in Fukuoka for both CPDLC and HF voice communication.

6.32   The 12 NM lateral separation minimum had been added to PANS-ATM in 2020. This separation was applicable in airspace where SLOP up to 2 NM was authorised and was used when one aircraft climbed or descended through another's level. Both aircraft needed to have RNP 4, RCP 240, and RSP 180 approvals.

6.33   Japan also presented the anticipated benefits of implementing the 12 NM offset method in the oceanic sector, which included enhancing airspace capacity and boosting operational efficiency.

<u>Progress Update on Capacity Optimisation of Air Routes L642 and M771 (WP/25)</u>

6.34   This paper presented the progress update on the enhancement of longitudinal spacing on ATS routes L642 and M771 to follow up on one of the action items agreed as Priority Area 2 in the region.

6.35   An operational trial was conducted between all concerned States and Administrations to adopt 20 NM minimum longitudinal spacing for L642 and M771 between 0200 and 1200 UTC on daily basis for aircraft pair cruising at or above FL290; equipped with serviceable ADS-B; and with constant or increasing longitudinal spacing.

6.36   During the trial period, aircraft without serviceable ADS-B shall cruise at FL280 or below unless prior approval was sought from the receiving ATCC/ACC.

6.37   ICAO APAC Regional Sub-Office queried on the expected trial period. Hong Kong China claimed that the trial would continue until further notice since large scale weather deviation in South China Sea often prohibit the operation with reduced longitudinal separation. China agreed with Hong Kong China's view and encouraged neighbouring FIRs work together to make more progress. Singapore expressed that they would share the experience in dealing weather deviation with Viet Nam in the upcoming SCSTFRG meeting.

<u>Optimisation of ATS Routes A461, M501 and A583 (WP/26)</u>

6.38   This paper presented the outcome of enhancing the minimum longitudinal spacing on ATS routes A461, M501 and A583 between the Philippines and Hong Kong China. 30 NM minimum longitudinal spacing would be implemented in three phases.

6.39   Phase 1 and Phase 2 implementation was completed in February 2023. 30 NM minimum longitudinal spacing was applicable to traffic pair on ATS routes A461 and M501with RNP 4 capability at FL290 or above under constant or increasing longitudinal spacing. Smooth implementation, increased capacity and enhanced efficiency were noted.

6.40   In Phase 3 implementation, 30 NM minimum longitudinal spacing would be applicable to traffic pair on ATS route A583 with RNP 4 capability, CPDLC and ADS-C equipage at FL290 or above under constant or increasing longitudinal spacing.

6.41   A new LOA between Hong Kong ATCC and Manila ACC was signed in September to officiate the enhancement.

6.42   The Chair appreciated the effort between States and Administration to collaborate and cooperate to enhance the regional capacity.

6.43   The Philippines expressed their gratitude to Hong Kong China for the significant increase in airspace capacity between the two FIRs, which would be expected to improve air traffic management and foster stronger aviation cooperation between the two FIRs.

Cross FIR Boundary UPR (IP/04)

6.44   Australia shared details about a trial involving cross FIR Boundary UPR between Australian and Indonesian airspace. The trial aimed to gather insights for expanding the initiative to other airlines and routes, with goals of reducing fuel consumption, lowering carbon emissions, and shortening flight times. Participating airlines provided routine feedback, showing significant savings. Official figures were not released as data was still being collated. This information, along with safety data, was to be presented in a Post Implementation Review in late 2024, potentially supporting the trial's expansion and continuation.

Optimisation and Enhancement of Air Traffic Management over the Bay of Bengal Area (IP/05)

6.45   The meeting was informed of Malaysia's implementation of default 50 NM longitudinal separation in the Bay of Bengal area and the additional flight level allocation scheme (FLAS) of flight level (FL) 360 for ATS routes L510, N571, P574 and P628. In collaboration with India, this initiative significantly enhanced flight capacity over the Bay of Bengal area and optimised air traffic management efficiency in the Kuala Lumpur FIR.

Indonesia's TableTop Exercise (TTX) on ATM Contingency Plan (IP/06)

6.46   Indonesia presented the successful conduct of a TableTop Exercise (TTX) to apply the Air Traffic Management Contingency Plan (ATM CP). The TTX demonstrated the effective coordination and response capabilities among AirNav Indonesia, the Directorate General of Civil Aviation (DGCA) Indonesia, the Indonesian Air Force (TNI AU), airlines, airports, the Meteorology, Climatology, and Geophysics Agency (BMKG), the National Search and Rescue Agency (BASARNAS), and airport authorities. It also identified both strengths and areas for improvement in contingency planning and execution.

CAAC ATM Contingency Arrangements International Parts Update (IP/07)

6.47   China provided information relating to the international part of China ATM contingency arrangements that had been published through aeronautical information circular (AIC) and Air Traffic Management Bureau (ATMB) website, aimed at sharing relevant information and obtaining possible feedback. The plan was applicable to the ATS units related to neighbouring States and Administrations at the second or third contingency levels events of the ICAO Asia and Pacific regions, during the periods when ATS were interrupted or may be interrupted, or when the airspace was unsafe or unavailable due to volcanic ash clouds, radioactive clouds, adverse weather events, or state aircraft activities, etc.

Contingency Plan for Volcanic Ash at Mount Ruang – Indonesia (IP/08)

6.48   The meeting was informed on the contingency response and contingency plan overview by the Indonesian civil authorities in the event of Mount Ruang eruption in North Sulawesi, Indonesia in April 2024, causing significant impact to aviation operations in North Sulawesi including airport and ATS routes closure.

China Airspace Classification and Pilot Update (IP/09)

6.49   The meeting was updated with information regarding the pilot schemes that China had performed in evaluating the airspace classification in China to better facilitate local necessities especially planning ahead for the development of general aviation and low-altitude air traffic such as drones and eVTOL.

Agenda Item 7: AOP, AIM, MET, SAR

AOP Subgroup Outcomes (WP/27)

7.1   ICAO presented relevant outcomes of the Eighth Meeting of the Aerodrome Operations and Planning Sub-Group (AOP/SG/8, Bangkok, Thailand, 15 to 19 July 2024).

7.2   AOP/SG/8 noted that AAITF/19 had agreed to ***Decision AAITF/19-3 – Establish APAC Common SWIM Aeronautical Information Services Ad hoc Group*** and was invited to participate. India expressed interest in joining the ad hoc group and would consult with its relevant authority before confirming participation.

Publication of the Status of Certification of Aerodromes in AIP

7.3   **Table** 7 listed the States that had not publish the status of certification of aerodromes in AIP Section AD 1.5.

Table 7: Status of AIP Section AD 1.5 in Sub-regions of Asia/Pacific

North Asia	Southeast Asia	South Asia	Pacific
--	1) Brunei Darussalam	1) Afghanistan	1) Kiribati 2) Nauru 3) Tuvalu 4) Marshall Islands 5) Micronesia (Federated States of) 6) Palau

7.4   States that had published the status of certification of aerodromes in other sections of AIP were encouraged to publish in Section AD 1.5 to align with the AIP template, as recommended in Appendix 2 of ICAO Doc 10066 *Procedures for Air Navigation Services – Aeronautical Information Management* (PANS-AIM).

Enhanced Global Reporting Format (GRF) for Assessing and Reporting Runway Surface Conditions

7.5   AOP/SG/8 noted that 15 States had informed ICAO APAC they had implemented GRF in 2021, however, as of 22 March 2024 only 14 States had published the procedures for assessment and reporting of runway condition report in AIP.

7.6   Annex 15 *Aeronautical Information Services (AIS)* Section 6.3.1.2 required that any permanent changes in the AIP be published as AIP Amendments. Therefore, the procedures for assessment and reporting of runway surface conditions report and issuance of information in the SNOWTAM format should also be published in national AIP. The most appropriate section for publication of above information in AIP would be Section AD 1.2.2 Snow plan.

7.7   The list of the States that had published procedures for assessment and reporting of runway condition report in AIP is depicted in the **Table 8** below:

Table 8: States/Administration that had Published Procedures for Assessment and Reporting of Runway Condition Report and Issuance of SNOWTAM in AIP

No.	States/Administrations	Procedures for assessment and reporting of runway condition report in AIP	Section of AIP
1.	Australia	√	AD 1.2, 2. Snow Plan; 3. Runway Surface Condition Assessment and Reporting (AIP, 23 March 2022)
2.	China	√	AD 1.2.2 Snow Plan (AIP, 15 January 2023)
3.	France (New Caledonia, French Polynesia, and Wallis & Futuna)	√	**POLYNÉSIE** AD 1.2.2 Runway Surface Condition Assessment and Reporting and Snow Plan (AIP, 29 December 2022) **NOUVELLE CALEDONIE, WALLIS ET FUTUNA** AD 1.2.2 Runway Surface Condition Assessment and Reporting and Snow Plan (AIP, 26 January 2023)
4.	India	√	AD 1.2, 2 Runway Surface Condition Assessment and Report (AIP, 22 February 2024)
5.	Japan	√	AD 1.2, 2.1. SNOWTAM (AIP, 24 February 2022)
6.	Maldives	√	AD 1.2, 2. Snow Plan, 2.1 Runway Surface Condition Assessment and Reporting (AIP, 25 May 2023)
7.	New Zealand	√	AD 1.2, 2. Snow Plan, 2.1 Runway Surface Condition Assessment and Reporting (AIP, 09 February 2024)
8.	Pakistan	√	AD 1.1, 5. Assessment and Reporting of Runway Surface Condition
9.	Republic of Korea	√	AD 1.2, 2. Snow Plan, Runway Surface Condition Assessment and Reporting, 2. Runway surface condition assessment and reporting (AIP, 09 February 2023)
10.	Singapore	√	AD 1.1, 6 Runway Surface Condition Assessment and Reporting (AIP, 02 December 2021)

No.	States/Administrations	Procedures for assessment and reporting of runway condition report in AIP	Section of AIP
11.	Sri Lanka	√	AD 1.2, 2 Snow Plan, 2.1 Runway Surface Condition Assessment and Reporting, (AIP, 21 March 2024)
12.	Thailand	√	AD 1.2, 3. Runway Surface Condition Assessment and Reporting (AIP, 18 May 2023)
13.	USA	√	ENR 1.1, 11. Runway Condition Reports (AIP, 16 July 2020)
14.	Viet Nam	√	AD 1.2, 2. Runway Surface Condition Assessment and Reporting at the Airports of Viet Nam (AIP, 30 November 2022)

7.8   States that had already published procedures for assessment and reporting of runway condition report and the issuance of SNOWTAM in other sections of AIP were invited by AOP/SG/8 to consider changing it to AD 1.2.2 Snow plan.

Space Weather Advisories via Flight Information Services (WP/36)

7.9   This paper highlighted the inconsistent approach to sharing space weather (SWX) advisory information to aircraft in flight across the APAC region, namely:

a) there was no equivalent SIGMET issued for SWX, nor NOTAM required. This was due to the often-global nature of the SWX advisories (e.g. "daylight side") and the potential for information overload if identical SIGMET and NOTAM were issued for every FIR;

b) another crucial difference from SIGMETs was that a SWX advisory was not FIR-based. This could be challenging for ANSPs to determine whether an advisory was relevant for the FIR they were responsible for; and

c) the inconsistent approach by States meant that a long-haul flight might receive information on SWX advisories that could impact its operation only during parts of its journey.

7.10   The meeting noted that space weather events can cause disruptions to (or even failures of) communications, navigation, and surveillance systems. In addition, they elevate radiation dose levels at flight altitudes, where high-energy particles may cause aircraft equipment failure or malfunction.

7.11   The meeting also confirmed that PANS – ATM para 9.1.3.8 contained the requirement on the transmission of information concerning space weather activity and means of transmission.

> *Information on space weather phenomena that have an impact on high frequency radio communications, communications via satellite, GNSS-based navigation and surveillance systems, and/or pose a radiation risk to aircraft occupants at flight levels within the area of responsibility of the ATS unit, shall be transmitted to the affected aircraft by one or more of the means specified in 9.1.3.1.1.*

7.12   The meeting was requested to discuss the need to develop guidance for the dissemination of relevant SWX information by ANSPs to operators via FIS for the APAC region. It was suggested that the group appropriate to assist in this development would be the new Meteorology Exercise (METEX) Advisory Group (AG) under MET/SG. The meeting also discussed the need for closer coordination between MET and ATM in understanding the impact of such advisories.

7.13   The meeting raised the issue that airlines might not be familiar with disseminated SWX advisory because there were not many States that issue SWX advisory. Another point was raised to also consider the effects of SWX on the Hight Altitude Airspace operations. For more information. the meeting was referred to the ICAO APAC/MID ATM Contingency Planning Workshop (25 to 27 June 2024) and APAC ATM Contingency Tabletop Exercise (28 June 2024).

NOTAM ASHTAM for Volcanic Unrest (WP/37)

7.14   ICAO, on behalf of Meteorology Sub-group presented the safety issue identified by the Meteorology Sub-group in relation to the lack of awareness by international aviation of elevated pre-eruptive unrest of many Asia and Pacific volcanoes and invited the meeting to consider options for addressing the problem as follows:

a)   States with responsibility for FIRs that contain active or potentially active volcanoes should ensure that information was shared with the responsible ACC/FIC by all relevant volcano observatories contained within the FIR (potentially associated with more than one State). States should take steps to ensure there was clear understanding of any volcanic activity alert level system used; and

b)   States that do not have FIR responsibilities should develop procedures and agreement with States who were the relevant FIR authorities for volcanic information dissemination based on ICAO requirements, so that necessary actions were taken to ensure safety.

7.15   It was anticipated that Amendment 82 to Annex 3 *Meteorological Services for International Air Navigation* would include a new recommended practice for State Volcano Observatories (SVOs) to provide volcanic activity information in the form of volcano observatory notice to aviation (VONA), however, until this was enabled in each applicable State, there would continue to be a need for the provision of NOTAM on volcanic unrest.

7.16   IFALPA noted that lack of appropriate NOTAM results into safety issues for Airspace Users. ICAO informed that the focus of MET/SG through the METEX AG is now developing guidance to States and Administrations to conduct Volcanic Exercises on their own. However, MET/SG was opened to conducting Volcanic Ash Exercises under ICAO guidance involving multiple stakeholders, subjected to the size and scope. The Chair welcomed the suggestion and asked IATA and IFALPA to join the exercises.

AIS – AIM Implementation Task Force Outcomes (WP/29)

7.17   Outcomes from the Nineteenth Meeting of the ICAO AIS – AIM Implementation Task Force (AAITF/19, Bangkok, Thailand, 10 to 14 June 2024) were provided to the meeting.

AIS – AIM Deficiencies

7.18   AAITF/19 had reviewed APANPIRG Air Navigation Deficiencies in the AIS/AIM field. No new deficiencies had been identified since APANPIRG/34. Nauru had provided evidence supporting the removal of the AIP Format not implemented deficiency. Philippines had provided evidence supporting the removal of the Quality Management System not implemented deficiency.

7.19   Sri Lanka, as requested by the Regional Office, had submitted supplementary evidence to support the removal of the Quality Management System not implemented deficiency. Review of the evidence is in progress. Any update to the deficiency status would be recommended to the APANPIRG meeting in November.

7.20   The list of AIS/AIM-related deficiencies as reviewed by AAITF/19 was included in WP/9 under Agenda Item 4 to this meeting.

AIS – AIM Implementation Status

7.21   An update was provided on the status of implementation of the performance expectations of the *APAC Regional Plan for Collaborative AIM*, which were expected to be implemented in in three phases: Phase I (immediately), Phase II (07 November 2019) and Phase III, (27 November 2025).

7.22   Hong Kong China, Japan and Singapore had reported implementation of all Phase I elements. Only Singapore reported implementation of all Phase II elements. **Figure 5** and **Figure 6** illustrated overall regional implementation of Phases I and II; approximately 60% for Phase I and 42% for Phase II (58% and 42% respectively in 2023). Combined progress towards implementation of Phases I and II was 53% (51% in 2023).
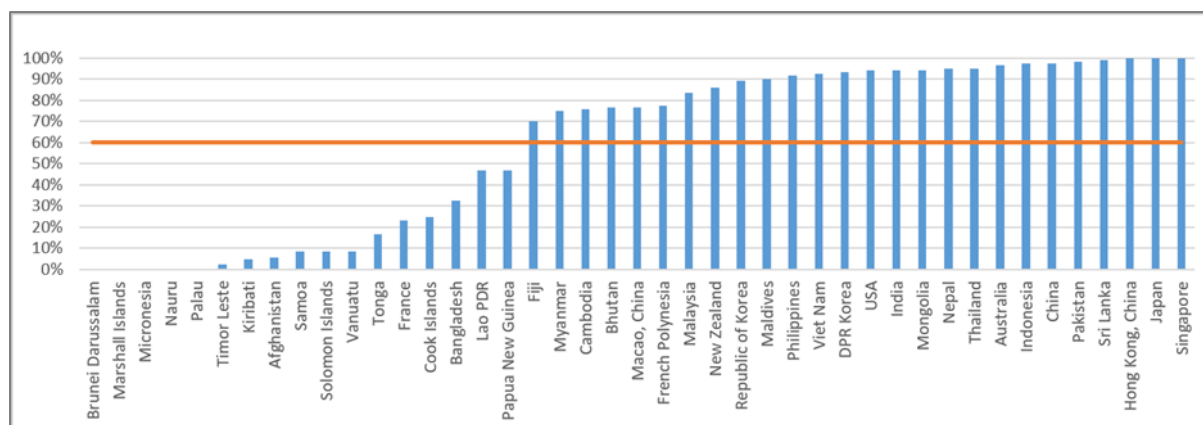
Figure 5: Regional Phase I Implementation Progress (updated on 15 May 2024)
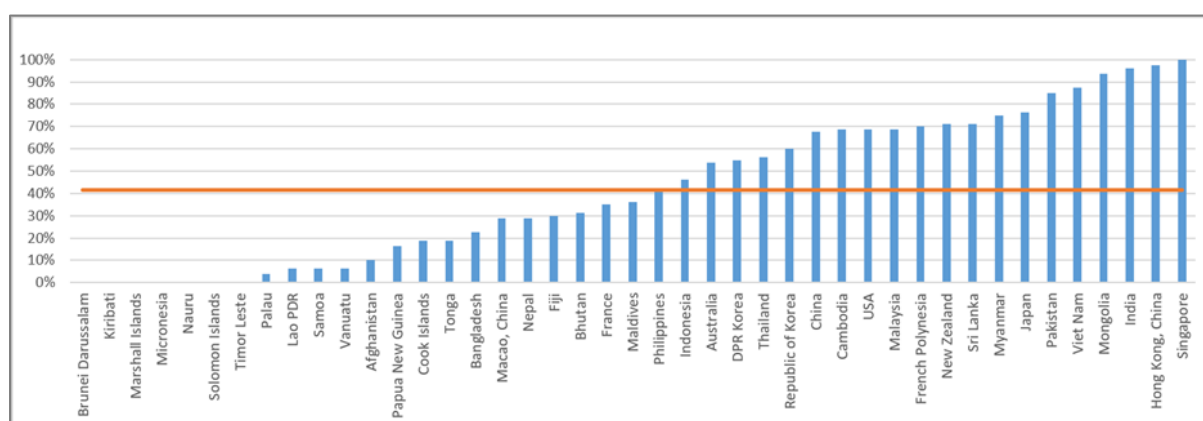
Figure 6: Regional Phase II Implementation Progress (updated on 15 May 2024)

7.23   Regional Implementation of Phase III elements, expected to be implemented by 2025, was approximately 17%, increased from 15% in 2023 (**Figure 7**).
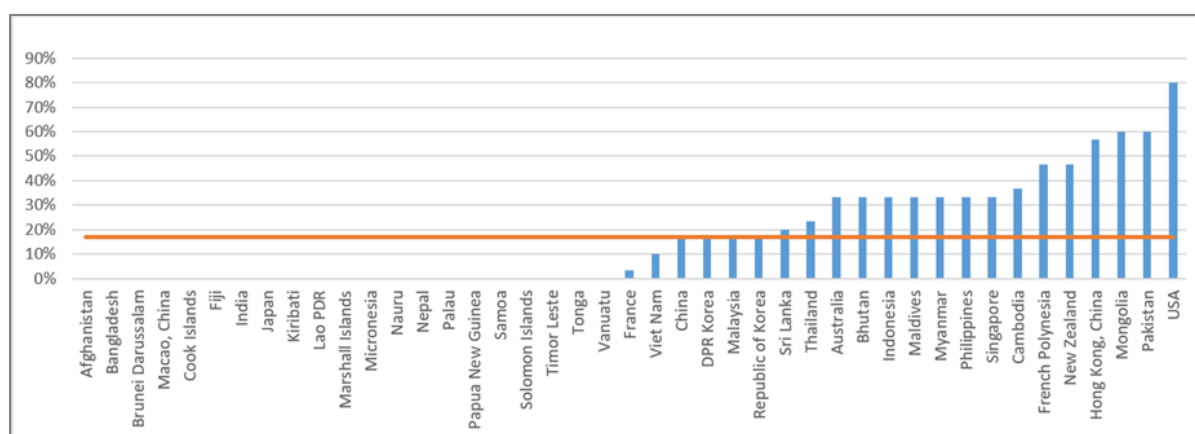
Figure 7: Regional Phase III Implementation Progress (updated on 15 May 2024)

7.24   The meeting was invited to note that these results continue to represent slow regional progress, particularly when recalling that the Phase I performance expectations reflect ICAO Standards and Recommended Practices (SARPS) in Annex 15 *Aeronautical Information Services* that have been applicable in Annex 15 for several decades.

NOTAM Proliferation

7.25   IFAIMA, in collaboration with the Secretariat, had provided a regional analysis of NOTAM proliferation. The meeting was reminded of the relevant ICAO provisions in Annex 15 *Aeronautical Information Services* and ICAO Doc 10066 *Procedures for Air Navigation Services – Aeronautical Information Management* (PANS-AIM).

7.26   As of 01 May 2024, a total of 6057 NOTAMs were active in the APAC Region. 294 (5%) of these were *old* (i.e. more than three months but less than one year), and 179 (3%) were *very old* (one year or more).

Airline Feedback on NOTAMs

7.27   IATA presented airline feedback on NOTAM quality, using examples from both the APAC region and elsewhere, and identified issues that needed addressing.

7.28   It was noted that, some States had not moved PERM NOTAMs into suitable aeronautical products, i.e., AIP according to the ICAO Doc 8126 *Aeronautical Information Services Manual* para 6.3.7.2. The meeting was informed that one airline recorded 38 different versions of how date, time, and month are presented in Item D) of published NOTAMs globally in one day. The wording used in Item D) made it difficult to understand its intent. As a result, end users were unable to effectively introduce automation to read Item D) of NOTAMs and populate them into an application.

7.29   IATA informed the meeting that late delivery of NOTAMs after their beginning time/date continued to be observed in the APAC region. It was reaffirmed that the industry needed a reliable and robust means to deliver aeronautical data in a timely manner.

Asia/Pacific Region ICARD Status and 5LNC Duplicate Resolution

7.30   The meeting was informed that 7483 ICARD requests were processed with 6753 approvals and 730 rejections between January 2021 and May 2024. The common reasons for refused requests were shared.

7.31   The meeting was also informed of the challenges the ICARD Planner and Regional Manager faced, including but not limited to a complex process of checking the States' requests and large batches in the same period.

7.32   The meeting agreed to the proposed action by the Secretariat as follows:

a)   States are requested to plan well in advance for 5LNC submission in ICARD with a maximum of 10 5LNCs submitted each week. If needed to submit more than 40 5LNCs within four consecutive weeks, please send an email to notify ICAO no later than two weeks in advance. A minimum of 30 working days for processing was proposed, with a procedure to contact the ICAO Regional ICARD Manager directly if the code was not approved by 20 working days after submission;

b)   the practice of reserving blocks of codes for State use was discontinued several years ago, and new blocks were no longer provided when existing blocks were exhausted. ICARD Planners needed to draw 5LNC from the pool of codes reserved for the APAC region. States were encouraged to release blocks of reserved codes;

c)   The ICARD Regional Manager would consult other Regions to standardise the assigning proximity radius, which could allow more 5LNCs for ICARD Planers to select; and

d)   The ICARD Regional Manager would follow up on issues related to 5LNCs, starting with 'X' as the first letter and all available 5LNCs with a combination of 'Q', which might pose sound-like confusion.

Update on the Publication of Aerodrome Certification

7.33   The meeting reaffirmed the PANS-AIM requirement for States to publish the status of certification of aerodromes in the AIP with predefined details.

7.34   States that had not published the status of certification of aerodromes in the State's AIP were urged to publish the status in AD 1.5 as soon as possible in accordance with Annex 14 Vol I (para. 2.13.1), PANS-Aerodromes (para. 2.3.7) and Appendix 2 to PANS-AIM.

Proposed Amendment to the Asia/Pacific Regional Plan for Collaborative Aeronautical Information Management

7.35   ICAO proposed amendment to the Regional Plan for Collaborative AIM, including Aviation System Block Upgrades (ASBU), Asia/Pacific AIM Compliance Analysis – USOAP Audit, and Structure of the Performance Improvement Plan. The proposal was included to **ATM/SG/12 WP/29 Attachment C**.

7.36   The meeting agreed to the following Conclusion:

Conclusion ATM/SG/12-4: Amendment to the Asia/Pacific Regional Plan for Collaborative AIM

That, the amendment to the Regional Plan for Collaborative AIM at **ATM/SG/12 WP/29 Attachment D** be adopted, and the amended Plan be posted on the ICAO Asia/Pacific Regional Office eDocuments webpage.

Revised Guidance on the Issuance of SNOWTAM

7.37 ICAO introduced the latest Guidance published in December 2020 on the Issuance of SNOWTAM used in the Asia/Pacific Region. ICAO APAC Regional Office would consult with HQ and other Regional Offices on how they deal with the EUR Doc 041 and any plan for the global guidance document. The meeting agreed to the following Conclusion:

Conclusion ATM/SG/12-5: Revised Guidance on the Issuance of SNOWTAM

That, the revised EUR Doc 041 – Guidance on the Issuance of SNOWTAM (V.1.1) at **ATM/SG/12 WP/29 Attachment E** be uploaded on the ICAO Asia/Pacific Regional Office eDocuments webpage to replace the existing.

Proposed Business Functionality of APAC Common SWIM Information Services

7.38 ICAO APAC SWIM TF Task Team on Information Services updated the meeting on the work to identify the business functionality to be supported by APAC Common SWIM Information Services for addressing the operational needs in APAC.

7.39 Realising a need for further discussion on the list of recommended services in the initial APAC Common SWIM Information Services, the meeting agreed to form an ad hoc group to discuss both technical and operational aspects of this subject rather than reaching a consensus at AAITF/19.

7.40 The meeting agreed to the following Decision:

Decision AAITF/19-3: Establish APAC Common SWIM Aeronautical Information Services Ad hoc Group

Quality Management System Seminar

7.41 A Quality Management System (QMS) seminar session was conducted on 14 June 2024 after the AAITF meeting. The aim of the seminar was to enhance States' understanding towards the implementation of QMS in order to be removed from the ANS Deficiency List for failure to implement such system. Six presentations were presented by two States and two international organizations.

Asia/Pacific Search and Rescue Update (WP/30)

7.42 The Ninth Meeting of the Asia/Pacific Regional Search and Rescue Work Group (APSAR/WG/9) was held in Bangkok, Thailand, from 7 to 10 May 2024. 61 participants from 21 States/ Administrations and two international organizations attended the meeting.

Global SAR Update

7.43 USA provided an overview of the outcomes of the Thirtieth Meeting of the ICAO/International Maritime Organization (IMO) Joint Working Group on Harmonization of Aeronautical and Maritime Search and Rescue (ICAO/IMO JWG-SAR), which was held in Cape Town, South Africa, from 06 to 10 November 2023.

7.44 The meeting was provided with a status report on the Cospas-Sarsat system, including system operations, significant developments, space and ground segments, beacons, false alerts, reporting by RCCs on use of the distress alert data provided, and results of Cospas-Sarsat Mission Control Centres (MCCs) – SAR Point of Contact (SPOC) communication tests.

7.45   Cospas-Sarsat presented information on deployment of Emergency Locator Transmitter – Distress Tracking (ELT [DT]), developed to support Global Aeronautical Distress and Safety System (GADSS). Noting the postponement of the ICAO requirement for Autonomous Distress Tracking (ADT) equipage to 01 January 2025, the meeting was informed that Cospas-Sarsat had declared full operational capability (FOC) for ELT (DT)s designed using first generation beacon technology from 1 January 2023 and for second-generation ELT (DT)s from 1 January 2024.

Asia/Pacific Regional Readiness for Autonomous Distress Tracking

7.46   The meeting was presented the results of a revised survey of Asia/Pacific regional readiness for ADT as agreed by APSAR/WG/8 meeting. ICAO agreed to circulate the State Letter (ICAO APAC Regional Office in State Letter (APAC) AP143/23 (ATM), 24 October 2023) communicating the survey to ATM and SPOCs identified in the ATM POC List to ensure that the survey was distribute to a wider audience.

7.47   A total of 17 Administrations responded to the revised survey. Overall response results of the survey showed that majority of Administrations were not ready for ADT. The average number of items marked "Yes" was 51%.

7.48   It was noted that the majority of APAC Administrations had yet to develop procedures for the response to ADT notification or ELT (DT) alerts; training of relevant SAR personnel, ATS personnel and flight despatchers to understand ADT notifications and ELT (DT) alerts had not been conducted; and Registration to the ICAO OPS CTRL Directory had not been conducted.

Autonomous Distress Tracking Possible Implementation Issues

7.49   Singapore highlighted the difference in notification processes for alerts RCCs receive for the ADT and for the only known ADT device to date, the ELT (DT). It was important that stakeholders note that, for ELT (DT) activations, the RCC would be notified through the MCCs per the provision in Annex 12.

7.50   The meeting was reminded to review the possible actions necessary to clarify the differences between receipt of multiple ELT-DT notifications, including ELT (DT) alert data, from the Cospas-Sarsat Programme and receipt of one ADT activation notification from Location of an Aircraft in Distress Repository (LADR).

Regional SAR Status

7.51   Based on the 2020 revision of UOAP CMA PQs had resulted in the total number relating to SAR being reduced from 26 to 16. An analysis of the revised 16 USOAP SAR-related Protocol Questions in April 2024 indicated that the overall EI for SAR had decreased when compared to the previous assessment.

7.52   From the PQ analysis, there were still weaknesses in the major areas of SAR indicated by USOAP, in the areas of:

- CE-3: 7.517 (26%) – [SAR service provider] SAR coordination agreements;

- CE-4: 7.499 (29%) – [SAR regulatory oversight] Implementation of the training plan;

- CE-7: 7.505, 7.543 and 7.545 (38%, 42% and 46%) – [SAR regulatory oversight] effective regulatory surveillance oversight of SAR, Detailed Plans of SAR operations and checks that SAR operational personnel had regular training, including the conduct of SAREX; and

- CE-8: 7.507 (38%) – [SAR regulatory oversight and service provider] mechanism to eliminate SAR regulatory deficiencies.

