International Civil Aviation Organization

Thirteenth Meeting of the Air Traffic Management Sub-Group (ATM/SG/13) of APANPIRG

Singapore, 25 – 29 August 2025

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

OUTCOMES OF CNS SG/29

(Presented by ICAO Secretariat)

SUMMARY

This paper presents the latest outcomes of significant discussions held in various CNS contributory bodies meetings on different matters in the CNS area under the CNS SG umbrella that may interest the ATM Sub-group.

1. INTRODUCTION

1.1 The Twenty-Ninth Meeting of the Communications, Navigation and Surveillance Sub-group (CNS SG/29) of APAC Air Navigation Planning and Implementation Regional Group (APANPIRG) was held at the ICAO APAC Regional Office, Bangkok, Thailand, from 16-20 June 2025. The Meeting was attended by **100** participants from **23** Member States/Administrations, **2** International Organizations and **3** industry partners. The Meeting was chaired by Mr. M H Hui, Assistant Director-General of Civil Aviation, Civil Aviation Department, Hong Kong China. Key documents of the meeting can be accessed at: https://www.icao.int/APAC/Meetings/Pages/2025-CNS-SG-29.aspx.

1.2 The ICAO Asia/Pacific System-Wide Information Management (SWIM) Seminar 2025 was held on **19 May 2025** at the ICAO Asia and Pacific Regional Office, Bangkok, Thailand. The theme of the Seminar was **Establishing SWIM – A Key Enabler for FF-ICE**. The Seminar was attended by **100** participants from **19** States/Administrations**, 3** International Organizations and **1** industry partner. The SWIM Seminar report and presentations can be accessed by this link.

1.3 The Tenth Meeting of the System Wide Information Management Task Force (SWIM TF/10) was held from **20 – 23 May 2025** in the ICAO APAC Regional Office, Bangkok, Thailand. The Meeting was attended by **109** participants from **23** States/Administrations**, 2** International Organizations and one industry partner. The SWIM TF/10 meeting report, working papers, information papers, and other resources can be accessed by the following link: https://www.icao.int/APAC/Meetings/Pages/2025-SWIM-Seminar-and-SWIM-TF10-SIPG2.aspx

1.4 The First Working Session of the SWIM Implementation Pioneer Ad-Hoc Group (SIPG WS/1) was held from **14 to 17 January 2025** in the ICAO Asia Pacific Regional Office, Bangkok, Thailand. The meeting was attended by **51** Participants from **13** States/Administrations and **2** International Organizations. The Working Session report and presentations can be accessed at: https://www.icao.int/APAC/Meetings/Pages/2025-SWIM-SIPG-Working-Session.aspx

1.5 The Second Working Session of the SWIM Implementation Pioneer Ad-Hoc Group (SIPG WS/2) was held from **26 to 30 May 2025** in the ICAO Asia Pacific Regional Office, Bangkok, Thailand. The meeting was attended by **64** Participants from **20** States/Administrations and **2** International Organizations. The Working Session report and presentations can be accessed at: https://www.icao.int/APAC/Meetings/Pages/2025-SWIM-Seminar-and-SWIM-TF10-SIPG2.aspx

1.6 This paper summarizes relevant information and updates that may be of interest for the ATM SG Meeting.

2. DISCUSSION

Election for Co-Chairs

2.1 Mr. M H Hui, Assistant Director-General of Civil Aviation, Civil Aviation Department, Hong Kong China, was unanimously elected as a Co-Chair of CNS SG of the APANPIRG.

Updates of APAC ANSP Committee

2.2 As the Secretary of the APAC ANSP Committee (AAC) could not attend the CNS SG/29 Meeting, the Meeting requested all Work Stream Leads or key contributors to share updates about the progress made by AAC from 2024-25.

2.3 Hong Kong China reported the progress of various tasks of Work Stream-1 (WS/1). It was reported that 4 out of 9 tasks agreed by WS/1 have already been completed. With respect to Task 2, two workshops were held in China in 2024, and one more workshop is planned for September or October 2025 in Chengdu, China. It was added that for Task 4, China, Singapore, and Thailand reached an agreement to start the cross-border trials with ATFM on SWIM. For Task 9, Hong Kong China has developed a template for the "Library of Guidance Material for Planning, Procurement and Implementation of ANS Systems." For Tasks 3 & 7, AEROTHAI has held the "Next Wave APAC Aviation Technologies through Synergy" Workshop on 17-21 February 2025, which aimed to explore new technology for regional ANS modernization and share experiences and best practices for ANS procurement and whole life management. It was noted that an "Asia Pacific ANS Life Cycle Management Survey" is being prepared to gather experiences and best practices from all AAC members.

2.4 Thailand provided an update on the progress of Workstream 2 (WS/2). The Meeting was informed that WS/2 focused on four key tasks. For Task 1, to review the current landscape and exploration of approaches to facilitate more effective implementation of ANS, notable initiatives under consideration include the proposal to establish a Next-Generation ATFM Working Group to develop a long-term vision and associated principles for regional ATFM operations, a gate-to-gate efficiency study, and the development of a regional data management framework. For Task 2, collaboration to establish key TBO building blocks, including SWIM and FF-ICE, in support of TBO development and implementation in the APAC region, the APAC TBO Pathfinder project is a key initiative, and its details were provided in IP/02. For Task 3, collaboration on the implementation of additional operational concepts, including remote towers, User-Preferred Routes (UPR), and Free Route Airspace (FRA), is being done, and for Task 4, provision of support to APAC ANSPs to strengthen their ATFM capabilities, with the overall objective of enabling broader and more active participation in the APAC Cross-Border Multi-Nodal ATFM Collaboration (AMNAC), in alignment with the ICAO "No Country Left Behind" initiative, is in progress.

2.5 USA shared information about the progress made in Work Stream-3 (WS/3) after the CNS SG/28 Meeting. It was informed that WS/3 is focused on delivering an enhanced Asia/Pacific Regional Contingency Framework (i.e., Version 4.0), including "how to" on coordination procedures and exercises of operational contingency plans for continuity of service. The Meeting noted that the current Asia/Pacific Region ATM Contingency Plan Version 3.0 needed a complete overhaul. WS/3 members have partnered with the ANB Regional Coordinator, ICAO Headquarters and the Regional Officer ATM of the ICAO APAC Regional Office in the development and delivery of a new regional contingency framework. It was informed that the draft Asia/Pacific Region ATM Contingency Plan Version 4.0 was delivered to ICAO Headquarters in June 2024 as part of the ICAO APAC/MID ATM Contingency Planning Workshop and APAC ATM Contingency Tabletop Exercise event. Since then, the members of WS3 have continued to meet monthly while waiting for the return of the draft framework to continue their efforts. It was added that WS/3 is waiting for the final version of the new contingency arrangement framework from ICAO Montreal. It was informed that recently, WS/3 members contacted the ICAO APAC Regional Office and proposed facilitating an APAC contingency arrangements workshop in October-November 2025. However, the ICAO APAC Regional Office suggested deferring to this event until the global framework is finalized.

2.6 India was requested to share the updates of Work Stream 4 (WS/4), if possible. India shared information about Continuous Climb and Descent Operations in India, while updates on WS/4 were not shared during the meeting.

Review Report of Tenth Meeting of System Wide Information Management Task Force (SWIM TF/10) – Sec (WP/06)

2.7 The paper presented the report of the Tenth Meeting of the System Wide Information Management Task Force (SWIM TF/10) held from 20 – 23 May 2025 in the ICAO APAC Regional Office, Bangkok, Thailand.

2.8 For the SWIM TF Co-Chair election, no nomination was received at the Meeting. As a result, the position remains vacant. It was suggested that the election be held again at a future SWIM TF Meeting.

2.9 The SWIM TF/10 Meeting reviewed SIPG's discussions on Internet connectivity options for the Asia/Pacific SWIM, which was in line with the SWIM TF's mandate to build SWIM over CRV and other IP-based networks, including the Internet. Three architecture options were considered: Option 1 was to have one or more Edge EMSs connected to the CRV as well as the Internet. The Edge EMS can then publish and consume services from both the Internet and CRV. Option 2 was to have the SWIM TI constructed over both the CRV and the Internet. Each Gateway EMS provider will need to span the Gateway EMS over both CRV and the Internet with an appropriate security mechanism to segregate between the two zones. Option 3 was to have the CRV service provider also provide the connectivity to the Internet. SWIM TF/10 agreed to further evaluate Options 1 and 2, with a preference for Option 1 as an early implementation path. SIPG was tasked with defining the functionalities and requirements for Edge and Gateway EMSs to guide States. Further discussion on Option 2's routing implications was also planned.

2.10 It was noted that SWIM TF/10 discussed and adopted the following **4 recommendations** on SWIM transition in the APAC region, which were raised by SIPG:

Recommendation 1: Reach out to relevant expert groups that govern the various data types being transmitted on AMHS for their SWIM migration strategy and proposed sunset date. (e.g., AAITF, FF-ICE ad-hoc group, MET/IE, ATFM ad-hoc group, etc.).

Recommendation 2: Work closely with the ACSICG AMHS and the SWIM Transition Group to map out a transition plan together. One topic of interest is the need for AMHS to SWIM conversion and how that should be managed.

Recommendation 3: Consider the possible use of any other data formats, in addition to AIXM, FIXM, and IWXXM, in the Asia-Pacific SWIM. This is to enable existing data to be quickly onboarded onto SWIM. The ATM Information Reference Model should be used to maintain semantic interoperability.

Recommendation 4: Inform the ATM Automation Systems Task Force (ATMAS TF) of the need for ATM automation systems to be SWIM compatible.

2.11 For Recommendation 1, the SWIM TF/10 Meeting was informed that the ATFM SG/14 meeting endorsed the draft conclusion, which was later adopted by APANPIRG/35 as Conclusion APANPIRG/35/4, on the adoption of FIXM v4.3 as the standard format for cross-border ATFM information exchange in the SWIM environment from Q3/2026.

Outcomes of the APAC Common SWIM Aeronautical Information Services Ad Hoc Group – APAC Common SWIM AIS Ad Hoc Group (WP/12 of SWIM TF/10)

2.12 In the SWIM TF/10 Meeting, the APAC Common SWIM AIS Ad Hoc Group presented the outcomes of the discussions held within the Ad Hoc Group. It was informed that experts from several States and international organizations, including IATA, IFAIMA, and ICAO, actively participated in these discussions. Additionally, India contributed an aerodrome expert through the Aerodrome Operations and Planning Sub-Group (AOP/SG) to participate in this task. The group convened **five meetings**, during which it reached consensus on an initial set of services. To facilitate clearer and more focused discussions, the Ad Hoc Group organized the topic into **four** subject areas: airspace-related information, aerodrome-related information, digital NOTAMs, and ATIS and SAR-related information.

2.13 The CNS SG/29 Meeting was informed that the Ad Hoc Group discussed and agreed to adopt ***AIXM 5.1.1 as the common regional version for APAC***. The group also proposed clearer definitions for prohibited area information, replacing the term "Airspace availability" with "Availability or activation/deactivation or temporarily change of airspace" to enhance understanding. They further proposed expanding the definition of airspace types included in the Airspace Feature Service. Additionally, the group agreed to include REQ/REP as an additional message exchange pattern for the Airspace Management Service. Furthermore, the Ad Hoc Group agreed to include a remark referencing the consideration of Free Route Airspace (FRA) and User Preferred Route (UPR) information in future planning.

2.14 It was added that the group decided to retain Runway Condition Report Service due to operational importance, despite not being able to make redundancies with SNOWTAMs. It also agreed to include REQ/REP as an additional message exchange pattern for Aerodrome Feature Service and Digital NOTAM Distribution Service. Besides, the Ad Hoc Group agreed that both ATIS Distribution Service and Search and Rescue Service should be considered for implementation in a future phase, as the information exchange model and message types are yet to be defined and are currently marked as 'TBD'.

2.15 The CNS SG/29 Meeting noted that matters relating to the Search and Rescue (SAR) service were to be discussed at the Asia and Pacific Search and Rescue Working Group (APSAR/WG) meeting, scheduled for 27–30 May 2025. The ICAO Secretariat of APSAR/WG will inform SWIM TF of any proposed changes arising from the APSAR/WG discussions. It was added that the outcomes will be reported to relevant meetings, including AAITF/20, AOP/SG/19, and ATM/SG/13.

Business functionality of APAC Common SWIM Information Services – Hong Kong China (WP/11 of SWIM TF/10)

2.16 This paper presented the updates on the work of the SWIM TF Task 6 team on Information Services to identify the business functionality to be supported by APAC Common SWIM Information Services for addressing the operational needs in APAC. The Meeting recalled the development of the list of business functionalities for APAC Common SWIM Information Services, along with a recommendation to apply **a three-level prioritization scheme**. It was further noted that SWIM TF/9 agreed for SWIM TF Task 6 lead and relevant experts to present the draft list for coordination with expert groups, including AAITF, APSAR/WG, ATFM SG, FF-ICE Ad-hoc Group, MET/IE WG and SURICG.