Regional SAR Plan Implementation Status

7.53   **Figure 8** illustrates the implementation status of the performance expectations of the SAR Plan as of 30 April 2024.
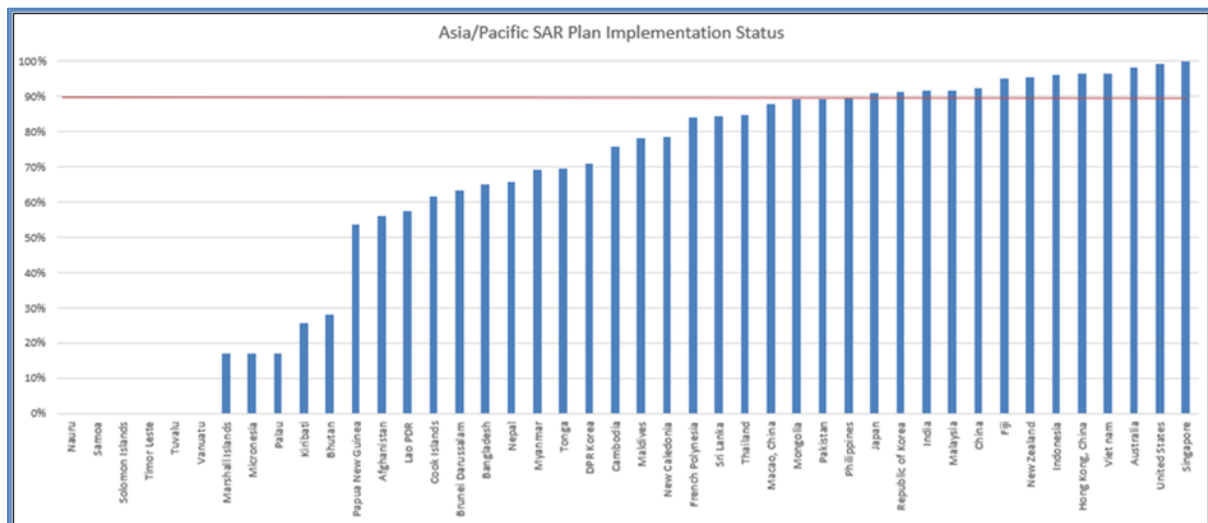
Figure 8: 41-Element Assessment of the Asia/Pacific SAR Plan Implementation

7.54   Regional policy established that States below 90% implementation would be considered to have an APANPIRG ANS Deficiency recorded for SAR implementation. Malaysia reported achieving 93% implementation status and was proposed to be removed from the Deficiency List. 13 Administrations that had reported implementation of 90% or more:

Australia, China, Hong Kong China, Fiji, India, Indonesia, Japan, Malaysia, New Zealand, Republic of Korea, Singapore, United States and Viet Nam

APANPIRG ATM and Airspace Safety Deficiencies in the SAR Field

7.55   APSAR/WG/9 proposed the following deficiency deletions for ATM/SG/12 and APANPIRG/35's consideration:

a) SAR Capability

- Malaysia

- Philippines

Information provided in Malaysia's and Philippines' 2024 SAR implementation status report

7.56   Deficiencies remain listed for the following Asia/Pacific Administrations:

Afghanistan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, Macao China, Cook Islands, DPR Korea, French Polynesia, Kiribati, Lao PDR, Maldives, Marshall Islands, Micronesia, Mongolia, Myanmar, Nauru, Nepal, New Caledonia, Pakistan, Palau, Papua New Guinea, Samoa, Solomon Islands, Sri Lanka, Thailand, Timor-Leste, Tonga, Vanuatu.

7.57   The updated list of deficiencies was provided in Agenda 4 to this meeting.

Asia/Pacific Document Review Cycle

7.58   The meeting was informed the update cycle of the APAC Seamless ANS Plan and its subsidiary plans, including Asia/Pacific SAR Plan. Since the Seamless ANS Plan update had been delayed for one year, the APAC subsidiary plan updates, including the Asia/Pacific SAR Plan, should be reviewed in 2025.

7.59   The Asia/Pacific SAR Plan, a key component of APAC SAR strategic initiatives, should also take into account the proposals by APSAR/WG/9 WP/17 Cooperation between the SAR Service and Accident Investigation Authority (Singapore) and APSAR/WG/9 WP/12 Entry into a State's Territory for SAR (USA). These proposals would significantly enhance the effectiveness of our SAR operations.

7.60   The meeting agreed to the following Conclusion:

Conclusion ATM/SG/12-6: Proposal for Annual Submission of Changes to Asia/Pacific Search and Rescue (SAR) Plan

That, States and Administrations are invited, if necessary, to submit proposals to APSAR/WG to incorporate amendments of related documents such as International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual into the Asia/Pacific Search and Rescue (SAR) plan where appropriate instead of waiting for the three years cycle.

Agenda Item 8: Any Other Business

Need for Proper Guidance to Establish Visual Approach Application Specifications for Parallel Runways (WP/31)

8.1   China highlighted the need for clearer guidelines on visual approach application specifications for parallel runways due to the rapid growth in air traffic, which necessitates using visual approaches for increased efficiency at high-density airports.

8.2   China expressed concerns that existing ICAO documentation, although covering visual approaches, lacks clarity on certain aspects. Therefore, they emphasised the importance of developing more precise guidelines to improve safety and efficiency in such operations.

8.3   The ICAO Secretariat informed the subject on the guidance document for the visual approach operations for parallel runways was discussed at the SASP-WG/39. The SASP-WG/39 meeting agreed that operations to parallel runways that included visual approaches were not Simultaneous Operations on Parallel or Near-Parallel Instrument Runways (SOIR), however, it was agreed that it might be beneficial to include in an Appendix to the next edition of ICAO Doc *9643 Manual on Simultaneous Operations on Parallel or Near-Parallel Instrument Runways (SOIR)* the lessons learned and other implementation considerations for such operations based on the experiences of those who conducted such operations.

8.4   Due to challenges faced by some APAC States/Administrations in implementing visual approach operations for parallel runways, which could be a possible option for States/Administrations to enhance aerodrome capacity, the meeting requested ICAO Secretariat to seek clarification from ICAO HQ on this matter and provide updates to the meeting.

8.5   IFALPA expressed their concerns regarding the implementation of visual approach for parallel runway operations and requested to be updated on the outcome from ICAO HQ.

State of Aviation Economics (WP/32)

8.6   IATA highlighted the importance of adopting the "Equilibrium" strategy, which focuses on balancing the needs of airspace users and ANSPs. This strategy calls for collaboration on safety, regulations, investment plans, operational strategies, capacity planning, and strategic objectives to improve the international and domestic aviation sectors that would contribute to a more sustainable and efficient aviation industry, supporting economic growth and global connectivity.

8.7   The Chair reminded APAC States/Administration to adhere to *APANPIRG Conclusion 34/15 – Adherence to ICAO Principles and Recommendations for Setting Air Navigation Charges* where States are urged to:

a) incorporate the four key charging principles from ICAO Docs 9082 and 9161 into national legislation, regulation or policies, and air services agreements; and

b) provide direction to ANSPs, airport operators and other service provider entities to comply with the Docs 9082 and 9161 guidance and intent, particularly the provisions relating to consultation with airspace users.

Upcoming ATM Activities by the ICAO APAC Regional Sub-office (WP/33)

8.8   The meeting was appraised of the upcoming ATM projects in 2024 planned by the ICAO Regional Sub-office to facilitate the implementation of the Air Navigation Service elements in the APAC Region listed below:

a) the South China Sea Traffic Flow Review Group (SCSTFRG) and the Bay of Bengal Traffic Flow Review Group (BOBTFRG) were the two ad hoc Small Working Groups formed by APANPIRG, subordinated to the South Asia, Indian Ocean, and Southeast Asia ATM Coordination Group (SAIOSEACG). The upcoming SCSTFRG/12 would be held in Bangkok, Thailand, from 11 to 12 November 2024, and the BOBTFRG/6 would be held from November 14 to 15 in the same week and venue as the SCSTFRG/12.

b) the Second Free Route Airspace (FRA) Implementation Workshop in the APAC Region was scheduled for 13 November 2024. This workshop was planned in between the SCSTFRG/12 and BOBTFRG/6 (from 14 to 15 November 2024) meetings, enhancing the efficiency of collaborative efforts and maximising travel economy for participants;

c) the upcoming Webinar on Civil-Military Cooperation in ATM for the APAC Region was scheduled from 20 to 21 November 2024 to assist States in enhancing Civil-Military ATM Cooperation and implementing Flexible Use of Airspace (FUA).

d) the ICAO APAC Regional Sub-Office would also host a webinar focused on Unmanned Aircraft Systems (UAS) and Remotely Piloted Aircraft Systems (RPAS) from 11 to 12 December 2024.

8.9   The Chair invited States, Administrations and International Organizations to consider contributing to the Workshops/Webinars planned by the ICAO Regional Sub-office and promote the Workshops/Webinars to the target participants.

8.10   ROK thanked ICAO Regional Sub-Office's efforts to carry out the meaningful work plan, and expressed their support on the planned activities.

8.11   India and Pakistan requested for the virtual or hybrid mode of ICAO Workshop with short duration of one or two days. ICAO emphasised that the one-day FRA Workshop was planned to be held back-to-back with the SCSTFRG/12 and BOBTFRG/6 and would be also open for online participation.

ATM Point of Contact Update (WP/34)

8.12   The List of ATM Points of Contact was circulated to all registered ATM/SG/12 participants for update.

Quantitative Collision Risk Modelling within CASA (IP/10)

8.13   Australia presented on the tool developed to quantify collision risk in any volume of airspace within the Australian FIR using surveillance data. By injecting the data into different module of the Airspace Risk Modelling System (ARMS), a numerical summary of the estimated collision risk per aircraft for the airspace would be provided to identify airspace volumes that may require attention and additional mitigation to maintain safe operations or to identify airspace volumes that are performing well.

Traffic Management of Electric Vertical Take-Off and Landing (EVTOL) at Expo (IP/11)

8.14   Japan provided information on traffic management rules for the safe introduction of electric vertical take-off and landing (eVTOL) aircraft at the Expo 2025 Osaka, Kansai, focusing on aspects such as airspace notification, flight plan coordination, conformance monitoring, information sharing, and operational support. These proposed rules aim to establish a best practice for eVTOL integration, promoting its future development and adoption.

Risk Analysis of Aircraft Deviation from the Planned Route in Nanning Area Control Airspace (IP/12)

8.15   China presented a risk analysis of aircraft deviations from the flight planned routes in Nanning Area Control airspace, highlighting four incidents that had occurred in 2024 caused by complex airspace, communication barriers, and inaccurate flight plans. Solutions included improving controllers' English communication skills, fostering controllers and airlines collaboration, and implementing measures to standardise procedures for correcting aircraft deviations.

8.16   The Meeting noted the various mitigations introduced and although not directly linked to RASMAG, such information would be beneficial as lessons learnt. Hence, China was invited to present similar paper at the next RASMAG meeting.

Shantou ATM Station Establishes Proactive Reporting Mechanism to Improve Operational Safety (IP/13)

8.17   In support of Asia/Pacific efforts to foster safety culture, China shared information on the proactive reporting mechanism implemented by the ATC Operation Department of Shantou ATM Station to improve operational safety, using a "dual-prevention mechanism" to identify and manage risks. The mechanism encouraged controllers to report potential risks and hazards, leading to the collection of 80 proactive reports in the first half of 2024, with one identified as a potential safety hazard requiring management.

Invitation to Future-Oriented Air Traffic Controller Capacity-building Workshop in China (Flimsy 2)

8.18   China provided information about the Future-oriented Air Traffic Controller Capacity-building Workshop to be held in Tianjin, China, from 30 to 31 October 2024. States/Administrations and International Organizations interested in participating in the event were invited to reach the organiser POCs by email at my_pzy@hotmail.com or 329487162@qq.com.

Agenda Item 9: Update the ATM Task List

APANPIRG ATM Sub-Group Terms of Reference and Task List (WP/35)

9.1   The ATM/SG Terms of Reference (TOR) were presented for review by the meeting.

9.2   The ATM/SG Task List was reviewed by the meeting and is provided in **Appendix F** to the Report.

Agenda Item 10: Date and venue for the next meeting

ATM/SG/13

10.1   The tentative timeframe for ATM/SG/13 was August 2025, and Singapore had graciously volunteered to host the next meeting and the venue was to be advised.

Closing

10.2   The Chair thanked meeting participants for their valuable work.

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LIST OF PARTICIPANTS

		STATE/NAME	TITLE/ORGANIZATION
1.		**AUSTRALIA (2)**	
	1.	Mr. Brad Parker	Manager CNS/ATM Civil Aviation Safety Authority **AUSTRALIA**
	2.	Mr. Chris Kumar	ATS Specialist Lead Airservices Australia **AUSTRALIA**
2.		**BHUTAN (3)**	
	3.	Mr. Kencho Tshering	AIS/PANS-OPS Officer Bhutan Civil Aviation Authority **BHUTAN**
	4.	Mr. Karma Yonten	Deputy Chief ATCO/AIS National Air Navigation Services Company (NANSC) **BHUTAN**
	5.	Mr. Karma Gayley	Senior ANS Officer Bhutan Civil Aviation Authority **BHUTAN**

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	7.	Mr. Hafizul bin Haji Abdul Hamid	Head of Air Navigation Services Department of Civil Aviation of Brunei Darussalam **BRUNEI DARUSSALAM**
4.		**CAMBODIA (3)**	
	8.	Ms. Tith Phoumith	Deputy Director of ANS Department State Secretariat of Civil Aviation **CAMBODIA**
	9.	Mr. Khorn Vannak	Senior ATM Development Manager Cambodia Air Traffic Services **CAMBODIA**
	10.	Mr. Nov Bunkong	Senior Manager Flight Procedure and Airspace Design Cambodia Air Traffic Services **CAMBODIA**

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	13.	Mr. Shen Yaxi	ATFM Air Traffic Management Bureau Civil Aviation Administration of China **CHINA**
	14.	Mr. Qi Ouyang	Airspace Office Assistant Middle South Regional Air Traffic Management Bureau Civil Aviation Administration of China **CHINA**
	15.	Mr. Liu Yonggang	Deputy Director, Airspace Planning Office Air Traffic Management Bureau Civil Aviation Administration of China **CHINA**

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	17.	Mr. Alex NG	Senior Safety & Quality Officer (En-route) Civil Aviation Department, Hong Kong **HONG KONG, CHINA**
	18.	Ms. Natalie KWOK	Evaluation Officer Civil Aviation Department, Hong Kong **HONG KONG, CHINA**
	19.	Ms. Michelle SIU	Electronics Engineer Civil Aviation Department, Hong Kong **HONG KONG, CHINA**
7.		**MACAO, CHINA (2)**	
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	21.	Ms. Cheong Kit Meng, Pricilla	Advisor to Head of ATS Division Macau International Airport Co. Ltd. **MACAO, CHINA**

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9.		**FRANCE (1)**	
	23.	Mr. Fabien Lemoine	Head of Operating Division Magenta Air Navigation Agency Interim Head Air Navigation Department French Civil Aviation Authority **FRANCE**
10.		**INDIA (1)**	
	24.	Mr. SLV Santhosh David	Deputy Director DGCA **INDIA**
11.		**INDONESIA (6)**	
	25.	Mr. Tian Kusdinar	Deputy Director of Air Navigation Operation Directorate General Civil Aviation **INDONESIA**
	26.	Ms. Emi Astuti	Air Navigation Inspector Directorate General Civil Aviation **INDONESIA**

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	29.	Mr. Sutopo	Planning and Evaluation Flight Procedure Manager AirNav Indonesia HQ **INDONESIA**
	30.	Mr. Muhammad Inwan Nuddin	TWR Services Manager AirNav Indonesia HQ **INDONESIA**
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13.		**LAO PDR (3)**	
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	34.	Mr. Amphone Thanasin	Deputy Chief of Area Control Center (ACC) Lao Air Navigation Services of Lao PDR **LAO PDR**
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20.		**REPUBLIC OF KOREA (2)**	
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	50.	Mr. S Subash	Deputy Director (International ATS Training) Civil Aviation Authority of Singapore (CAAS) **SINGAPORE**
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	55.	Ms. Qi Chen	Principal Engineer Civil Aviation Authority of Singapore (CAAS) **SINGAPORE**
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	78.	Ms. Awassada Phopratab	Transport Technical Officer, Practitioner Level Bangkok Rescue Coordination Center **THAILAND**
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	85.	Mr. Hoang Tuan Nam	Manager of Flight Coordination Division Air Traffic Flow Management Center Vietnam Air Traffic Management Corporation **VIET NAM**
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	90.	Mr. George Chan	Regulatory Affairs Manager - Industry and Flight Operations IATA/Cathay Pacific Airways **CHINA**
	91.	Ms. Megan Yin	Senior Manager-Air Traffic System Asia Pacific United Airlines **CHINA**

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28.		**IFALPA (2)**	
	94.	Mr. Sivanit Ratanadib	IFALPA Director The International Federation of Air Line Pilot's Associations – IFALPA **THAILAND**
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	98.	Mr. Weng Kit Ying	Air Traffic Management Officer ICAO Asia and Pacific Regional Office **THAILAND**
	99.	Mr. Anony Tak Chuen CHUI	AIM/ATM Officer ICAO Asia and Pacific Regional Office **THAILAND**
	100.	Dr. Trish Prakayphet Chalayonnawin	Programme Analysis Associate, Air Traffic Management ICAO Asia and Pacific Regional Office **THAILAND**
	101.	Ms. Ying Zhang	Deputy Chief ICAO Asia and Pacific Regional Sub-Office **CHINA**
	102.	Mr. Manjunath K. Nelli	Regional Officer, Air Traffic Management ICAO Asia and Pacific Regional Sub-Office **CHINA**
	103.	Mr. Zhi Feng Xu	Regional Officer, Air Traffic Management (AOM) ICAO Asia and Pacific Regional Sub-Office **CHINA**

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	104.	Dr. Hyuk Jin KWON	Regional Officer, Air Traffic Management ICAO Asia and Pacific Regional Sub-Office **CHINA**
	105.	Ms. Chen Yanru	Administrative Support and Programme Assistant ICAO Asia and Pacific Regional Sub-Office **CHINA**

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LIST OF WORKING AND INFORMATION PAPERS

WORKING PAPERS

No.	Agenda Item	Subject	Presented by
01	1	Provisional Agenda	Secretariat
02	2	ATM/SG/11, APANPIRG/34 and AN-CONF/14 Outcomes	Secretariat
03	3	ANS USOAP Update	Secretariat
04	3	Updating the Asia/Pacific Seamless ANS Plan	Secretariat
05	3	FIT-Asia and RASMAG Outcomes	Secretariat
06	3	Application of ATC Separation Minimums	Secretariat
07	3	Progress of the APAC Data Analytics Ad-Hoc Group	Singapore on behalf of Australia, China, Hong Kong China, Indonesia, Papua New Guinea, Philippines, Singapore, Sri Lanka, Thailand, United States
08	3	Proposed Regional Monitoring and Reporting Scheme for A-CDM Implementation	ATFM/IR/SWG
09	4	Air Navigation Service Deficiencies List	Secretariat
10	5	Regional Air Navigation Plan Update	Secretariat
11	5	Main Outcomes of CNS SG/28	Secretariat
12	5	Air Traffic Flow Management Steering Group Outcomes	Secretariat
13	5	Regional Supplementary Procedures Doc 7030 Update	Secretariat
14	5	Reporting of Global Navigation Satellite System (GNSS) Interference	Singapore
15	5	Rationalization of Navigation Infrastructure	IATA
16	5	Progress update of the ICAO Asia Pacific Flight and Flow Information for a Collaborative Environment (FF-ICE) Ad-Hoc Group	Singapore on behalf of Hong Kong China, Japan, New Zealand, Singapore, Thailand, and United States
17	5	Towards Harmonised Realisation of the ICAO Global Trajectory based Operations (TBO) Concept in the Asia and Pacific Regions	Indonesia, Japan, Republic of Korea, New Zealand, Singapore, Thailand, United States and IATA
18	5	Cross-Border Direct Routing Operations (DRO) between Indonesia and Singapore	Indonesia and Singapore
19	6	Regional ATM Contingency Planning and Contingency Operations Update	Secretariat

No.	Agenda Item	Subject	Presented by
20	6	SAIOSEACG Meeting Outcomes	Secretariat
21	6	Asia Pacific Region ATS Route Catalogue	Secretariat
22	6	Progress Update of the Space Vehicle Launch and Re-Entry Coordination Small Working Group (SVLRC SWG)	United States
23	6	North Pacific (NOPAC) Route System Redesign	United States and Japan
24	6	Offset Climb/Descent Procedures in Oceanic Airspace of Fukuoka FIR	Japan
25	6	Progress Update on Capacity Optimisation of Air Routes L642 and M771	Hong Kong China
26	6	Optimisation of ATS Routes A461, M501 and A583	Hong Kong China and Philippines
27	7	AOP Subgroup Outcomes	Secretariat
-	-	*(withdrawn)*	-
29	7	AIS – AIM Implementation Task Force Outcomes	Secretariat
30	7	Asia/Pacific Search and Rescue Update	Secretariat
31	8	Need for Proper Guidance to Establish Visual Approach Application Specifications for Parallel Runways	China
32	8	State of Aviation Economics	IATA
33	8	Upcoming ATM activities by the ICAO APAC Regional Sub-office	Secretariat
34	8	ATM Point of Contact Update	Secretariat
35	9	APANPIRG ATM Sub-Group Terms of Reference and Task List	Secretariat
36	7	Space Weather Advisories via Flight Information Services	Secretariat on behalf of MET/SG
37	7	NOTAM/ASHTAM for Volcanic Unrest	Secretariat on behalf of MET/SG

INFORMATION PAPERS

No.	Agenda Item	Subject	Presented by
01	1	Provisional List of Papers	Secretariat
02	5	The Long-Term Vision for the Future Air Traffic Systems of Japan (CARATS)	Japan
03	5	Research and Application of Air-to-Ground Data Link Technology for Transmitting Turbulence Information	China
04	6	Cross FIR Boundary UPR	Australia

No.	Agenda Item	Subject	Presented by
05	6	Optimisation and Enhancement of Air Traffic Management over the Bay of Bengal Area	Malaysia
06	6	Indonesia's TableTop Exercise (TTX) on ATM Contingency Plan	Indonesia
07	6	CAAC ATM Contingency Arrangements International Parts Update	China
08	6	Contingency Plan for Volcanic Ash at Mount Ruang - Indonesia	Indonesia
09	6	China Airspace Classification and Pilot Update	China
10	8	Quantitative Collision Risk Modelling within CASA	Australia
11	8	Traffic Management of Electric Vertical Take-Off and Landing (EVTOL) at Expo	Japan
12	8	Risk Analysis of Aircraft Deviation from the Planned Route in Nanning Area Control Airspace	China
13	8	Shantou ATM Station Establishes Proactive Reporting Mechanism to Improve Operational Safety	China
14	5	Updates on ATM Activities in Vietnam	Viet Nam

FLIMSIES

No.	Agenda Item	Subject	Presented by
01	6	SVLRC SWG	Secretariat
02	8	Invitation to Future-Oriented Air Traffic Controller Capacity-Building Workshop in China	China

PRESENTATIONS

No.	Agenda Item	Subject	Presented by
01	6	The Asia Pacific Region ATS Route Catalogue (WP/21)	Secretariat
02	8	State of Aviation Economics (WP/32)	IATA
03	3	Progress of the APAC Data Analytics Ad-Hoc Group (WP/07)	Singapore on behalf of Australia, China, Hong Kong China, Indonesia, Papua New Guinea, Philippines, Singapore, Sri Lanka, Thailand, United States
04	3	Proposed Regional Monitoring and Reporting Scheme for A-CDM Implementation (WP/08)	ATFM/IR/SWG

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INTERNATIONAL CIVIL AVIATION ORGANIZATION

ASIA/PACIFIC SEAMLESS ANS PLAN

Version 3.6 September 2024

This Plan was originally developed by the Asia/Pacific Seamless ATM Planning Group (APSAPG) and amended when appropriate by APANPIRG.

CONTENTS

SCOPE OF THE PLAN

<u>Plan Structure</u>

1.1   The Seamless Air Navigation Service (ANS) Plan (hereinafter referred to as the 'Plan') references different levels of ANS planning. At the upper level is a global perspective, which is guided mainly by references to the Global Air Navigation Plan (GANP, Doc 9750) and its global technical planning frameworks1, the Global ATM Operational Concept (Doc 9854) and the Global Aviation Safety Plan (GASP). Beneath this level is regional planning primarily provided by the Asia/Pacific Regional Air Navigation Plan, this Plan and other guidance material, in order to define goals and means of meeting State planning objectives, such as:

- Asia/Pacific Regional Air Navigation Plan requirements and objectives;

- the Seamless ANS performance framework, with a focus on technological and human performance within the GANP's Aviation System Block Upgrade (ASBU) Block 0, Block 1 and Block 2 elements, non-ASBU elements, and civil-military cooperation elements;

- a deployment plan with specific operational improvements, transition arrangements, expected timelines and implementation examples; and

- an overview of financial outcomes and objectives, cross-industry business and performance/risk management planning.

1.2   Key components of this Plan, as updated, are expected to be migrated into the Regional Air Navigation Plan Volume III under a future project to be initiated by ICAO.

1.3   The Plan does not use 'continental', 'remote' and 'oceanic' areas to refer to an assumed geographical application area, as many Asia/Pacific States have islands or archipelagos that can support a higher density of Communications, Navigation, Surveillance (CNS) systems than in a purely 'oceanic' environment. In accordance with the CONOPS that air navigation services should be provided commensurate with the capability of the CNS equipment, it is important to categorise airspace in this manner, and simplify the numerous references to this capability throughout the Plan. Thus the Plan categorises airspace by reference to its CNS (Communications, Navigation and Surveillance) capability as:

- a)   <u>Category R</u>: remote en-route airspace with Air Traffic Services (ATS) HF or CPDLC communications and outside the coverage of ground-based surveillance coverage; or

- b)   <u>Category S</u>: serviced (or potentially serviced) en-route airspace – by both direct (not dependent on a Communication Service Provider (CSP)) ATS communications and surveillance; or

- c)   <u>Category T</u>: terminal operations serviced by both direct ATS communications and surveillance.

1.4   The word 'States' in the Plan includes Special Administrative Regions and territories.

1.5   The operational improvements addressed in the Plan are expected to be implemented in

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1 Basic Building Blocks (BBBs) and Aviation System Block Upgrades (ASBUs)
https://www4.icao.int/ganpportal/

phases.:

- Phase I, expected implementation by 12 November 2015 (past);

- Phase II expected implementation by 07 November 2019 (past);

- Phase III expected implementation by 03 November 2022 (past);

- Phase IV expected implementation by 27 November 2025; and

- Phase V expected implementation by 23 November 2028.

1.6   No phase, nor any element, is binding on any State, but should be considered as a planning framework. The Seamless ANS Plan itself is therefore guidance material.

1.7   It is important to note that the Plan's Phase commencement dates are planning targets, and should not be treated like a 'hard' date such as the example of the implementation of Reduced Vertical Separation Minimum (RVSM). In that case, there was a potential major regional problem if all States did not implement at the same time by the specific agreed date, which was clearly not the case for the start of the Plan's Phases I, II or III.

1.8   In that regard, although it would have been ideal if all States achieved capability on day one of each Phase I, this was probably not realistic. However, States should consider the impact on stakeholders and improving capacity of the ANS system overall by not achieving target implementation dates. The Plan's Phase dates were chosen as being an achievable target for the majority of States. However, the dates were not designed to accommodate the least capable State, otherwise the region as a whole would fall behind the necessary urgent ANS improvements required by the Director's General of Civil Aviation and the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG).

Plan Review

1.9   The Plan needs to be updated to take into account ASBU threads in Block 1, 2 and 3 modules elements, when these modules elements and their associated technology become mature.

1.10   Periodic updates to the Plan are also required in respect of the economic information contained therein.

1.11   As an iterative process, the Plan requires regular updating to keep current with aviation system changes. It is intended that APANPIRG and its contributory bodies conduct a complete review of the Plan every three years (or a shorter period determined by APANPIRG) of the Plan to align with the review cycle of the GANP. The Plan and its subsequent revisions should be endorsed by APANPIRG.

1.12   The previous practice of scheduling Plan updates to coincide with the GANP cycle and the approval of the GANP update by the ICAO Assembly presented a significant challenge to the Asia/Pacific Region in terms of fully analyzing and comprehending GANP changes which may be still under final development quite late in the cycle, and then identifying and prioritizing GANP elements for regional implementation while developing any proposed regional planning elements in parallel. The 2019 update of the Seamless Plan included consideration of the major GANP update which was still being finalized during that year and had not yet been approved by the ICAO Assembly.

1.13   APANPIRG/33 (December 2022) agreed that the three-year update cycle of the Plan continue to be aligned with GANP updates, with each Plan update to be developed and endorsed in the year immediately following the scheduled meetings of the ICAO Assembly (**Figure 1**).

Asia Pacific Document Review Cycle

2023
- Review of APAC Seamless ANS plan
- Inclusion of APAC seamless ANS plan PASL phase IV for APANPIRG/34 approval

2024
- *APAC subsidiary plans - review

2025
- ICAO assembly – Revision to GANP

2026
- Revision to APAC Seamless ANS plan in respond to revised GANP (2025)
- Incorporate Seamless ANS plan into Regional Air Navigation plan Vol III

2027
- *APAC subsidiary plans - review

*APAC subsidiary plans :
- ASIA/PACIFIC Framework for Collaborative ATFM
- ASIA/PACIFIC SAR Plan
- Asia/Pacific Regional Plan for Collaborative AIM
- ASIA/PACIFIC Region ATM Contingency Plan
- Asia/Pacific A-CDM Implementation Plan

Figure 1: Planned Review and Update Process

1.14	Review of the Navigation and Surveillance strategies needs to result in the update to the Seamless ANS Plan to ensure consistency.

1.15	The review of the Plan during 2019 deleted reference to Phase I as Phase II commenced in November 2019, although the uncompleted elements from Phase I were moved to Phase II. The implementation dates of Phase II Preferred Aerodrome/Airspace and Route Specifications (PARS) and Preferred ATM Service Levels (PASL) items align with the commencement of GANP Block 1, whereas Phase III is a mid-Block 1 update.

1.16	Due to the unavailability of an implementation reporting mechanism since 2019, Phase II elements are retained in this version of the Plan. With the availability of an updated reporting mechanism from 2024, the uncompleted elements from Phase II will be incorporated in Phase III in the 2026 update of the Plan.

1.17	The 2023/2024 update of the Plan introduces new ASBU Block 1 elements in Phase IV, and some Block 2 elements in Phase V. Phase IV of the PARS and PASL implementation framework will also be referenced.

> **DISCLAIMER:** The presentation of material in this report does not imply the expression of any opinion whatsoever on the part of ICAO or APANPIRG concerning the legal status of any country, territory, city or area of its authorities, or concerning the delimitation of its frontiers or boundaries.

PLAN OBJECTIVES AND DEVELOPMENT

Plan Objective

2.1   The objective of the Plan is to facilitate Asia/Pacific Seamless ANS operations, by developing and deploying ~~ATM~~ ANS solutions capable of ensuring safety and efficiency of air transport throughout the Asia/Pacific region. The Plan provides a framework for a transition to a Seamless ANS environment, in order to meet future performance requirements.

2.2   The Plan provides the opportunity for the Asia/Pacific region to pursue the benefits from research and development conducted by various States including the NextGen programme (United States of America), the European Single European Sky ATM Research (SESAR), and Japanese Collaborative Actions for Renovation of Air Traffic Systems (CARATS).

2.3   ICAO Doc 9854 contains a vision of an integrated, harmonized, and globally interoperable ATM System, with a planning horizon up to and beyond 2025. In this context, the Plan is expected to encourage more partnering relationships among States within sub-regions.

Hierarchy of Plans

2.4   The Plan was developed as part of a suite of Asia/Pacific air navigation plans, and thus, the Plan should not be considered in isolation. The *Asia/Pacific Regional Air Traffic Flow Management (ATFM) Framework*, *Asia/Pacific Plan for Collaborative AIM*, *Regional ATM Contingency Plan*, *Asia/Pacific Search and Rescue (SAR) Plan* and *Asia/Pacific Airport Collaborative Decision Making (A-CDM) Implementation Plan* all form part of the aforementioned suite of planning and guidance material connected to the Plan (**Figure 1**).
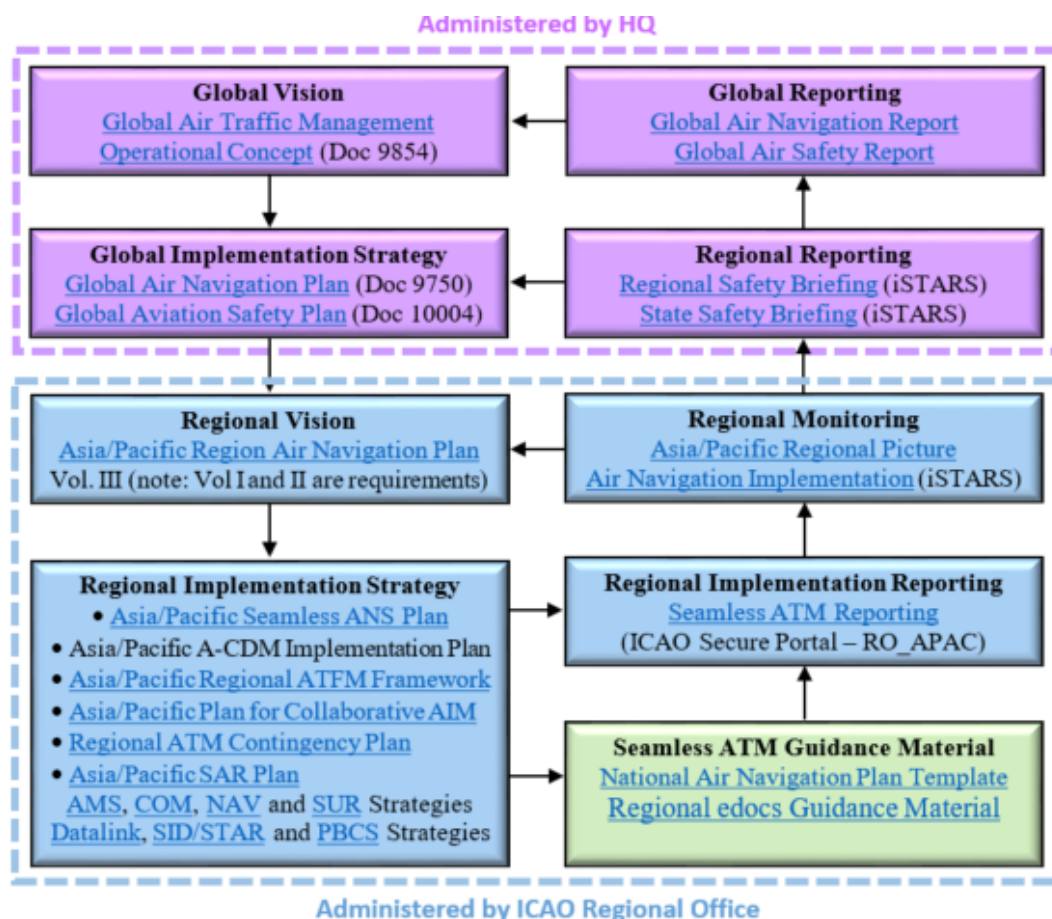

Figure 2: Structure of Global and Regional Planning and Reporting

4

2.5   The Plan should also be read in conjunction with the Asia/Pacific Regional Aviation Safety Plan (RASP-AP), to ensure the safety initiatives related to ANS are taken into account.

2.6   This Plan addresses the full range of ATM stakeholders, including civil and military Air Navigation Services Providers (ANSPs), civil and military aerodrome operators as well as civil and military airspace users. The Plan has been developed in consultation with Asia/Pacific States, administrations and also with International Organizations (IOs).

> *Note: civil airspace users include scheduled aviation, business aviation, general aviation and Unmanned Aircraft System (UAS) operators.*

2.7   States should consult with stakeholders and determine actions, in order to commit to achieving the objectives of Seamless ANS and the requisite performance objectives in the areas of safety, environment, capacity and cost-efficiency that flow from this Plan.

2.8   ASBU Block 0 modules contained technologies, systems and procedures which were expected to be available from 2013. The Plan also references ASBU Block 1 and 2 elements, available from 2019 and 2025 respectively. Where such technology, systems, standards and procedures are available earlier than these dates and appropriate deliverables can be provided, the intention was to develop aggressive yet practical implementation schedules within this Plan to provide the earliest possible benefits.

2.9   The ICAO *Manual on Global Performance of the Air Navigation System* (ICAO Doc 9883) provides guidance on implementing a performance-oriented ATM System. The *Manual on ATM System Requirements* (ICAO Doc 9882) contains eleven Key Performance Area (KPA) system expectations, as well as a number of general performance-oriented requirements. In accordance with the expectations of these documents, the Asia/Pacific Seamless ATM Planning Group (APSAPG) adopted the following categories of operational improvements to facilitate Seamless ANS operations:

   a)   Preferred Aerodrome/Airspace and Route Specifications (PARS); and

   b)   Preferred ATM Service Levels (PASL).

2.10   The PARS/PASL introduced two categories of operational improvements, which incorporate system expectations, such as general performance-oriented requirements. Each operational improvement is composed of a list of expectations of different aspects of the aviation system.

2.11   In considering the planning necessary before the PARS/PASL Phase dates, it is important to ensure everyone in the planning process is aware that the necessary groundwork and capability building must take place as a priority, and that full operational capability by the Phase date commencement was a secondary consideration. It is recognised that some States would be working towards implementation during the Phase, in an effort to implement as soon as possible, and others that implemented as soon as the technology and systems were available.

2.12   Prior to implementation, each State should verify the applicability of PARS and PASL by analysis of safety, ATM capacity requirements to meet current and forecast traffic demand, efficiency, predictability, cost effectiveness and environment to meet the expectations of stakeholders. The PARS/PASL elements would be either:

   a)   not applicable; or

   b)   already implemented; or

   c)   not implemented.

2.13   The PARS and PASL were/are expected to be implemented in five phases; Phase I by 12 November 2015 (past), Phase II by 07 November 2019 (past), Phase III by 03 November 2022 (past) and Phase IV by 27 November 2025, and Phase V by 23 November 2028.

2.14   The PARS contains expectations for airspace and ATS routes, including aircraft equipage to facilitate Seamless ANS operations, and are primarily for the State regulator and airspace authority, and are of interest to airspace planners, flight procedure designers and aircraft operators.

2.15   The PASL contain the expectations for Air Navigation Service Providers (ANSP) and is therefore a matter for the State regulator or the ATS authority. The PASL is of primary interest to ANSPs and aircraft operators. The PARS and PASL together form the foundation of Seamless ANS development, and as such should be enabled by national regulations, rules and policies wherever applicable to enable a harmonised effort by all stakeholders.

2.16   The planned migration of this Plan into the Regional Air Navigation Plan Volume III may require a review of the PARS/PASL structure.

Seamless ANS Definition

2.17   The objective of Seamless ANS (previously Seamless ATM) was agreed by the Asia/Pacific Seamless ATM Planning Group (APSAPG) as follows:

The objective of Seamless ATM is the safe and interoperable provision of harmonized and consistent air traffic management service provided to a flight, appropriate to the airspace category and free of transitions due to a change in the air navigation service provider or Flight Information Region.

2.18   APSAPG noted the following description as the CANSO definition of Seamless ATM:

Seamless ATM operations is defined as ATM operations in contiguous airspace that is technically and procedurally interoperable, universally safe, and in which all categories of airspace users transition between Flight Information Regions, or other vertical or horizontal boundaries, without requiring a considered action to facilitate that transition and without any noticeable change in:

1) Type or quality of service received;

2) Air navigation and communications performance standards; and

3) Standard practices to be followed.

Note: the term 'Seamless ATM' was amended to 'Seamless ANS' in 2019, to reflect the fact that there are areas such as aerodromes that are not part of the Air Traffic Management field.

2.19   The ICAO Twelfth Air Navigation Conference (AN-Conf/12, Montreal, 19-30 November 2012) endorsed 10 High Level Air Navigation Policy Principles in the GANP, and the Asia/Pacific Seamless ANS Principles are aligned with these high-level principles.

EXECUTIVE SUMMARY

Seamless ANS

3.1   Aviation is a significant driver of economic growth in the and contributes strongly to the economic wellbeing of the diverse cultures and people in the Asia/Pacific region. In 2016 aviation contributed USD684 billion in economic activity and generated 30.2 million jobs (Direct and indirect) to the regional economies. By 2030 it is forecast these figures will grow to USD 1.3 trillion and 70 million jobs.

3.2   Strong demand for air travel continued to propel the recovery of passenger markets in 2023. The total industry achieved a remarkable 36.9% year-on-year (YoY) growth, as traffic, measured in revenue passenger-kilometer (RPKs), reached 94.1% of 2019 levels, a significant increase from 2022 when it stood at 68.7%. While the airline industry had recovered the majority of its traffic 2019 levels as of December 2023, network restoration remained relatively uneven as connectivity and passenger demand to and from Asia Pacific has not yet reached its pre-pandemic status (source: IATA monthly statistics)

3.3   The Asia/Pacific region is showing the largest passenger recovery in 2023, expected to reach close to 3 billion passengers. In 2024, the region will continue its growth, yet at a slower pace, and is expected to attain 3.5 billion or 103% of the 2019 level. In the current scenario, the region is forecasted to be near 3.9 billion passengers by the end of 2025. (source: ACI)

3.4   As the world's major manufacturing and distribution hub, the Asia/Pacific Region also accounted for the largest share of global air freight traffic in 2018, at 35.5%. In a challenging year for air freight, following the global inventory restocking cycle in 2017 as well having to face a number of headwinds including a moderation in world trade and deterioration in some of the key leading indicators, the Asia/Pacific region grew Freight Tonne Kilometres (FTKs) at a pace of 1.8%, below the global industry figure of 3.5% for the year.

3.5   From 2023 to 2042, total passenger traffic worldwide is predicted to grow at CAGR of 4.3%, with a steep recovery gradient observed in the first 3 years (9.1% CAGR for 2023 to 2026), then converging to the pre-COVID-19 growth rate (3.6% CAGR for 2023 to 2052). Global passenger traffic is expected to reach nearly 20 billion in 2042, double the 2024 projection.(ACI)

3.6   In 2052, global passenger traffic is expected to reach close to 25 billion, approximately 2.5 times the 2024 projection. (ACI)

COVID-19 Impact

3.7   Global passenger traffic in 2024 is predicted to surpass the 2019 level for the first time since COVID-19, reaching 9.7 billion passengers or 106% of the 2019 level (12% YoY growth rate). The growth rate is expected to gradually decelerate in succeeding years, as more markets recover from the effects of COVID-19.

3.8   The coronavirus (COVID-19) pandemic had a severe impact on the aviation industry in the Asia/Pacific Region during 2020 –2023. In 2019, international travel within Asia represented 13.3 percent of global international travel, ranking it as second biggest market after the intra-Europe market. In 2021 Asia's share fell to 1.5 percent. Air Traffic in Asia-Pacific region was predicted to record only slow improvement in 2022, achieving only 62% of 2019 levels.

3.9   "Lost" travel between 2020 and 2022 was equivalent to 1.8 x 2019 Revenue Passenger Kilometres (RPKs) and by 2040, if 2022 forecasts are realized, traffic may still be 6% below pre-pandemic forecasts. However, after a slow start, post COVID-19 recovery remains on track despite several obstacles, both predicted and unforeseen. Overall RPKs are currently (2023) at 84% of 2019

levels.

3.10   The aviation industry is expected to recover to 2019 levels in 2024. Domestic and international passenger numbers are expected to recover to 2019 levels in 2024 and 2025 respectively. Asia Pacific lags behind other regions' recovery in the short term with the regional split showing North America in the lead, in 2023, followed by Europe and the Middle East in 2024, and Latin America, Africa, and Asia Pacific in 2025. Asia Pacific is forecast to lead traffic growth in the longer term (2040 horizon) surpassing other regions by 2028. (source-IATA)

3.11   Before the COVID-19 pandemic, global passenger volume was estimated to reach 10.5 billion passengers in 2023, or 119% of the 2019 level. The current projection of global passenger volume in 2023 is approximately 8.7 billion passengers, which is 95% of the 2019 level, or 31% year-on-year (YoY) growth from the 2022 volume. (source-ACI)

3.12   At the beginning of the COVID-19 pandemic, the international passenger market had more impact than the domestic passenger market due to international travel restrictions. The international passenger market has recovered significantly in 2023, expected to reach 3.5 billion with 42% YoY growth. In 2024, international passenger traffic is forecasted to be 4 billion with 14% YoY growth. Domestic passenger traffic is forecasted to be 5.2 billion in 2023 with 25% YoY growth, then slowing down to 5.7 billion in 2024 with 10% YoY growth. (Source: ACI)

3.13   Given the size and diversity of the region, ANS harmonisation efforts will require the needs of the least developed ANSPs to be addressed especially in the areas of technical assistance such as funding, expertise and training. Differences in economic development may also mean that traffic demands are not uniform in the region, and therefore ANS solutions should be driven by analysis of costs and benefits and performance requirements appropriate to the traffic demands.

3.14   The diverse operating environments also mean that the implementation situation varies significantly across States. As such, the economic analysis of implementation activities such as ASBUs should be undertaken by States, and assisted by the Plan.

3.15   **Figure 3, Figure 4 and Figure 5** indicate the projected economic and air traffic growth which necessitated the Seamless ANS approach.

World Economic Outlook Growth Projections

		PROJECTIONS	
(Real GDP, annual percent change)	2023	2024	2025
World Output	**3.2**	**3.2**	**3.2**
Advanced Economies	**1.6**	**1.7**	**1.8**
United States	2.5	2.7	1.9
Euro Area	0.4	0.8	1.5
Germany	–0.3	0.2	1.3
France	0.9	0.7	1.4
Italy	0.9	0.7	0.7
Spain	2.5	1.9	2.1
Japan	1.9	0.9	1.0
United Kingdom	0.1	0.5	1.5
Canada	1.1	1.2	2.3
Other Advanced Economies	1.8	2.0	2.4
Emerging Market and Developing Economies	**4.3**	**4.2**	**4.2**
Emerging and Developing Asia	**5.6**	**5.2**	**4.9**
China	5.2	4.6	4.1
India	7.8	6.8	6.5
Emerging and Developing Europe	**3.2**	**3.1**	**2.8**
Russia	3.6	3.2	1.8
Latin America and the Caribbean	**2.3**	**2.0**	**2.5**
Brazil	2.9	2.2	2.1
Mexico	3.2	2.4	1.4
Middle East and Central Asia	**2.0**	**2.8**	**4.2**
Saudi Arabia	–0.8	2.6	6.0
Sub-Saharan Africa	**3.4**	**3.8**	**4.0**
Nigeria	2.9	3.3	3.0
South Africa	0.6	0.9	1.2
Memorandum			
Emerging Market and Middle-Income Economies	**4.4**	**4.1**	**4.1**
Low-Income Developing Countries	**4.0**	**4.7**	**5.2**

Source: IMF, *World Economic Outlook*, April 2024

Note: For India, data and forecasts are presented on a fiscal year basis, with FY 2023/24 (starting in April 2023) shown in the 2023 column. India's growth projections are 6.9 percent in 2024 and 6.5 percent in 2025 based on calendar year.

INTERNATIONAL MONETARY FUND　　　　　　　**IMF**.org
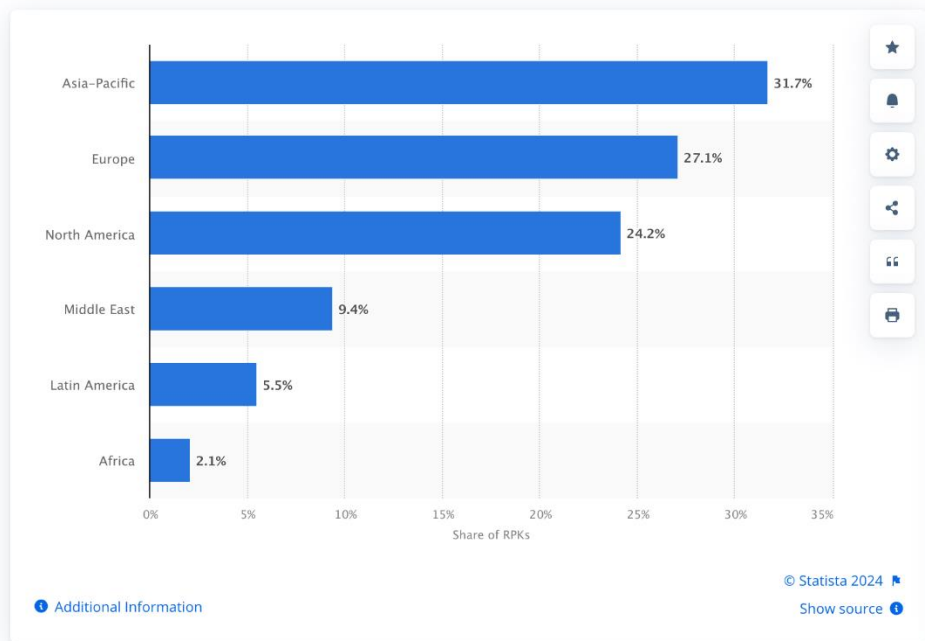
Fig 3: World Economic Growth Outlook (source-IMF)

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Fig 4 : Worldwide Passenger Air Traffic By Region-2023 (Source: Statista)
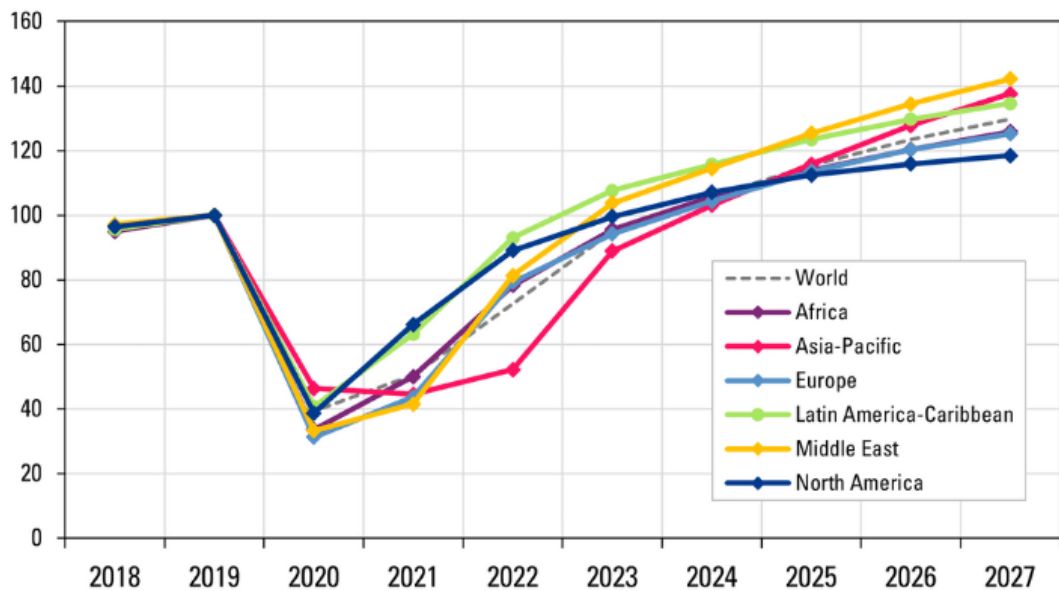

Fig 5: Medium Term Passenger Traffic Forecast By Region (*Source: ACI World Airport Traffic Forecasts (WATF) 2023–2052)*

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3.16   The 46th Directors General Civil Aviation Conference (DGCA/46, Osaka, Japan, October 2009) was the genesis of Asia/Pacific Seamless ANS discussion. The DGCA Conference requested that Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) to take a lead role in development of Seamless ANS in the Asia/Pacific region.

3.17   APANPIRG/22 created the APSAPG in 2011 under Decision 22/56, with a primary goal to develop an *Asia/Pacific Seamless ATM Plan*. APANPIRG/24 (2013) adopted version 1 of the Plan.

3.18   The Global Air Navigation Industry Symposium (GANIS, Montréal, 20-23 September 2011) introduced the ASBU concept. This inferred an iterative improvement, from Block 0 (zero) to 3. Although the implementation of all ASBU elements is not mandatory, it is intended to achieve the highest level of conformance; thus supporting global interoperability and Seamless ANS.

3.19   Subject to several recommendations the AN-Conf/12 endorsed the ASBU concept and the consequential changes to the GANP. The AN-CONF/12 stressed that ASBU implementation and requirements needed to be coordinated at a regional level based on operational requirements, and that action plans to address identified impediments to ATM ANS modernization should be developed. This Plan is part of the Asia/Pacific strategy to address the requirement for action plans, and to guide Asia/Pacific administrations in their ANS planning.

3.20   At the first ICAO APAC Ministerial Conference on Civil Aviation, held in Beijing, China in January 2018, the Ministers in charge of civil aviation representing 36 APAC governments endorsed the *Beijing Declaration*, formalizing their shared commitments to high-priority aviation safety and efficiency objectives (**Appendix A**). They agreed to pursue cooperative progress on objectives relating to aviation safety oversight, State Safety Programme (SSP) implementation, airport certification, independence of accident investigation authority, the timely implementation of the Asia/Pacific Seamless Air Traffic Management Plan (now Seamless ANS Plan), and the sharing of information and best practices for air navigation and search and rescue services.

>   *Note: Beijing Declaration commitments to ANS implementation have been updated by the declaration of the Second ICAO APAC Ministerial Conference on Civil Aviation, held in 2024.The updated Delhi Declaration is available in Appendix A.*

Air Navigation Service Provider Summary

3.21   The safety and efficiency of flights transcend national borders and airspace boundaries. Seamless ANS is therefore possible only if there is close regional collaboration among States, their ANSPs and all stakeholders. Cooperation is the key to success.

3.22   Given the size and diversity of the region, ANS harmonisation efforts will require the needs of the least developed ANSPs to be addressed especially in the areas of technical assistance such as funding, expertise and training. Differences in economic development may also mean that traffic demands are not uniform in the region, and therefore ANS solutions should be driven by analysis of costs and benefits and performance requirements appropriate to the traffic demands.

Aerodrome Operator Summary

3.23   Aerodrome operations are a key component for Seamless ANS, especially in regard to infrastructure and operational efficiencies.   The collaborative interaction of various stakeholders is important to ensure that aerodrome operations, facilities and equipment are suitable for all aircraft operators. Aerodrome operators require the airspace, ATM, aerodrome and aircraft operations to be cohesive and interoperable. This includes not only the aerodrome movement areas but the terminal and ancillary services, which may include border protection, fuel, baggage and passenger facilitation, which need to be aware of the interaction of their services with the aircraft operations.

3.24   Short-, medium- and long-term aerodrome planning needs to take into account the seamless system so that capital investment is aligned to ANS operational efficiencies. Aerodrome development and airline changes are catalysts for changes driven by the aerodrome operator, but there is a need to ensure en-route and terminal ATS efficiencies are not impacted or lost, due to poor aerodrome infrastructure and operations. A saving in aircraft flight time can easily be eroded by lack of gates, poor taxiway-runway interface and inadequate terminal facilities. Stakeholder involvement and infrastructure changes needs to be coordinated to maximise the efficiencies from a systemic approach to aerodrome, airspace, air traffic management and aircraft operations.

ABBREVIATIONS AND ACRONYMS

AAR	Aerodrome Arrival Rate or Airport Acceptance Rate
ABAS	Aircraft Based Augmentation Systems
ABI	Advanced Boundary Information (AIDC)
ACARS	Aircraft Communication Addressing and Reporting System
ACAS	Airborne Collision Avoidance System
A-CDM	Airport Collaborative Decision-Making
ACIS	Airport Collaborative Information Sharing (ACIS)
ACC	Area Control Centre
ACP	Acceptance (AIDC)
ADIZ	Air Defence Identification Zone
ADC	Air Defence Code
ADOC	Aircraft Direct Operating Cost
ADS-B	Automatic Dependent Surveillance-Broadcast
ADS-C	Automatic Dependent Surveillance-Contract
AeroMACS	Aeronautical Mobile Airport Communication System
AIDC	ATS Inter-facility Data Communications
AIGD	ICAO ADS-B Implementation and Guidance Document
AIM	Aeronautical Information Management
AIRAC	Aeronautical Information Regulation and Control
AIRB	Basic Airborne Situational Awareness
AIRD	ATM Improvement Research and Development
AIRMET	Information concerning en-route weather phenomena which may affect the safety of low-level aircraft operations
AIS	Aeronautical Information Service
AIXM	Aeronautical Information Exchange Model
AMAN	Arrival Manager
AMHS	ATS Message Handling System
AMS	Aeronautical Mobile Service
ANSP	Air Navigation Service Provider
AN-Conf	Air Navigation Conference
AOC	Assumption of Control (AIDC)
AOM	Airspace Organization and Management
AOP	Airport Operations Plan
APAC	Asia/Pacific
APANPIRG	Asia/Pacific Air Navigation Planning and Implementation Regional Group
APCH	Approach
APEC	Asia Pacific Economic Cooperation
APOC	Airport Operations Centre
APSAPG	Asia/Pacific Seamless ANS Planning Group
APUAS	Asia/Pacific Unmanned Aircraft System
APV	Approach with Vertical Guidance
APW	Area Proximity Warning
ASBU	Aviation System Block Upgrade
ASD	Aircraft Situation Display
ASEAN	Association of Southeast Asian Nations
ASM	Airspace Management
ASMGCS	Advanced Surface Movements Guidance Control Systems
ATC	Air Traffic Control
ATCONF	Worldwide Air Transport Conference
ATFM	Air Traffic Flow Management
ATIS	Automatic Terminal Information Service
ATN/OSI	Aeronautical Telecommunication Network/Open System Interconnection

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ATS	Air Traffic Services
ATSA	Air Traffic Situational Awareness
ATM	Air Traffic Management
BOB	Bay of Bengal
CANSO	Civil Air Navigation Services Organization
CARATS	Collaborative Actions for Renovation of Air Traffic Systems
CDM	Collaborative Decision-Making
CCO	Continuous Climb Operations
CDO	Continuous Descent Operations
CDP	Climb Decent Procedure
CFIT	Controlled Flight into Terrain
CLAM	Cleared Level Adherence Monitoring
COM	Communication
CONOPS	Concept of Operations
CNS	Communications, Navigation, Surveillance
CPAR	Conflict Prediction and Resolution
CPDLC	Controller Pilot Data-link Communications
CPWG	Cross-Polar Working Group
CSP	Communication Service Provider
CTA	Control Area
CTR	Control Zone
DARP	Dynamic Airborne Re-route Planning
DCL	Data-link Departure Clearance
DFMC.	Dual Frequency Multi Constellation
DGCA	Conference of Directors General of Civil Aviation
DMAN	Departure Manager
DME	Distance Measuring Equipment
EST	Coordinate Estimate
EVS	Enhanced Vision System
FAA	Federal Aviation Administration
FANS	Future Air Navigation Systems
FDPS	Flight Data Processing System
FIR	Flight Information Region
FIRB	Flight Information Region Boundary
FL	Flight Level
FLAS	Flight Level Allocation Scheme
FLOS	Flight Level Orientation Scheme
FRMS	Fatigue Risk Management System
FUA	Flexible Use Airspace
GANIS	Global Air Navigation Industry Symposium
GANP	Global Air Navigation Plan
GASP	Global Aviation Safety Plan
GBAS	Ground-based Augmentation System
GDP	Gross Domestic Product
GLS	GBAS Landing System
GNSS	Global Navigation Satellite System
GPI	Global Plan Initiative
HF	High Frequency
HFDL	High Frequency Data Link
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IM	Interval Management Procedure
IMC	Instrument Meteorological Conditions
INS	Inertial Navigation Systems
IO	International Organizations

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IPACG	Informal Pacific ATC Coordinating Group
ISPACG	Informal South Pacific ATS Coordinating Group
ITP	In-Trail Procedure
IWXXM	ICAO meteorological information exchange model
KPA	Key Performance Area
LNAV	Lateral Navigation
LVO	Low Visibility Operations
MET	Meteorological
METAR	Aerodrome routine meteorological report *(in meteorological code)*
MLAT	Multilateration
MON	Minimal Operating Networks
MSAW	Minimum Safe Altitude Warning
MTCD	Medium Term Conflict Detection Tool
MTF	Major Traffic Flow
MWO	Meteorological Watch Office
NANP	National Air Navigation Plan
NAV	Navigation
NextGen	Next Generation Air Transportation System
NOPS	Network Operations
NSS	Non Cooperative Surveillance Radar
OPMET	Operational Meteorological *(information)*
OLDI	On-Line Data Interchange
OTS	Organised Track System
PACOTS	Pacific Organized Track System
PARS	Preferred Aerodrome/Airspace and Route Specifications
PASL	Preferred ANS Service Levels
PBN	Performance-based Navigation
PIA	Performance Improvement Area
PinS	Point in Space
PKP	Passenger Kilometres Performed
PVT	Passenger Value of Time
RAIM	Receiver Autonomous Integrity Monitoring
RAM	Route Adherence Monitoring
RANP	Regional Air Navigation Plan
RASMAG	Regional Airspace Safety Monitoring Advisory Group
RPAS	Remotely Piloted Aircraft System
RPK	Revenue Passenger Kilometres
RNAV	Area Navigation
RNP	Required Navigation Performance
RVSM	Reduced Vertical Separation Minimum
SAARC	South Asian Association for Regional Cooperation
SATVOICE	Satellite Voice Communications
SAR	Search and Rescue
SB ADS-B	Space Based ADS-B
SBAS	Satellite-based Augmentation System
SCS	South China Sea
SESAR	Single European Sky ATM Research
SHEL	Software, Hardware, Environment and Liveware
SID	Standard Instrument Departure
SIGMET	Information concerning en-route weather phenomena in the atmosphere which may affect the safety of aircraft operations
SPECI	Aerodrome special meteorological report
SB ADS-B	Space-Based ADS-B
SSR-DAPS	Secondary Surveillance Radar Downlink of Aircraft Parameters
STAR	Standard Terminal Arrival Route or Standard Instrument Arrival (Doc 4444)

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STCA	Short Term Conflict Alert
STS	Special Handling Status
SUA	Special Use Airspace
SUR	Surveillance
SVGS	Synthetic Vision Guidance Systems
SWIM	System-Wide Information Management
TAF	Aerodrome Forecast
TAWS	Terrain Awareness Warning Systems
TBO	Trajectory Based Operations
TCAC	Tropical Cyclone Advisory Centre
TCAS	Traffic Collision Avoidance System
TOC	Transfer of Control
UAS	Unmanned Aircraft Systems
UAT	Universal Access Transceiver
UPR	User Preferred Routes
VHF	Very High Frequency
VAAC	Volcanic Ash Advisory Centre
VDL	VHF Data Link
VMC	Visual Meteorological Conditions
VNAV	Vertical Navigation
VOLMET	Meteorological information for aircraft in flight
VOR	Very High Frequency Omni-directional Radio Range
VSA	Visual Separation on Approach
VSAT	Very Small Aperture
WAFC	World Area Forecast Centre

BACKGROUND INFORMATION

<u>Principles</u>

5.1   There were considered to be three major areas of Seamless ANS Principles, involving People (human performance), Facilities (physical equipment), and Technology and Information. The 37 Principles agreed by APSAPG and endorsed by APANPIRG are included as **Appendix B**.