2.17 The SWIM TF/10 Meeting was informed that the MET SG/28 meeting held on 8-12 July 2024 reviewed and provided corrections to the proposed business functionalities of APAC Common Meteorological Information Services. In addition, the Second Asia/Pacific FF-ICE Ad-hoc Group Meeting and Workshop (FF-ICE/2) held from 18-20 March 2025 reviewed and updated the list of APAC Common SWIM Flight Information Services related to FF-ICE.

2.18 MET/IE WG/23 held from 25-28 March 2025 identified that subsequent updates to the list of APAC Common SWIM Meteorological Information Services would be required to reflect outcomes from the recent METP/6 Meeting and suggested that the information service priorities be revisited. MET/IE WG/23 agreed that the proposed updates be prepared for further review and consideration by the SWIM TF, including consistent use of the term “information service”.

2.19 SURICG/10 held from 21-23 April 2025, reviewed the list and recognized that SURSG’s inputs may be valuable for the finalization of the list. The list was modified and further consulted with SURSG/4 delegates by email. After incorporating all inputs, the final list of APAC Common SWIM Surveillance Information Services was prepared by the SURICG/10 meeting for consideration by the SWIM TF/10.

2.20 ATFM SG/15 held from 29 April to 2 May 2025 reviewed the portion of APAC Common SWIM Flight Information Services, specifically the “ATFM/A-CDM integrated service” and “Traffic flow status service”. The ATFM SG/15 meeting advised that the terminology used in the list be further verified against the draft PfA of future PANS-ATM (Doc 4444). The ATFM SG/15 meeting agreed to provide a revised list to the SWIM TF/10 meeting. The updates to APAC Common SWIM Flight Information Services related to ATFM and A-CDM, developed by the ATFM SG, were presented as part of WP/32.

2.21 The SWIM TF/10 Meeting recalled the information shared at SWIM TF/9 that IMP is working on an Information Service Definition (ISD) template for subject-matter-expert Panels, e.g., ATMRPP, METP, to develop domain-specific ISDs. It was suggested that the progress of these works in the IMP, ATMRPP, and METP is monitored to align regional descriptions with the global guidance. While considering the need to develop an APAC version of ISDs for some of the APAC Common SWIM Information Services, the Task 6 team will assess whether the necessary ISDs are covered by the templates/guidance developed at the global-level Panels and indicate this information in a new column of the table for APAC Common SWIM Information Services.

2.22 It was added that the first version of the list of APAC Common SWIM Information Services will be incorporated into the APAC SWIM Implementation Guidance Document being developed.

2.23 The SWIM TF/10 Meeting reviewed the proposed initial set of APAC Common SWIM Information Services, as reviewed and updated by MET SG/28, FF-ICE/2, MET/IE WG/23, and SURICG/10. It was added that the APAC Common SWIM Aeronautical Information Services Ad-hoc Group also reviewed and provided updates to the APAC Common SWIM Aeronautical Information Services as presented by WP/12.

2.24 The publication of services with incomplete fields was discussed at length. Various suggestions were considered, including creating a separate table for such services, excluding them from the first version of the list, or including all services with a footnote explaining the presence of "TBD" or "?". After detailed deliberation, it was agreed that the **first version of the APAC Common SWIM Information Services list will include only those services for which complete information is provided**. Services containing "TBD" or "?" fields will be excluded from the first publication. However, these services will be retained as the working draft for further refinement and reviewed in the future SWIM TF meetings, following coordination with relevant expert groups. **ACTION ITEM 10-4** As a result, the following services were removed:

Table 1: List of APAC Common SWIM Information Services Removed from the First Adopted Version

APAC Common SWIM Aeronautical Information Services		
1.	ATIS distribution service	Provides continuous and automated broadcast of recorded aeronautical information in airport and terminal areas.
2.	Search and rescue service	Allows Rescue Coordination Centres (RCCs) to exchange information with neighbouring RCCs and ATS units for coordination during SAR operations.
APAC Common SWIM Flight Information Services		
3.	ADP Distribution Service	Supports publication and distribution of ATFM Daily Plan (ADP), based on information included in the APAC ADP Exchange Procedure[1]. The published ADP is designed to inform for stakeholders on upcoming demand/capacity constraints and possible ATFM measures.
4.	Flow-Specific ATFM Measure Service	Supports *notification* of information related to "flow-specific" ATFM measures, i.e. measures whose control mechanisms apply to a "group of flights" on a particular traffic flow. An example is the Minutes-in-Trail (MINIT) requirement applied on an eastbound traffic using A1 from VT*, VV* to RK*. Recipients of this information should take actions to comply with the ATFM measure contained herein.[2]
APAC Common SWIM Meteorological Information Services		
5.	Special Air Report (ARS) Service	Provides reports of special observations made by aircraft when they encounter special weather phenomena, such as moderate/severe turbulence or icing. (Note: Currently, there is no plan to implement this information service at the MET Panel)

[1] The ADP template included herein is not updated. The new ADP template had been agreed by the AMNAC group and included into the AMNAC COP v6.1, Appendix D, and was proposed to the ATFM/SG/15 (Apr-May 2025). The meeting agreed that the Secretariat will update the ADP Exchange Procedure to include the new template, which has already been supplied by AMNAC core team post-meeting.

[2] Common operating procedures for this group of ATFM measures (e.g., MINIT, MIT, MDI, Re-Route, Level Capping) have not been developed for the APAC region yet, and should be developed before finalizing the information service to support the operations.

6.	MET derived from Mode S DAPs Service	Provides upper air winds and temperatures derived from Mode S Downlinked Aircraft Parameters (DAPs) (e.g., true airspeed, ground speed, magnetic heading, true track angle) and facilitates exchange of derived winds and temperatures among MET service providers.

2.25 It was noted that the information exchange model identified for one of the APAC Common SWIM Surveillance Information Services is ASTERIX Cat 21+FPL (payload in JSON or RAW format. It was highlighted at the Meeting that the RAW format of FPL does not exist. The ICAO Secretariat was requested to share this observation with SURSG for further review and clarification. **ACTION ITEM 10-5**

2.26 Regarding the suggestion in WP/19 to include a reference for each information service as part of the Task 6 activities, the Meeting discussed the value and potential benefits of the proposal. It was also considered whether such a reference should be added in a separate column or integrated into an existing one. After detailed deliberation, the Meeting agreed to the proposal and requested Task 6 leads to include reference(s) for each information service in the brief description column, where such information is available. **ACTION ITEM 10-6**

2.27 The updates provided by FF-ICE/2 to add REQ/REP in some APAC Common SWIM Flight Information Services were discussed. To support harmonized service implementation, the Meeting highlighted the need for clarification on how REQ/REP should be implemented. Particularly, the distinction between synchronous REQ/REP and asynchronous REQ/REP was noted as essential for facilitating discussion within the FF-ICE Ad-Hoc Group. Accordingly, SIPG, together with China, Japan, and the Republic of Korea, was requested to develop a clear explanation and guidance for further review and discussion of the FF-ICE Ad-Hoc group. **ACTION ITEM 10-7**

2.28 The SWIM TF/10 Meeting recommended that States/Administrations submit suggestions regarding any services to the relevant expert groups. Any subsequent modifications to services, if deemed necessary by the expert groups, could then be proposed to the SWIM TF for consideration at its future meetings.

2.29 The SWIM TF/10 Meeting conducted a detailed review of each service included in the list of APAC Common SWIM Information Services. It was observed that the services were described at varying levels of granularity. For instance, some services within a particular information domain appeared to be divisible into multiple distinct services. The Meeting also noted differing levels of understanding among expert groups regarding SWIM information services and the information required to be filled in the template. However, it was agreed that the review activity undertaken by the relevant expert groups has enhanced overall understanding and supported the groups in visualizing SWIM services in their respective future aviation concepts.

2.30 The SWIM TF/10 Meeting discussed a need for clear guidance to States/Administrations on the proposed first version of Common SWIM Information Services, which is considered a guidance document for States/Administrations to support their SWIM development and implementation. Additionally, it was agreed that clarification as proposed in Flimsy/04 of SWIM TF/10 should also be provided as part of the first version of the list to ensure the same understanding on the use of these APAC Common SWIM Information Services.

2.31 The SWIM TF/10 Meeting discussed various proposals to improve the APAC Common SWIM Information Services list. Australia consolidated the key suggestions for enhancement into Flimsy/02 and proposed that APANPIRG subsidiary bodies regularly review the APAC Common SWIM Information Services document and notify the SWIM TF of any new or changes to existing business requirements for APAC Common SWIM information services. A draft conclusion was proposed for these proposed requirements. In addition, by Flimsy/04, Australia proposed that the SWIM TF adopt a Draft Decision to clarify that, based on the business requirements articulated by Expert Groups to date, the SWIM TI being designed and provisioned at this time is not specified to support the provision of aircraft separation.

2.32 The SWIM TF/10 Meeting suggested that Task 6 Leads consider information shared in Flimsy/02 and draft a guidance document to provide better instructions for other contributory bodies in reviewing and updating the list of APAC Common SWIM Information Services if deemed necessary. It was also suggested that other APANPIRG contributory bodies regularly review the APAC Common SWIM Information Services document and notify the SWIM TF of any new or changes to existing business requirements for APAC Common SWIM information services. These suggestions were agreed to be communicated as part of the guidance document to be developed. **ACTION ITEM 10-8** ICAO Secretariat was requested to coordinate with other contributory bodies on the proposed regular review process, sharing the significance of the updated APAC Common SWIM information services. **ACTION ITEM 10-9**

2.33 The list of APAC Common SWIM Information Services finalized by the SWIM TF/10 Meeting is provided in **Appendix A**. The SWIM TF/10 Meeting agreed to publish the list as the first version and present the revised list for consideration by CNS SG/29 through the following Draft Decision and subsequent adoption by APANPIRG/36. The proposed decision was adopted by the CNS SG/29 Meeting. After APANPIRG/36's adoption of the proposed Draft Decision, the list of APAC Common SWIM Information Services will be uploaded to the ICAO APAC e-document portal. **ACTION ITEM 10-10**

<table>
<tr><td colspan="3">Draft Decision CNS SG/29/06 (SWIM TF/10/02) - Adoption of APAC Common SWIM Information Services, v1.0</td></tr>
<tr><td colspan="2">What: The first version of APAC Common SWIM Information Services, provided in Appendix A, is adopted for immediate use by APAC States/Administrations. The set of APAC Common SWIM Information Services and the associated performance of SWIM Technical Infrastructure underpinning these services are not specified to support the provision of aircraft separation.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To assist APAC States/Administrations in planning and implementing their SWIM information services.</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: 20-Jun-25</td><td colspan="2">Status: Draft to be adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☒Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other: MET SG, ATM SG, AOP SG</td></tr>
</table>

2.34 The SWIM TF/10 Meeting noted the Roadmap for Meteorology in SWIM (MET-SWIM Roadmap) adopted by the 6th Meeting of METP. It was agreed that forming an action or task to progress this work from an APAC perspective falls outside the scope of the SWIM TF. In addition, the Meeting discussed that the SWIM TF is not in a position to comment on the possible options of the SWIM aggregator for MET information services, as the discussion is still ongoing at the global level. It was considered that such evaluations would be appropriately conducted by relevant operational experts/user groups. The SWIM TF/10 Meeting was also informed that METP has endorsed a guideline for MET-SWIM Implementation, which will be distributed to the PIRGs to support SWIM Implementation.

2.35 The SWIM TF/10 Meeting was informed about the modified version of the hierarchical architecture, with a limited number of Gateway EMSs, optimized multi-connections between Gateway EMSs and redundant connections between Gateway EMS and Edge EMS. Based on this architecture, ANSPs will be required to deploy the Gateway EMS on a separate device from their internal EMS. This configuration was presented as an effective model as it effectively transforms the ANSP's internal EMS into an Edge EMS, thereby fundamentally altering its operational dynamics and ensuring the integrity and security of the overall system architecture.

2.36 The SWIM TF/10 Meeting noted that to achieve SWIM implementation by 2030, APAC SWIM architecture needs to consider not only the Publish/Subscribe MEP but also the Request/Reply MEP. Given the current emphasis on the regional SWIM prototype architecture using an EMS being developed by SIPG in the APAC region, the primary issue is to discuss how the Request/Reply MEP should be implemented. The SWIM TF/10 Meeting was recommended to consider that future implementation of the Request/Reply MEP in APAC SWIM architecture should be strategically planned with API GW topology that reflects and complements the architectural direction of GEMS.

2.37 The SWIM TF/10 Meeting was presented with the update on FIXM version 4.3 Extension development, and the following draft conclusion was endorsed by the SWIM TF/10 Meeting for APANPIRG/36 adoption through CNS SG/29 endorsement. The CNS SG/29 Meeting endorsed the Draft Conclusion.