<u>Aviation System Block Upgrade (ASBU)</u>

5.2   At the Global level, ICAO started the ASBU initiative as a programme framework that developed a set of aviation system solutions or upgrades intended to exploit current aircraft equipage, establish a transition plan and enable global interoperability. ASBUs comprised a suite of elements organised into flexible and scalable building blocks, where each element represented a specific, well bounded improvement. The building blocks could be introduced and implemented in a State or a region depending on the need and level of readiness, while recognizing that not all the elements were required in all airspaces. ASBUs described a way to apply the concepts defined in the Doc 9854 with the goal of implementing regional performance improvements and were used in the new edition of the GANP to guide implementation. AN-Conf/12 agreed that the ASBUs and the associated technology roadmaps were integral parts of the GANP and a valuable implementation tool kit.

5.3   ASBU are comprised of a suite of elements, each having the following qualities:

- a clearly-defined measurable operational improvement and success metric;

- necessary equipment and/or systems in the aircraft and on the ground along with an operational approval or certification plan;

- standards and procedures for both airborne and ground systems; and

- a positive business case over a clearly defined period of time.

5.4   ASBU are groups of operational improvements to advance air navigational capabilities and improve the performance of their air navigation system in a cost effective way. They are classified into three functional categories:

- Information;

- Operational; and

- Technology.

<u>Asia/Pacific ASBU Implementation</u>

5.5   **Table 1** provides a summary of the Block 0 , Block 1 and Block 2 elements, and the expected priority for implementation within the Asia/Pacific Region. The allocation of priority was based on factors including its importance in promoting Seamless ANS:

- **Priority 1** = critical upgrade assignment based on whether the implementation of an element could bring most benefit to the region or regional upgrade by States and is essential to achieve the service level required globally;

- **Priority 2** = recommended upgrade for those elements which would bring benefits to the region and generally to be implemented from 2022, but States are encouraged to implement earlier if beneficial; and

- **Priority 3** = assigned to those elements which may <u>not</u> be universally implemented in the Asia/Pacific Region.

5.6   A cost-benefit or economic analysis before implementation was identified as essential to determine whether to implement certain elements such as SURF-B0/1/1-4, but should not preclude an economic analysis of other elements as determined by the State. Detailed information on the development, scope, objectives, stakeholders and dependencies for each ASBU element is provided at https://www4.icao.int/ganpportal/.

Functional Category	Element	Description	Priority	Responsibility for Review
Information	AMET B0/1-4	Meteorological observations, forecast, warning, climatological and historical products, and dissemination (PASL 7.41)	**1**	MET SG
	AMET – B1/1-4	Meteorological products supported by automated decision systems or aids using IWXXM	2	
	AMET-B2/1 to B2/4	Integrated meteorological observations in support of enhanced ATM and airport decision-making processes, particularly in the near-term.	3	MET SG
	DAIM-B1/1 – 6:	Provision of quality-assured digital aeronautical data and information, including AIP, terrain and obstacle, aerodrome and instrument flight procedure data sets (PASL 7.40)	**1**	ATM SG
	DAIM-B1/7	Provision of digital NOTAM improvements	2	
	DAIM-B2/1 to B2/5	Integrated aeronautical information service in a SWIM environment in support of enhanced operational ground and air decision-making processes for all phases of flight.	3	
	FICE-B0/1:	Automated basic AIDC (PASL 7.26)	**1**	CNS SG
	FICE-B2/2	To enhance ATS flight plan processing including constraints evaluation and enhanced flight information sharing.- Filing Service	2	CNS SG ATM SG
	FICE-B2/4	Flight Data Request Service	2	
	SWIM-B2/1	Information Service provision	2	
	SWIM B2/2	Information Service Consumption	2	
Operational	ACDM-B0/1	Airport CDM Information Sharing (ACIS) (PARS 7.3)	**1**	AOP SG ATM SG
	ACDM-B0/2	Airport CDM integration with ATM Network (PARS 7.3, 7.18)	**2**	AOP SG ATM SG
	ACDM-B1/1 – 2:	Airport CDM Integration with ATM Network, AOP and APOC	2	AOP SG ATM SG
	ACDM-B2/1-3:	AOP, APOC and Total Airport Management (PARS 7.2XX)	3	AOP SG
	APTA-B0/1	PBN non-precision approaches (with basic capability); (PARS 7.4, 7.5, 7.10, 7.13, 7.14, 7.21)	**1**	CNS SG
	APTA-B0/2:	Basic PBN SID and STAR procedures (with basic capability); (PARS 7.4, 7.5, 7.10, 7.13, 7.14, 7.21)	**1**	
	APTA-B0/3	SBAS/GBAS CAT I precision approach procedures; (PARS 7.5, 7.6, 7.10, 7.14, 7.21)	3	

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	APTA-B0/4	CDO (Basic): (PARS 7.14, 7.19, 7.21)	2	
	APTA-B0/5	CCO (Basic) : (PARS 7.14, 7.19, 7.21)	2	
	APTA-B0/6	PBN Helicopter Point in Space (PinS) Operations; (PARS 7.5, 7.6, 7.10, 7.14, 7.21)	3	
	APTA-B0/7	Performance-based aerodrome operating minima for advanced aircraft (PARS 7.14, 7.19, 7.21)	2	
	APTA-B0/8	Performance-based aerodrome operating minima for basic aircraft (PARS 7.14, 7.19, 7.21)	2	
	APTA-B1/1	PBN approaches (with advanced capability), (PARS 7.14, 7.21, 7.22, 7.23)	3	
	APTA-B1/2	PBN SID and STAR procedures(with advanced capability) (PARS 7.14, 7.21, 7.22, 7.23)	3	
	APTA-B1/4	CDO(Advanced) (PARS 7.14, 7.21, 7.22, 7.23)	3	
	APTA-B1/5	CCO (Advanced) (PARS 7.14, 7.21, 7.22, 7.23)	3	
	APTA-B2/1	GBAS CAT II/III precision approach procedures	3	
	APTA-B2/2	Simultaneous operations to parallel runways	3	
	APTA-B2/3	PBN Helicopter Steep Approach Operations	3	
	APTA-B2/4	Performance-based aerodrome operating minima for advanced aircraft with SVGS (PARS 7.14, 7.21, 7.22, 7.23)	3	
	CSEP-B1/1 – 4:	basic airborne situational awareness AIRB and VSA, and performance-based horizontal separations (PARS 7.20)	2	ATM SG
	CSEP-B2/1 – 3:	Interval management procedure; cooperative separation at low altitudes and higher airspace	3	
	DATS-B1/1	Digital Aerodrome Air Traffic Services	3	AOP SG ATM SG CNS SG
	FRTO-B0/1 – 4:	Direct routing, Airspace Planning and FUA, Flexible Routings, and basic conflict detection and conformance monitoring (PASL 7.29 ,7.31 PASL 7.36)	**1**	ATM SG
	FRTO-B1/1 – 7:	Free Route Airspace, RNP routes, Advanced FUA and Airspace Management (ASM), Dynamic Sectorisation, Enhanced Conflict Detection Tools and Conformance Monitoring, and Multi-Sector Planner Function (PASL 7.29, 7.51)	2	
	FRTO-B2/1 – 4:	Integrated ATFM and ATC Planning; Dynamic Airspace Configuration; Cross border FRA; Enhanced Conflict Resolution Tools	3	

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	NOPS-B0/1 – 5:	Initial integration of ASM with ATFM, Collaborative Network Flight Updates, Basic Network Operation Planning and Initial Airport/ATFM slots, A-CDM Network Interface and Dynamic Slot Allocation (PASL 7.38)	**1**	
	NOPS-B1/1 – 10:	Short Term ATFM measures, Enhanced NOPS Planning, Enhanced integration of airport operations and NOPS planning, Enhanced Traffic Complexity Management, Full integration of ASM with ATFM, Initial Dynamic Airspace configurations, Enhanced ATFM slot swapping, Extended Arrival Management, ATFM Target Times and Collaborative Trajectory Options Programme (PASL 7.52)	2	
	NOPS-B2/1 -2	Optimised ATFM in initial TBO context; Enhanced Dynamic airspace configuration	3	
	NOPS-B2/3	Collaborative Network operation planning	3	
	NOPS-B2/4	Multi ATFM slot swapping and Airspace User priorities	3	
	NOPS-B2/5	Further airport integration	3	
	NOPS-B2/6	ATFM for Cross Border FRA	3	
	NOPS-B2/7	UTM Network Operations	3	
	NOPS-B2/8	Higher Upper airspace network operations	3	
	OPFL-B0/1:	ITP	3	
	OPFL-B1/1:	CDP	3	
	OPFL-B2/1	Separation minima using ATS Surveillance when VHF not available	3	
	RSEQ-B0/1 – 2:	Arrival and Departure Management (PASL 7.32)	**1**	
	RSEQ-B0/3	Point merge (PARS 7.2XX)	3	AOP SG ATM SG CNS SG
	RSEQ-B1/1	Extended arrival metering (PASL 7.46)	2	ATM SG
	RSEQ-B2/1	Integration of Arrival and departure Management	3	
	SNET-B0/1 – 4	STCA, MSAW, APW, APM (PASL 7.31)	**1**	ATM SG CNS SG
	SNET-B1/1 – 2:	Enhanced STCA with aircraft parameters and in complex TMAs (PASL 7.50)	2	
	SURF-B0/1 – 3:	Basic ATC surface operations tools, comprehensive situational awareness, situational awareness, alerting service (PASL 7.47)	2	CNS SG ATM SG

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	SURF-B1/1 – 5:	Advanced surface traffic management visual aids, pilot comprehensive awareness and runway alerting, enhanced ATC alerting, routing service to support ATC and EVS for taxiing (PASL 7.48)	2	
	SURF-B2/1 - B2/3	Enhanced surface guidance for pilots and vehicle drivers; Conflict alerting for pilots for runway operations	3	CNS SG ATM SG
	TBO-B0/1:	Introduction of time-based management within a flow centric approach (PASL 7.52)	2	
	TBO-B1/1 –	Initial Integration of time-based decision-making processes (PASL 7.52)	2	
	TBO-B2/1- B2/2	Pre departure Trajectory synchronization; extended Time based management across multiple FIRs.	3	ATM SG CNS SG
	WAKE-B2/1-2	Wake Separation Minima based on 7 aircraft groups; Time based Wake separation minima on final approach	3	
~~CNS~~ Technology ~~and Services~~	ASUR-B0/1 – 3:	ADS-B, MLAT, SSR-DAPS (PARS 7.8, 7.9, 7.11, 7.12 : PASL 7.27 , 7.28, 7.29, 7.30)	1	CNS SG
	ASUR-B1/1	Reception of aircraft ADS-B signals from space (SB ADS-B)	2	
	ASUR-B2/1	Evolution of ADS-B and Mode S	3	
	ASUR-B2/2	Community based surveillance system for airborne aircraft (low and higher airspace)	3	
	COMI-B0/1 – 2, 4 – 6:	ACARS, ATN/OSI, VDL Mode 2 Basic, SATCOM Class C Data, HFDL (PARS 7.21)	2	
	COMI-B0/3, 7:	VDL Mode O/A, AMHS (PASL 7.25)	**1**	
	COMI-B1/1	Ground-Ground Aeronautical Telecommunication Network/Internet Protocol Suite (ATN/IPS) (PARS 7.21)	1	
	COMI-B1/1 – 4:	VDL Mode 2 Multi-Frequency, SATCOM Class B (SB-S) Voice and Data, ATN/IPS and AeroMACS Ground-Ground	2	
	COMI-B2/1	Air Ground ATN/IPS,	3	
	COMI-B2/2	AeroMACS, aircraft mobile connection	3	
	COMI-B2/3	Links meeting requirements for non-safety critical communication	3	
	COMS-B0/1 – 2:	CPDLC (FANS 1/A & ATN B1) for domestic and procedural airspace and ADS-C (FANS 1/A) for procedural airspace	2	
	COMS-B1/1 – 3	PBCS approved CPDLC (FANS 1/A+), ADS-C and SATVOICE for domestic and procedural airspace	2	
	COMS-B2/1-3	PBCS approved CPDLC, ADS-C, SATVOICE	3	
	NAVS-B0/1 – 4:	SBAS, GBAS, ABAS, MON (PARS 7.7)	2	

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NAVS-B1/1:	Extended GBAS	3	
NAVS-B2/1-3	DFMC- GBAS, SBAS, ABAS	3	

Table 1: Asia/Pacific ASBU Block 0, Block 1 and Block 2 Priority

Implemented Elements

5.7   The following ASBU Block 0 elements were considered to be almost universally implemented within the APAC Region in terms of being established Annex 6 standards (ACAS) by or in the early stages of Block 1 from 2019 (GADSS), so were not referenced as a priority in Table 1:

- **ACAS-B1/1:** ACAS Improvements (TCAS Version 7.1); and

- **GADS-B1/1 – 2**: Aircraft Tracking and Contact directory service (PASL 7.42).

Regional Elements

5.8   The Regional elements were incorporated into the Seamless ANS framework used to assess the uptake by Asia/Pacific States.

5.9   **Table 2** provides a summary of the Regional Seamless ANS elements, and the expected priority for implementation within the Asia/Pacific Region. The allocation of priority was based on factors including its importance in promoting Seamless ANS.

Functional Category	Regional Seamless ANS Element	Priority
Operational	Aerodrome management and coordination (PARS 7.1)	2
	Optimization of runway capacity facilities (PARS 7.2)	3
	ADS-B, SSR Mode S and PBN Airspace (PARS 7.8, 7.9, 7.10)	2
	Flight Level Orientation Scheme (FLOS) (PARS 7.15)	2
	Civil-Military SUA management (PARS 7.16)	1
	Unmanned Aircraft Systems (PARS 7.17)	2
	Adjacent ATS sector coordination (PASL 7.24)	2
	Airspace classification (PASL 7.33)	2
	ATC horizontal separation (PASL 7.34)	2
	Flight Level Allocation Schemes (FLAS) (PASL 7.35)	2
	ATC sector capacity (PASL 7.37)	2
	Electronic Flight Progress Strips (PASL 7.39)	2
	Enhanced SAR systems (PASL 7.42)	1
	ANSP human and simulator performance (PASL 7.43)	1
	Civil-Military strategic and tactical coordination (PASL 7.44)	1
	Civil-Military common procedures and training (PASL 7.44)	2
	Space Vehicle launches/space re-entry management (PASL 7.45)	1
Technology	ATS surveillance data sharing (PASL 7.28)	2
	Civil-Military integrated systems and facilities (PASL 7.44)	2
	Data-Link Departure Clearance (DCL) (PASL 7.49)	2

Table 2: Asia/Pacific Seamless Regional Elements Priority

5.10   There are 16 Priority 1 [ASBU Block 0 and Block 1 and Regional] Elements as follows:

a)   Aeronautical Meteorology: AMET-B0/1 – 4;

b)   Aeronautical Information Management : DAIM-B1/1 – 6*;

c)   Airport CDM: ACDM-B0/1 – 2;

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> d) ANSP human and simulator performance (Regional);
>
> e) ATS Inter-facility Datalink Communications: FICE-B0/1;
>
> f) Space Vehicle launches and re-entry management (Regional);
>
> g) Civil-Military Special Use Airspace (SUA) management (Regional);
>
> h) Civil-Military strategic and tactical coordination (Regional);
>
> i) Core data communications: VDL Mode O/A and AMHS COMI-B0/3, 7;
>
> j) Direct and Free Route Operations: FRTO-B0/1 – 4;
>
> k) Enhanced SAR systems (Regional);
>
> l) Ground-based Surveillance: ASUR-B0/1 – 4;
>
> m) Network Operations: NOPS-B0/1 – 5;
>
> n) Performance-based Navigation Approach Procedures: APTA-B0/1 – 2;
>
> o) Runway Sequencing: RSEQ-B0/1 – 2; and
>
> p) Safety Nets SNET-B0/1 – 4.

Note: DAIM-B1/7 is placed within PASL Phase III.

Human Performance

5.11   The Global ATM Operational Concept (Doc 9854) states:

Humans will play an essential and, where necessary, central role in the global ATM system. Humans are responsible for managing the system, monitoring its performance and intervening, when necessary, to ensure the desired system outcome. Due consideration to human factors must be given in all aspects of the system.

5.12   The AN-Conf/12 emphasised the importance of human performance considerations by endorsing Recommendation 6/4-which called for the integration of human performance as an essential element for the implementation of ASBU modules and in the planning and design phase of new systems and technologies, as part of a safety management approach.

5.13   The role of the human is especially important in delivering high quality and consistent services supporting Seamless ANS. Therefore, it is crucial to ensure that, training and licensing requirements are developed using a competency-based framework, fatigue-related risk is managed appropriately, and safety data, including the reporting of hazards, is collected, analysed and acted upon within ATM systems that support Seamless ANS. States should identify specific efficiency improvements expected from ASBU Element deployment. These expectations should include regulatory and/or procedural changes needed to optimize new capabilities.

5.14   One of the more important human performance aspects in order to deliver a consistent, harmonised and efficient service is ATC training, to change from a procedural mind set to one that used the tactical delivery of services based on ATS surveillance and automated safety net decision support tools (airborne and ground).

5.15   Moving from reliance on paper-based flight progress strips to an electronic equivalent connected to the ATS surveillance Flight Data Processing System (FDPS) or direct data inputs to the Aircraft Situation Display (ASD) support this paradigm shift. The use of paper flight progress strips in automated ATM environments reduces efficiency, increases transcription error/data mismatch, and artificially caps ATC capacity due to retention of manual tasks made redundant by the automation capability.

5.16   Controllers need to be trained on the application of tactical separation, including the use of positive control techniques, such as vectoring and speed control when conflict pairs approach minimum separation. In this regard, it is important that managers facilitate a modern operating environment in terms of air safety incidents and human factors, so personnel are confident using the full capability provided by the CNS facilities.

5.17   A critical human performance issue is the training of ANSP management and regulators in human performance issues. These decision-makers had an important influence on outcomes in terms of supporting the right environment for Seamless ANS activities, whether that is providing financial resources, or establishing high-level policies and procedures.

5.18   A key component of Seamless ANS is the ability of controllers to operate, and have confidence in, a new operating environment. The appropriate use of ATC simulators to enhance their learning experience is an essential part of the necessary training.

5.19   In planning to deliver Seamless ANS services, it is assumed that each State and aircraft operator will comply with the English language proficiency requirements in accordance with ICAO Standards and Recommended Practices. States should be considering the highest levels of English language proficiency for all operational controllers to ensure they can respond appropriately to irregular occurrences (e.g.: emergencies) by use of an internationally recognised system.

5.20   States must acknowledge the challenge of modifying current practices and procedures to incorporate and optimize improved system capability. States and ANSPs are encouraged to establish sub regional or bilateral relationships to share best practices and develop strategies to improve performance.

5.21   An optimal 'aviation culture' within regulators and service providers can only be implemented when top managers instil an understanding of a system-wide approach that creates an organic, learning and safe environment. When considering the key factors supporting an 'aviation culture', it is important to acknowledge that no 'national culture' is perfectly aligned with 'aviation culture', so there will always be a need for gap analysis and changes where development of an appropriate culture is required. In focussing on management it is therefore important to train managers, and for managers to have a level of competency in the following areas (**Figure 6**):

     a) the advantages of a responsible, informed and accountable management, which promotes a proactive organisational culture with safety as a first priority, using open communications and a team management approach; and

     b) the implementation of an appropriate organizational culture which is effectively driven by management through embedded safety review and assessment teams, allowing the organization to respond organically to its operating environment;

     c) the systematic application of human factors principles in –

- air safety investigation;

- system design (ergonomics, human-in-the-loop);

- effective training (including the use of simulators);

- fatigue management;

- automated safety nets; and

- contingency planning;

     d) the implementation of effective safety reporting systems that –

- are non-punitive, supporting a 'Just Culture';

- promote open reporting to management; and

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- focus on preventive (systemic), not corrective (individual) actions in response to safety concerns, incidents and accidents.

Figure 6: Optimal Aviation Culture Factors

Civil-Military Cooperation

5.22   One of the key enablers for improvement of ATM efficiencies supported by Doc 9854 (Global ATM Operational Concept) is the use of FUA. This is an airspace management concept based on the principle that airspace should not be designated as purely civil or military, but rather as a continuum in which all user requirements are accommodated to the greatest possible extent. FUA normally referred to the activation of SUA, but could also include controlled airspace.

5.23   The establishment and operation of SUA required careful assessment, review and management, to ensure the most appropriate airspace designation is used, and the airspace is operated in a cooperative manner. This is ordinarily only possible through discussion between military and civil parties. Thus, a key to the establishment of effective FUA is risk-based assessments, determining the risks or security issues involved through coordinated and cooperative methods if possible.

> *Note: Annex 2 Rules of the Air states that restricted areas were airspace of defined dimensions, <u>above the land areas or territorial waters</u> of a State, which means that restricted areas must not be designated over the high seas or in airspace of undetermined sovereignty*

5.24   Restricted areas designed to segregate civil aircraft from airborne military operations or ordnance firing would be expected when the risk of an accident for non-segregated operations is higher than acceptable. However, lower risk military operations (such as using small calibre weapons at an established firing range) may only require the establishment of a danger area or even no SUA. Thus the type, dimensions, activation notice and duration of SUA activity should be appropriate and commensurate with the type of activity affecting the airspace.

5.25   APANPIRG/9 (August 1998) developed the following guidelines for Civil-Military cooperation in the following areas: military procedures, aeronautical facilities and ground services, civil and military ATS unit personnel, airspace, research and development, common terminology, abbreviations rules and procedures, military exercises, and non-sensitive military data.

- If at all possible, military training should be conducted in locations and/or at times that do not adversely affect civilian operations, particularly those associated with

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major aerodromes. This requires strategic planning by formal Civil-Military coordination bodies.

- Consideration of the interoperability and operations of military systems is an integral part of a Seamless ANS environment. With increasingly complex aircraft equipage civil requirements, non-compliant military or other State aircraft may become more difficult to manage using Special Handling Status (STS). The limitations or requirements of military aircraft cockpits, avionics and airframes may even preclude some civil systems, and yet military aircraft still need to transit airspace used predominantly by civil operations.

- Military participation at civil ATM meetings and within ATS Centres will often lead to a better understanding of civil needs, as well as military requirements, including the operation of Unmanned Aircraft Systems (UAS). UAS have been predominately used by the military in segregated airspace, but now many forms of State missions including customs, immigration and police operations are being planned, as well as a myriad of potential civil uses.

- Responses to Search and Rescue (SAR), Civil Defence (normally natural disaster emergencies), and national security events will inevitably require Civil-Military coordination so this needs to be taken into account during the planning for such operations.
  As these occurrences could involve a number of States, regional Civil-Military planning is crucial in order to reduce the response time for emergency services to aid those in need. The response to an international aviation SAR event may well involve a location over the high seas, so all States should have SAR agreements with neighbouring nations to ensure that SAR services were unimpeded to the maximum possible extent.

5.26   The Asia/Pacific Civil-Military Cooperation Seminar/Workshop (Bangkok, 28 February to 1 March 2012) recommended that the following Civil-Military cooperation/coordination principles and practices should be elevated to the highest political level in the Asia/Pacific regions:

- Civil-Military working arrangements should be enacted where discussion of both civil and military needs were able to be negotiated in a balanced manner;

- the importance of the interoperability of civil air transport infrastructure and national security was recognized;

- the interoperability of civil and military systems including data-sharing was emphasized; and

- regular review of controlled airspace and special use airspace was encouraged to be undertaken by States to ensure its establishment, size, activation and operation was appropriate in terms of optimal Civil-Military operations.

5.27   The Asia/Pacific Civil-Military Cooperation Seminar/Workshop requested ICAO to update existing provisions related to Civil-Military cooperation/coordination and further develop guidance material related to airspace planning and management, including FUA.

5.28   Data sharing arrangements (including aircraft surveillance) are a key part of Civil-Military cooperation for tactical operational responses, and to increase trust between civil and military units. Data sharing between the civil and military could facilitate CDM, a vital component of ATFM. The Regional Surveillance Strategy espouses Civil-Military cooperation and system interoperability.

5.29   Aircraft operating ADS-B technology transmit their position, altitude and identity to all listeners, conveying information from co-operative aircraft that have chosen to equip and publicly broadcast ADS-B messages. Thus, there should be no defence or national security issues with the use

and sharing of such data.

Note: Some military transponders may support ADS-B using encrypted messages, but this data is not normally decoded or used at all by civil systems. In many cases, tactical military aircraft are not ADS-B equipped or could choose to disable transmissions. In future, increasing numbers of military aircraft would be ADS-B capable, with the ability to disable these transmissions. ADS-B data sharing should not influence the decision by defence agencies to equip or not equip with ADS-B. Moreover, it is possible for States to install ADS-B filters that prevent data from sensitive flights being shared. These filters can be based on a number of criteria and typically use geographical parameters to only provide ADS-B data to an external party if aircraft were near the boundary.

5.30   The ten Civil-Military elements identified by APANPIRG are as follows:

   a) **Strategic Coordination**. This element emphasised the creation of a permanent body, facilities and procedures to facilitate long and medium-term planning for optimal civil and military operations, and the tactical coordination element. This element features the establishment of a national body that encompasses military (and State aircraft operators) and civil stakeholders, to develop high level Civil-Military cooperation policy.

   b) **Tactical Coordination.** The establishment of facilities and procedures derived from the high level strategic coordination body for the daily, safe and efficient tactical management of operations. Tactical coordination features participation of military officers at appropriate civil ATM meetings, airspace scheduling through interaction and communications between civil and military units, and military representation within civil ATC Centres where necessary.

   c) **Airspace Review**. The regular review of SUA and controlled airspace, to ensure that the means and notice of activation provide adequate warning for other airspace users, the SUA types reflect the usage, and the lateral and vertical limits are the minimum required to safely contain the activity therein (Annex 11 2.19.2.1 (b) refers). The review of airspace should be conducted by an airspace authority independent or a collaboration of civil and military airspace users.

   d) **Flexible Use Airspace**. Mechanisms to ensure the minimisation of airspace being exclusively assigned for civil or military use in accordance with FUA principles, assessed by the percentage of military SUA within a Flight Information Region (FIR).

   e) **International Airspace**. The minimisation of SUA and other military entities that may adversely affect international airspace. Restricted and prohibited areas must not be designated within international airspace or airspace of undefined sovereignty.

   f) **Integrated Civil-Military ATM Systems**. The integration of civil and military ATM systems where practicable, including the management of civil and State UAS aircraft, policies and procedures to manage State aircraft that are non-compliant with civil requirements, systems to manage civil and military SAR units, and joint procurement of systems where possible.

   g) **Joint Civil-Military Aerodromes and Navigation Aids**: The operation of joint civil-military aerodromes if possible, and the provision of navigation aids that could be utilised by both civil and military aircraft where practical.

   h) **Shared Civil-Military Data**: The provision of ATS surveillance data from civil surveillance systems to military units to improve monitoring (thereby minimising the need for individual defence identification authorisation), trust and confidence. The provision of surveillance data from military surveillance systems where this would enhance ATS surveillance coverage and redundancy; suitably filtered as appropriate.

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i) **Common Civil-Military Training and Procedures**. The familiarisation of civil and military ATM personnel with each other's systems and procedures, where national security allows. Training and licensing of civil and military air traffic controllers to equivalent standards. The implementation of the same or equivalent standards, procedures and policies for the provision of ATS and the management of air traffic.

j) **Space Vehicle Launch and Re-entry**. Effective coordination mechanisms established by States responsible for space vehicle launch and re-entry activities to ensure the safety of civil air navigation in the air and on the ground, with particular emphasis on how such activity affects other States in terms of safety and efficiency.

5.31   The efficient management of rocket/missile launch and space re-entry activity by both State and civil agencies is critical to minimise disruption to other airspace users. Increasingly, ballistic launch and space re-entry activity may be conducted by other State or civil/private agencies, which should conform with the same expectations in this Plan as military agencies. The coordination of all the stakeholders will be enhanced by:

- coordination agreements between the State civil aviation authority, the ANSP, and the launch/re-entry agency concerned; and

- strategic coordination conducted between the State civil aviation authority prior the activity and tactical management of the launch/re-entry activity.

5.32   Asia/Pacific Regional Guidance for Space Object Launch and Re-Entry Activities Coordination is at https://www.icao.int/APAC/Pages/eDocs.aspx.