<table>
<tr><td colspan="3">Draft Conclusion CNS SG/29/07 (SWIM/TF/10/03) – Asia/Pacific Regional FIXM version 4.3 Extension</td></tr>
<tr><td colspan="2">What: The FIXM version 4.3 Extension described in SWIM/TF/10/WP30 be:
a) adopted as the Asia/Pacific FIXM version 4.3 Extension;
b) uploaded to the ICAO Asia/Pacific Regional Office website for use by Asia/Pacific Administrations to support cross-border ATFM operation, A-CDM, ATFM/A-CDM integration, and traffic synchronization; and
c) presented to the FIXM CCB for review and publication on the FIXM official website.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td colspan="2">Why: To provide the information exchange model necessary to support cross-border ATFM operation, A-CDM, ATFM/A-CDM integration, and traffic synchronization in the Asia/Pacific Region, in line with Conclusion APANPIRG/35/4.</td><td>Follow-up: ☐Required from States</td></tr>
<tr><td>When: 20-Jun-25</td><td colspan="2">Status: Draft to be adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☒Sub groups ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other: SWIM TF</td></tr>
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Review Report of the First and Second Working Sessions of the SWIM Implementation Pioneer Ad-Hoc Group (SIPG WS/1 and SIPG WS/2) – Sec (WP/07)

2.38 The SWIM Implementation Pioneer Ad-Hoc Group (SIPG) held two in-person working sessions—WS/1 in January 2025 and WS/2 in May 2025—to advance the Asia/Pacific regional SWIM prototype. Early discussions focused on information security under ICAO Doc 10204 (MAIS) and the Trust Framework Panel's (TFP) development of PKI guidance (ACCP and Trust Framework Implementation manuals). SIPG agreed to propose responsibilities for PKI rollout across safety-critical SWIM use cases, trial self-signed certificates, and inform the CRV Operations Group of certificate needs.

2.39 In-depth architecture debates contrasted with fully meshed and hierarchical models. After reviewing proposals by Singapore (SIPG lead), China, Japan, and CANSO, SIPG endorsed a modified hierarchical architecture that addresses prior demo-trial issues. Gateway EMS requirements were specified—messaging, routing, failover, high availability (> 99% uptime), and potential AMHS/SWIM conversion services—and Edge versus Gateway roles were clarified. Performance metrics (latency, throughput) and differentiated services code points (DSCP "AF21") for CRV traffic were also defined. Internet connectivity options were narrowed to an interim Edge EMS dual-connect model while longer-term approaches are refined.

2.40 SIPG also reviewed the transition challenges between AMHS and SWIM. Four recommendations were captured and adopted with refinement: engage expert groups on migration strategies and sunset dates (e.g., FIXM v4.3 adoption by Q3 2026), develop joint AMHS–SWIM transition plans with ACSICG, onboard additional data formats beyond AIXM/FIXM/IWXXM using the ATM Information Reference Model, and notify ATMAS TF of SWIM compatibility needs. Conflicting guidance on AFTN/AMHS versus direct SWIM adoption was noted as a source of State confusion.

2.41 At WS/2, SIPG prioritized eleven tasks—ranging from defining Edge/Gateway EMS functionality (Priority 1) to integration testing, performance measurement, and operationalization conditions (Priority 2–3). Trials of message-topic versus message-property routing, self-signed certificate continuation pending ACCP publication, and governance linkages were assigned to task leads, with a target to complete Tasks 1–10 by end-2026 and Task 11 (operational test procedures) by April 2027. An updated work plan diagram and Task Leads roster were agreed upon. SIPG will reconvene in January 2026 to review progress and prepare its next report to SWIM TF.

Outcomes of the SWIM Seminar – Sec (WP/08)

2.42 The paper reviewed the outcomes of the ICAO Asia/Pacific System-Wide Information Management (SWIM) Seminar 2025, held in Bangkok on 19 May 2025. The theme of the Seminar was **Establishing SWIM – A Key Enabler for FF-ICE**. The Seminar emphasized the urgency of SWIM implementation ahead of the 2034 sunset of the 2012 flight plan format, with regional efforts targeting 2032. Seven presentations were delivered by experts from JCAB, CAAS, AEROTHAI, CANSO, IATA, and Frequentis, sharing national SWIM/FF-ICE progress, use cases, technical architecture, and challenges. Key recommendations included forming multidisciplinary teams, harmonizing regional SWIM/FF-ICE mandates, and exploring centralized SWIM infrastructure. Minimum SWIM capabilities were defined for airlines (AIXM/IWXXM/FIXM processing, SWIM connectivity, dynamic NOTAM integration) and ATM providers (flight-data connectivity, CRV/Internet access, cybersecurity, governance, and SWIM TI functions).

APAC TBO Pathfinder - FF-ICE/R1 Laboratory Demonstration – Thailand (IP/02)

2.43 Singapore, Thailand, and the USA presented an overview of the APAC TBO Pathfinder project, a regional initiative aimed at identifying the capabilities required for TBO in the APAC region. It shared information about three workgroups, each focused on progressing specific goals and deliverables. It was informed that in line with Recommendation 3.2/2 of the 14th Air Navigation Conference (AN-Conf/14), which calls for a transition to FF-ICE services and cessation of ICAO 2012 flight plan by 2034, WG2 has identified its first key milestone as the execution of FF-ICE/R1 laboratory demonstration which will showcase the operational benefits of FF-ICE/R1 and provide firsthand experience in developing the necessary technical capabilities. Two levels of participation: Level 1: Participants with no FF-ICE/R1 services prototype and Level 2: Participants with FF-ICE/R1 services prototype were introduced.

2.44 The Meeting was informed that the FF-ICE/R1 laboratory demonstration is scheduled to take place from 22 to 24 July 2025 in Hanoi, Viet Nam. It will showcase operational scenarios involving flights between the following city pairs:

a) Guam → Bangkok,

b) Tokyo → Bangkok,

c) Bali → Bangkok, and

d) Auckland → Singapore.

2.45 Technical capabilities to be demonstrated include:

a) FF-ICE/R1 services, i.e., planning service, filing service, trial service, flight data request service, and notification service, using FIXM version 4.3 FF-ICE messages;

b) Message integrity validation through security services aligned with the ICAO Trust Framework;

c) SWIM technical infrastructure and SWIM information services.

2.46 It was added that lessons learned from the demonstration will be shared with relevant APANPIRG contributory bodies, such as the SWIM Task Force and FF-ICE Ad-Hoc Group, to support their ongoing discussions and developments. To further build up capabilities towards TBO implementation, FF-ICE/R2 (post-departure trajectory negotiation and revision) activities, including technical interchange meetings, tabletop exercises, technical trials, and a laboratory demonstration, are planned for 2025 – 2026.

2.47 The CNS SG/29 Meeting noted key achievements made by the TBO Pathfinder Project and encouraged States to participate at level 1 or level 2 based on their capabilities. It was suggested to consider taking advantage of the level 1 participation as an observer and take the opportunity to learn, interact, and exchange information.

Accelerating the LDACS Technique Development for Civil Aviation Application – China (WP/33)

2.48 China informed about the L-band digital aeronautical communication system (LDACS) properties, its advantages in the application of civil aviation, and the progress of international standardization and the development status in China. The Meeting noted that the validation of LDACS was conducted within the framework of ICAO panels, the Single European Sky ATM Research (SESAR) Programme, etc. Various platforms were built in the CNS/ATM Lab of CAAC, aiming to test the compatibility between LDACS and DME, GNSS L5/E5a/B2a signals, ADS-B and SSR. Test results were summarized and presented in past ICAO meetings.

2.49 China informed that the LDACS compatibility test remained an urgent task. It was envisaged that the necessary testing would be completed to derive compatibility criteria between LDACS and legacy L-band systems by the end of 2025. Based on these results, LDACS standardization activities can be continued and completed. China encouraged more entities to conduct LDACS compatibility tests through international collaborations and provide comments on the possible applications of LDACS in civil aviation.

2.50 The CNS SG/29 Meeting admitted that LDACS is an innovative project that will bring a revolution to aviation communication infrastructure. In response to a question about experience by other States/Administrations for LDACS, no other States/Administrations expressed they had such experience.

Outcomes of Survey for assessment of readiness for Amendment 91 to Annex 10, Volume III on Selective Calling (SELCAL) Codes Implementation – Sec (WP/27)

2.51 The paper shared information about a survey conducted by the ICAO APAC Office to assess the readiness of ANSPs' Flight Plan (FPL) processing systems handling SELCAL32. The Meeting was reminded about the survey on the readiness of APAC States/Administrations' flight plan processing systems handling SELCAL32 in 2024 by State Letter Ref.: T 8/4.3: AP072/23 (CNS) 6 June 2024. The objective of the survey was to evaluate the preparedness of ICAO member States for the implementation of Annex 10 Amendment 91 concerning the SELCAL that became applicable on November 3, 2022, and identify any associated challenges.

2.52 The CNS SG/29 Meeting noted that a total of *thirteen responses* from Australia, China, Hong Kong China, Macau China, Fiji, French Polynesia, India, Indonesia, Japan, New Zealand, Pakistan, Singapore, and Thailand were received. Based on responses received, it was concluded that most APAC States/Administrations that participated in the survey are ready to implement ICAO provisions Amendment 91 to the International Standards and Recommended Practices, Annex 10 — Aeronautical Telecommunications, Volume III — Communication Systems. However, it was highlighted that only 13 States/Administrations participated in the survey, which makes it difficult for us to assess APAC region readiness. The Meeting requested that APAC States/Administrations that have not responded to the survey share their readiness with the ICAO APAC Office. **ACTION ITEM 29-3**

Space-based VHF Update – Australia (IP/03)

2.53 Australia provided an update on Space-Based VHF and the progress within ICAO since the new spectrum allocation was achieved at the World Radiocommunications Conference 2023. It also provided a brief overview of the technology; the challenges associated with frequency planning and the need for cooperation at the regional and inter-regional levels when implementing Space-Based VHF.

2.54 The CNS SG/29 Meeting noted that the SB-VHF CG is working closely with PT-SBV and both groups are planning to start inter-panel coordination of the PfAs with the Air Traffic Management Operations Panel (ATMOPS), Separation and Airspace Safety Panel (SASP), Communications Panel - Operational Datalink Specific Working Group (CP-OPDLWG) and the Flight Operations Panel (FLTOPSP) in the 2nd half of 2025.

2.55 It was anticipated that in October 2025, the FSMP-WG will endorse the PfA items relating to Annex 10 Volume V, and in December 2025, the CP-DCIWG will endorse the PfA items relating to Annex 10 Volume III. Following this, the ICAO secretariat will present the PfA for the Air Navigation Commission (ANC) review, and there will be an ICAO State Letter requesting comments on the PfA before the ANC endorses the PfA to go to the ICAO Council for approval in March 2028. This may result in an Applicability Date of November 2028.

2.56 The CNS SG/29 Meeting noted that SASP and OPDLWG are considering whether additional separation standards are required and how Required Communications Performance (RCP) could be applied to Space-Based VHF; however, no formal work in this area has started. It is expected that testing and operational trials will begin in late 2026 or early 2027, including in the APAC region. Once the SARPs are published and the regional coordination process is agreed upon, multiple service providers are expected to provide a space-based VHF and space-based ADS-B service for the aviation industry.

2.57 The CNS SG/29 Meeting noted that the standardization process has incorporated issues of ionospheric and scintillation effects on space-based VHF, and associated thresholds have been defined by expert panels.

2.58 It was noted that WRC-23 approved a new allocation for the Space-based VHF band specifically for Low Earth Orbit (LEO) satellites.

2.59 A question about the need for deployment of 8.33 KHz channel spacing in the APAC region in the near future, when space-based VHF will be implemented, was raised. It was also shared that there is a need to assess the effect of the deployment of space-based VHF on terrestrial VHF systems in the APAC region. The Meeting agreed that SRWG should discuss the proposed needs and share updates with CNS SG at the next meeting. **ACTION ITEM 29-4**

Outcomes of Radio Navigation Symposium – Sec (WP/12)

2.60 Ms. Muna Alnadaf, Technical Officer, CNSS, ICAO HQ and Navigation System Panel (NSP) Secretary, presented key outcomes of the Radio Navigation Symposium by WP/12 and recommendations arising from the Symposium by WP/28.

2.61 The ICAO APAC Radio Navigation Symposium was held in New Delhi, India, from 07–09 April 2025. The theme of the Symposium was ***GNSS RFI: Collectively Bridging Gaps and Shaping the Path Forward.*** The Symposium aimed to provide a collaborative platform to exchange experiences and insights on GNSS RFI, analyze its impact and challenges, and facilitate in-depth discussion on mitigation measures and future development to build a resilient aviation system. The Symposium developed recommended actions to guide future efforts in managing GNSS RFI. It also addressed the USOAP Radio navigation flight inspection requirements and the latest developments. Detailed information about different discussions made in the symposium and other resources can be accessed at: https://www.icao.int/APAC/Meetings/Pages/Radio-Navigation-Symposium.aspx

2.62 The summary of the discussion made by different panels during the three days of the Symposium was shared with the meeting.

Recommendation from Radio Navigation Symposium - Sec (WP/28)

2.63 The CNS SG/29 Meeting recalled that ICAO, in collaboration with ITU and IMO, has recently issued a joint statement on the protection of the radio navigation satellite service from harmful interference. The ICAO/ITU/IMO statement called for five (5) key actions, which the Symposium reaffirmed and outlined a set of recommended actions and best practices containing six objectives and associated recommendations for all aviation stakeholders, provided in **Appendix B**. The list of recommendations was explained in detail at the meeting.

2.64 The CNS SG/29 Meeting was informed that as part of ICAO's engagement with ITU, the existing GNSS RFI reporting procedure between the two agencies has been reviewed to explore potential enhancements. A new account for ICAO will be created on ITU's online tool, the Satellite Interference Reporting and Resolution System (SIRRS), to facilitate reporting and improve the tracking of cases where analysis determines a significant impact on air navigation with an international scope. In such cases, ICAO will promptly transmit the results to ITU. Additionally, the system will facilitate keeping ICAO informed about the progress in applying the procedure outlined in Article 15, Section VI, of the Radio Regulations for cases of harmful interference to GNSS identified by ICAO. ICAO will also be notified as soon as the interference incident is deemed resolved.

2.65 An update about GNSS RFI- related NOTAM was shared with the Meeting. It was recalled that the 14th Air Navigation Conference (AN-Conf/14) acknowledged the absence of a standardized NOTAM Q-code for GNSS interference events and subsequently requested ICAO to develop additional NOTAM codes to enhance consistency and operational efficiency. GNSS RFI-related NOTAMs contain varying Q-Codes and inconsistent significations. IATA reported that eighteen (18) different Q-Codes are used worldwide, rendering filtering mechanisms ineffective. Furthermore, it has been noted that different text is used for Item E, such as "GPS Unreliable," "GPS Jamming," "GPS signal interference," and "GNSS interference,". This diversity created challenges for operators attempting to identify and search in NOTAMs for information about GNSS interference events.

2.66 It was informed that two (2) Q-codes and recommended Item E texts have been identified by the ICAO navigation systems panel (NSP) and will be incorporated in relevant ICAO documents. Furthermore, guidance on how pilots should interpret NOTAM is being developed.

2.67 In response to a question about tentative dates for incorporation of new provisions in relevant ICAO documents for States' use, it was shared that it may be Q1-2026.

2.68 Japan shared that the provided list of recommendations and the AN-Conf/14 recommendation suggested that States/Administrations detect GNSS jamming and spoofing, while there are several methods to detect GNSS RFI. Japan asked if there is any guidance material from ICAO for States/Administrations to help them get information about how to do such detection. Alternatively, is there any plan from ICAO to develop such guidance material?

2.69 ICAO HQ informed about an ongoing work of developing a concept of operation for detection and downlinking GNSS RFI onboard the aircraft so that the aircraft uses ADS-B to detect GNSS RFI and download the status to the ATC Centre through the ADS-B 1090 MHz.

2.70 Regarding GNSS RFI detection, it was shared that NSP is developing an iPACK, which is a standardized implementation package for mitigation of the impact of GNSS RFI, and one of the aspects that the iPACK plans to cover is the detection and monitoring tools. Currently, there are various tools available within the States or commercially, from a very simple online tool to a very sophisticated tool that can be installed in an airport or through the FIR. Alternatively, States can compare ADS-B data with SSR and detect GNSS spoofing or jamming. Currently, there is no plan from ICAO to work on Guidance Material for GNSS RFI detection tool/system, as there are other priorities such as Resilient Operation Network (RON) and complementary PNT in addition to authentication features for core constellation and SBAS. In addition, GNSS reporting is a pending task for NSP.

2.71 China suggested that avionics manufacturers and SATCOM service providers should also be incorporated to conduct cybersecurity, as mentioned in Recommendation 6.2. ICAO HQ agreed with the proposal and emphasized the security by design system. It was clarified that by the proposed recommendations, the intention is for States/Administrations to proactively assess all aviation services using satellites and take mitigation measures based on risk analysis outcomes, as jamming and spoofing may be encountered in other satellite systems in the future.

2.72 Considering the significance of the list of recommendations presented to the Meeting, the Meeting suggested that ICAO consider publishing them at the global level and sharing them with all States/Administrations officially. **ACTION ITEM 29-5**

GNSS and Data Link Disruption Ad-Hoc Group

2.73 Regarding the question by the CNS SG/29 Meeting on the progress of work done by the *GNSS* and Data Link Disruption Ad-Hoc Group since its formation during updates from ATM SG, it was stated that the kick-off meeting was planned for February 2025, which was not conducted due to unforeseen circumstances. It was added that the ICAO Secretariat is currently working with the ATM SG Chair to start the work assigned to this Ad-hoc Group. Japan shared concerns about the delay this group made in beginning to work, considering the significance of GNSS RFI issues in the APAC Region. The USA informed that the delay occurred because the USA previously agreed to be a Rapporteur of the Ad-Hoc group, but could not progress further due to the restructuring of the FAA, USA. The Meeting requested that the ICAO Secretariat escalate the resolution of the issue, preventing further work progress by this group, so that the deliverables expected by the Ad-Hoc Group can be completed with priority.

2.74 On the question of the reason for the name of the group as GNSS and Data Link Disruption Ad-Hoc Group and the interrelation of GNSS issues with Data Link disruption, it was informed that Data Link disruption issues had been discussed in past ATM SG meetings. It was added that Data Link disruption issues also result in increased ATC separation till the issue is resolved. In addition, the Ad Hoc Group was required to develop a procedure for both Air Traffic Controllers (ATCOs) and pilots in the event of GNSS or Data Link disruption. Therefore, the formed Ad Hoc Group undertook both areas under a unified Terms of Reference (ToR).

Outcomes of Flight Inspection and Procedure Validation Seminar – Sec (WP/13)

2.75 The paper summarised the discussion of the Flight Inspection and Procedure Validation (FIPV) Seminar held in Bangkok, Thailand, from 30 July to 1 August 2024. A total of fourteen (14) presentations were delivered by Experts from various States/Administrations and Industries.

2.76 The Seminar emphasized that ICAO documents (Docs 8071, 10068, 9906) are guidance only and that States must follow their own regulatory frameworks for instrument flight procedure (IFP) design, validation, and periodic review (maximum of five years). The Minimum Operational Network concept and the complementary role of conventional navaids alongside GNSS were highlighted due to interference concerns. Participants agreed that flight inspection must incorporate multi-constellation and anti-jamming technologies for GNSS-challenged environments. The APAC Flight Procedure Programme's Phase 5 strategy was shared to build sustainable IFP capabilities.

2.77 An open discussion on RPAS for flight inspection identified regulatory fragmentation, technical and operational challenges, and uncertain business cases; however, RPAS can support ground inspections and enhance NAVAID monitoring. A GNSS RFI session covered detection, mitigation, and the need for robust regulations governing in-band radiators. As an outcome, ICAO APAC will update its Catalogue of Flight Inspection and Flight Validation Service Providers, incorporating RPAS capabilities, based on survey responses from 16 States. Results underscored the need for standardized RPAS use and potential new guidance (e.g., a job card or Doc 8071 chapter) for UAS-based flight inspection.

2.78 ICAO HQ informed that during the AN-Conf/14, China presented a paper on using drones for flight inspection, and later, NSP requested China to present a draft of the job card on the topic. During the JWGs14 (29 April - 8 May 2025) of NSP, China prepared a proposal, which was discussed and agreed upon by the panel. However, the job card has not been endorsed yet by the Air Navigation Commission (ANC). The job card will be presented to ANC after the NSP meeting in January 2026. It was clarified that the title of the document would be "UAS-based flight inspection."

2.79 In response to a question, ICAO HQ clarified the difference between the three different dates: The adoption date, applicable date, and effective date mentioned in the State letter related to the amendment to any SARPs. More information can be accessed by this link.

Establishment and Validation of Australia's Backup Navigation Network – Australia (IP/04)

2.80 Australia informed about a Backup Navigation Network (BNN), which is intended to support the safe completion of flights in the event the GNSS is unavailable. The Meeting noted that the number of Navigation Aids prior to and following the establishment of the BNN reduced from 394 to 209. Since the BNN was established in 2016, a further four ground-based Navigation Aids have been decommissioned based on consultation with the aviation community and an extensive safety assessment. Australia informed that the safety argument was validated through fault tree analyses with the top-level events of Mid-Air Collision (MAC) and Controlled Flight into Terrain (CFIT) over a number of scenarios in the GNSS environment, indicating that the reduced aid network maintains acceptable safety standards, validating the design of the BNN in the context of GNSS operations.

2.81 The Meeting noted that Australia continued to review the composition of the BNN to ensure it remains fit for the purpose. It was added that Australia is considering the various factors in the future composition of the BNN, including a) the increasing number of instances of GNSS interference and spoofing being observed at other locations in the world, b) the need for the state to consider economic resilience and mitigation to the potential for mid and long term GNSS disruptions or corruption; c) instances of GNSS interference observed and reported locally, d) instances of GNSS unavailability to pilots due to avionics failure or malfunction, e) evolution of aircraft capabilities that will improve GNSS resilience, and f) evolution of regulatory requirements for PBN including the requirements for flight planning and avionics fitment.

2.82 The Meeting encouraged States/Administrations to share their readiness for Minimum Operational Network (MON) to mitigate GNSS RFI issues in future CNS SG meetings.

2.83 Hong Kong China presented the critical role of the ADS-B Central Data Processor System (CPS) in enhancing air traffic surveillance. Hong Kong China highlighted that the implementation of an ADS-B CPS could be effective in addressing the issues of falsified target displays caused by GNSS spoofing and encouraged States to consider its implementation based on their needs.

2.84 The Meeting noted that a Performance-Based Surveillance Sub-Group (PBSSG) is discussing using a cooperating surveillance system for separation, not for non-cooperative systems. The future versions of the RSUR manual could be modified to add guidance for this. USA will provide outcomes of the discussion in future SURICG meetings.

ADS-B Quality Performance Monitoring – Japan (WP/24)

2.85 Japan informed that with a plan to integrate ADS-B data to expand the area of higher accuracy and higher update rate, Japan has developed an ADS-B quality performance monitoring tool. This tool continuously acquires C/N0 data for each GPS satellite from the 80 GPS-based Control stations nearest to each airport, switching between them at regular intervals. If the C/N0 value falls below a set value, the tool will alert to the possibility of GNSS jamming. Currently, these tools have been evaluated for official operation. Japan proposed collaborations among APAC States to improve the ADS-B quality performance of aircraft and promote collaborations among APAC States to share information on methodologies for GNSS RFI monitoring.

2.86 The Meeting shared the significance of the information shared in the paper and suggested that Japan present this information in future SURICG Meetings. **ACTION ITEM 29-7**

ADS-B GNSS Performance Issues in Australia– Australia (IP/05)

2.87 Australia shared recent unique ADS-B problems experienced in Australia relating to the interaction between avionics and GNSS, affecting some aircraft, which resulted in ADS-B tracks being dropped from air traffic controller screens. The Meeting was informed that Airbus had advised ongoing monitoring of ADS-B surveillance loss events. Airservices Australia (ANSP), in conjunction with the regulator CASA, has continued to monitor the issue and is working with Airbus to resolve it. It was added that Airbus planned to integrate findings from these events into future ADIRU and AESS standards to enhance resilience against the impacts of satellite signal degradation.

2.88 The Meeting deliberated on the deficiencies of ADS-B and suggested that such issues must be presented in the SURICG Meeting. The Meeting requested that the SURICG Co-Chair share information about any discussion being held in SURICG on these topics. SURICG Co-Chair informed that SURICG has an agenda for a report on surveillance ground systems, avionics performance monitoring, and improvement in compliance, under which ADS-B and other surveillance sensors issues are discussed. It was informed that the ICAO APAC office manages the ADS-B avionics problem reporting database. In addition, the Surveillance Panel (SP) maintains the FAA No Services Aircraft List (NASL), which is the list indicating all aircraft that do not comply with minimum ADS-B requirements. The SURICG Co-Chair informed that SURICG is discussing the need to maintain the proposed databases, and the outcomes will be shared at the CNS SG meeting. **ACTION ITEM 29-8**

APAC Seamless ANS Plan V4.0 Update – Sec (WP/16)

2.89 ICAO Secretariat recalled the steps taken in past CNS SG meetings to provide inputs for Seamless ANS Plan v4.0, which was adopted by the Thirty-Fifth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/35) held at the ICAO Asia and Pacific Regional Office in Bangkok, Thailand, from 25 to 27 November 2024 by Conclusion 35/1.

2.90 The Meeting was informed that recently, it was observed that the priorities of some CNS ASBUs finalized by CNS-related ASBUs Review Ad-hoc Group for the Next Edition of the Seamless ANS Plan were not correctly reflected in the published Asia/Pacific Seamless ANS Plan Version 4.0. This discrepancy might result from editorial errors during the gathering of voluminous feedback from all sources.

2.91 Recognizing that the review of ASBU NAVS falls under the responsibility of the CNS SG, the ICAO Secretariat proactively prepared and submitted a working paper for consideration at the Seventh Meeting of the Asia/Pacific GBAS/SBAS Implementation Task Force (GBAS/SBAS ITF/7, Bangkok, Thailand, 14–16 May 2025). This initiative was undertaken to solicit comments and feedback from navigation experts regarding the appropriate prioritization of the NAVS Block 0 elements prior to proposing amendments to the CNS SG.