Airspace Equipage Mandates

5.33   From operators' perspective, the following were important considerations:

- Preparation Time: Operators need time to prepare for any mandated equipage requirement – if new equipment is involved, several years may be required to allow fitment to take place during normal airframe maintenance cycles.

- Cost Benefit: Operational improvements, including the use of new technologies or implementing ASBUs, need to provide operational benefits that outweighed the total cost of implementation and operation. This included the airspace user side of the equation. States/ANSPs should carry out studies of the costs and benefits for all stakeholders.

- Education and promulgation: States/ANSPs should work with local airlines and International Organizations to ensure industry and other stakeholders are educated and informed regarding upcoming aircraft equipage mandates very early in the planning process. Ideally, the dialogue should begin with user consultation pertaining to the selection of appropriate solutions. Once a decision has been made, user education should include briefings, media notifications as well as required AIS promulgation.

- Service Outcomes: States/ANSPs must ensure the service delivery efficiencies enabled by an aircraft equipage mandate are actually delivered operationally coincident with the implementation date of the mandate. If service delivery is delayed, any related aircraft equipage mandate should also be delayed accordingly. States/ANSPs should consider offering operational advantages to early adopters of the desired equipage or capability to offset costs. This would enable operators to make at least partial use of the mandated capability in advance of the mandated date.

- Harmonization: it is essential that States/ANSPs harmonize requirements with neighbours as far as practicable, including implementation dates.

- • Regulatory considerations: it is essential that regulators are involved very early in the planning process. Experience shows that regulatory approvals are often a problem with the introduction of aircraft equipage mandated environments.

- • High Seas: Where airspace over the High Seas is affected, States must ensure appropriate ICAO processes are followed, including amendments to the required ICAO provisions.

Regulation and Safe Operation of Unmanned Aircraft Systems

5.34   ICAO Headquarters, supported by the Unmanned Aircraft Systems Advisory Group (UAS-AG), developed a global resource of information and guidance material, including:

- • the UAS Toolkit, providing general guidance on such issues as UAS regulations and risk-based approaches to regulation, training and education needs and authorizations, and examples of, and links to, existing UAS regulations of 39 States; and

- • a UAS Traffic Management (UTM) framework, summarizing key principles, lessons learned and best practices in the establishment of requirements for approval of UTM service providers.

    Note: the UTM framework is subject to ongoing development, in line with the growth of global knowledge and experience in UTM.

5.35   The UAS Toolkit, UTM framework and other relevant information is available on the ICAO Unmanned Aviation web pages at: https://www.icao.int/safety/UA/Pages/default.aspx.

5.36   Considering the rapid growth of the UAS industry, and the consequent economic and social benefits arising, there is an immediate need for an aviation regulatory response to facilitate access to non-segregated airspace while protecting the safety and access to airspace of conventional airspace users. For this purpose, an Asia/Pacific regional performance expectation for the regulation of UAS is included in PARS Phase II.

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CURRENT SITUATION

Aerodrome Analysis

6.1   In the last three decades, aerodrome operators in Asia-Pacific region invested billions of dollars to enhance capacity of existing aerodromes and to build new aerodromes to meet increasing air traffic demand. Notable examples are the opening of Siem Reap-Angkor, Beijing Daxing, Chengdu Tianfu and Kertajati airports and the expansion of Hong Kong and Suvarnabhumi airports. Notable examples are the opening of Bangalore, Hong Kong, Incheon, Kuala Lumpur International, Shanghai Pudong and Suvarnabhumi airports and the expansion of New Delhi and Beijing Capital airports. The automation and the adoption of self-service technology for passenger handling such as check-in and automated border control has enabled many airports to build up capacity without expanding passenger terminal footprint.

6.2   Runways are typically the capacity bottleneck of aerodromes but aircraft parking stands, baggage sorting and transfer facilities, aprons and passenger security screening points operating close to or over capacity are becoming choke points as well, especially at hub airports. A-CDM promises to alleviate congestion but the close collaboration between airport management and other stakeholders such as its shareholder, ATM and airlines is essential to a coordinated development of the capacity of the regional air transport network in the long-term.

Implementation Progress

6.3   To cater for Seamless ANS Plan version 3.0, the new ICAO APAC Seamless ANS Reporting Tool was developed for allow States/Administrations to report on their Seamless ANS implementation progress. The status of the reporting process as of July 2024 is depicted in **Figure 7**.

> *Important note: the new ICAO APAC Seamless ANS Reporting Tool (accessible via the ICAO APAC SharePoint Platform using the pre-registered secure login credential at https://oaci.sharepoint.com/sites/ATM_reporting/SitePages/ANS-Reporting-Implementation.aspx) had been developed by ICAO HQ to take into account the changes to the latest version of the Global Air Navigation Plan and the 2019 (version 3.0) update of the Asia/Pacific Seamless ANS Plan. According to State letter Ref.: T 8/5.1 – AP060/24(CNS), States/Administrations were required to complete the reporting over this new platform by 31 May 2024.*
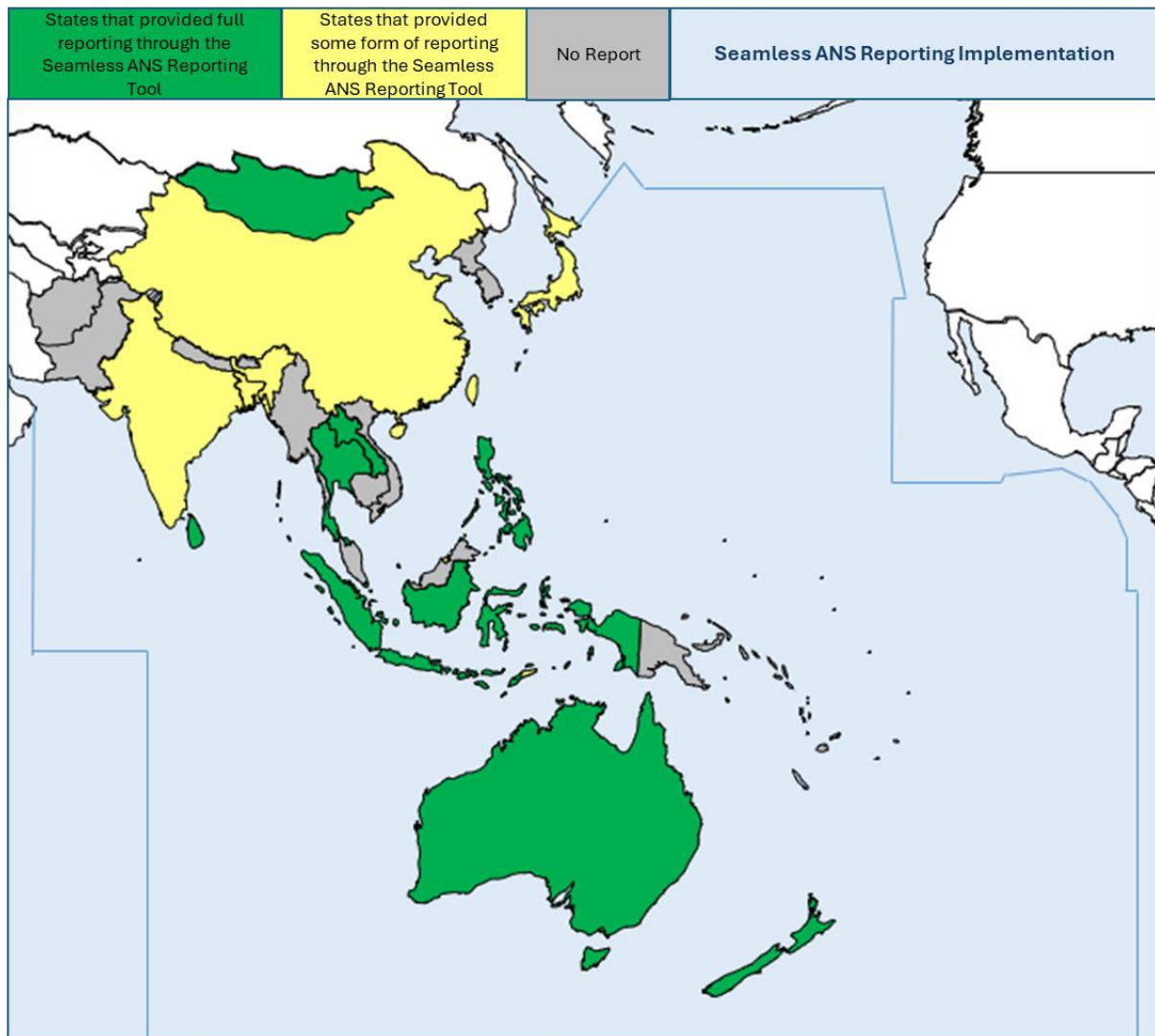
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Figure 7: Seamless ATM Reporting (2024)

6.4   A total of 17 States/Administrations, i.e. 41.5% of the APAC States/Administrations, had submitted some form of reporting on the new ICAO APAC Seamless ANS Reporting Tool. Among those 17 States/Administrations, only eleven States had submitted a comprehensive report. Hence there was insufficient information to carry out effective evaluation on the implementation progress.

6.5   The 17 States /Administrations that have provided at least some form of reports are as below: Australia, Bangladesh, Brunei Darussalam, China, Hong Kong China, Macao China, India, Indonesia, Japan, Lao PDR, Mongolia, New Zealand, Philippines, Singapore, Sri Lanka, Thailand, Timor-Leste

6.6   The 11 States /Administrations that have provided comprehensive reporting are: Australia, Hong Kong China, Macao China, Indonesia, Lao PDR, Mongolia, New Zealand, Philippines, Singapore, Sri Lanka, Thailand

6.7   Seamless ANS implementation data is used to support an iSTARS tool intended to illustrate ANS planning and implementation (https://istars.icao.int/Sites).

6.8   The progress of implementation of the Plan had been unacceptably slow, with the Plan having been endorsed by APANPIRG in 2013, and the Phase I elements expected to be at least partly implemented by the start of Phase I in November 2015, to ensure a matching of ground-based capability

with that on modern aircraft systems. However, as of March 2019, the implementation progress by States and Administrations that had been reporting was illustrated in Figure 8:
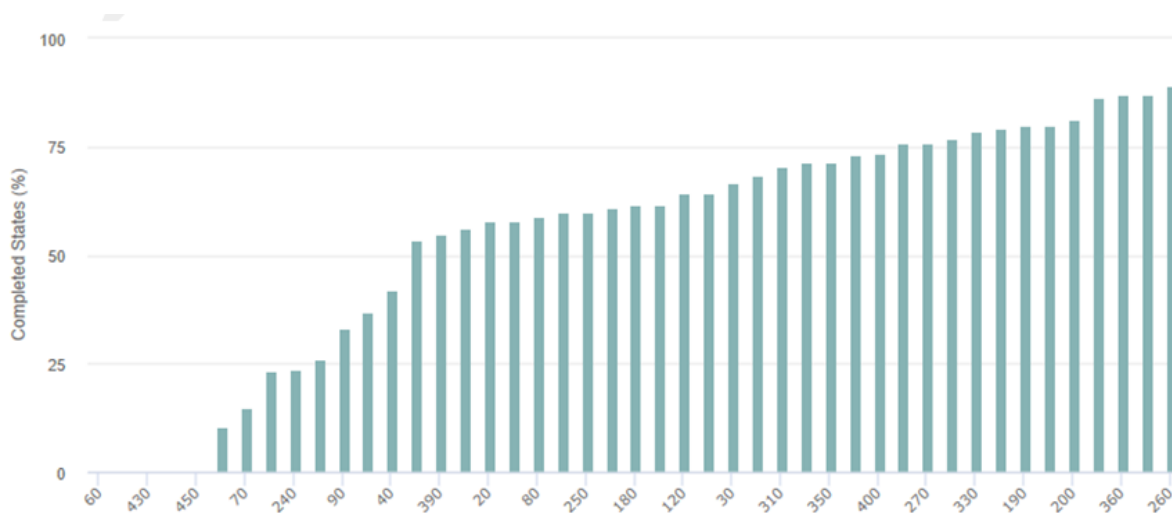

Figure 8: Percentage of Completed Seamless ATM Elements (March 2019)

6.9   The following APANPIRG Conclusions are related to implementation actions that Asia/Pacific States and Administrations should have taken:

> ***APANPIRG 24/55 State Seamless ATM Planning***
>
> *That, given the urgency and priority of Seamless ATM planning for the Asia/Pacific as acknowledged by the 46th Conference of Directors General of Civil Aviation (DGCA, Osaka, Japan, 12-16 October 2009) and APANPIRG/22 (05-09 September 2011), States should be urged to:*
>
> *a) review Version 1.0 of the Asia/Pacific Seamless ATM Plan and utilise the Plan to develop planning for State implementation of applicable Seamless ATM elements;*
>
> *b) ensure relevant decision-makers are briefed on the Seamless ATM Plan;*
>
> *c) submit the first Regional Seamless ATM Reporting Form to the ICAO Regional Office by 01 March 2014; and*
>
> *d) where possible, participate and contribute to Seamless ATM system collaborative training and research initiatives.*
>
> ***APANPIRG 27/1 Mobilization of Human / Financial Resources to Achieve the Seamless ATM Plan Objectives***
>
> *That, States/Administrations not achieving the expected implementation progress of regional priorities for Air Navigation Systems, should: a) give highest priority to the implementation of regional priorities and provide human/financial resources to CAAs and ANSPs to complete Seamless ATM phase I implementation; and b) mobilize human and financial resources to plan for timely implementation of phase 2 and phase 3 elements assessed as relevant by their national gap analysis.*

6.10   In 2013, the Asia/Pacific Region agreed in endorsing APANPIRG Conclusion 24/55 that it was essential to brief decision-makers and to review the Plan to develop State planning. Three years later, APANPIRG/27 had noted that: the ten regional targets planned for completion in November 2015 were far from being achieved as of August 2016; the second cycle of the seamless ATM planning is starting and needs focus from high decision makers to mobilize adequate resources.

6.11   Notwithstanding these APANPIRG Conclusions and associated Action Items (such as Action Item 52/21) from the Conferences of Directors General of Civil Aviation Asia and Pacific

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Regions), the lack of adherence to commitments first outlined in the Kansai Statement in 2009 indicated a lack of high-level agreement to modernisation by many States. Therefore, a stronger emphasis on a whole-of government planning approach to include all stakeholders using a National Air Navigation Plan (NANP) is necessary, to ensure greater buy-in, resource allocation and accountability through monitoring.

6.12 The Asia/Pacific Regional Air Navigation Plan Volume II requires that States shall establish and maintain a NANP that supports implementation of the Global Air Navigation Plan and regional air navigation planning2. It further states that States shall report their implementation progress and status of the applicable global and regional air navigation planning elements at least once each year, and provides a list of Basic Planning Elements (BPE) that should be included in the NANP.

6.13 Few States have reported their NANP status, and a NANP reporting template proposed by ICAO in 2021 did not reach consensus agreement due to the objection of one State.

<u>Airspace and FIR Analysis</u>

6.14 During earlier studies, there were several features of the lack of Seamless ANS facilities and practices that had been evident in the Asia/Pacific region.

    a) Size of FIR – fragmented FIRs resulting in flights transiting multiple FIRs with multiple TOC points.

    b) Traffic density – the capacity of ANSP infrastructure and airspace had not kept up with traffic growth.

    c) Airspace and ATS route design and capacity –

- route structure based on historical requirements and not on current aircraft navigational capability;

- ground-based navigation aid routes, around which SUAs have grown;

- crossing tracks with and without ATS surveillance, whereby States mainly rely on the use of FLAS for procedural flight level separation;

- requirement for vertical transitions because of the two different FLOS (metric and imperial) in the region;

- routes with flight level, direction, and time restrictions making flight planning more complex;

- routes with restrictions that are un-coordinated with neighbouring FIRs; and

- restrictive route structures agreed to in a historical context which is inadequate for today's traffic requirements.

    d) ATS surveillance and communications capability -

- non- existent/unreliable surveillance or communications capability at times;

- capability not fully utilised to provide appropriate level of service; and

- hand-off procedures not aligned to ATM facilities and capabilities.

    e) Compatibility between FIRs –

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2 Asia/Pacific Regional Air Navigation Plan Volume II, Section 3. *Specific Regional Requirements*

- Infrastructure development based only on national requirements, resulting in duplicated and yet uncoordinated facilities; and

- Unnecessarily conservative separation requirements at TOC points (it was not clear if this is due to lack of confidence in adjacent FIRs capability to adhere to agreed procedures, or for other operational reasons).

f) ATC standards –

- Apparent reluctance in applying ICAO standard separation minima (it was not clear if this is due a lack of confidence in ATM competence or capability); and

- Although GNSS separation is available in Doc 4444, few ANSPs in the Asia/Pacific Region used this as an alternative means of providing longitudinal separation.

g) Focus groups

- Lack of effective focus groups to address airspace capacity and FIR issues, although there had been an increase in informal and bi-lateral ATM coordination;

- Lack of a requirement for regular review mechanisms of operational issues within an FIR, including feedback from aircraft operators.

h) non-universal implementation of AIDC.

6.15   Generally, flights operating on Major Traffic Flows (MTFs) between large FIRs (particularly where there were multiple FIRs being provided services by one State) in Category R airspace were already reasonably seamless, such as in the Pacific. However, apart from being largely oceanic in nature, these MTFs had the advantage of being usually in an east/west alignment between continents and were not impacted by busy crossing routes.

6.16   In addition, lower traffic density MTF enabled flexible tracks such as UPR applications. It was notable that these MTFs tended to have dedicated focus groups like Informal South Pacific ATS Coordinating Group (ISPACG) and Informal Pacific ATC Coordinating Group (IPACG) conducting regular reviews of operational efficiency.

6.17   Where long and short haul routes crossed multiple smaller FIRs, particularly with busy regional flows, there was a greater likelihood of reduced efficiency caused by a combination of inconsistent application of ATM procedures and standards, non-harmonized infrastructure development, route structure, TOC and other legacy issues. However, there were also examples of partly Seamless ANS between some busy city pairs (such as Singapore/Kuala Lumpur and Kuala Lumpur/Bangkok) in the region, resulting from bilateral efforts between ANSPs.

Figure 9: South China Sea Ground Based ATS surveillance gaps (as of 2022)

Note: Figure (9) only considers Ground-based surveillance infrastructures and does not include other forms of Space-based interrogation.

Figure 10: South China Sea ATS DCPC VHF gaps (as of 2022)

Note: Figure 10 only considers DCPC VHF communications and does not include other forms of DCPC communications.

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6.18   **Figure 11** and **Figure 12** provide information on Ground Based ATS surveillance and communication gaps in the Bay of Bengal (BOB).
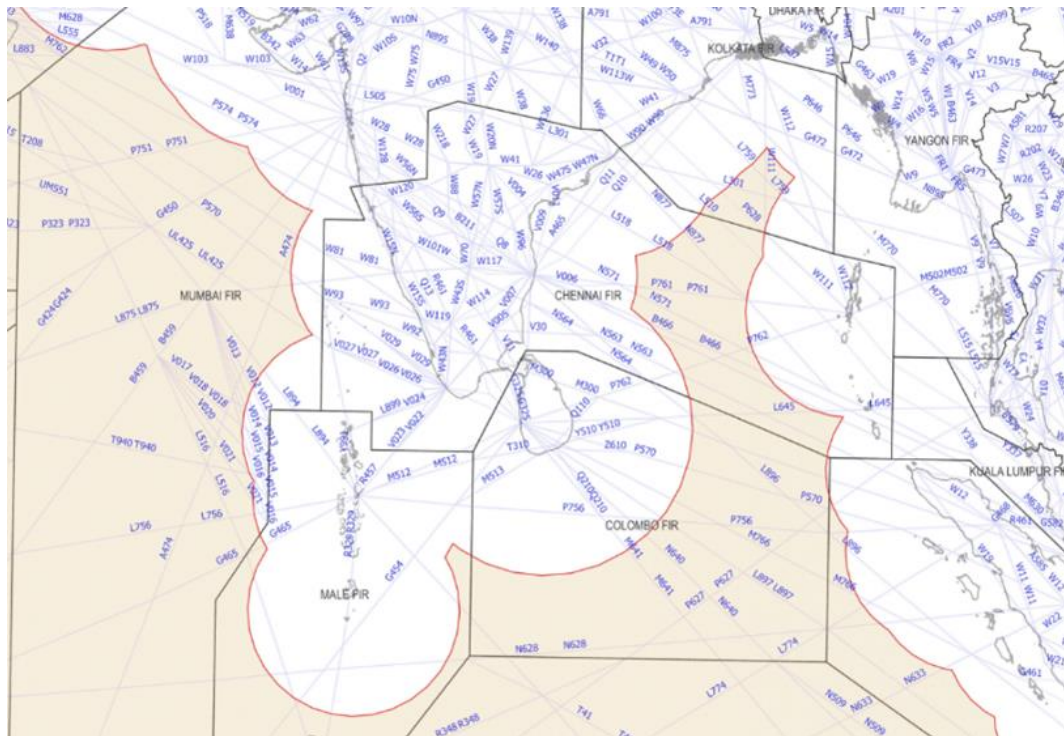
Figure 11: Bay of Bengal ATS surveillance gaps (as of 2022)
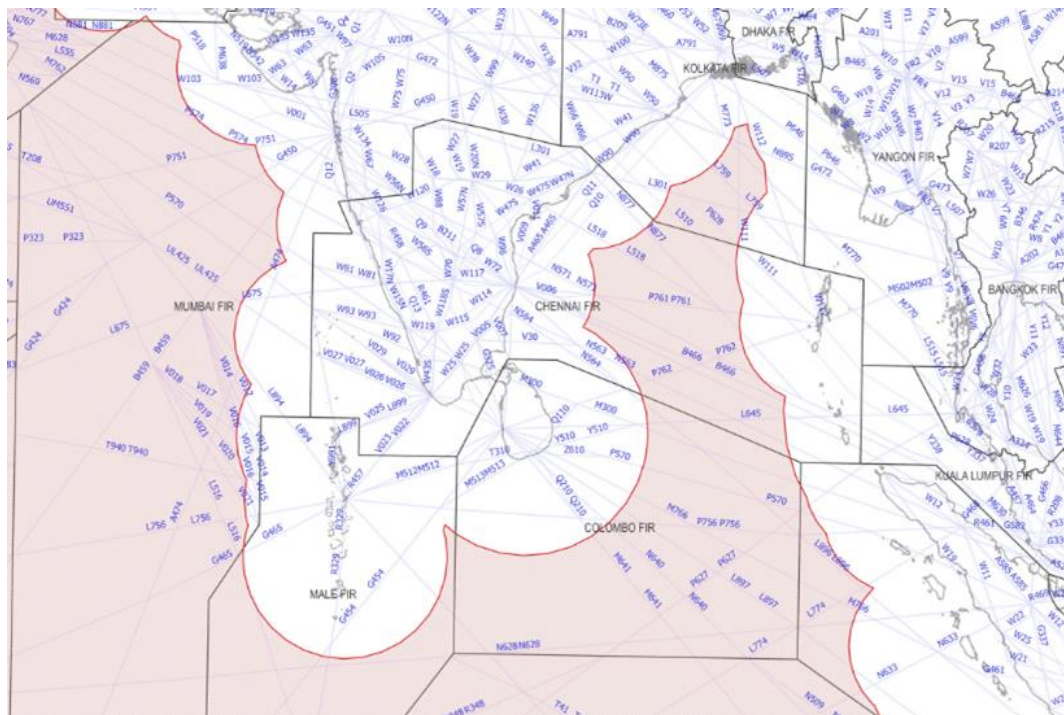
Figure 12: Bay of Bengal ATS DCPC VHF gaps (as of 2022)

6.19   The main areas of the Asia/Pacific region lacking ATS surveillance and DCPC VHF only communication coverage which need to be rectified with such capability from ground or space-based solutions due to traffic density, weather deviations and contingency responses are as follows:

      a)   highest priority: SCS airspace and the northwestern portion of the Manila FIR (**Figure 9 and Figure 10**);

b) high priority: BOB airspace between the Indian subcontinent and the Andaman Islands (**Figure 11 and Figure 12**), the Indian subcontinent and the Arabian Sea;

c) medium priority: airspace between Indonesia and Australia (between Java and West Australia); and

d) lower priority: Coral Sea between Papua New Guinea and Australia.

Europe – Asia/Pacific Trans-Regional Issues

6.20   A number of ATS routes from the Russian Federation converged within Mongolian airspace because of the limited number of entry/exit points on the Mongolian/Chinese airspace boundary. Military restrictions had affected ATS route development to China/Mongolia/DPRK and Japanese airspace. An enhancement of Civil-Military cooperation and ATM coordination is necessary to address these trans-regional issues.

6.21   There was a long-standing problem with the incompatibility of some elements of the European On-Line Data Interchange (OLDI) system with the more global AIDC messages from the Russian Federation to China and Mongolia.

6.22   Russia utilised a 30 km (16NM) separation within its upper airspace, while Mongolia initially used 80NM when ATS surveillance was implemented in mid-2012, with an intention to reduce this to a surveillance-based separation after appropriate training.

6.23   Given the need to minimise safety issues such as Large Height Deviations and to improve confidence in order to minimise trans-regional separations, ATS surveillance data-sharing between the Russian Federation and China/Mongolia is necessary in accordance with PASL Phase I, even if only based on ADS-B.

North/South America – Asia/Pacific Trans-Regional Issues

6.24   There were no major trans-regional issues between Asia and North America via the Anchorage Oceanic, Fukuoka and Oakland Oceanic FIR due to the continuing work at the IPACG involving Japan and the United States. The Cross-Polar Working Group (CPWG) also discussed operations extending into the area between Asia and North America. The Fukuoka and Oakland Oceanic FIRs had high-density Category R airspace but is served by an OTS (PACOTS; Pacific Organized Track System). ADS-C, CPDLC and AIDC were fully deployed in the Anchorage Oceanic, Fukuoka and Oakland Oceanic FIRs, and common procedures, including 30NM separation standards based on RNP4, DARP, UPR were applied.

6.25   The Oakland Oceanic FIR and South Pacific utilised technologies consistent with Block 0 and with Conflict Prediction and Resolution (CPAR), AIDC, CPDLC and ADS-C, were able to provide a Seamless ANS service already between Asia/Pacific and North America. This included the provision of UPRs and DARP where operationally possible. These developments had been managed through the ISPACG, and were a model for other oceanic regions in the Asia/Pacific.

6.26   The airspace between the Pacific and South America had very low density traffic. South American States had not yet developed the same Seamless ANS services capability in the trans-regional airspace to support ATM and essential SAR services. However, Chile is an active member of ISPACG.

Middle East/Africa – Asia Trans-Regional Issues

6.27   The transition of traffic from the Muscat FIR to the Mumbai FIR is identified as a contributing factor to the congestion in the Bahrain FIR and causal factor for the delayed departures from airports, particularly in the United Arab Emirates. India had recently reduced horizontal separation on some routes to 50/50NM. In addition, FLAS is also used in Arabian Sea Airspace and applied to low density traffic against the higher density Middle East (MTF AR-5) routes. Owing to the improved utilisation of CPDLC, FLAS is currently being used only on the following five ATS Routes in Mumbai FIR: P751, G450 (non-CPDLC equipped aircraft), P570, N563 and M300.

6.28   Oman required 10 minute longitudinal separation between eastbound aircraft from the United Arab Emirates regardless of the level the aircraft were climbing to, with plans to reduce this to seven minutes, consistent with the 50NM standard applied within the Mumbai FIR. However, this is still very restrictive, given the ATS surveillance coverage within the Muscat FIR and the fact that the aircraft were climbing to a number of different flight levels.

6.29   The problem of OLDI conversions to AIDC between India and the Sultanate of Oman had prevented implementation of AIDC trans-regionally in this area thus far.

ADS-B Collaboration

6.30   Potential projects highlighted in the past include ADS-B data sharing between Myanmar and India over the BOB and among Singapore, Brunei Darussalam and the Philippines in the eastern part of the SCS.

6.31   In May 2015 the ANSPs of India and Myanmar had signed an ADS-B data sharing agreement at the sidelines of the CANSO Asia Pacific Conference in Fukuoka, Japan thus establishing the collaborative framework for ADS-B data sharing involving ADS-B stations in India (Port Blair and Agartala) and ADS-B stations in Myanmar (Coco Island and Sittwe). The objective was to provide end-to-end surveillance for several busy airways over the BOB similar to that accomplished over the SCS. India had also completed an agreement for implementation of Space based ADS-B Data Services for the Oceanic Regions of Indian FIRs and the trials for the same is likely to commence by Jan 2020.

6.32   ADS-B collaboration over the eastern part of the SCS had also been making progress. Singapore had worked closely with the Philippines and Brunei Darussalam to share ADS-B data and VHF communications to plug surveillance gaps on the trunk routes M767 and N884. SB ADS-B was also being considered to fill any remaining gaps. When completed, these airways within the SCS should have complete surveillance coverage.

Impact of Major Regional and Global Events

6.33   The unavailability of Russian Federation airspace to the vast of airlines in recent period induced a significant impact to the choice of ATS routes to conduct efficient air transport between Europe and APAC region. Such airspace closure activity has also worsened the inter-regional traffic demand through the already limited and geopolitically sensitive Middle East Corridor.

6.34   Russian invasion of Ukraine on 24th February 2022 led to the restriction of air traffic in Ukrainian and Russian air spaces due to the military activity and war-related sanctions. Airspace closures have forced airlines to take detours and seek alternative routes. All these causes considerable increasing of flight time on routes connecting Europe and Asia, North America and Asia and North America and Middle East. In turns longer travel times lead to the increasing of aircrafts' fuel burn, which causes higher airlines operating costs and CO_2 emissions.

6.35   The Russia-Ukraine conflict has challenged commercial aviation in yet another way. The

closure of the airspace over Russia causes a lengthening of intercontinental routes to Asia for European airlines. Similarly, transatlantic routes to and from North America have been significantly hindered by the closure of Russian airspace. The most heavily impacted markets are Europe-Asia and Asia-North America. This includes flights between the US and Northeast Asia, and between Northern Europe and most of Asia.

PERFORMANCE IMPROVEMENT PLAN

The Asia/Pacific Seamless ANS Plan, Version 3.0 (November 2019) , specified performance objectives to be implemented in three phases of *Preferred Aerodrome/Airspace and Route Specifications* (PARS) and *Preferred ANS Service Levels* (PASL). This version of the Plan, is structured under the following phases:

- Phase II – expected implementation by 07 November 2019;

- Phase III - expected implementation by 03 November 2022; and

- Phase IV – expected implementation by 27 November 2025; and

- Phase V – expected implementation by 23 November 2028.

Note 1: Phase I – elements (expected implementation by November 2015) that had not been completed by November 2019 were moved to Phase II;

Note 2: Phases II and III are retained in this version of the plan due to the delayed availability of the implementation reporting mechanism following the 2019 update, and taking into consideration the impact of the COVID-19 pandemic.