2.92 It was agreed in GBAS/SBAS ITF/7 Meeting that not all ASBU NAVS Module Block 0 elements should be accorded the same level of priority within the Asia/Pacific Region. The ICAO Secretariat proposed the subdivision of these elements from a consolidated 'Thread' into discrete individual elements. This approach was aimed at ensuring that appropriate prioritization is assigned to each element accordingly. The CNS SG/29 meeting deliberated and agreed on the following proposal:

> *"Keep priority 2 for NAVS-B0/1 GBAS and NAVS-B0/2 SBAS as some APAC States do not have access to such systems, and to change the priorities of NAVS-B0/3 ABAS and NAVS-B0/4 Nav. MON to Priority 1".*

Functional Category	Element	Description	Priority	Responsibility for Review
Technology	NAVS-B0/1	GBAS	2	CNS SG
	NAVS-B0/2	SBAS	2	
	NAVS-B0/3	ABAS	1	
	NAVS- B0/4	Nav. MON	1	

2.93 It was agreed that the ICAO Secretariat will incorporate these changes as a corrigendum to the existing Asia/Pacific Seamless ANS Plan Version 4.0 and submit it to APANPIRG/36 for endorsement.

ANS Reporting tool updates – Sec (SP/03)

2.94 ICAO Secretariat informed that the ICAO Asia/Pacific Seamless ANS Reporting Tool was launched in 2024 to support regional implementation monitoring. Following APANPIRG/34 Conclusions, States/Administrations were expected to submit reports by 30 June 2024 and annually by 28 February thereafter. The ICAO Secretariat informed that as of 10 June 2025, only 9 States/Administrations have updated information using the reporting tool. However, there are several inconsistencies in the submitted information. The data submitted by 9 States/Administrations, along with key issues found, were shared with the Meeting. It was added that despite all APAC States having initiated the reporting process, data submissions show inconsistencies, including incomplete fields, missing updates, and blank "applicable/non-applicable" sections. States were encouraged to share obstacles and suggestions for further tool enhancement to ensure more accurate and comprehensive reporting across the region.

2.95 The CNS SG/29 Meeting was informed that the ICAO Workshop on APAC Seamless ANS Reporting Tool was conducted from 17 April to 19 April 2024, in which several States/Administrations participated. It was suggested that delegates contact participants from their States/Administrations and submit data using the ANS Reporting tool with their help. It was also added that the guidance on filling out the reporting tool is available on the workshop webpage.

2.96 Hong Kong China shared inconsistencies it observed in the ANS Reporting Tool in the "Seamless Plan or ASBU Reference" column and the corresponding column in "Seamless Plan Explanation." It was requested that while updating the reporting tool for Seamless ANS Plan 4.0, the ICAO Secretariat consider a comprehensive review of all ASBUs and associated descriptions/definitions for States/Administrations to refrain from adding wrong interpretations. **ACTION ITEM 29-12**

Delhi Declaration implementation related to CNS – Sec (WP/19)

2.97 The Second Asia Pacific Ministerial Conference on Civil Aviation was held from 11 -12 September 2024 in New Delhi, India. In the Conference, the APAC Ministers reviewed commitments made under the Beijing Declaration and agreed to another set of commitments to high-priority aviation strategic objectives in the form of the Asia Pacific Ministerial Declaration on Civil Aviation (Delhi). The Conference endorsed the Second Asia and Pacific Ministerial Declaration on Civil Aviation (Delhi), also known as the Delhi Declaration. The CNS SG/29 Meeting noted that the Delhi Declaration generates the political will needed to support the organization's various objectives for an effective and efficient aviation system.

2.98 The comparison of commitment under the ANS between the Beijing and Delhi Declarations and corresponding indicators was shared with the meeting in the following Table:

SN	Commitments in the Delhi Declaration	Corresponding Commitments in the Beijing Declaration	Indicators
1)	Performance-Based Navigation (PBN) implementation in accordance with ICAO Assembly Resolution A37-11 on Global PBN Goals;	Performance-Based Navigation (PBN) implementation;	Percentage of PBN Approach procedures on international runway ends. Percentage of PBN SIDs/STARs on international runway ends
2)	Common Ground/Ground Telecommunication	Common ground/ground telecommunication	Status of connection to Common aeRonautical VPN

SN	Commitments in the Delhi Declaration	Corresponding Commitments in the Beijing Declaration	Indicators
	Infrastructure to support ANS applications	infrastructure to support Air Navigation Services (ANS) applications;	(CRV) and Aeronautical Message Handling System (AMHS)
3)	Expediting the implementation of ICAO provisions related to System Wide Information Management (SWIM);	New	Under Preparation
4)	Enhanced Surveillance capability for improved Safety and Efficiency;	Enhanced surveillance capability, including Automatic Dependent Surveillance-Broadcast (ADS-B) technology;	Number of States providing ADS-B based surveillance service either for separation or situation awareness

2.99 It was informed that SWIM TF/10 Meeting was invited to collaborate towards achieving the targets of the Delhi Declaration and to share the latest implementation status of commitments with the ICAO APAC Office for accurate progress tracking. It was added that as the ANS commitments in the Delhi Declaration constitute an element related to SWIM, indicators are required to be developed to measure this commitment for 2025-2026.

2.100 The SWIM TF/10 Meeting discussed various potential indicators to assess the progress of SWIM implementation within the APAC region. Suggestions included measuring the level of involvement of APAC States/Administrations in SWIM-related demonstrations or trials, the existence of national SWIM activities, plans, or policies, as well as enhancements in ANS infrastructure aimed at meeting SWIM requirements. Additionally, the Meeting discussed a simplified categorization approach to classify States' SWIM implementation progress into three levels, i.e., "In Preparation/Planning", "Under Development/Implementation," and "In Operation".

2.101 The SWIM TF/10 Meeting agreed that the proposal required more deliberation, and the task was assigned to the SWIM Co-Chair and the ICAO Secretariat. It was agreed that the ICAO Secretariat would inform the DGCA/60 Conference that indicators to measure SWIM implementation in the APAC region are under development, and the latest status of APAC States/Administrations' readiness for SWIM implementation will be shared with the DGCA/61 Conference. ACTION ITEM 10-31 SWIM TF Co-Chair and ICAO Secretariat will define the first draft of indicators by the end of 2025 and share them with SWIM TF Task Leads for review. A survey will then be conducted in Q1 2026 to finalize the preferred indicators for the APAC region.

2.102 The latest status of various indicators related to CNS was shared with the CNS SG/29 meeting. The CNS SG/29 Meeting suggested that APAC States/Administrations collaborate and work towards achieving the targets of the Asia Pacific Ministerial Declaration on Civil Aviation (Delhi). It was recommended that States/Administrations share their latest implementation status of Delhi Declaration commitments with the ICAO APAC Office so that progress can be tracked and the status reported accurately in future meetings.

Review the status of CNS deficiencies – Sec (WP/21)

2.103 The ICAO Secretariat presented the Air Navigation Deficiencies in the CNS field, which was reviewed in APANPIRG/35. The Meeting noted that the only outstanding issue was the unreliability of AFS communication between Afghanistan and Pakistan. Last year, it was reported that Pakistan had joined CRV and was actively coordinating with Afghanistan to restore the communication

link. Pakistan shared the expectation of restoring the connection by the end of 2024 in the CNS SG/28 Meeting. Pakistan was requested to provide updates on outstanding deficiencies.

2.104 Pakistan informed that the AFS communication link between Pakistan and Afghanistan remains non-operational due to the absence of a functioning AFS system on the Afghanistan side. Pakistan is fully prepared and available to activate the link as soon as Afghanistan establishes the required AFS infrastructure. Afghanistan had not given any tentative timelines. Therefore, it was requested that this deficiency be removed from Pakistan's side. **ACTION ITEM 29-13** The current list of Air Navigation Deficiencies in the CNS field was reviewed in CNS SG/29 and is provided in **Appendix C** of this paper.

Update on Trust Framework Activities – Sec (SP/01)

2.105 Mr. Michael Goodfellow, Technical Officer GIS, Trust Framework Panel (TFP) Secretary, presented the key initiatives advanced by the TFP. It was announced that the Aviation Common Certificate Policy (ACCP), establishing baseline PKI interoperability requirements and profiles (including SBAS authentication), is undergoing coordination and targeting the July 2025 publication. The Manual on Aviation Information Security (MAIS Doc 10204) provides risk assessment and security objective guidance; its first edition has been released, with some sections pending further coordination. Development of a Manual on Trust Frameworks has begun, outlining how to form Trust Framework Instances (TFIs) for secure aviation communications, with an editorial group formed. Technical progress includes demonstrations of connected aircraft concepts (ENRI) and drone identification work (IETF). Future meetings are scheduled for TFP-WG/3 in November 2025 and the full panel in 2026.

2.106 In response to a question about the expected publication date of Doc 10169, it was stated that intern panel coordination is ongoing and will be published in a few months.

2.107 Nothing TFP has made significant progress in the last few years, the meeting requested the TFP plan for implementing the TFP framework worldwide. Mr. Goodfellow informed that in the past, before the TFP formation, the Trust Framework Study Group (TFSG) was intended to explore the possibility of creating a large global trust framework for aviation. There were several operational and mostly political challenges to achieving that goal, which resulted in the concept “Trust Framework Instances (TFI)”. Currently, States/Administrators have multiple trust frameworks that are based upon common standards that would allow them to interoperate. Therefore, ICAO decided not to build a monolithic trust framework but to provide a standard set of principles that will enable others to develop their trust frameworks and simplify interoperability across domains as required.

Need for the Creation of an APAC Contributory Body for the Management and Implementation of ICAO ANS Cybersecurity Provisions - CRV OG and SWIM TF (WP/18)

2.108 CRV OG and SWIM TF presented recommendations for the creation of a new APAC contributory body for the joint management and implementation of cybersecurity provisions. The recommendation resulted from detailed discussion and deliberation held in first Working Session of the SWIM Implementation Pioneer Ad-Hoc Group (SIPG WS/1) held from 14 to 17 January 2025, the Thirteenth Meetings of Common aeRonautical VPN Operations Group (CRV OG/13) held from 5-8 March 2025, the Twelfth Meeting of the Aeronautical Communication Services (ACS) Implementation Coordination Group (ACSICG/12) held from 25 to 28 March 2025, the Second Working Session of the SWIM Implementation Pioneer Ad-Hoc Group (SIPG WS/2) held from 26 to 30 May 2025, and the Tenth Meeting of the System Wide Information Management Task Force (SWIM TF/10) was held from 20 – 23 May 2025.

2.109 As PKI-based approaches impact all communications in aviation, it was critical to ensure seamless integration with SWIM-enabled systems, ATC networks, and airborne systems. The issuance and management of digital certificates for SWIM entities (ATM Service Providers, Airspace Users, Information Services, and relevant devices) were essential to securing SWIM-based operations. Additionally, the use of digital signatures for cross-border and multi-regional SWIM message exchanges strengthens data integrity and communication trust.

2.110 The Meeting noted it is necessary to establish a new working group or task force to explore the development of a regional federated PKI architecture that ensures secure interoperability across multiple states and regions. Additionally, a technical community was needed to support the implementation of Trust Framework Instances for various applications. Collaboration with the SWIM TF was also considered essential to support the implementation of a Trust Framework Instance for SWIM, enabling secure, interoperable, and resilient aviation information exchange and flight operations.

2.111 SWIM TF Co-Chair shared that APANPIRG/33 adopted its Conclusion APANPIRG/33/09 to set the Asia/Pacific SWIM implementation timeframe to be between 2024 and 2030, with 2030 being the target timeline for implementation completion and emphasized the need for the creation of the group. She highlighted that the self-signed certificate trial being taken by SWIM TF is only a temporary solution due to the absence of the appropriate digital certificate infrastructure in the APAC region. This underscored the need for this proposed group to begin its work.

2.112 Malaysia strongly supported the recommendations and added that achieving stringent performance standards necessitates some applications, such as SWIM, specialized expertise to develop and refine a common PKI standard tailored for SWIM. Malaysia recognized the critical need for a dedicated APAC contributory body, as proposed, to harmonize the implementation of cybersecurity provisions, including PKI and digital certificates, across the region. It was suggested that this body would ensure interoperability, security, and resilience in SWIM-based information exchanges, aligning with ICAO's cybersecurity frameworks, such as the Manual of the Public Key Infrastructure (PKI) Policy for Aeronautical Communications (Doc 10095) and the Aviation Common Certificate Policy (Doc 10169).

2.113 China, Fiji, Thailand, Singapore and the USA supported the proposal. Mr. Goodfellow informed that PKI is more than a set of technologies. He shared the need for discussion on many complex matters, such as who would issue certificates, how the certificates would be issued, and the assessment criteria under which they would be assessed to make sure that they follow the agreed procedures. It was advised that there are higher-level governance and procedural questions that need to be addressed, along with technical aspects.

2.114 The CNS SG/29 Meeting deliberated at length about the name of the proposed group. After deliberation, it was agreed to initially name the group "**ANS Information Assurance Task Force (ANSIA TF)."**

2.115 **Australia, China, Japan (TBC), Malaysia, New Zealand, Singapore, Thailand and the USA** volunteered to join the group. It was agreed that the ANSIA TF would prepare the draft Terms of Reference (ToR), its key deliverables, and plan in close coordination with CRV OG, ACSICG, SWIM TF, TFP Secretary and Information Management Panel Secretary. **ACTION ITEM 29-14.** It was also agreed that the first meeting would be conducted in Q1-2026. **ACTION ITEM 29-15** Other Member States/Administrations who wish to join the Task Force could liaise with the ICAO Secretariat after the meeting.