Preferred Aerodrome/Airspace and Route Specifications (PARS)

Note 1: prior to implementation, the applicability of PARS should be verified by analysis of safety, current and forecast traffic demand, efficiency, predictability, cost effectiveness and environment to meet expectations of stakeholders.

Note 2: Phase I had an expected implementation by 12 November 2015.

PARS Phase II (expected implementation by 07 November 2019)

Aerodrome Operations

7.1   All high density international aerodromes[3] should enable, in accordance with an Airport Master Plan, aerodrome management and coordination services:

e)   when traffic density requires, an appropriate apron management service to regulate aircraft operations in coordination with ATS;

f)   ATS coordination (including meetings and agreements) related to:

- airport development and maintenance planning;

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[3] High density international aerodromes referenced in these performance objectives are:

- aerodromes having 100,000 scheduled movements per annum or more; or

- aerodromes where strategic slot allocation is implemented; or

- aerodromes designated by the relevant authority as requiring or potentially requiring ATFM implementation.

- local authority coordination (environmental, noise abatement, and obstacles);

g) regular airport capacity analysis, including a detailed assessment of passenger, airport gate, apron, taxiway and runway capacity.

7.2　　Where practicable, all high density international aerodromes should provide, in accordance with an Airport Master Plan, the following facilities to optimise runway capacity:

h) additional runway(s) with adequate separation between runway centrelines for parallel independent operations;

i) parallel taxiways, rapid exit taxiways at optimal locations to minimize runway occupancy times and entry/exit taxiways;

j) rapid exit taxiway indicator lights (distance to go information to the nearest rapid exit taxiway on the runway);

k) twin parallel taxiways to separate arrivals and departures;

l) perimeter taxiways to avoid runway crossings;

m) taxiway centreline lighting systems;

n) adequate manoeuvring area signage (to expedite aircraft movement);

o) holding bays;

p) additional apron space in contact stands for quick turnarounds;

q) short length or tailored runways to segregate low speed aircraft;

r) taxi bots or towing systems, preferably controlled by pilots, to ensure efficiency and the optimal fuel loading for departure; and

s) advanced visual docking guidance systems.

7.3　　All high density international aerodromes should operate an A-CDM system for ACIS integrated with the ATM network function consistent with **ACDM-B0/1 – 2** (Priority 1).

Terminal Operations (Category T airspace)

7.4　　Where practicable, all aerodromes should have **RNAV 1** (ATS surveillance environment) or **RNP 1** (ATS surveillance and non-ATS surveillance environments) SID/STAR procedures consistent with **APTA-B0/2** (Priority 1).

Note 1: Where a short length or tailored runway designed to segregate low speed aircraft is established, the runway should be served by PBN procedures including SID and STAR that provided segregation from the procedures serving other aerodrome runways as far as practicable.

Note 2: PBN procedures that overlay visual arrival and departure procedures should be established where this provided an operational advantage.

7.5　　Where practicable, all instrument runways serving aeroplanes should have the following approach procedures consistent with **APTA-B0/1** (Priority 1) and **APTA-B0/3**:

t) SBAS/GBAS CAT1 precision approaches; or ILS CAT1 approaches (with APV approach as a backup); or

u) Approaches with Vertical Guidance (APV); RNP APPCH with LNAV-VNAV or LPV Minima; or

v) if an APV is not practical, straight-in RNP APCH with Lateral Navigation (LNAV) or SBAS based LPV Minima.

Note: When establishing the implementation of PBN approach procedures in accordance with Assembly Resolution A37-11, States should first conduct an analysis of the instrument runway eligibility for APV approaches. This analysis should include the feasibility of the APV at a particular location, the presence of regular commercial operations and the current or projected user fleet capability for APV. Locations where APV approach were either not feasible or where regular operators could not realise the benefit of APV should implement RNP APCH with LNAV minima instead of APV, to provide the safety benefits of straight-in approach procedures.

7.6   All international aerodromes with rotary wing operations should establish PBN Helicopter PinS Operations consistent with **APTA-B0/6** where there is an operational benefit (Priority **2**).

7.7   SBAS, GBAS, ABAS and MON systems should be established as appropriate to the level and type of aircraft operations and the operating environment consistent with **NAVS-B0/1 - 4**, subject to an assessment of benefits and costs.

Note 1: the application of GNSS and its augmentations such as GBAS Landing System (GLS) is recommended where these systems were economically beneficial.

Note 2: As far as practicable, airspace and instrument flight procedures associated with international aerodromes should not be constrained by international borders and political barriers, and be established only after appropriate consideration of:

w)   environmental efficiencies;

x)   noise abatement and local authority regulations;

y)   adjacent aerodromes;

z)   conflicting instrument flight procedures; and

aa) affected ATC units or ATM procedures.

7.8   Unless supported by alternative means of ATS surveillance (such as radar, where there are no plans for ADS-B), all Category T airspace supporting international aerodromes should be designated as non-exclusive or exclusive as appropriate ADS-B airspace requiring operation of ADS-B OUT using 1090ES with DO-260/260A and 260B capability to support **ASUR-B0/1**.

Note 1: non-exclusive means that non-ADS-B aircraft may enter the airspace, but may be accorded a lower priority than ADS-B equipped aircraft, except for State aircraft.

Note 2: in areas where ADS-B based separation service was provided, a mandate for the carriage of ADS-B OUT using 1090ES with DO260/60A or 260B is recommended.

Note 3: States should refer to the ADS-B implementation in the ICAO ADS-B Implementation and Guidance Document (AIGD).

7.9   All Category T airspace supporting international aerodromes should require the carriage of an operable mode S transponder within airspace where Mode S radar services are provided to support **ASUR-B0/3**.

7.10   All Category T airspace supporting international aerodromes should be designated as non-exclusive or exclusive PBN airspace as appropriate to allow operational priority for PBN approved aircraft, except for State aircraft, to facilitate seamless operations and off-track events such as weather deviations to support **APTA-B0/1 – 3 and 6**.

En-route Operations

7.11   Unless supported by alternative means of ATS surveillance (such as radar, where there are no plans for ADS-B), all Category S upper controlled airspace supporting international aerodromes

should be designated as non-exclusive or exclusive as appropriate ADS-B airspace requiring operation of ADS-B OUT using 1090ES with DO-260/260A and 260B capability to support **ASUR-B0/1**.

7.12   All <u>Category R and S</u> upper controlled airspace should require the carriage of an operable mode S transponder within airspace where Mode S radar services are provided to support **ASUR-B0/3**.

7.13   All <u>Category R and S</u> upper controlled airspace should be designated as non-exclusive or exclusive PBN airspace as appropriate to allow operational priority for PBN approved aircraft, except for State aircraft, to facilitate seamless operations and off-track events such as weather deviations to support **APTA-B0/2**.

> *Note 1: airspace mandates should be harmonised with adjacent airspace and implemented in accordance with guidance provided in this document.*

7.14   As far as practicable, all new ATS Routes should be PBN Routes in accordance with the following specifications to support **APTA**-**B0/1 – 8**, and **APTA-B1/1 – 5**:

- <u>Category R</u> airspace – **RNP 4**, **RNP 10** (RNAV 10) ; and

- <u>Category S</u> airspace –**RNAV 2** or **RNP 2**.

> *Note 1: ATS routes should be designated with a navigation performance specification commensurate with the CNS/ATM operational environment (within Category S airspace, the PBN specification is not significant to ATC as it is used for track-keeping assurance, not ATC separation). The ATS route navigation performance specification selected should be harmonised and utilise the least stringent requirement needed to support the intended operation. When obstacle clearance or ATC separation requirements demand, a more stringent navigation specification may be selected.*

> *Note 2: RNP 2 is expected to be utilised before Phase 2, when the RNP 2 instrument procedure design, ATC separation standards and operational approval are in place. The Asia/Pacific recognises an equivalency for RNP 2 as being an aircraft approved for RNAV 2, RNP 1 and with GNSS. Prior to the ICAO standard flight plan being updated to recognise RNP 2, States should ensure that aircraft operators with RNP 2 approval file designator 'Z' in field 10 and 'NAV/RNP 2' in field 18 (in addition to designator 'R' to indicate PBN approved).*

> *Note 3: within Category R airspace, transition to RNP 4 or RNP 2 oceanic specifications is recommended at the earliest opportunity. RNP 4 and RNP 2 requires ADS-C and CPDLC, whereas RNP 2 oceanic requires dual independent installations.*

7.15   All States should use the ICAO Table of Cruising Levels (FLOS) based on feet as contained in Annex 2 Appendix 3a.

<u>Civil-Military Cooperation</u>

7.16   Civil-Military Airspace expectations are as follows:

a) SUA should only be established after due consideration of its effect on civil air traffic by the appropriate Airspace Authority to ensure it will be:

- used for the purpose that it is established;

- used regularly;

- as small as possible, including any internal buffers, required to contain the activity therein;

- if applicable, operated in accordance with FUA principles; and

- activated only when it is being utilised; and

b) SUA should be regularly reviewed to ensure the activities that affect the airspace, and size and timing of such activity are accurately reflected by the SUA type, dimensions, activation notice and duration of activation.

Unmanned Aircraft Systems

7.17   States should implement regulations supporting the integration of UAS operations in non-segregated airspace, using a risk-based approach and in accordance with the guidance provided by the UAS Advisory Group of the Remotely Piloted Aircraft Systems (RPAS) Panel, as a minimum.

~~Seamless~~ PARS Phase III (expected implementation by 03 November 2022)

Aerodrome Operations

7.18   All high density international aerodromes should operate an A-CDM system integrated with the ATM network, consistent with **ACDM-B0/1 – 2**.

Terminal Area Operations

7.19   Terminal Areas serving high density international aerodromes should implement CCO and CDO operations consistent with **APTA-B0/4 – 5** where practicable, and performance-based aerodrome operating minima-advanced and basic aircraft consistent with **APTA-B0/7 – 8**.

> *Note: this does not preclude a State considering implementation of CCO/CDO and performance-based aerodrome operating minima at other aerodromes as appropriate.*

7.20   Unless excepted by ATC, all aircraft operating within Category S and T controlled airspace should have systems that enable basic airborne situational awareness AIRB and VSA and where applicable, performance-based horizontal minima consistent with **CSEP-B1/1 – 4**.

En-Route Operations

7.21   As far as practicable, all new ATS Routes should be PBN Routes in accordance with the following specifications to support **COMS-B0/1 – 2, COMS-B1/1 – 3**, **APTA-B0/1 – 8**, and **APTA-B1/1 – 5**:

- Category R airspace – **RNP 2** (or **RNP 4**); and

- Category S airspace –**RNAV 2** or **RNP 2**.

PARS Phase IV (expected implementation by 27 November 2025)

Terminal Operations

7.22   Where there is an operational benefit Terminal Areas serving all high density international aerodromes should implement advanced capability PBN SID and STAR procedures and performance-based aerodrome operating minima for advanced aircraft with SVGS consistent with **APTA-B1/1 – 3**.

> *Note: this does not preclude a State considering implementation of advanced capability PBN SID and STAR procedures and performance-based aerodrome operating minima for advanced aircraft at other aerodromes as appropriate.*

7.23   Where there is an operational benefit, all Terminal Areas serving high density international aerodromes should implement Advanced CDO and CCO operations consistent with **APTA-B1/4 – 5**.

7.24   Where there is an operational benefit, Terminal Areas serving all high density international

aerodromes should implement point merge operations consistent with **RSEQ-B0/3**.

PARS Phase V (expected implementation by 23 November 2028

Aerodrome Operations

7.25. All high density international aerodromes should establish Airport Operations Centres (AOPCs) consistent with ACDM-B2/2.

7.26. Where there is an operational requirement and benefit, all international aerodromes should implement performance-based aerodrome operating minima consistent with **APTA-B2/4.**

Preferred ANS Service Levels (PASL)

> *Note: prior to the implementation, the applicability of PASL should be verified by analysis of safety, current and forecast traffic demand, efficiency, predictability, cost effectiveness and environment to meet expectations of stakeholders.*

PASL Phase II (expected implementation by 07 November 2019)

ATS Communications

7.27. All ATS sectors providing ATS surveillance in adjacent airspace should have direct speech circuits or digital voice communications, meeting pre-established safety and performance requirements, and where practicable, automated hand-off procedures that allow the TOC of aircraft without the necessity for voice communications, unless an aircraft requires special handling.

> *Note: this element is applicable to ATC sectors within ATS units and between ATS units providing services in adjacent airspace.*

7.28. Where applicable, all ATC Sectors should be supported by VDL Mode O/A and AMHS communication systems consistent with **COMI-B0/3, 7** (Priority 1).

7.29. ATS systems should enable AIDC (version 3 or later), or an alternative process that achieves at least the same level of performance as AIDC, between en-route ATC units and terminal ATC units where transfers of control are conducted consistent with **FICE-B0/1,** unless alternate means of automated communication of ATM system track and flight plan data are employed (Priority 1). As far as practicable, the following AIDC messages types should be implemented:

- Advanced Boundary Information (ABI);
- Coordinate Estimate (EST);
- Acceptance (ACP);
- TOC; and
- Assumption of Control (AOC).

> *Note: States should note the necessity to utilise Logical Acknowledgement Message processing (LAM) when implementing AIDC (refer to guidance in Chapter XX in PAN ICD).*

ATS Surveillance

7.30. ADS-B (using 1090ES), MLAT or radar surveillance systems should be used to provide coverage of all Category S airspace as far as practicable, and Category T airspace supporting international aerodromes, consistent with **ASUR-B0/1 – 2**. Data from ATS surveillance systems should be

integrated into operational ATC aircraft situation displays (standalone displays of ATS surveillance data should not be used operationally).

Note 1: ATM systems, including ATS surveillance systems and the performance of those systems, should support the capabilities of PBN navigation specifications and ATC separation standards applicable within the airspace concerned. Guidance on the performance of ATS communication and surveillance systems is available in ICAO Document Doc 10037 (Global Operational Data-link Document)

Note 2: ATC units with ADS-B where Category S and Category T airspace supporting high-density aerodromes may consider utilizing ADS-B for situational awareness and/or separation.

Note 3: ATC units operating within controlled airspace wholly served by Mode S SSR and/or ADS-B surveillance should implement the use of the standard non-discrete Mode A code 1000 for Mode S transponder equipped aircraft to reduce the reliance on assignment of discrete Mode A SSR codes and hence reduce the incidence of code bin exhaustion and duplication of code assignment.

7.31. Subject to appropriate filtering, ATS surveillance data, particularly from ADS-B, should be shared with neighbouring ATC units to support **ASUR-B0/1 – 2**.

7.32. Within Category R airspace, ADS-C surveillance and CPDLC should be enabled to support PBN-based separations, as well as UPR and DARP, consistent with **COMS-B0/1 – 2** and **FRTO-B0/1-4** and **FRTO-B1/1 – 7**.

7.33. Mode S surveillance and the use of Mode S Downlinked Aircraft Parameters (DAPS) should be enabled in all upper level Category S airspace and all Category T airspace servicing high density city pairs consistent with **ASUR-B0/3**. ATM automation system specifications should include the processing and presentation in ATC human-machine interfaces and decision support and alerting tools, the communications, navigation and approach aid indicators received in items 10 and 18 of FPL and ATS messages, where applicable, and the following Mode S or ADS-B downlinked aircraft parameters as a minimum:

- Aircraft Identification;

- Aircraft magnetic heading;

- Aircraft indicated airspeed or Mach Number; and

- Pilot selected altitude.

Note1: DAPS may not be present in downlinked reports from some aircraft ADS-B applications.

Note 2: Downlinking of correct Aircraft Identification (Flight ID) enables automated coupling of ATS surveillance system information with the flight plan, and unambiguous ATC identification of aircraft. States should undertake comprehensive education programs to ensure pilots set the correct Flight ID. Guidance on the correct use of the aircraft identification function is provided in the ADS-B Implementation and Operations Guidance Document, available on the ICAO Asia/Pacific Regional Office website.

7.34. ATS surveillance systems should enable basic conflict detection and conformance monitoring STCA, MTCD, APW, APM and MSAW consistent with **FRTO-B0/4** and **SNET-B0/1 – 4** (Priority 1). Route Adherence Monitoring (RAM) should be utilised when monitoring PBN route separations. Cleared Level Adherence Monitoring (CLAM) should be utilised to monitor RVSM airspace.

Air Traffic Management

Note: ATM system design (including ATS communication and surveillance, ATC separation minimum, aircraft speed control and ATC training) should be planned and implemented to support optimal aerodrome and enroute operations determined by the capacity expectations for the runway(s) and airspace concerned.

7.35. All international aerodromes where ATFM facilities are required should be served by AMAN/DMAN facilities consistent with **RSEQ-B0/1 – 2** (Priority 1).

Note: All AMAN systems should take into account airport gates for runway selection and other aircraft departures from adjacent gates that may affect arriving aircraft.

7.36. Controlled airspace classification should be consistent with Annex 11 Appendix 4 and applied as follows:

  a) Category R upper controlled airspace– **Class A**; and

  c) Category S upper controlled airspace– **Class A**, or if there are high level general aviation or military VFR operations: **Class B** or **C**; and

  d) Category S lower controlled airspace- **Class C**, **D** or **E** airspace, as determined by safety assessments.

7.37. All ATC units should authorise the use of the horizontal separation minima stated in ICAO Doc 4444 (PANS ATM), or as close to the separation minima as practicable, taking into account such factors as:

  a) the automation of the ATM system, including automated hand-off between sectors;

  b) the capability of the ATC communications system;

  c) the performance of the ATS surveillance system, including data-sharing or overlapping coverage at TOC points; and

  d) ensuring the competency of air traffic controllers to apply the full tactical capability of ATS surveillance systems.

Note 1: the delivery of ATC services should be based primarily on the CNS/ATM capability. When using Annex 10 compliant ATS surveillance, 5NM (enroute) or 3NM (terminal) surveillance-based separations should be authorised within ATC sectors. At the TOC points in such environments, 5-10NM should be authorised with auto hand-off and surveillance data-sharing or overlapping coverage at the TOC point, and 5-20NM without auto hand-off, as determined by an appropriate safety assessment.

Note 2: the efficacy, continuity and availability of ATM services should be supported by adherence with regional planning and guidance material regarding ATM automation and ATM contingency systems (regarding ATM contingency operations, refer to the Regional ATM Contingency Plan).

7.38. Priority for FLAS level allocations should be given to higher density ATS routes over lower density ATS routes. FLAS should comply with Annex 2, Appendix 3a unless part of an OTS. FLAS other than OTS should only be utilised for safety and efficiency reasons within:

  e) Category R airspace with the agreement of all ANSPs that provide services:

  • within the airspace concerned; and

  • within adjacent airspace which is affected by the FLAS; or

  f) Category S airspace with the agreement of all ANSPs that provide services:

  • where crossing track conflictions occur within 50NM of the FIRB; and

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- ATS surveillance coverage does not overlap the FIRB concerned, or ATS surveillance data is not exchanged between the ATC units concerned.

7.39. ATC units should conduct Airspace Planning and enable systems that manage direct and flexible routings where practicable, and the optimal operation of FUA consistent with **FRTO-B0/1 − 4** (Priority 1).

7.40. All ATC Sectors should have a nominal aircraft capacity figure based on a scientific capacity study and safety assessment, to ensure safe and efficient aircraft operations.

> *Note: A study of the terminal ATC Sector airspace capacity every 15 minutes is provided in Appendix D*

7.41. All ACCs operating within FIRs where demand may exceed capacity should implement ATFM incorporating CDM to enhance capacity, using bi-lateral and multi-lateral agreements, initial integration of ASM with ATFM, Collaborative Network Flight Updates, Basic Network Operation Planning and Initial Airport/ATFM slots, A-CDM Network Interface and Dynamic Slot Allocation consistent with **NOPS-B0/1 − 5** (Priority 1).

> *Note 1: refer to the Asia/Pacific ATFM Framework on Collaborative ATFM for more details on Network Operations expectations.*

> *Note 2: full FUA is not yet incorporated into the Asia/Pacific ATFM Framework for Collaborative ATFM.*

7.42. ATC systems should utilise electronic flight progress strips wherever automation systems allow the capability due to efficiency and transcription error/data mismatch issues.

<u>Air Navigation Services</u>

7.43. ATM systems should be supported by digitally-based AIM systems consistent with **DAIM-B1/1 − 6,** in adherence with ICAO and regional AIM planning and guidance material. ATM systems should be supported by aeronautical information digital data exchange of at a minimum, version AIXM 5.1 (Priority 1).

> *Note: Regional AIM policies are contained within the Asia/Pacific Regional Plan for Collaborative AIM.*

7.44. Aeronautical meteorological observations, forecast, warning, climatological and historical products (such as aerodrome meteorological forecasts and reports, aerodrome warnings and wind shear warnings) should be disseminated to users consistent with **AMET-B0/1-4**, and in accordance with global and regional guidance material. An agreement between the MET authority and the appropriate ATS authority should be established to ensure the appropriate exchange of meteorological information obtained from aircraft (Priority 1).

7.45. An appropriate enhanced SAR system and systems to support aircraft tracking capability should be established consistent with the provisions of Annex 12 and to <u>support</u> **GADS-B1/1 − 2**, and in accordance with the *Asia/Pacific SAR Plan*.

<u>ANSP Human and Simulator Performance</u>

7.46. The following systems should be established to support human performance in the delivery of a Seamless ANS service. The systems should consider all the elements of the SHEL Model (Software, Hardware, Environment and Liveware – humans), in accordance with the ICAO Human Factors Digest No. 1 and related reference material:

    a) human performance training for all managers of operational air navigation services

(such as aerodrome operators, ATC organisations and aeronautical telecommunications), such training to include the importance of:

- a proactive organisational culture where managers and operational staff are informed and safety is a first priority, using open communications and an effective team management approach;

- assessment and management of risks by safety review and assessment teams comprising multidisciplinary operational staff and managers which review safety performance and assess significant proposals for change to ATM systems, particularly those related to human capabilities and limitations;

- human factors in –

  o air safety investigation;

  o system design (ergonomics, human-in-the-loop);

  o effective training (including the improved application of simulators);

  o fatigue management;

  o automated safety nets; and

  o contingency planning;

- effective safety reporting systems that –

  o are non-punitive, supporting a "positive safety culture";

  o promote open reporting to management; and

  o focus on preventive (systemic), not corrective (individual) actions in response to safety concerns, incidents and accidents.

e) human performance-based training and procedures for operational staff providing ATS, including:

- the application of tactical, surveillance-based ATC separation;

- control techniques near minimum ATC separation; and

- responses to ATM contingency operations, irregular/abnormal operations and safety net alerts.

f) human performance-based training and procedures for staff providing operational air navigation services (such as aerodrome staff operating 'airside', air traffic controllers and aeronautical telecommunications technicians) regarding the importance of:

- an effective safety reporting culture; and

- 'Just Culture' (Priority 1).

Note 1: prevention of fatigue systems should be established to support human performance in the delivery of a Seamless ANS service. The systems should be consistent with guidance within ICAO Doc 9966 FRMS – Fatigue Risk Management System.

Note 2: regarding ATM contingency operations, refer to the Regional ATM Contingency Plan.

Civil-Military Cooperation

7.47. Civil-Military ATM expectations are as follows:

a) a national Civil-Military body should be formed to coordinate strategic civil-military

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activities (military training should be conducted in locations and/or at times that do not adversely affect civilian operations, particularly those associated with major aerodromes);

b)   formal civil-military liaison should take place for tactical responses by encouraging military participation at civil ATM meetings and within ATC Centres;

c)   integration of civil and military ATM systems using joint procurement, and sharing of ATS surveillance data (especially from ADS-B systems) should be provided as far as practicable;

d)   joint provision of Civil-Military navigation aids and aerodromes;

e)   common training should be conducted between civil and military ATM units in areas of common interest; and

f)   civil and military ATM units should utilize common procedures as far as practicable.

Note: the term 'military' in this context may include other State functions such as customs, police, and paramilitary activities.

7.48. All States with organisations that conduct space vehicle launch or re-entry activities should ensure:

a)   the development of written coordination agreements between the State civil aviation authority and the launch/re-entry agency concerned;

b)   that strategic coordination is conducted between the State civil aviation authority and any States affected by the launch/re-entry activity at least 14 days prior to the proposed activity, providing notice of at least:

   i)   three days for the defined launch window; and

   ii)   24 hours for the actual planned launch timing;

c)   that consideration of affected airspace users and ANSPs is made after consultation, so that the size of the airspace affected is minimized and the launch window is optimized for the least possible disruption to other users; and

d)   that communication is established with affected ANSPs to provide accurate and timely information on the launch/re-entry activity to manage tactical responses (for example, emergencies and activity completion) (Priority 1).

Note 1: increasingly, space vehicle launch and re-entry activity is being conducted by commercial organisations, so this element applies equally to State or private operations.

Note 2: guidance for States on space vehicle launch and re-entry activity is available on the ICAO Asia/Pacific eDocuments webpage.

PASL Phase III (expected implementation by 03 November 2022)

Aerodrome Operations

7.49. All ATC units providing services to high density international aerodromes should operate extended arrival metering consistent with **RSEQ-B1/1**.

7.50. All ATC units providing services to international aerodromes should operate basic ATC surface operations tools, comprehensive situational awareness, situational awareness, alerting service consistent with **SURF-B0/1 – 3**.

7.51. All ATC units providing services to high density international (ICAO aerodrome reference codes[4] 3 and 4) aerodromes having complex layouts should ~~operate~~ implement A-SMGCS incorporating advanced surface traffic management visual aids, pilot comprehensive awareness and runway alerting, enhanced ATC alerting, routing service to support ATC and enhanced vision systems (EVS) for taxiing and runway safety alerting logic consistent with **SURF-B1/1 – 5**.

> *Note1: AMAN/DMAN arrival/departure management needs to be integrated with advanced surface management systems: A-SMGCS with SMAN or ASDE-X.*
>
> *Note 2: SURF standards are provided in EUROCAE/RTCA documents ED-159/DO-312/ ED-165.*

7.52. All ATM systems serving high density international aerodromes should implement Data-link Departure Clearance (DCL) compliant with EUROCAE WG78/RTCA SC 214 standards.

Terminal Operations

7.53. ATS surveillance systems should enable Enhanced STCA with aircraft parameters and in complex TMAs consistent with **SNET-B1/1 – 2**.

En-Route Operations

7.54. ACCs should enable, where practicable, Free Route Airspace, RNP routes, Advanced FUA and Airspace Management (ASM), Dynamic Sectorisation, Enhanced Conflict Detection Tools and Conformance Monitoring and Multi-Sector Planner Function consistent with **FRTO-B1/1 – 7**.

> *Note: CPAR is a key enabler for 'free route airspace' and enroute UPR and DARP operations.*

7.55. All ACCs operating within FIRs where demand may exceed capacity should operate systems that enable, where applicable, Short Term ATFM measures, Enhanced NOPS Planning, Enhanced integration of airport operations and NOPS planning, Enhanced Traffic Complexity Management, Full integration of ASM with ATFM, Initial Dynamic Airspace configurations, Enhanced ATFM slot swapping, Extended Arrival Management, ATFM Target Times and Collaborative Trajectory Options Programme consistent with **NOPS-B1/1 – 10** supporting the integration of time-based management within a flow centric approach, consistent with **TBO-B0/1** and **TBO-B1/1**.

7.56. All ATC units should be equipped with or be able to interface with communication systems appropriate to support the service provided, consistent with:

a) **COMI-B0/1 – 2, 4 – 6** including ACARS, ATN/OSI, VDL Mode 2 Basic, SATCOM Class C Data, and HFDL; and

b) **COMI-B1/1 – 4**, including VDL Mode 2 Multi-Frequency, SATCOM Class B (SB-S) Voice and Data, ATN/IPS and AeroMACS Ground-Ground; and

c) **COMS-B0/1 – 2**, including CPDLC (FANS 1/A & ATN B1) for domestic and procedural airspace and ADS-C (FANS 1/A) for procedural airspace; and

d) **COMS-B1/1 – 3**, including PBCS approved CPDLC (FANS 1/A+), ADS-C and SATVOICE for domestic and procedural airspace.

> *Note 1: the Asia/Pacific Region has established the CRV (Common aeRonautical Virtual private network), in order for ANSPs serving as Inter-regional Backbone Boundary*

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[4] Annex 14 *Aerodromes* Volume I *Aerodrome Design and Operations* section 1.6

Intermediate Systems to connect to the IP network infrastructure of other regions.Note 2: ANSPs should upgrade their ATS voice communication systems or implement analogue/digital VoIP converters in compliance with the EUROCAE ED-137 standards (interoperability standards for VOIP ATM components).

7.57. ACCs operating within Category R airspace should implement SB ADS-B consistent with **ASUR-B1/1**, subject to an assessment of costs and benefits.

Note: this does not preclude the use of SB ADS-B by other ATC units to augment surveillance capability or to act as a backup.

Air Navigation Services

7.58. ATM systems should be supported by digitally-based NOTAM consistent with **DAIM-B1/7**.

Note: Regional AIM policies are contained within the Asia/Pacific Collaborative AIM Plan.

7.59. All States should ensure that aeronautical meteorological products supported by automated decision systems or aids using IWXXM consistent with **AMET-B1/1 – 4**.

PASL Phase IV (expected implementation by 27 November 2025)

Aerodrome Operations

7.60. Where there is an operational benefit, remotely operated Aerodrome Air Traffic Services should be implemented, consistent with **DATS B1/1**.

Air Navigation Services

7.61. Capability for providing aeronautical meteorological observations in support of automated decision processes or aids and performance based requirements, involving meteorological information, meteorological information translation, ATM impact conversion and ATM decision support should be enabled, consistent with **AMET-B1/1**.

Information Exchange

7.62. States should establish SWIM services consistent with **SWIM-B2/1-2**, implementing the following as a minimum;

    a)   Information Service Provision SWIM-B2/1;

    b)   Information Service Consumption SWIM-B2/2;

PASL Phase V (expected implementation by 23 November 2028)

Air Traffic Management

7.63. All ATC units providing services to international high density aerodromes should operate enhanced surface guidance for pilots and vehicle drivers, comprehensive situational awareness and conflict alerting service for runway operations consistent with **SURF-B2/1 – 3.**

7.64. All aerodromes where ATFM facilities are required, should be served by an integrated system of arrival and departure management sequences into a single runway or dependent runways consistent with **RSEQ-B2/1**.

7.65. ACCs and terminal airspaces should enable Dynamic Airspace Configurations for different traffic flow or complex situations, Enhanced Conflict Detection Tools and Conformance Monitoring

consistent with **FRTO-B2/1 – 2 and NOPS-B2/2**.

7.66. ACCs should enable, where practicable, large-scale cross-border Free Route Airspace in coordination with adjacent FIRs, and enhanced conflict resolution tools consistent with **FRTO-B2/3 – 4**.