2.116 With the abovementioned, the following draft decision was proposed, which was endorsed and adopted by the CNS SG/29 Meeting.

<table>
<tr><td colspan="3">Decision CNS SG/29/14 - Creation of ANS Information Assurance Task Force (ANSIA TF).</td></tr>
<tr><td colspan="2">What:
To ensure consistent implementation of the requirements of ANS information security in the APAC region in accordance with the various manuals and guidance documents published by the ICAO and other international organizations, especially Certificates and PKI, a contributory body is proposed to be created under the CNS Sub-group to manage this using personnel experienced in the management and provisioning of ANS cybersecurity.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To provide consistent implementation of the requirements.</td><td colspan="2">Follow-up: ☒Required from States</td></tr>
<tr><td>When: 20-Jun-25</td><td colspan="2">Status: Adopted by Subgroup</td></tr>
<tr><td colspan="3">Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: ACSICG, CRV OG, SWIM TF</td></tr>
</table>

AirNav Maintenance Facility – Indonesia (IP/06)

2.117 Indonesia presented the implementation of the AirNav Maintenance Facility, which was established in 2025 to enhance the readiness and reliability of air navigation facilities in Indonesia by providing services in repair, innovation, and development of CNS equipment. Key services included the repair of equipment modules, logistics support through spare parts availability, and the development of solutions for issues such as part obsolescence. It was informed that the facility is staffed by 11 specialized personnel, organized into managerial and technical functions, ensuring compliance with industry standards, quality assurance, and effective repair processes. The meeting noted that since its founding until the end of May 2025, AMF has repaired 38 modules comprising various types of CNS & Electrical equipment. The achievement of 38 repaired modules indicates a positive trend toward meeting AMF's annual target.

2.118 The CNS SG/29 Meeting suggested that it would be helpful if the scope of work could be extended to receive repair orders from other States/Administrations.

Connected Aircraft – USA (SP/04)

2.119 USA introduced the Connected Aircraft (CA) concept, which is based on the Global Air Traffic Management Operational Concept (GATMOC). It emphasized establishing performance requirements aligned with operational needs, identifying failure conditions, and implementing robust communication systems. It was stated that the CA concept envisioned loading messages into the FMS, like what CPDLC does today while respecting requirements for data integrity and segregation, thereby reducing crew workload and eliminating transcription errors. It utilizes additional commercial pathways to support real-time capabilities and updates to the ATCO, information regarding the current state will be sent to both the ATM and the FOC. An aircraft with communications capabilities will have implications on both airborne and ground-based systems, as well as the establishment and maintenance of multiple active links, which will require new management techniques to ensure safe and effective operations. The USA also outlined technical Considerations and regulatory considerations related to the CA. Some of the use cases of CA, including Trajectory negotiations, avoiding a weather constraint, commercial link used in conjunction with aviation link, UAS location sharing, Information on vehicle state (speed, location, direction of flight) sent to the ground, and Information consolidated and a traffic picture is sent back to RPICs for improved real-time situational awareness were shared with the Meeting.

2.120 The CNS SG/29 Meeting noted that EFBs play a notable role in the CA concept, providing a potential interface for the AU to take advantage of additional efficiency, flexibility, and cost-effectiveness in the delivery and display of certain kinds of information, supplementing and enhancing the information provided by the FMS. In addition, the Aircraft domain guard function - Protection mechanism(s) between the Aircraft Control Domain (ACD) and Airline Information Services Domain (AISD) and the Aircraft data gateway enables the exchange of aircraft avionics data in other protocols and services consistent with COTS technologies.

2.121 It was suggested that interoperability is critical to achieving widespread adoption of these capabilities. One means of achieving interoperability is to standardize CA services without reference to the underlying data link technology. Such standards would include service functional descriptions, end-to-end performances, and operational safety assessments without any reference to the communication path, enabling stakeholders or CSPs to select the best data link technology for the service.

2.122 The Meeting noted the recommendations made by AN-Conf/14, namely Recommendation 4.1/1 –Validation, standardization and implementation of the connected aircraft concept and air-ground connectivity strategy.

2.123 In response to a question about the need for use cases mentioned in the presentation about UAS while the C2 link is already available, it was informed that on the UAS, there are multiple links, and the use of the C2 links is mainly for command and control for the remote pilot to the aircraft. There is a need for situational awareness to report regularly about vehicles' positions, such as intended directions, which is non-safety critical. For such cases, using a different commercial link to segregate and avoid overusing the C2 link was suggested by the speaker.

Review of ToR and action items – Sec (WP/23)

2.124 The Meeting noted that the CNS SG Terms of Reference (ToR) were first adopted under APANPIRG/22 in 2011 and became effective with the 2013 meeting cycle. The ToR established the scope, objectives and reporting lines for CNS SG and its contributory bodies in support of APANPIRG's CNS work.

2.125 The Meeting reviewed the Terms of Reference of CNS SG effective from 2013 and noted that the ToR has not been modified for more than ten years. It was agreed that several changes have been made in the last 10 years, including the role and responsibilities of CNS SG, which should be reflected in the revised ToR. In addition, the current ToR missed the detailed information about composition, chairpersonship, and other essential data usually incorporated in standard ToR. It was agreed to form **an Ad-Hoc group** composed of members from **China, Hong Kong China, Thailand and the USA**. In reviewing the ToR, the ad-hoc group was advised to refer to the CNS ToR of other regions. The revised ToR will be presented by the ad-hoc group at the next CNS SG meeting. **ACTION ITEM 29-16** The current ToR is provided in **Appendix D**.

2.126 The Meeting reviewed and updated the Action Items List for CNS SG/28. A total of **16** action items were identified during the CNS SG/29 Meeting.

CNS Meeting Plan for 2026 – Sec (IP/08)

2.127 The paper shared the following tentative schedule for the CNS contributory bodies' Meetings to be held in 2026 for Meeting information and action. The schedule was revised by the meeting as follows. The ICAO Secretariat will inform Member States about the exact dates, mode and venue of the Meeting while issuing invitation letters at least three months before the event.

No.	Name of Meeting	Dates (in 2026)	Mode of Meeting	Location
1.	SIPG WS/3	26-30 January	In-Person	Bangkok
2.	CRV OG/15	January/February	In-Person	Bangkok
3.	SRWG/10	4–6 February	In-Person	Bangkok
4.	ANSIA TF/1	Q1 2026	In-Person	Bangkok
5.	SBAS/GBAS ITF/ 8	March	In-Person	Bangkok
6.	SURSG/4	March	In-Person	Bangkok
7.	SURICG/11	23-25 March	In-Person	Bangkok
8.	ACSICG/13	20-24 April	In-Person	Fiji
9.	PBNICG/13	May	In-Person	Bangkok
10.	SWIM Activity	25 May (Tentatively)	In-Person	Bangkok
11.	SWIM TF/11	26- 29 May or 25-29 May	In-Person	Bangkok
12.	ATMAS TF /7	1-4 June	In-Person	Bangkok
13.	CNS/SG/30	06-10 July	In Person	Bangkok

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) endorse the Draft Decision CNS SG/29/06 *(SWIM TF/10/02)* - Adoption of APAC Common SWIM Information Services, v1.0 for adoption by APANPIRG/36;

c) review APAC Common SWIM Aeronautical Information Services related to ATM SG, particularly those with incomplete fields, and share the review results with the SWIM TF for inclusion in the next version of APAC Common SWIM Information Services document;

d) consider establishing a mechanism to conduct regular review of the APAC Common SWIM Information Services document, and notify the SWIM TF of any changes to existing business requirements identified in the document or the introduction of new ones related to ATM SG;

e) agree on the issue of corrigendum to the existing Asia/Pacific Seamless ANS Plan Version 4.0 and submit it to APANPIRG/36;

f) note the suggestion made by CNS SG/29 for improvement of the ICAO Asia/Pacific Seamless ANS Reporting Tool;

g) consider establishing a regional migration strategy and timeline for transitioning to the ATM information exchange via SWIM;

h) deliberate and review the list of recommendations provided in **Appendix B** and share feedback;

i) discuss any relevant matters as appropriate.

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APPENDIX A

Business Functionality of APAC Common SWIM Information Services (Updated by MET SG/28, FF-ICE/2, MET/IE WG/23, SURICG/10, AAITF/19 and ATFM SG/15)

First Version (May 2025)

(Editorial note – changes arising from MET SG/28, FF-ICE/2, MET/IE WG/23, SURICG/10, AAITF/19 and ATFM SG/15 are indicated with ~~strikethrough~~ and highlighted text.)

Purpose.– This list of APAC Common SWIM Information Services, including associated priorities, provides States/Administrations with guidance on anticipated services to support their planning and implementation of SWIM.

Notes.– Priority of Recommended ~~s~~Services in ~~i~~Initial APAC Common SWIM Information Service (IS) ((1)/(2)/(3)):

- Priority (1): Recommended for region-wide implementation for region-wide benefits
- Priority (2): Recommended for implementation as much as practicable
- Priority (3): Additional information services without common regional requirements and not included as a part of common regional information services

Business functionality of the information service	**Brief description of the service**	**Type of information to be exchanged**	**Information exchange model / Message type**	**Message exchange pattern**	**Priority ~~of Recommended sService in iInitial APAC Common SWIM IS~~ (1) / (2) / (3)**
APAC Common SWIM Aeronautical Information Services					
Airspace management service	Exchanges of airspace status information between ASM Support System and Air Traffic Control (ATC) System. The sharing of airspace availability and airspace structure in real-time will contribute to a	~~Airspace availability,~~ Availability or activation/deactivation or temporarily change of airspace, restricted area, danger area, search and rescue regions	AIXM	Pub/Sub or Req Reply	2

Business functionality of the information service	**Brief description of the service**	**Type of information to be exchanged**	**Information exchange model / Message type**	**Message exchange pattern**	**Priority ~~of~~ ~~Recommended sService in iInitial APAC Common SWIM IS~~ (1) / (2) / (3)**
	more efficient execution of the flight as information impacting the trajectory will be exchanged.				
Airspace feature service	Provides the characteristics of the three-dimensional airspace, described as horizontal projection with vertical limits, and their relevance to air traffic.	FIR/UIR boundaries, waypoints, enroute ATS routes, SIDs and STARs, navaids, procedures, and other airspace not limited to restricted area, prohibited area, danger area, search and rescue regions (Remarks – Other data published in the AIP may be included)	AIXM	Pub/Sub or Req Reply	2
Aerodrome feature service	Provides current and/or planned airport layout features, such as aerodrome mapping data, runway, taxiway, passenger facilities.	Runways, movement areas, aerodrome services, navaids, instrument landing systems, Aerodrome location, communication facilities (frequencies)	AIXM	Pub/Sub or Req Reply	2
Runway Condition Report service	Provides runway surface conditions and contaminants (least to most slippery) that are directly correlated to aircraft take-off and landing performance.	Global Reporting Format (GRF) for runway surface conditions	AIXM	Pub/Sub or Req/Reply	2
Digital NOTAM distribution service	Provides aeronautical information in accordance with the Digital NOTAM Specification, such as runway closure.	Digital NOTAM (e.g. Special activity airspace (SAA) NOTAMs, or other types of NOTAMs)	AIXM	Pub/Sub or Req Reply	2
APAC Common SWIM Flight Information Services					
GUFI service	GUFI (Globally Unique Flight Identifier) generation and provision	GUFI	FIXM	Req/Reply	1

Business functionality of the information service	**Brief description of the service**	**Type of information to be exchanged**	**Information exchange model / Message type**	**Message exchange pattern**	**Priority ~~of~~ ~~Recommended sService in iInitial APAC Common SWIM IS~~ (1) / (2) / (3)**
~~ATFM/A-CDM integrated service~~	~~Allows exchanges of flight plans and A-CDM milestone parameters among different stakeholders (such as arrival/departure ATFM units, airlines and airport operators) to connect A-CDM process to ATFM operations.~~	~~CLDT, TOBT, CTOT, CTO, TTOT, TSAT, etc.~~	~~FIXM~~	~~Pub/Sub Req/Reply~~	~~1~~
FF-ICE filing service	Provides a means to submit, update or cancel flight plans through a SWIM-based interface using FIXM.	Flight plan for registration, update or cancellation	FIXM	Req/Reply Pub/Sub	1
FF-ICE ~~data~~ publication service	Provides harmonised sharing of flight ~~plan~~ information in a global standard supporting common situation awareness.	Flight ~~plan~~ information for publication	FIXM	Pub/Sub	2
FF-ICE trial service	Allows operators to test the effect of a potential change in a flight plan prior to committing to the change.	Proposed changes in a flight plan	FIXM	Req/Reply	2
FF-ICE flight data request service	Allows an operator to request the current status of a flight plan, or an ANSP can request an operator to submit the latest version of their flight plan.	Current status of a flight plan, a copy of flight plan or supplementary plan	FIXM	Req/Reply	1
FF-ICE notification service	Provides notification of a change in flight state, such as Departure (DEP) and Arrival (ARR) Air Traffic Service (ATS) messages.	ARR, DEP messages	FIXM	Pub/Sub Req/Reply	1
FF-ICE planning service	Allows operators to submit preliminary flight plans for early Air Traffic Flow Management (ATFM) planning and to obtain feedback regarding restrictions/constraints affecting the flight.	Preliminary flight plan for early ATFM planning	FIXM	Req/Reply Pub/Sub	2

Business functionality of the information service	**Brief description of the service**	**Type of information to be exchanged**	**Information exchange model / Message type**	**Message exchange pattern**	**Priority ~~of~~ ~~Recommended sService in iInitial APAC Common SWIM IS~~ (1) / (2) / (3)**
Flight-Specific ATFM Measure Service	Supports *notification* of information related to "flight-specific" ATFM measures, i.e. measures whose control mechanisms apply to a single flight. An example is the Ground Delay Program (GDP), whose control mechanism is a Calculated Take-Off Time (CTOT), or an ATFM measure for airborne flight, whose control mechanism is a Calculated Time Over (CTO). Recipients of this information should take actions to comply with the ATFM measure contained herein.	CTOT, CTO, CLDT, and fields currently included in APAC AFTN/AMHS-Based ICD for ATFM[1]	FIXM	Pub/Sub Req/Reply	1
ATFM/A-CDM Integration Service	Supports exchanges of flight-specific ATFM measure information and A-CDM milestone parameters among stakeholders, including arrival/departure ATFM units, airspace users, and airport operators, to integrate A-CDM process with ATFM operations.	ATFM measure information: CTOT A-CDM departure planning information: TOBT, TTOT, TSAT	FIXM	Pub/Sub Req/Reply	1
APAC Common SWIM Meteorological Information Services					
FOR AERODROME					
METAR/SPECI ~~information~~ service	Provides ~~of~~ IWXXM-formatted METAR/SPECI product specified in ICAO Annex 3.	Provision of the existing Annex 3 product via an information service ~~in Annex 3. Information service will be enabled through Amendment 81 to Annex 3 as~~	IWXXM	Pub/Sub Req/Reply	1
TAF ~~information~~ service	Provides ~~of~~ IWXXM-formatted TAF product specified in ICAO Annex 3.		IWXXM	Pub/Sub Req/Reply	1

[1] Based on the conclusion from ATFM/SG/15, an amendment to this ICD will be proposed in which a more structured use of REGUL and REGCAUSE fields will be introduced. This proposal is expected to be tabled at the upcoming CNS/SG meeting.

Business functionality of the information service	**Brief description of the service**	**Type of information to be exchanged**	**Information exchange model / Message type**	**Message exchange pattern**	**Priority ~~of~~ ~~Recommended sService in iInitial APAC Common SWIM IS~~ (1) / (2) / (3)**
		~~recommended practice with applicability from Nov 2024.~~			
Aerodrome Meteorological Observation Information Service ~~observation information service~~	Provides continuous observations of weather parameters at an aerodrome. Advanced meteorological SWIM (MET-SWIM) service being developed by MET Panel.	To be introduced as recommended practice in Annex 3 (Amd 84~~83~~) in Nov 2030~~2027~~ tentatively (Note: Level of standardisation needs to be considered, as different aerodrome information services may be required for different use cases.)	IWXXM	Pub/Sub or Req/Reply	2*
Aerodrome Meteorological Forecast Information Service ~~forecast information service~~	Provides information of the expected meteorological conditions, including probability, at an airport during a specified period. Advanced meteorological SWIM (MET-SWIM) service being developed by MET Panel.		IWXXM	Pub/Sub or Req/Reply	2*
FOR ENROUTE					
SIGMET ~~information~~ service	Provides ~~of~~ IWXXM-formatted SIGMET product specified in ICAO Annex 3.	SIGMETs for thunderstorm, tropical cyclone, turbulence, icing, mountain wave, duststorm, sandstorm, volcanic ash and radioactive cloud	IWXXM	Pub/Sub Req/Reply	1
AIRMET ~~information~~ service	Provides ~~of~~ IWXXM-formatted AIRMET product specified in ICAO Annex 3.	Provision of the existing Annex 3 product via an information service	IWXXM	Pub/Sub Req/Reply	~~1~~2
Tropical Cyclone Advisory ~~information~~ service	Provides ~~of~~ IWXXM-formatted Tropical Cyclone Advisory product specified in ICAO Annex 3. (Designated provider: States with Tropical Cyclone Advisory Centre)		IWXXM	Pub/Sub Req/Reply	1

* Will become Priority (1) when it is introduced as recommended practice in Annex 3 tentatively in Nov 2030

Business functionality of the information service	**Brief description of the service**	**Type of information to be exchanged**	**Information exchange model / Message type**	**Message exchange pattern**	**Priority ~~of~~ ~~Recommended sService in iInitial APAC Common SWIM IS~~ (1) / (2) / (3)**
Volcanic Ash Advisory ~~information~~ service	Provides ~~of~~ IWXXM-formatted Volcanic Ash Advisory product specified in ICAO Annex 3. (Designated provider: States with Volcanic Ash Advisory Centre)		IWXXM	Pub/Sub Req/Reply	1
Space Weather Advisory ~~information~~ service	Provides ~~of~~ IWXXM-formatted Space Weather Advisory product specified in ICAO Annex 3. (Designated provider: States with Space Weather Advisory Centre)		IWXXM	Pub/Sub Req/Reply	1
Volcano Observatory Notice for Aviation (VONA) ~~information~~ service	Provides ~~of~~ IWXXM-formatted VONA specified in ICAO Annex 3. Provision of VONA ~~will become the~~ is a recommended practice in Annex 3 (Amd 82) ~~in 2025~~. (Designated provider: States with a designated State Volcano Observatory)		IWXXM	Pub/Sub Req/Reply	2
Quantitative volcanic ash ~~(QVA)~~ concentration information (QVA) service	Provides detailed information of significant volcanic ash in the atmosphere, including probabilities of ash concentration thresholds over space and time. Advanced meteorological SWIM (MET-SWIM) service being developed by MET Panel. (Designated provider: States with ~~VAAC~~ Volcanic Ash Advisory Centre (VAAC))	QVA ~~grids grid point~~ gridded forecasts including probabilities~~,~~ and IWXXM QVA objects. ~~To be introduced as~~ A recommended practice for significant ash clouds in Annex 3 (Amd 82) ~~in Nov 2025 tentatively~~ for VAACs in a position to do so from Nov 2025, and for all VAACs from Nov 2026.	Gridded data (e.g. NetCDF), IWXXM	Pub/Sub ~~or~~ Req/Reply	~~1~~2[#]

[#] Will become Priority (1) from Nov 2026

Business functionality of the information service	**Brief description of the service**	**Type of information to be exchanged**	**Information exchange model / Message type**	**Message exchange pattern**	**Priority ~~of~~ ~~Recommended s~~Service in ~~iInitial APAC Common SWIM IS~~ (1) / (2) / (3)**
WAFC (World Area Forecast Centres) gridded ~~grid point~~ forecast service	Provides global gridded weather forecasts. (Designated provider: WAFCs (UK and US))	Global gridded forecasts of CB, icing, turbulence, upper winds, upper-air temperatures and humidity, flight level and temperature of tropopause, and direction, speed and flight level of maximum wind	Gridded data in GRIB2	Pub/Sub ~~or~~ Req/Reply	1
WAFC significant weather (SIGWX) forecast service	Provides global WAFC SIGWX data sets with coverage expressed in polygons. (Designated provider: WAFCs (UK and US))	Significant weather forecast such as tropical cyclone, ~~severe squall lines,~~ turbulence, icing, etc.	IWXXM	Pub/Sub ~~or~~ Req/Reply	1
Satellite image service	Provides satellite observational information.	Satellite derived MET information (e.g. significant convection)	Gridded format (e.g. NetCDF) and image format	Req/Reply	2
Weather radar image service	Provides two- or three-dimensional radar observational information.	Weather radar reflectivity to visualise the intensity of convection	Gridded format (e.g. NetCDF) and image format	Req/Reply	2
APAC Common SWIM Surveillance Information Services					
Surveillance data **only** sharing service	Provides surveillance data of aircraft. ~~Provides three-dimensional position, time and identification of aircraft and other data as appropriate.~~	~~Position~~ latitude, longitude, ~~altitude,~~ flight level, ground speed (optional), ~~track angle,~~ magnetic heading (optional), ~~call sign, Mode S address,~~ target identification, target address, **mode 3/A code** (optional), **date**, time of message reception for position, ~~data quality~~, quality indicators, ~~Mode S DAP~~, **SAC, SIC**	ASTERIX Cat 21 (payload in JSON or RAW format)	Pub/Sub	~~2~~1

Business functionality of the information service	**Brief description of the service**	**Type of information to be exchanged**	**Information exchange model / Message type**	**Message exchange pattern**	**Priority ~~of Recommended sService in iInitial APAC Common SWIM IS~~ (1) / (2) / (3)**
Surveillance data with flight plan information sharing service	Provides surveillance data of aircraft with flight plan information.	globally unique flight identifier, aircraft identification, departure aerodrome, destination aerodrome, aircraft type (optional), wake turbulence category **(optional)** latitude, longitude, flight level, ground speed **(optional)**, magnetic heading **(optional)**, target identification, target address, mode 3/A code **(optional)**, date, time of message reception for position, quality indicators, SAC, SIC	ASTERIX Cat 21+FPL (payload in JSON or RAW format)	Pub/Sub	2

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APPENDIX B

नागर विमानन मंत्रालय
MINISTRY OF CIVIL AVIATION

ICAO APAC RADIO NAVIGATION SYMPOSIUM

GNSS RFI: Collectively Bridging Gaps and Shaping the Path Forward

7th – 9th April 2025 New Delhi, India

List of Recommendations

The ICAO APAC Radio Navigation Symposium reviewed existing Global Navigation Satellite System (GNSS) Radio Frequency Interference (RFI) mitigation strategies with the objective of identifying gaps and offering insights into actions required to address the evolving challenges posed by GNSS RFI in terms of technological, procedural, and human-centric aspects of mitigation.

The Symposium reaffirmed the significance of the ICAO/ITU/IMO Joint Statement on the Protection of Radio Navigation Satellite Service (RNSS) from Harmful Interference and outlined a set of recommended actions and best practices to achieve the following objectives:

Objective 1: Minimize GNSS RFI occurrence through effective regulatory measures and enforcement.

1.1 States should:

1.1.1 ensure sufficient aviation representation in delegations of States to ITU WRC-27 preparatory meetings, to progress future improvements to ITU Resolution 676 and to ensure that future WRC updates of Radio Regulations do not adversely impact GNSS;

1.1.2 improve coordination with the military by facilitating the sharing of information on GNSS RFI testing and any relevant activities such as Counter-UAS operations;

1.1.3 possess the necessary technical capabilities to detect GNSS RFI, conduct Radio Frequency (RF) measurements, and geolocate the source of the GNSS RFI; and

1.1.4 utilise the ITU Radio Regulations (RR) escalation procedure (RR Article 15) to ensure proper resolution for incidents of GNSS RFI with cross-border impact that cannot be solved nationally or internationally through routine procedures;

1.1.5 States should also consider submitting reports to the respective ICAO Regional Office, which can then forward those reports to the ITU Satellite Interference Reporting and Resolution System (SIRRS) for further action.

1.2 Radio regulatory authorities of States need to step up enforcement against GNSS jamming transmitters (GPS Jammers) while educating the public about their illegality, without unintentionally exposing system vulnerabilities. Law enforcement should monitor and act against online marketplaces selling such devices. Additionally, making the ownership of GPS jammers illegal will help authorities confiscate them more effectively and strengthen regulatory control.

1.3 All stakeholders need to contribute to the development of further ICAO guidance to strengthen the link between air operator reports, air navigation services provider (ANSP) confirmation, and spectrum regulator engagement. The coordination and reporting processes must be efficient and simplified to ensure timely and effective management.

Objective 2: Support Air Crews in Operational Risk Reduction and Management

2.1 ICAO should consider the necessity of standardized radiotelephony phraseologies for specific scenarios. Establishing clear, standardized communications in these situations could greatly benefit both pilots and air traffic controllers, ensuring accurate and efficient responses.

2.2 Airlines and aircraft manufacturers should:

2.2.1 integrate GNSS RFI factors into fuel and alternate planning to ensure contingency measures are in place for potential navigation disruptions, including refining dispatch decisions based on aircraft equipment and ensuring the aircraft's capabilities match the expected interference conditions;

2.2.2 ensure pilots maintain proficiency in conventional navigation methods, supporting operational resilience in GNSS-degraded environments. This includes:

2.2.2.1 providing training to ensure pilots can operate effectively using conventional procedures, enabling them to fly without reliance on GNSS when necessary.

2.2.2.2 encouraging position cross-checking using VOR radials for situational awareness; and

2.2.2.3 ensure a full Inertial Reference System (IRS) alignment before departure if the aircraft experienced GNSS RFI during the previous flight, as indicated in the aircraft journey log.

2.2.3 clarify and streamline GNSS RFI reporting, potentially through Electronic Flight Bags (EFB) integration, to facilitate timely incident reporting; and

2.3 The symposium acknowledged IATA's initiative in providing the Turbulence Aware platform to support airline information sharing and encouraged the development of similar initiatives for GNSS RFI information exchange.