7.67. ACCs should enable, where practicable, ATFM for cross-border Free Route Airspace in coordination with adjacent FIRs, and enhanced conflict resolution tools consistent with NOPS-B2/6 and **FRTO-B2/3 – 4**.

7.68. All ACCs operating within FIRs where demand may exceed capacity should operate systems that enable, where applicable, collaborative network operations planning, further integration of airport operations and NOPS planning, multi ATFM slot swapping and airspace user priorities consistent with **NOPS-B2/1-5** supporting the integration of time-based management within a flow centric approach, consistent with **TBO-B0/1** and **TBO-B1/1**.

Air Navigation Services

7.69. Capability for providing integrated aeronautical meteorological observations, forecast and, warning information, climatological and historical products in support of automated decision processes and the design and planning of infrastructure, flight routes and airspace management should be enabled, consistent with **AMET-B2/1-3**.

7.70. Integrated meteorological information service in the SWIM environment in support of enhanced operational ground and air decision-making processes, particularly in the planning phase and near-term should be implemented consistent with **AMET-B2/4**.

ATS Communications

7.71. All ATC units should be equipped with or be able to interface with communication systems appropriate to support the service provided, consistent with:

   a) **COMI-B2/1 – 3** including Air/Ground ATN/IPS and AeroMACS and Links for non-safety communication; and

   b) **COMS-B2/1 – 3**, including PBCS approved CPDLC, ADS-C and SATVOICE for domestic and procedural airspace.

Information Exchange

7.72. States should establish FF-ICE (Flight and Flow Information for Collaborative Environment) consistent with **FICE-B2-4,** SWIM services consistent with **SWIM-B2/3**, Aeronautical Information dissemination consistent with **DAIM-B2/1** and Meteorological information service consistent with **AMET-B2/4**, implementing the following as a minimum;

   a) Filing Service- FICE-B2/2;

   b) Flight Data Request service- FICE-B2/4;

   c) SWIM Registry SWIM-B2/3;

   d) Dissemination of Aeronautical Information in a SWIM Environment DAIM-B2/1; and

   e) Meteorological Information Service in SWIM AMET-B2/4;

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RESEARCH AND FUTURE DEVELOPMENT POSSIBILITIES

<u>Research and Development</u>

8.1   To develop the tools and systems required to meet foreseeable long-term requirements, there is a need for States to undertake and co-operate on ATM Improvement. This includes major efforts to define concepts, to extend knowledge and invent new solutions to future ATM challenges so these new concepts are selected and applied in an appropriate timely manner. Such efforts could be forged through collaborative partnerships between, States, ANSPs, International Organizations, institutes of higher learning and specialised technical agencies. This concept is consistent with Seamless ANS Principle 36 (*Inter-regional cooperation ('clustering') for the research, development and implementation of ATM projects*).

8.2   The need for concepts beyond current technology and systems was reinforced at APANPIRG/23 in 2012. With the end goal of a globally interoperable ATM system in mind, the region will have to consider planning for a long term supporting concept and infrastructure. States should not overlook the need to include the development of future ATM concepts that will ensure the safety and fluidity of air transportation over the next few decades. The following are possible areas that should be considered for future development, in order to continue pursuance of Seamless ANS beyond ASBU Block 0 and Block 1 implementations and global interoperability:

a.   <u>Space-Based ATS Surveillance</u> - The AN-Conf/12 endorsed Recommendation 1/9 regarding space-based ADS-B systems being included in the GANP. With the availability of space-based ADS-B several APAC States have commenced studies with a view to its implementation to support improved separation, particularly in oceanic (Category R) airspace. Subject to the development by ICAO of standards and procedures for the application of this technology for ATC separation and the necessary supporting communications systems, regional policy and planning development should examine opportunities and develop policies to take advantage of this technology

b.   <u>Sub-Regional ATFM</u> - Inter-linked (data-sharing) ATFM units (which may be virtual offices) should be developed to serve various sub-regions. This concept is consistent with Seamless ANS Principle 8 (*Sub-regional ATFM based on system-wide CDM serving the busiest terminal airspace and MTF*). The Global ATM Operational Concept paragraph 2.4.3 states: *Demand and capacity balancing will be integrated within the ATM system*;

c.   <u>Collaborative Air Navigation Services</u> - This concept is consistent with the following Seamless ANS Principles: 9 (*Cross-border/FIR cooperation for use of aeronautical facilities and airspace, collaborative data sharing, airspace safety assessment and ATM Contingency planning*) and 15 (*Collaboration by ANSPs for evaluation and planning of ATM facilities*). The AN-Conf/12 endorsed Recommendation 5/1, regarding collaboration in airspace organization and routing, which emphasised, *inter alia*, the need to take advantage of improved models for inter-regional coordination and collaboration to achieve seamless air traffic management and more optimum routes through airspace.

d.   <u>Airspace Optimisation</u> - the CONOPS states: *Where possible the number of FIRs should be minimized particularly along traffic flows. FIRs should not necessarily be based strictly on the boundaries of sovereign territories*. This concept is consistent with and the following Seamless ANS Principles: 12 (*The optimisation of airspace structure through amalgamation and use of technology*) and 16 (*Optimization of ATM facilities through amalgamation and the use of technology, including automation, satellite-based systems and remote facilities*). The Global ATM Operational Concept paragraph 2.2.2 states: *While acknowledging sovereignty, airspace will be organized globally.*

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Homogeneous ATM areas and/or routing areas will be kept to a minimum, and consideration will be given to consolidating adjacent areas;

e. Consistent Operating Practices and Procedures - this is aligned with Seamless ANS Principle 3 (*Harmonised regional or sub-regional rules and guidelines*) and 4 (*Shared ATM operational standards, procedures, guidance materials through common manuals and templates*); and

f. Transition Altitude/Layer Harmonisation – this is consistent with AN-Conf/-12 Recommendation 5/1 b).

MILESTONES, TIMELINES, PRIORITIES AND ACTIONS

<u>Milestones</u>

9.1		Section 7 (Performance Improvement Plan) provides milestones and timelines for a number of elements in the PARS and PASL Phase II, III and IV, being effective 07 November 2019, 03 November 2022 and 27 November 2025 respectively. Phase I elements that had not been completed as of 2019 were moved to Phase II.

9.2		It should be noted that States should commence planning for the various elements, such as PBN specifications detailed in the PARS to cover overall ATM operations, taking into account the whole phase of flight. This should be planned from the approval of this Plan, to ensure a smooth transition by the onset of Phase I, and should include consideration of issues such as:

- 	aircraft equipage and certification;
- 	safety/operational analysis and assessment;
- 	cost-effectiveness;
- 	budgetary issues;
- 	development of operational procedures; and
- 	training.

9.3		States should commence planning for PBN specifications detailed in the PARS and other initiatives which have been globally documented, to facilitate a smooth transition by the onset of Phase I. The Regional PBN Plan is expected to transition to a general guideline for implementation during this period, with the prescriptive PBN specifications being incorporated into this Plan.

9.4		Section 8 (Research and Future Development Possibilities) provides, subject to future agreement by concerned parties, possible Seamless ANS improvements beyond 2019 until 2031.

<u>Priorities</u>

9.5		It is a matter for each State to determine priorities in accordance with its own economic, environmental, safety and administrative drivers. Such drivers may include a data driven assessment of their own performance.

<u>Actions</u>

9.6		Noting that the Plan had the status of guidance material in terms of regional policy expectations, this Plan necessitated a number of implementation actions.

9.7		The ICAO Seamless ANS Reporting System supports the implementation of the global and regional items by monitoring progress of States and administrations.

9.8		APANPIRG and its contributory bodies such as the ATM Sub-group and the CNS Sub-group are responsible for the oversight of air navigation issues within the Asia/Pacific, so these bodies needed to be made aware of State implementation progress of Seamless ANS initiatives. APANPIRG and its contributory bodies need to manage the implementation of Seamless ANS through the ASBU framework and this Plan.

9.9		Section 6 (Current Situation) provides detailed analysis and major concerns in the region. Some of the non-ICAO sub-regional collaborative frameworks or actions have successfully achieved ATM operational improvements in the past. These forums will continue to be important in Seamless ANS implementation in the future.

9.10   The ICAO Asia and Pacific Regional Office assists, where necessary, the implementation of Seamless ANS within its accredited States. In addition, the Asia and Pacific Regional Office coordinates with adjacent ICAO regional offices on an ad hoc basis or at relevant trans-regional meetings.

Appendix A:

Beijing Declaration

2.0 Air Navigation Services

2.1 Commit to implementation by 2022 of the Asia/Pacific Seamless Air Traffic Management (ATM) Plan to enhance ATM capacity and harmonisation in the Region, including a focus on:

a) Transitioning from Aeronautical Information Service (AIS) to Aeronautical Information Management (AIM) System;
b) Performance Based Navigation (PBN) implementation;
c) Common ground/ground telecommunication infrastructure to support Air Navigation Services (ANS) applications;
d) An enhanced level of civil/military cooperation;
e) Enhanced surveillance capability including Automatic Dependent Surveillance-Broadcast (ADS-B) technology;
f) Air Traffic Flow Management/Collaborative Decision Making (CDM) implementation for high density airports; and
g) Air navigation in national planning frameworks such as National Development Plans (NDPs) supported by National Air Navigation Plans.

2.2 Promote sharing of best practices in the provision of ANS including Aeronautical Search and Rescue (SAR), Meteorological Services for International Air Navigation (MET) and Air Traffic Flow Management (ATFM) through regional cooperation and enhanced coordination.

Delhi Declaration

4.0. Air Navigation Services

4.1   Commit to resources in modernization and innovation in Air Navigation Services, in tandem with developments in the airport and airline capacity, to support recovery and meet future demand for air travel and new entrants.

4.2   Commit to implement the ICAO Standards and Procedures for Air Navigation Services (PANS), and the Asia/Pacific Seamless ANS Plan (including prioritized GANP elements) and its subsidiary plans to enhance ANS capacity and harmonization in the Asia and Pacific Region focusing on as a matter of priority:

a. Phase I, II and III of the Asia/Pacific Regional Aeronautical Information Management (AIM);

b. Improved Airspace Safety and Capacity through the implementation of more efficient Air Traffic Control (ATC) separation minima;

c. Performance Based Navigation (PBN) implementation in accordance with ICAO Assembly Resolution A37-11 on Global PBN Goals;

d. Common Ground/Ground Telecommunication Infrastructure to support ANS applications;

e. Expediting the implementation of ICAO provisions related to System Wide Information Management (SWIM);

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f.   Enhanced civil/military cooperation;

g.   Enhanced Surveillance capability for improved Safety and Efficiency;

h.   Air Traffic Flow Management (ATFM) and Airport Collaborative Decision Making (A-CDM) implementation;

i.   Air Traffic Management (ATM) contingency planning, in coordination with neighbouring States/Administrations;

j.   Air navigation in national planning frameworks such as National Development Plans (NDPs) supported by National Air Navigation Plans (NANP); and

k.   Enhancement of safety risk assessment capability.

4.3   Share best practices, resources and capability in the provision of ANS, including Aeronautical Search and Rescue (SAR), Meteorological Services for International Air Navigation (MET) and Air Traffic Flow Management (ATFM) through regional cooperation and enhanced coordination.

4.4   Work collaboratively through ICAO and Regional collaborative platforms towards Seamless ANS, including Flight and Flow Information for a Collaborative Environment (FF-ICE) and Trajectory-Based Operations (TBO) to support future traffic growth and sustainability.

Appendix B: Seamless ANS Principles

People: Cultural and Political Background

1. High-level political support (including development of educational information for decision-makers) to support Seamless ANS initiatives, including military cooperation and AIM.

2. Education and implementation of non-punitive reporting and continuous SMS improvement systems.

Aviation Regulations, Standards and Procedures

3. Harmonised regional or sub-regional rules and guidelines, modelled on the regional application of common regulations incorporated by reference into local legislation.

4. Shared ATM operational standards, procedures, guidance materials through common manuals and templates.

5. The promotion of mutual recognition of ATM qualifications between States.

6. An emphasis on delivery of ATM services based on CNS capability, resulting in flexible, dynamic systems.

7. The use of high-fidelity simulators to train controllers on the optimal application of ATC separations and procedures that support Seamless ANS applications, emergency and contingency responses, testing of software releases, and may serve as a backup ATM platform.

ATM Coordination

8. Sub-regional ATFM based on system-wide CDM serving the busiest terminal airspace and MTF.

9. Cross-border/FIR cooperation for use of aeronautical facilities and airspace, collaborative data sharing, airspace safety assessment and ATM Contingency planning.

10. Encouragement of military participation in civil ATM meetings and in ATS Centres where necessary.

Airspace Organisation

11. Promoting flexible use airspace arrangements and regular review of airspace to ensure it is appropriate in terms of purpose, size, activation and designation.

12. The optimisation of airspace structure through amalgamation and use of technology.

Facilities: Aerodromes

13. To encourage aerodrome operators to actively participate in ATM coordination in respect of Airport CDM development and operational planning, including aerodrome complexity and capacity.

14. Planning and coordination with local authorities and government agencies to take into account environmental issues, obstacles, aerodrome and PBN development.

ATS Units

15. Collaboration by ANSPs for evaluation and planning of ATM facilities.

16. Optimization of ATM facilities through amalgamation and the use of technology, including automation, satellite-based systems and remote facilities.

Navigation Aids

17. The continued rationalisation of terrestrial navigation aids to satellite-based procedures, while retaining a minimum network necessary to maintain safety of aircraft operations.

18. Support for a GNSS-based global PBN approval standard.

19. Regional cooperation for augmentation systems in terms of interoperability and increased service areas, and a GNSS ionospheric monitoring network.

Telecommunication

20. Encouragement of the use of ground-ground ATN/AMHS and diverse satellite communication systems.

21. Enhancement of data-link capabilities (VHF including VDL M2, SATCOM).

22. Where cost beneficial and appropriate, the implementation of:

    - SATVOICE technologies and standards;
    - HF data-link;
    - VSAT networks in support of COM and SUR.

23. The prioritisation of AIDC systems to alleviate ATC coordination issues.

ATS Surveillance

24. The encouragement of ADS-B and/or MLAT implementation to improve ATS surveillance coverage, redundancy and multiple tracking capability.

25. Establishment of ADS-C where radar, ADS-B (including satellite –based ADS-B) and/or MLAT is not possible.

26. Expansion of ATS surveillance data-sharing initiatives.

Technology and Information: Flight Operations

27. Implementation of UPR and DARP where practicable.

28. Implementation of CDO and CCO where possible.

29. The encouragement of appropriate technologies that support Trajectory-Based Operations.

Aeronautical Data

30. Early implementation of AIM, including cooperative development of aeronautical databases and SWIM to support interoperable operations.

ATM Systems and Safety Nets

31. Application of ground-based safety nets, which includes tactical and strategic conflict probing (such as APW, STCA) and MSAW.

32. Support for Inter-facility Flight Data Processing System capability.

33. Collaborative development of CDM, ATFM, A/MAN and D/MAN support tools.

34. Encouragement of Digital ATIS and VOLMET information systems.

35. Encourage sharing of air traffic data between military ATM systems and civil ATM systems.

ATM Modernisation Projects

36. Inter-regional cooperation ('clustering') for the research, development and implementation of ATM projects.

37. A focus on technologies for earliest deployment and best cost benefits.

Appendix C: Capacity Expectations

1   Capacity metrics will vary considerably, depending upon many factors such as the COM and SUR capabilities, the presence of terrain, physical attributes of aerodromes and weather. Thus the expectations outlined for the following States need to be treated with caution, however they form a useful guide as to the sort of capability being achieved with modern systems and appropriately trained controllers.

2   **Table D1** provides an indication of potential Aerodrome Arrival Rate (AAR) for a single runway, given aircraft ground speeds and aircraft spacing near the runway threshold (source: *Guide for the Application of a Common Methodology to Estimate Airport and ATC Sector Capacity for the SAM Region, Attachment 7: Calculation of the Aerodrome Acceptance Rate used by the FAA*).

Speed	3NM	3.5NM	4NM	4.5NM	5NM	6NM	7NM	8NM	9NM	10NM
140kt	46	40	35	31	28	23	20	17	15	14
130kt	43	37	32	28	26	21	18	16	14	13
120kt	40	34	30	26	24	20	17	15	13	12

Table D1: Potential Runway Arrival Rate

3   ATC capacity calculations needed to take into account the volume of airspace of each sector, which varied considerably by State, and factors such as automation, density of traffic and complexity of routes/airspace. The ICAO *Manual on Collaborative Air Traffic Flow Management* (Doc 9971) contained guidelines for ATC sector capacity assessment. **Table G2** provides simplified ATC sector calculation guidance from Doc 9971.

Average sector flight time (minutes)	Optimum sector capacity value (aircraft)
3 minutes	5 aircraft
4	7
5	8
6	10
7	12
8	13
9	15
10	17
11	18
12 minutes or more	18

Table D2: Simplified ATC Sector Capacity Table (no complexity/automation allowance)

4   Australia, Japan, New Zealand, Singapore, Thailand and the United States provided runway and airspace (ATC Sector) capacity data, to indicate potential capacity figures in varying Visual Meteorological Conditions (VMC) and Instrument Meteorological Conditions (IMC) circumstances.

        Australia

5   Brisbane and Melbourne aerodrome capacity expectations:

- single runway: **48** (24 arrivals - 150 seconds between arrivals, 24 departures, VMC);

- single runway: **40** (20 arrivals - 180 seconds, 20 departures, IMC).

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Japan

6   Aerodrome capacity expectations:

- Narita (dual runways): 56-64;

- Haneda (4 runways): 74.

New Zealand

7   Auckland aerodrome capacity expectations:

- single runway: **45** (VMC);

- single runway: **39** (IMC circling);

- single runway: **37** IMC below circling with missed approach protection for jets);

- single runway: **32** (IMC below circling with missed approach protection)

8   ATC Sector capacity expectations:

- terminal/low level <u>Category T</u> airspace: **12** aircraft; and

- en-route <u>Category S</u> airspace: **15** aircraft;

- en-route <u>Category R</u> airspace: **15** aircraft.

Singapore

9   Changi aerodrome capacity expectations:

- single runway: **30** (IMC); and

- two parallel/near parallel runways: **72** (IMC);

- three parallel/near parallel runways: to be confirmed, possibly 100+ (IMC).

10   ATC Sector capacity expectations:

- terminal/low level <u>Category T</u> airspace: **14** aircraft; and

- en-route <u>Category S</u> airspace (sector dimension of 150NM x 100NM): 7 aircraft (extrapolated $\sqrt{6.66}$ x airspace volume = 2.58 x 7 = **18**).

Thailand

11   Suvarnabhumi aerodrome capacity expectations:

- single runway: **34** (VMC/IMC).

United States of America

12   **Table D3** provides an indication of optimal aerodrome parallel or near parallel arrival rate runway <u>arrival</u> capacity at selected USA aerodromes. It should be noted that multiple runway combinations or whether runways were used for arrivals, departures, or both yielded a number of permutations from the data.

Aerodrome	Runways	IMC	VMC
ATL	5	104	126
ORD	5	84	112
DFW	5	90	96

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ATL	4	92	112
DEN	4	-	114
LAX	4	64	80
ORD	4	-	92
ATL	3	76	96
DEN	3	-	96
IAD	3	72	100
ATL	2	68	82
JFK	2	-	58
SDF	2	40	52
ATL	1	34	42
SDF	1	20	26
SFO	1	25	27

Table D3: Capacity at selected US airports

13   Average aerodrome <u>arrival</u> capacity expectations (range):

- single runway: IMC average **26** (25-34), VMC average **32** (26-42);

- two parallel/near parallel runways: IMC **55** (40-68), VMC **64** (52-82);

- three parallel/near parallel runways: IMC **74** (72-76), VMC **97** (96-100);

- four parallel/near parallel runways: IMC **78** (64-92), VMC **100** (80-112);

- five parallel/near parallel runways: IMC **92** (84-104), VMC **111** (96-126).

14   ATC Sector capacity expectations:

- terminal/low level <u>Category T</u> airspace: **12-18** aircraft; and

- en-route <u>Category S</u> airspace: **16-20** aircraft; and

- en-route <u>Category R</u> airspace: **17-24** aircraft.

<u>Summary</u>

15   **Table D4** summarises runway and airspace capacity expectations from States, with the greatest capacity achieved in optimum conditions highlighted in bold.

	Parallel or Near Parallel Runway Capacity					ATC Sector Capacity		
	1	2	3	4	5	T	S	R
Australia	40-48							
Japan		56-64		74				
NZ	32-40					12	15	15
Singapore	30	72				14	18	
Thailand	34							
USA	**61**	**95**	**150**	**177**	**211**	12-**18**	16-**20**	17-**24**
Doc 9971 Simplified Table Comparison						15	18	18

Table D4: Capacity Expectations Summary

Note: Given the unique operation environment and constraints of individual States, these figures are indicative only and do not represent the same expectation across different States in the region

Appendix D: List of References

Global and Regional Framework

Doc 9673 *Asia/Pacific Regional Air Navigation Plan*
Doc 9750 *Global Air Navigation Plan*
Doc 9854 *Global Air Traffic Management Operational Concept*
Doc 10004 Global Aviation Safety Plan

Air Navigation Services

Annex 10 *Aeronautical Telecommunications*
Annex 11 *Air Traffic Services* (particularly Chapter 2 [2.1 and 2.30], and Attachment C)
ASBU Document
ASEAN *Master Plan on ASEAN Connectivity*
Asia/Pacific Air Traffic Flow Management Concept of Operations
Asia/Pacific Air Navigation Concept of Operations
Asia/Pacific Regional Performance-Based Navigation Implementation Plan (V4.0)
Circular 330 *Civil-Military Cooperation in Air Traffic Management*
Doc 4444 *Procedures for Air Navigation Services Air Traffic Management (PANS ATM)*
Doc 8071 Manual on Testing of Radio Navigation Aids Volume 2
Doc 9613 *Performance-based Navigation Manual*
Doc 9882 *Manual on ATM System Requirements*
Doc 9883 *Manual on Global Performance of the Air Navigation System*
Doc 9906 *Quality Assurance Manual for flight Procedure Design Volume 5*
Doc 9971 *Manual on Collaborative Air Traffic Flow Management*
Global Operational Data-link Document
ICAO AN-Conf/12 Yellow Cover Report on Agenda Item 1
Roadmap for the Transition from AIS to AIM

Flight Operations

Annex 6 *Operation of Aircraft*
Doc 8168 *Procedure for Air Navigation Service Aircraft Operations Volume I Flight Procedures*
Doc 8168 *Procedure for Air Navigation Service Aircraft Operations Volume II Flight Procedures*
Doc 9931 Continuous Descent Operations (CDO) Manual
Doc 9993 Continuous Climb Operations (CCO) Manual

Human Factors

Annex 1 *Personnel Licensing*
Circular 214 *Fundamentals on Human Factors*
Circular 227 *Training of Operational Personnel on Human Factors*
Circular 241 *Human Factors in ATC*
Circular 249 *Human Factors in CNS and ATM Systems*
Circular 318 *Language Testing Criteria for Global Harmonization*
Circular 323 *Guidelines for Aviation English Training Programmes*
Doc 9835 *Manual on the Implementation of ICAO Language Proficiency Requirements*
Doc 9966 *Fatigue Risk Management Systems*
Human Factors Digest No. 1

INTERNATIONAL CIVIL AVIATION ORGANIZATION

ASIA/PACIFIC REGIONAL GUIDANCE

FOR

SPACE OBJECT LAUNCH AND RE-ENTRY ACTIVITIES COORDINATION

Version 1.0, September 2024

Approved by ATM/SG/12 and published by the
ICAO Asia and Pacific Office, Bangkok

Contents

1:   SCOPE OF THE PLAN

1.1   This guidance document was created by the Space Vehicle Launch and Re-entry Coordination Small Working Group (SVLRC SWG) formed through a decision of the 10th Meeting of the Air Traffic Management Sub-Group of APANPIRG in October 2022. The document builds upon and replaces the regional guidance provided in the Asia/Pacific Seamless ANS Plan Version 3.0, and in the Asia/Pacific Planning Checklist for Ballistic Launch and Space Re-Entry, approved by the 29th APANPIRG and is in keeping with the provisions of UN Resolution 2222 (XXI) as amended.

1.2   Participants of the SWG consisted of representatives from Australia, China, Hong Kong China, India, Japan, New Zealand, Papua New Guinea, Republic of Korea, Singapore, Sri Lanka, Thailand, the United States, Viet Nam, and IATA.

1.3   This guidance applies to all forms of space object launch and re-entry activities (hereinafter referred to as activities), and includes commercial, State, ballistic launch, or any other space object activities that can pose a hazard to civil aviation.

1.4   The goal of this guidance is to achieve timely and efficient collection, coordination and dissemination of space object launch and re-entry information that will assist with avoiding hazards to civil aircraft and minimize interference with the normal operation of such aircraft.

1.5   This guidance should be harmonized with other ICAO regions who are working on similar efforts so that there is consistency across the globe on how space object launch and re-entry activities are coordinated and disseminated.

1.6   While space object launch and re-entry activities have existed for decades within the region, not all States and/or stakeholders are equally affected. The collection, coordination and dissemination of space object launch and re-entry activity information mainly include the following stakeholders:

- Launching State

- Launching State Appropriate ATS Authority

- Affected Appropriate ATS Authority

- Launch and Re-entry Operator

- Airspace user

1.7   To facilitate timely and orderly information dissemination, all APAC States are encouraged to identify and provide contact information for space object launch and re-entry activity coordination. These will be added to the regional Asia/Pacific Space Object Launch and Re-Entry Points of Contact list, maintained by the ATM/SG Secretariat.

1.8   Launching State Appropriate ATS Authorities should make efforts to collaborate with affected appropriate ATS authorities, operators, and other affected stakeholders to minimise potential impacts to the airspace system.

1.9   Generally, space object launch and re-entry activities take place from pre-defined locations, including States facilities or private spaceports. Launch locations should be positioned with consideration for minimal disruption to the safety and efficiency of airspace system.

1.10   The procedures below are intended to improve regional coordination efforts by

complementing well-established and proven processes compliant with ICAO Annex 11 (Air Traffic Services), Doc 10088 (Manual on Civil-Military Cooperation in Air Traffic Management), Doc 9554 (Manual Concerning Safety Measures Relating to Military Activities Potentially Hazardous to Civil Aircraft Operations), and replacing existing ICAO APAC regional guidance. States conducting space object launch and re-entry activities, or managing airspace affected by said activities are encouraged to create, test, and refine practices and procedures that fit their needs. The *State* is responsible for coordination of activities potentially hazardous to civil aircraft, regardless of whether they're conducted by its space launch agencies, its military, or any other organization.

1.11   States defining consistent coordination procedures allows sufficient time for airspace managers to assess the operational impact and airspace users to plan around hazardous activity. States routinely conducting space object launch and re-entry activities and States managing affected airspace, are encouraged to dedicate adequate resources to this planning and coordination effort to assure the continued safe operation of all airspace users.

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2: DEFINITIONS, ABBREVIATIONS AND ACRONYMS

2.1 DEFINITIONS

Affected Appropriate ATS Authority – the relevant authority responsible for providing air traffic services in the airspace affected by space object launch and re-entry activities conducted by the Launching State.

Airspace user – Organisations or individuals operating flights using aircraft and/or vehicles in the airspace.

Air traffic services unit. A generic term meaning variously, air traffic control unit, flight information centre or air traffic services reporting office.

Appropriate ATS authority – the relevant authority designated by the State who is responsible for providing air traffic services in the airspace concerned. This is commonly referred to as the Air Navigation Service Provider or Air Traffic Services Provider.

Launch State – a State which launches or procures the launching of a space object or a State from whose territory or facility a space object is launched. This includes any space object launch and re-entry activities.

Launch Window – the span of time during which a launch or re-entry may take place while satisfying the constraints imposed by safety and mission objectives.

NOTAM – A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

Launch and Re-entry Operator – an entity who conducts or will conduct the launch and/or re-entry of a space object and any payload.

Space object – includes component parts of a space object as well as its launch vehicle and parts thereof.

NOTE: The definitions listed above are to aid readers in understanding and applying the principles outlined in this document. They may not be universally agreed upon outside of the APANPIRG.

2.2 ACRONYMS AND ABBREVIATIONS

AFTN	Aeronautical Fixed Telecommunication Network
AIS	Aeronautical Information Service
AMHS	ATS Message Handling System
ATC	Air Traffic Control
ATS	Air Traffic Service
ATSU	Air Traffic Service Unit
FIR	Flight Information Region
NOF	International NOTAM Office
POC	Point of Contact

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3: PROCEDURES FOR COORDINATING SPACE OBJECT LAUNCH AND RE-ENTRY ACTIVITIES

3.1   This section provides an overview of the general responsibilities of the Launching State, Launching State Appropriate ATS authority, Affected Appropriate ATS authority, Operator and Airspace User. All entities must coordinate to ensure the safe and efficient integration of activities into airspace systems. It is important to consider the responsibilities of each organization within their States.

3.1.1   Launching State

- Regulates space object launch and re-entry activities.

- Develops and enacts regulations ensuring that the space object launch and re-entry operator and the Launching State appropriate ATS Authority comply with the requirements in ICAO Annexe 11 for the coordination of activities potentially hazardous to civil aircraft.

- Identifies the appropriate ATS authority responsible for coordination of space activities, including identifying the proper entity to initiate NOTAM request for space object launch and re-entry activities within the FIR/s assigned to the launching State in accordance to Annex 15, Section 2.1.

- Validates the launch window and the coordinates of the extent of the airspace affected by the space object launch and re-entry activities.

  Note: There are various responsible authorities within individual Launching States as far as space object coordination activities.

3.1.2   Launching State Appropriate ATS Authority

- Serve as the focal point for collecting, coordinating, and disseminating all available information relevant to space object launch or re-entry activities to affected appropriate ATS authorities and/or other affected stakeholders.

- Identify and assess potential impacts or constraints to airspace where the State is responsible for the provision of air traffic services, to ensure the compliance of the requirements in ICAO Annex 11, Section 2.19.

  Note: This includes the determination for the need to establish any special use airspace (SUA), airspace restrictions or temporary withdrawal of established ATS routes to avoid hazards to civil aircraft and inform affected ATSU accordingly.

- Plot area using validated coordinates and provide a graphical representation of the polygon to affected appropriate ATS authorities for reference.

- Ensure the safe and efficient integration of space object launch and re-entry activities into the airspace system.

3.1.3   Affected Appropriate ATS Authority

- Receive and coordinate information relevant to space object launch or re-entry activities from launching state appropriate ATS authorities with other affected stakeholders.

- Identify and assess potential impacts or constraints to airspace where the State is responsible for the provision of air traffic services, to ensure the compliance of the requirements in ICAO Annex 11, Section 2.19.

  Note: This includes the determination for the need to establish any special use airspace (SUA), airspace restrictions or temporary withdrawal of established ATS routes to avoid hazards to civil aircraft and inform affected ATSU accordingly.

- Plot Hazard/Danger Area

- Ensure the issuance and update of any NOTAM promulgating information on the activity.

- Ensure the safe and efficient integration of space object launch and re-entry activities into the airspace system.

3.1.4 **Operator**

- Provide tentative launch window commencement time and duration (primary and, if any, backup timing and dates), and extent of airspace affected (latitude/longitude coordinates), and any other necessary supporting information to the Launching State Appropriate ATS Authority.

  Note: Once the Launching State approves an operation, the operator works with the Appropriate ATS Authority to determine the necessary steps for coordination of airspace and operations.

3.1.5 **Airspace User**

- Undertake safety risk assessments in accordance with standard operating procedures;

- Comply with promulgated airspace and ATS restrictions.

3.2 **PRE-LAUNCH PLANNING AND COORDINATION**

3.2.1   Operational coordination to the Appropriate ATS Authority of affected airspace should be accomplished using Aeronautical Fixed Telecommunication Network (AFTN) or ATS Message Handling System (AMHS), while supplemental material should be provided via email. Ideally a conference call or some other form of positive coordination should also be accomplished by the Appropriate ATS Authority responsible for the airspace over the State where the activity planning organization is located. States should provide group mailboxes for operational coordination.

Note: This may include a list for advanced planning, including additional POCs for situational awareness, and one for tactical event updates, such as removal once an activity is complete to reopen the airspace. Ideally, each State has a single group email box forwarding information internally to appropriate parties.

3.2.2   The Launching State Appropriate ATS Authority responsible for coordinating space object launch and re-entry activity should begin coordinating with affected appropriate ATS authorities at **least 10 days (ideally 14 days)** prior to the proposed activity. The following information should be included in the coordination:

- Tentative launch window commencement time and duration (primary and, if any, backup timing and dates).

- Activity time of day and extent of airspace affected (latitude/longitude coordinates).

Note: In cases where extent of airspace affected crosses multiple FIRs, individual requests should be developed and sent to each impacted FIR. The appropriate ATS authority developing requests should ensure there are shared points for airspace affected spanning across multiple FIRs to ensure safety.

- Identification of POC in the Affected Appropriate ATS Authority.

- Any other necessary supporting information

3.2.3   The Appropriate ATS authority for affected airspace should ensure planning and notification are in place for all stages of the activity to include any re-entry/debris possibility, and in accordance with ICAO Doc 10066. Publication of the NOTAM for all affected FIRs will be completed at least seven days in advance and include the following items of information:

- Activity window duration

- Activity time of day and extent of proposed danger or restricted area (latitude/longitude coordinates)

Note: For ease of implementation, each danger area should be plotted with the minimum number of coordinates to present a polygon (please refer to PANS AIM for exacts on how the danger area is formulated). Publication of the danger area coordinates is crucial to ensure the safety of air traffic, especially in the event of an emergency. It is therefore vital for ATC and flight crew to have precise awareness of danger areas while managing any inflight contingencies.

- Any other necessary supporting information, such as affected airways, alternate routings, direct routings, etc. (please see attachment A)

3.3   **TACTICAL LAUNCH COORDINATION**

3.3.1   Launching State Appropriate ATS authority should provide notice of **three days** prior to the requested launch window via AMHS/AFTN to all affected appropriate ATS authorities.

3.3.2   Positive coordination between affected Appropriate ATS authority and Launching State Appropriate ATS authority should be executed to confirm and manage the requested dates of the activity **within three days, but not less than 24 hours**, of the proposed start. The definitive information should be shared externally to ensure maximum efficiency of affected airspace.

3.3.3   After confirming coordination via AMHS/AFTN, the affected Appropriate ATS authority should publish a NOTAM for the **launch "Window" with three days' notice**, **but not less than 24 hours.**

Note: NOTAM are published by the NOF serving the affected FIR in response to the request/direction of the appropriate ATS authority for that FIR.

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4: RE-ESTABLISHING NORMAL AIRSPACE OPERATIONS FOLLOWING THE END OF ACTIVITIES

4.1   When confirmation from the operator of the end of activities potentially hazardous to civil aircraft occurs prior to the end of the coordinated launch window, the Launching State Appropriate ATS Authority should notify affected appropriate ATS authorities to enable timely cessation of mitigations and withdrawal of NOTAMs for all affected FIRs. Otherwise, the NOTAMs will expire as published.

4.2   Cancellations of launch activities at any point of time needs to be disseminated by the Launching State Appropriate ATS Authority as soon as possible to all affected FIRs.

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5: POST-LAUNCH ASSESSMENT

5.1   It is recommended for the Launching State to designate the Appropriate ATS Authority to conduct a post-activity assessment which helps in improving the maturity of launch-related airspace management processes. It is recommended that the affected State and the affected appropriate ATS authority conduct a similar assessment. All stakeholders may provide comments to improve future activities. POCs may exchange suggestions on improving coordination and reducing impacts on civil air traffic flow.

5.2   States should share lessons learned and proposed revisions to this regional guidance with APANPIRG, through its ATM Sub-Group.

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APPENDIX A: Space Object CHECKLIST

- Launch required by:

- Proposed Temporary Danger Area:

- Proposed Launch Window, including backup dates:

- Date: DD/MM/YYYY to DD/MM/YYYY   Time: XX:XX to YY:YY UTC

- Proposed Definitive launch window:

- Date: DD/MM/YYYY to DD/MM/YYYY   Time: XX:XX to YY:YY UTC

- Expected exact date of launch: DD/MM/YYYY

Affected FIR	*Affected AWYs*	*Affected Flights in requested Time window*	*Option 1: Suggested revised time and date*	*Option 1: Affected flights in revised time and date*	*Option 2: Suggested revised time and date*	*Option 2: Affected flights in revised time and date*

1. With this information, airspace managers and other State authorities are expected to assess the impact of the proposed launch or re-entry details and determine if the activities can be conducted safely. This assessment includes airspace and airways affected as well as expected traffic density during the event. Potential mitigations include rerouting of traffic around the danger area or delay of traffic to avoid the event window.

2. If adequate mitigations are available, the airspace manager, State, or designated competent authority should reply to the requester noting support. However, if adequate mitigations are not available, timely feedback to the requestor clarifying the issue and potential solutions is required. Note space missions require specific timing to meet orbital requirements. Options for modification may be limited. If needed, establishing a planning call to address concerns or clarify mission parameters is highly effective.

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APPENDIX B: LIST OF REFERENCES

- Doc 10088 – Manual on Civil-Military Cooperation in Air Traffic Management

- Doc 9554 – Manual Concerning Safety Measures Relating to Military Activities Potentially Hazardous to Civil Aircraft Operations

- Asia/Pacific Seamless ANS Plan V3.0

- Doc 10066 Procedures for Air Navigation Services Aeronautical Information Management (PANS AIM)

- Asia/Pacific Regional Air Navigation Plan

- Doc 9750 Global Air Navigation Plan

- Doc 9854 Global Air Traffic Management Operational Concept

- Doc 10004 Global Aviation Safety Plan

- Annex 11 Air Traffic Services

- Annex 15 Aeronautical Information Services

- Doc 4444 Procedures for Air Navigation Services Air Traffic Management (PANS ATM)

- FAA Joint Order 7400.2P – Procedures for Handling Airspace Matters

- Basics of Space Flight Section III. Space Flight Operations (nasa.gov)

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ATM and Airspace Safety Deficiencies List (Updated 27 September 2024)

States/facilities	Deficiencies			Corrective Action		Priority **
	Description	Date first reported	Remarks	Executing body	Target date	
	WGS-84 Requirements of Paragraph 1.2.1 of Annex 15					
Afghanistan	WGS-84 - Not implemented	24/6/2014		Afghanistan	~~TBD~~ 01/12/2025	A
Brunei Darussalam	WGS-84 - Not implemented	24/6/2014		Brunei Darussalam	TBD	A
Marshall Islands	WGS-84 - Not implemented	24/6/2014		Marshall Islands	TBD	A
Micronesia	WGS-84 - Not implemented	24/6/2014		Micronesia	TBD	A
Nauru	WGS-84 - Not implemented		Conferring with consultant	Nauru	TBD	A
Palau	WGS-84 - Not implemented	24/6/2014		Palau	TBD	A
Samoa	WGS-84 - Not implemented	24/6/2014		Samoa	TBD	A
Vanuatu	WGS-84 – Not implemented	2/7/1999	Implemented at main airports	Vanuatu	1999	A
	AIP Format Requirements of Chapter 5 of Annex 15					
Kiribati	AIP Format - Not implemented	7/7/99	ATM/AIS/SAR/SG/18 (June 2009) was advised AIP in draft stage	Kiribati		A
~~Nauru~~	~~AIP Format - Not implemented~~	~~7/7/99~~	~~ATM/AIS/SAR/SG/18 (June 2008) was advised work soon to start~~	~~Nauru~~		~~A~~
	AIS Quality Management System Requirements of Paragraph 3.6.1 of Annex 15 Quality Management System - Not implemented					

	Deficiencies			Corrective Action		
States/facilities	**Description**	**Date first reported**	**Remarks**	**Executing body**	**Target date**	**Priority** **
Afghanistan	AIS Quality Management System - Not implemented	24/6/2014		Afghanistan	TBD	A
Bangladesh	AIS Quality Management System - Not implemented	24/6/2014		Bangladesh	TBD	A
Bhutan	AIS Quality Management System - Not implemented	24/6/2014		Bhutan	TBD	A
Brunei Darussalam	AIS Quality Management System - Not implemented	24/6/2014		Brunei Darussalam	~~TBD~~ 31/03/2026	A
Cambodia	AIS Quality Management System - Not implemented	24/6/2014		Cambodia	TBD	A
Kiribati	AIS Quality Management System - Not implemented	24/6/2014		Kiribati	TBD	A
Lao PDR	AIS Quality Management System - Not implemented	24/6/2014		Lao PDR	TBD	A
Maldives	AIS Quality Management System - Not implemented	24/6/2014		Maldives	~~TBD~~ 30/09/2024	A
Marshall Islands	AIS Quality Management System - Not implemented	24/6/2014		Maldives	TBD	A
Micronesia	AIS Quality Management System - Not implemented	24/6/2014		Micronesia	TBD	A
Myanmar	AIS Quality Management System - Not implemented	9/6/2016		Myanmar	~~TBD~~ 31/12/2025	A
Nauru	AIS Quality Management System - Not implemented	24/6/2014		Nauru	TBD	A

| States/facilities | Deficiencies | | | Corrective Action | | |
	Description	Date first reported	Remarks	Executing body	Target date	Priority **
Nepal	AIS Quality Management System - Not implemented	24/6/2014		Nepal	TBD	A
Palau	AIS Quality Management System - Not implemented	24/6/2014		Palau	TBD	A
~~Philippines~~	~~AIS Quality Management System - Not implemented~~	~~24/6/2014~~		~~Philippines~~	~~TBD~~	~~A~~
Samoa	AIS Quality Management System - Not implemented	24/6/2014		Samoa	TBD	A
Solomon Islands	AIS Quality Management System - Not implemented	24/6/2014		Solomon Islands	TBD	A
Sri Lanka	AIS Quality Management System - Not implemented	9/6/2016		Sri Lanka	TBD	A
Timor-Leste	AIS Quality Management System - Not implemented	24/6/2014		Timor-Leste	TBD	A
Vanuatu	AIS Quality Management System - Not implemented	24/6/2014		Vanuatu	TBD	A
	Aeronautical Data Area of Responsibility - requirements of Paragraph 2.1.2 of Annex 2 to ensure that the provision of aeronautical data and aeronautical information covers its own territory and those areas over the high seas for which it is responsible for the provision of ATS					
Bangladesh	Aeronautical Data Promulgation Within the State's Area of Responsibility - Not implemented	29/03/2019 SAIOACG/9		Bangladesh	TBD	A

States/facilities	Deficiencies			Corrective Action		
	Description	Date first reported	Remarks	Executing body	Target date	Priority **
	Designation of Restricted Areas - requirements of Annex 2 (Definitions) to ensure that restricted areas are designated above the land areas or territorial waters of a State					
Australia	Designation of Restricted Areas Above the Land Areas or Territorial Waters of a State - Not implemented	29/03/2019 SAIOACG/9	Danger areas within international airspace that is part of a State's responsibility is acceptable	Australia	December 2022	A
India	Designation of Restricted Areas Above the Land Areas or Territorial Waters of a State - Not implemented	29/03/2019 SAIOACG/9	Danger areas within international airspace that is part of a State's responsibility is acceptable	India	TBD	A
	Airspace Classification Requirements of Paragraph 2.6 of Annex 11					
China	Airspace Classification - Not implemented	7/7/99	Difference to Annex 11 is published in AIP, China.	China	APANPIRG/19 updated, implementation planned by end 2010.	A
Macao, China	Airspace Classification - Not implemented	05/09/2018		Macau, China	TBD	A
Nauru	Airspace Classification - Not implemented	7/7/99		Nauru	TBD	A
Solomon Islands	Airspace Classification - Not implemented	7/7/99		Solomon Islands	TBD	A

States/facilities	Deficiencies			Corrective Action		
	Description	Date first reported	Remarks	Executing body	Target date	Priority **
	ATS Message Addressing Requirements of Doc 4444 PANS-ATM Section 11.4 (Message Types and their Application)		Note: the threshold for a Deficiency is 5% or more DEP messages reported to have not been sent, and where the analysed data provided evidence of a systemic (either systems or human factors) failure to send the message			
Maldives	DEP message transmission	09/08/2019	DEP messages inconsistently transmitted Conclusion APANPIRG/27/12 and ICAO correspondence	Maldives	TBD	A
	SAR capability: Requirements of Annex 12 as defined in the Regional Air Navigation Plan Volume II Part I – GENERAL PLANNING ASPECTS Section 3 SPECIFIC REGIONAL REQUIREMENTS, failure to reach 90% or more implementation of the Asia/Pacific SAR Plan					
Afghanistan	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/6 56%	Afghanistan	2019	U
Bangladesh	Asia/Pacific SAR Plan	17/05/2019	~~APSAR/WG/8 65%~~ APSAR/WG/9 65%	Bangladesh	2019	U
Bhutan	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/8 28%	Bhutan	2019	U
Brunei Darussalam	Asia/Pacific SAR Plan	17/05/2019	APSAR/WG/4 63%	Brunei	2019	U

States/facilities **	Deficiencies			Corrective Action		
	Description	Date first reported	Remarks	Executing body	Target date	Priority **
Cambodia	Asia/Pacific SAR Plan	6/07/2015	~~APSAR/WG/4 76%~~ APSAR/WG/9 76%	Cambodia	2019	U
Macao, China	Asia/Pacific SAR Plan	6/07/2015	~~APSAR/WG/4 85%~~ APSAR/WG/9 88%	Macao, China	2019	U
Cook Islands	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/8 62%	Cook Islands	2019	U
DPR Korea	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/8 71%	DPR Korea	2019	U
French Polynesia	Asia/Pacific SAR Plan	17/05/2019	APSAR/WG/8 84%	French Polynesia	2019	U
Kiribati	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 26%	Kiribati	2019	U
Lao PDR	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 57%	Lao PDR	2019	U
~~Malaysia~~	~~Asia/Pacific SAR Plan~~	~~17/05/2019~~	~~APSAR/WG/8 85%~~ APSAR/WG/8 92%	~~Malaysia~~	~~2019~~	~~U~~
Maldives	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/8 78%	Maldives	2019	U
Marshall Islands	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/5 17%	Marshall Islands	2019	U
Micronesia	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/5 17%	Micronesia	2019	U
Mongolia	Asia/Pacific SAR Plan	17/05/2019	~~APSAR/WG/5 73%~~ APSAR/WG/9 89%	Mongolia	2019	U
Myanmar	Asia/Pacific SAR Plan	6/07/2015	~~APSAR/WG/4 67%~~ APSAR/WG/9 69%	Myanmar	2019	U
Nauru	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 0%	Nauru	2019	U

States/facilities	Deficiencies			Corrective Action		
	Description	Date first reported	Remarks	Executing body	Target date	Priority **
Nepal	Asia/Pacific SAR Plan	6/07/2015	~~APSAR/WG/7 56%~~ APSAR/WG/9 66%	Nepal	2019	U
New Caledonia	Asia/Pacific SAR Plan	17/05/2019	APSAR/WG/8 78%	New Caledonia	2019	U
Pakistan	Asia/Pacific SAR Plan	17/05/2019	~~APSAR/WG/8 89%~~ APSAR/WG/9 89%	Pakistan	2019	U
Palau	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/5 17%	Palau	2019	U
Papua New Guinea	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/7 54%	Papua New Guinea	2019	U
~~Philippines~~	~~Asia/Pacific SAR Plan~~	~~6/07/2015~~	~~APSAR/WG/8 86%~~ APSAR/WG/9 90%	~~Philippines~~	~~2019~~	~~U~~
Samoa	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 0%	Samoa	2019	U
Solomon Islands	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 0%	Solomon Islands	2019	U
Sri Lanka	Asia/Pacific SAR Plan	17/05/2019	~~APSAR/WG/8 83%~~ APSAR/WG/9 84%	Sri Lanka	2019	U
Thailand	Asia/Pacific SAR Plan	17/05/2019	~~APSAR/WG/8 82%~~ APSAR/WG/9 85%	Thailand	2025	U
Timor-Leste	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 0%	Timor-Leste	2019	U
Tonga	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 70%	Tonga	2019	U
Tuvalu	Asia/Pacific SAR Plan	28/05/2022	APSAR/WG/7 0%	Tuvalu	2024	U
Vanuatu	Asia/Pacific SAR Plan	6/07/2015	APSAR/WG/4 0%	Vanuatu	2019	U

States/facilities	Deficiencies				Corrective Action		
	Description	**Date first reported**	**Remarks**		**Executing body**	**Target date**	**Priority** **
	Non Provision of Safety-related Data Requirement of Paragraph 3.3.5.1 of Annex 11 (provision of data for monitoring the height-keeping performance of aircraft) and APANPIRG Conclusion 16/6 – Non Provision of safety related data by States						
Afghanistan	Non-provision of safety related data	12/07/2019	Failure to submit Kabul LHD data for January-December 2018 and 2020. Afghanistan had submitted data for the period January to July 2021, but no further LHD reports were received after August 2021.		Afghanistan	~~RASMAG/27~~ TBD	U
French Polynesia	Non-provision of safety related data	RASMAG/29	Failure to submit Tahiti's LHD data for January-December 2023.		French Polynesia	RASMAG/30	U
	State Responsibility to comply with the Annex 6 Height-Keeping Monitoring Requirement Annex 6 Part I Section 7.2.9 (10th Ed.) and Part II Section 2.5.2.10 (9th Ed.)						
Afghanistan	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/23	Remaining monitoring burden of 50% (RASMAG/29) MAAR informed ICAO that all known airframes in Afghanistan have complied with the monitoring requirement (November 2022). Deficiency retained due to the unknown status of the Afghanistan aeronautical authority responsible for ensuring monitoring is conducted.		Afghanistan	~~RASMAG/24~~ TBD	A

States/facilities	Deficiencies			Corrective Action		
	Description	Date first reported	Remarks	Executing body	Target date	Priority **
India	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/29	Remaining monitoring burden of 48% (RASMAG/29)	India	TBD	A
Mongolia	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/28	Remaining monitoring burden of 43% (RASMAG/28) Remaining monitoring burden of 18% (RASMAG/29)	Mongolia	TBD	A
Nepal	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/28	Remaining monitoring burden of 45% (RASMAG/28) Remaining monitoring burden of 45% (RASMAG/29)	Nepal	TBD	A
New Zealand	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/28	Remaining monitoring burden of 36% (RASMAG/28) Remaining monitoring burden of 11% (RASMAG/29)	New Zealand	TBD	A
Pakistan	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/22	Remaining monitoring burden of 45% (RASMAG/26) Remaining monitoring burden of 27% (RASMAG/29)	Pakistan	RASMAG/24	A
Papua New Guinea	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/28	Remaining monitoring burden of 69% (RASMAG/28) Remaining monitoring burden of 15% (RASMAG/29)	Papua New Guinea	TBD	A
Philippines	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/29	Remaining monitoring burden of 40% (RASMAG/29)	Philippines	TBD	A
Solomon Islands	Non-compliance with LTHM requirement (remaining monitoring burden more than 30%)	RASMAG/28	Remaining monitoring burden of 50% (RASMAG/28) Remaining monitoring burden of 0% (RASMAG/29)	Solomon Islands	TBD	A
	Data Link Performance Monitoring and Analysis Requirements of Paragraph 2.28 and/or 3.3.5.2 of					

States/facilities	Deficiencies			Corrective Action		
	Description	Date first reported	Remarks	Executing body	Target date	Priority **
	Annex 11 not met					
India	Post-implementation monitoring not implemented	13/07/2017	Performance monitoring and analysis was reported for the Chennai and Kolkata FIRs, but was not reported for the Mumbai FIR.	India	TBD	A
~~Maldives~~	~~Post-implementation monitoring not implemented~~	~~29/5/2015~~	~~Problem Reports not provided to CRA. Performance monitoring and analysis not reported to FIT.~~ (FIT-Asia/14): Disabled the ADS-C function from the ATM system due to an application issue, and CPDLC/HF is used beyond VHF coverage.	~~Maldives~~	~~TBD~~	~~A~~

** Note: In accordance with the *APANPIRG Handbook - Asia/Pacific Supplement to the Uniform Methodology for the Identification, Assessment and Reporting of Air Navigation Deficiencies*, priority for Air Navigation Deficiencies is guided by the principle that a deficiency with respect to an ICAO Standard is accorded a "U" status, while a non-compliance with a Recommended Practice or a PANS is considered as "A" or "B" subject to additional expert evaluation. The final prioritization of deficiencies is the prerogative of APANPIRG.

ATM Sub Group of APANPIRG ― TASK LIST

The priorities assigned in the list have the following connotation:

A = Tasks of a high priority on which work should be expedited; and
B = Tasks of a medium priority on which work should be undertaken as soon as possible but not to the detriment of Priority "A" tasks.

(Last update September 2024, amendments are shown in highlight*)*

ACTION ITEM & PRIORITY	DESCRIPTION	TARGET DATE	RESPONSIBLE PARTY	STATUS	REMARKS
18/8 **Priority A**	**Identify and manage Deficiencies in the ATM, AIS and SAR fields** a) Develop and maintain Deficiencies list, b) Identify unimplemented items in the ANP, c) Assist States to correct deficiencies, d) Promote timely resolution of safety-critical items identified by APANPIRG	ONGOING	**Functional Responsibility:** No specific working group established, all parties have responsibilities in this area (States, Users, International Organisations, Regional Office, ATMSG APANPIRG)	OPEN	

ACTION ITEM & PRIORITY	DESCRIPTION	TARGET DATE	RESPONSIBLE PARTY	STATUS	REMARKS
18/9 **Priority B**	**SAR Matters** Assist appropriate provision of SAR facilities, services and procedures within the Asia Pacific Region by: a) Periodic review of SAR facilities, services and procedures in the region, b) Encourage States to delegate or negotiate SAR services, c) Asia/Pacific SAR Plan Assessment be kept up to date and distributed to States for information and action., d) Asia/Pacific "Register of SAR Agreements" be kept up to date and distributed to States for information and action	ONGOING	States, Regional Office, APSARWG ATM/SG APANPIRG	OPEN	States to update the ATM/SG and APSAR/WG each year on SAR capability
22/1 **Priority B**	**Review and Update the Asia/Pacific Route Catalogue**	On-going	IATA, ATM Coordination Groups, ATM/SG	OPEN	
5/5	Phase 2 of the Alphanumeric Call Sign Project report to ATM/SG/7	ONGOING	IATA/States/ CANSO/ACI	Open	ATM/SG/10 WP/22 ATM/SG/9 update: *Conclusion APANPIRG/31/11* urged aerodrome operators, in coordination with CANSO and ACI, to consider a trial to identify and overcome barriers, with a view to

ACTION ITEM & PRIORITY	DESCRIPTION	TARGET DATE	RESPONSIBLE PARTY	STATUS	REMARKS
					developing a project for the APAC Region.
5/8	Follow-up on Mumbai/Mogadishu/Seychelles FIR route PfA	~~SAIOSEAG/3~~ SAIOSEAG/4	India, ICAO	Open	Coordinate with ICAO ESAF and States.
9/3	Follow up on Fukuoka/Khabarovsk FIR boundary discrepancy	~~2024(TBA)~~ 2025(TBA)	ICAO	Open	~~ATM/SG/9 report 5.48~~ ~~Update 21/10/22: Meeting planned tentative November 2022.~~ Update 5/10/23: Meeting TBA
9/7	Review Regional ATM Contingency Plan	~~ATM/SG/12~~ ATM/SG/13	ICAO/IATA Australia Nepal	Open	ATM/SG/9 report 6.57 ATM/SG/12 Report para 6.7
10/4	Explore option of conducting a workshop on the classification of airspace, and seek information from States in order to compile guidance in the form of a checklist of considerations in determining airspace classification	~~ATM/SG/12~~ ATM/SG/13	ICAO, States? Nepal	Open	ATM/SG/10 report 5.66
10/5	Develop SEI (Alphanumeric Call Signs) for consideration for inclusion in the APAC RASP. Consider inclusion of related regional planning element in the Seamless ANS Plan	~~ATM/SG/12~~ ATM/SG/13	ICAO, RASG SEI WG	Open	ATM/SG/10 report 5.74
10/7	Conduct workshop on Safety Management and	~~2024~~ 2025	USA (facilitator) Australia, Hong	Open	ATM/SG/10 report 8.6, 8.7

ACTION ITEM & PRIORITY	DESCRIPTION	TARGET DATE	RESPONSIBLE PARTY	STATUS	REMARKS
	Positive Safety Culture in ATM		Kong China, India, Japan, Malaysia, Nepal, Other States? IATA, IFALPA, ICAO		
10/8	Arrange a meeting to discuss implementation of 20 NM longitudinal spacing on L642 M771	~~November 2022~~ 2024(TBA)	China, Hong Kong China, Singapore, Viet Nam ICAO	~~Open~~ Completed	Timing subject to administrative issues or restrictions
11/1	Coordinate with ICAO HQ for RPAS-specific separation under development	ATM/SG/12	ICAO	~~Open~~ Completed	ATM/SG/11 report 5.46
11/2	Encourage airspace users to equip ADS-C/CPDLC, RNP2/4 and RSP180 RCP240 capabilities in Indian oceanic airspace	ATM/SG/12	India, IATA	~~Open~~ Completed	ATM/SG/11 report 5.57 & 6.16
11/3	Examine the global practices and guidance for A-MAN, D-MAN, S-MAN and Extended A-MAN (X-MAN) integration and report to the ATM/SG/12	~~ATM/SG/12~~ ATFM/SG/15	ICAO	Open	ATM/SG/11 report 5.84
11/4	Conduct a workshop on Training for ATC	ATM/SG/12	ICAO (RSO)	~~Open~~ Completed	ATM/SG/11 report 5.96
11/5	Coordinate with the AGA section of the ICAO Asia/Pacific Regional Office on the possibility of conducting a workshop on the Aerodrome operation, including Runway Safety	~~ATM/SG/12~~ ATM/SG/13	ICAO (RO/ATM and RO/AGA)	Open	ATM/SG/11 report 5.102

ACTION ITEM & PRIORITY	DESCRIPTION	TARGET DATE	RESPONSIBLE PARTY	STATUS	REMARKS
11/6	Participate in APICS 2023	APICS2023	States/Administrations and IOs	~~Open~~ Completed	ATM/SG/11 report 5.120
11/7	Provide NOPAC Route System Redesign information for BOBTFRG and SAIOSEAG	~~BOBTFRG/6~~ SAIOSEACG/4	Japan, USA	Open	ATM/SG/11 report 6.18
11/8	Coordination with AAC WS3 on the CADENCE contingency OIS for use in desk-top exercise.	06 Oct 2023	CANSO, ICAO	~~Open~~ Completed	
11/9	Participate in the CADENCE's Contingency desk-top exercises	ATM/SG/12	Australia, CANSO, Japan, USA, Philippines, Singapore, New Zealand, Indonesia, Malaysia, IATA, ICAO	~~Open~~ Completed	ATM/SG/11 report 6.41
11/10	Coordinate with ICAO HQ on 5LNCs' pronunciation difference issue	ATM/SG/12	ICAO	~~Open~~ Completed	ATM/SG/11 report 6.46
11/11	Continue to improve AKARA airspace safety and efficiency through bilateral or if necessary multilateral meetings, and coordinate with the TWG secretariat if necessary.	~~ATM/SG/12~~ ATM/SG/13	China, Republic of Korea	Open	ATM/SG/11 report 6.60 and 6.61
11/12	Conduct a face-to-face meeting of the SVLRC SWG and validation desk-top exercise	November 2023	ICAO (SVLRC SWG)	~~Open~~ Completed	ATM/SG/11 report 6.67
11/13	Coordinate with ICAO HQ on regional TIBA frequency and promulgation in the Regional Supplementary Procedures (Doc 7030)	ATM/SG/12	ICAO	~~Open~~ Completed	ATM/SG/11 report 6.75

ACTION ITEM & PRIORITY	DESCRIPTION	TARGET DATE	RESPONSIBLE PARTY	STATUS	REMARKS
11/14	Coordinate with ICAO HQ on the feasibility of AIP AD1.2.3	~~AAITF/19~~ AAITF/20	ICAO	Open	ATM/SG/11 report 7.6
11/15	Review the updated APAC use cases and user requirements for SWIM-based MET information services supporting ATFM	ATFM/SG/14 and MET/R WG/13	States/ Administrations	~~Open~~ Completed	ATM/SG/11 report 7.52
11/16	Provide State Letters for: SVLRC SWG face-to-face meeting; FF-ICE ad hoc group; and Data Analytics ad hoc group	13 Oct 2023 (SVLRC) 31 Nov 2023	ICAO, FF-ICE ad hoc group, Data Analytics ad hoc group (Singapore)	~~Open~~ Completed	ATM/SG/11 report 3.62, 5.76 & 6.67
12/1	Discuss the appropriate section to include GNSS interference reporting procedures in the AIP	AAITF/20	ICAO	Open	ATM/SG/12 Report para 5.30
12/2	Request for relevant ATM and CNS technical experts to attend the various ATM/CNS meetings of SWIM, TBO, FF-ICE and ATFM	ATM/SG/13	ICAO	Open	ATM/SG/12 Report para 5.45
12/3	Coordinate with ICAO ANB on guidance document for visual approach for parallel runways	ATM/SG/13	ICAO	Open	ATM/SG/12 Report para 8.4
12/4	Submit an Information Paper on the risk analysis of aircraft deviation from the planned route	RASMAG/30	China	Open	ATM/SG/12 Report para 8.14

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