Objective 3: Ensure effective support to flight crews while maintaining safety

3.1 States should:

3.1.1 prioritize suitable staffing levels, sector workload planning, and continuous monitoring of compliance with clearances to ensure effective air traffic management;

3.1.2 ensure ATC readiness to provide radar vectors when requested navigational assistance in a surveillance environment, clock checks, and clearly define circumstances under which ATC may refuse vectoring;

3.1.3 ensure comprehensive ATCO training and awareness programs focusing on response to abnormal situations and clearance deviations, equipping controllers with the necessary skills to handle unexpected events effectively; and

3.1.4 identify critical areas for Terrain Awareness and Warning System (TAWS) climb and deconfliction advisories, ensuring controllers provide timely and accurate guidance to pilots.

Objective 4: Ensure suitable CNS capabilities are available as required

4.1 States should:

4.1.1 ensure timely and effective communication regarding GNSS RFI incidents. A warning could be issued via NOTAM, Aeronautical Information Publication (AIP), and/or Automatic Terminal Information Service (ATIS) as appropriate;

4.1.2 ensure ATSEP personnel receive training/awareness program on GNSS RFI detection, mitigation, and reporting. Simulation exercises and collaborative awareness programs could be implemented to enhance response capabilities and operational resilience;

4.1.3 establish a Resilient Operational Network (RON) by ensuring availability of sufficient navigation infrastructure to support continuous Performance Based Navigation (PBN) operations and by facilitating positional awareness through maintenance of a VOR/DME Network for reliable cross-checking; and

4.1.5 implement GNSS jamming and spoofing monitoring using ADS-B Out (ground-based or space-based) or Wide Area Multilateration (WAM).

Objective 5: Strengthen capabilities to maintain PBN and optimize operational efficiency by leveraging current technology

5.1 Aircraft and avionics manufacturers should:

5.1.1 avoid cross-contamination of aircraft/avionics sensors due to GNSS RFI;

5.1.2 augment GNSS time with precision time sources to improve resilience and mitigate disruptions;

5.1.3 enhance GNSS robustness with rapidly deployable Multi-Mode Receivers (MMR) and strategic system upgrades; and

5.1.4 enable advanced RNP operations using DME through improvements to multi-DME navigation and clarifying the DME interrogator scanning and selection criteria.

5.2 States should:

5.2.1 implement spoofing monitors in surveillance trackers while conducting a comprehensive ADS-B to SSR/WAM comparison; and

5.2.2 optimise DME transponder network planning and coverage.

Objective 6: Achieve Robust Positioning, Navigation, and Timing (PNT) through long-term C-PNT development

6.1 States should:

6.1.1 conduct a comprehensive cyber risk assessment for all CNS/ATM systems, particularly space-based systems, and implement adequate mitigation measures; and

6.1.2 enhance GNSS resilience and improve cybersecurity defenses through standardization and implementation of advanced technical improvements such as authentication mechanisms, improved Controlled Reception Pattern Antennas (CRPA) for robust interference mitigation and enhanced signal reception, GNSS RFI detection systems and downlink enhancements to identify and counter GNSS RFI in real time and ensure secure and reliable data transmission across GNSS networks.

6.2 ICAO should:

6.2.1 enhance L-Band spectrum utilization through standardization of enhanced DME (eDME) and assess other candidate PNT solutions;

6.2.2 establish a balanced CNS evolution roadmap, whereas ground, air, and space capabilities should work collaboratively within a unified framework that prioritizes spectrum efficiency as the fundamental driver; and

6.2.3 emphasize the core objective of the Integrated Communication, Navigation, Surveillance and Spectrum (CNSS), transforming common mode weaknesses into strengths through smart integration while maintaining independence across ground, air, and space systems.

APPENDIX C

REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE CNS FIELDS IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective Action			
Requirement	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action**
Reliable ground to ground communication as specified in the regional Air Navigation Plan (Doc.9673) Tables CNS II-1; CNS II-2 & CNS II-3	Afghanistan and Pakistan	Unreliability of AFS communication between Afghanistan and Pakistan was brought to the notice of APANPIRG/21. Lack of reliability in the AFS including data communication between Kabul and Karachi and ATS voice communication between Lahore and Kabul was identified.	September 2010	A follow-up COM coordination meeting held in July 2019 discussed way forward	1. Site visits in Pakistan by expert from the VSAT service provider were made in February and March 2016. Remedial recommendations were provided to CAA. Pakistan. Pakistan requested ICAO to provide assistance in establishing VSAT link in 2022. 2. Both Afghanistan and Pakistan agreed to as first step to recover the VSAT connection by upgrading terminals in Lahore and Karachi. Afghanistan will provide assistance and does the Network Configuration settings; 3. A VPN link was established between Karachi and Kabul through UK. Now the VPN link between UK and Kabul is un-serviceable. 4. Both States also agreed to implement CRV as soon as practical to resolve the existing COM deficiencies. 5.Pakistan has joined CRV and is actively coordinating with Afghanistan to restore the communication link between Afghanistan and Pakistan. Pakistan expected to restore the connection by the end of 2024.	CAA. Afghanistan and CAA. Pakistan **For APANPIRG/36 from Pakistan-** Request that this deficiency be removed from Pakistan's side.	End of 2024 No dates can be shared from Pakistan – CNS SG/29 (16-20 June 2025)	A

Identification		Deficiencies			Corrective Action			
Requirement	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action**
					6. The AFS communication link between Pakistan and Afghanistan remains non-operational due to the absence of a functioning AFS system on the Afghanistan side. Pakistan is fully prepared and available to activate the link as soon as Afghanistan establishes the required AFS infrastructure. Afghanistan had not given any tentative timelines. Therefore, it was requested that this deficiency be removed from Pakistan's side.			

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5.2 Report of the APANPIRG Contributory Bodies Review Task Force Meeting

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5.2.5 APANPIRG/26 noted that following the reorganization of APANPIRG structure and the revised Terms of Terms of the Sub Groups, it is necessary for the Sub group to review the structure of its Working Groups and Task Forces and their Terms of Reference. APANPIRG adopted the following Decision.

Decision APANPIRG/26/66 — Review Terms of Reference of Contributory Bodies under the APANPIRG Sub Groups

That, the Secretariat, in consultation with Chairs of the existing Task Forces and Working Groups under the APANPIRG Sub Groups, reviews the TOR as necessary, and submits to the respective Sub Groups and APANPIRG/27 for further review and adoption.

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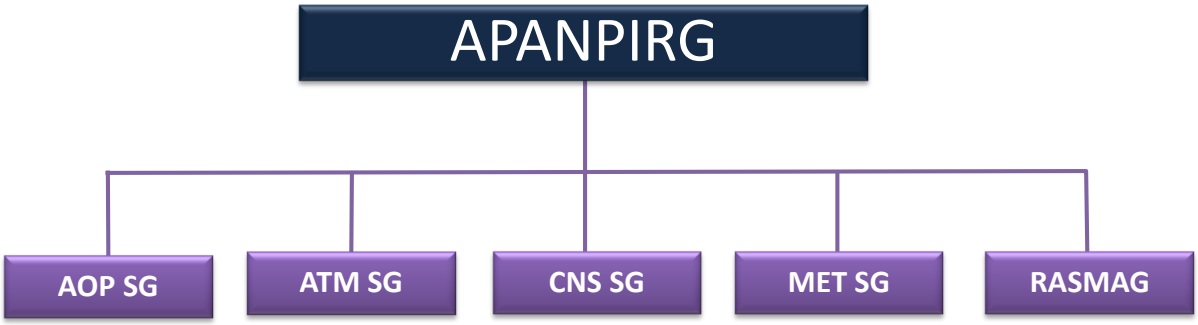
APPENDIX B

PROPOSED NEW STRUCTURE OF APANPIRG



- AOP SG: Aerodrome Operations and Planning Sub Group
- ATM SG: Air Traffic Management Sub Group
- CNS SG: Communications, Navigation and Surveillance Sub Group
- MET SG: Meteorology Sub Group
- RASMAG: Regional Airspace Safety Monitoring Advisory Group

Note: The scope of the ABSRTF is limited to APANPIRG Sub Groups

APPENDIX C

Terms of Reference for APANPIRG Communications, Navigation and Surveillance/Sub Group (CNS/SG)

The Objectives of the CNS/SG are to:

1) *ensure continuous and coherent development of the CNS parts of the Asia/Pacific Regional Air Navigation Plan (APAC ANP) in a manner that is harmonized with adjacent regions, consistent with ICAO SARPs, the Global Air Navigation Plan and the Global Aviation Safety Plan;*

2) *facilitate the implementation of CNS systems and services identified in the APAC ANP, Aviation System Block Upgrade (ASBU) priority modules and Asia/Pacific Seamless ATM Plan elements using the project management principles where appropriate;*

3) *review, identify and address deficiencies that impede the implementation or provision of efficient CNS services in the Asia & Pacific Regions.*

Deliverables to meet the Objectives:

1) *Progress report to be **submitted** to APANPIRG addressing the CNS SG deliverables (listed in 2 to 9 below);*

2) *CNS parts of the APAC ANP to be **reviewed** and, as necessary, amendment proposals **prepared** to update the APAC ANP to reflect changes in the operational and global requirements;*

3) *Level of implementation of CNS systems and services to be **monitored** and, as necessary, **facilitated** to support the effective implementation of ASBU priority modules and the Asia/Pacific Seamless ATM Plan elements;*

4) *Air navigation deficiencies in the field of CNS to be `**identified** (which may require any necessary systems performance monitoring to be **facilitated**) and, where necessary, appropriate corrective action **proposed** and the development and implementation of action plans by States to resolve identified deficiencies **facilitated**;*

5) *Air navigation deficiencies in the field of CNS (as listed in the APANPIRG database) to be **reviewed** and, as necessary, **updated** to reflect the current situation;*

6) *Research and development, trials and demonstrations in the field of CNS and other relevant areas to be **monitored** and, as necessary, the transfer of this information and expertise between States **facilitated**;*

7) *Specific recommendations to be **made,** and guidance materials **developed,** aimed at improving CNS services by the use of existing and/or new procedures, facilities and technologies;*

8) *Inter-regional and intra-regional co-ordination issues in the field of CNS to be **reviewed** and **identified** and, as necessary, actions **recommended** addressing those issues*;

9) *CNS environmental initiatives are consistently identified and progressed; and report outcomes from CNS environmental initiatives*;

10) *Draft Conclusions and Decisions to be **formulated** relating to matters in the field of CNS that come within the scope of the APANPIRG work plan.*

APPENDIX D

Project Management Principles

1 In the context of a project management approach, projects will be identified primarily from ASBU Modules adopted by APANPIRG, agreed regional targets and objectives and existing initiatives. Any ANS operational improvement is conducted through a project[1]. The Seamless ATM implementation guidance published and maintained by the ICAO Regional Office would apply for structuring the project and providing the necessary technical guidance (standards etc). However the level of documentation required would be commensurate with the project objectives and scale (see below).

2 Where it is not the case, a project team will be nominated by States and concerned international organizations in coordination with SG. The Task Force Chair and/or the ICAO Secretariat will act as Project Managers.

3 In this regard it is proposed that the ToR of the Sub Groups should be reviewed to better support the ICAO performance framework, in particular implementation activities to align with ASBUs and regional priorities. It is also proposed to empower the Sub Groups/Task Forces to make decisions on internal matters and take corrective actions. The Sub Groups would have the ability to agree, without further APANPIRG endorsement, any Conclusion or Decision (especially those concerning guidance to States in the implementation of ICAO SARPs) that does not have significant additional economic, environmental or political effects, which should be considered at a higher level at APANPIRG.

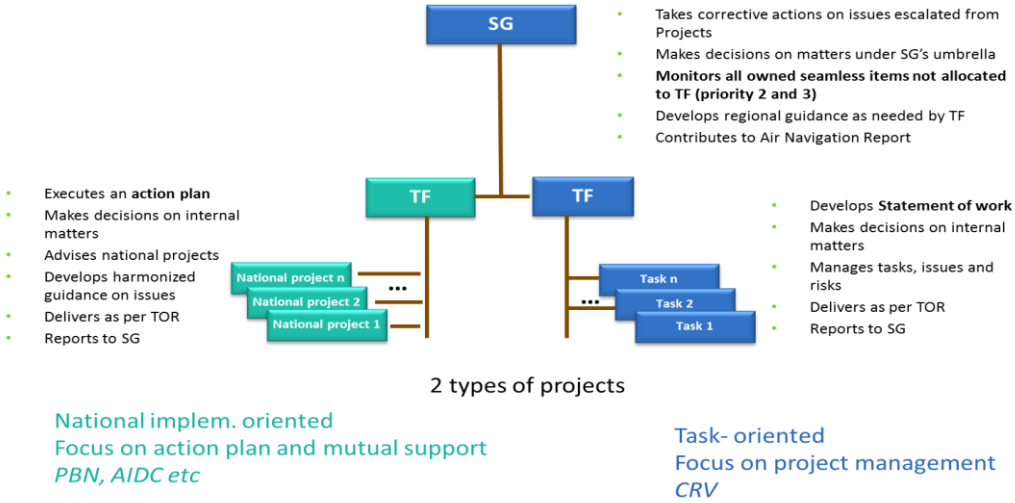
Scale of projects

4 The scale of the project will be defined as experience shows that coordination and control activities vary accordingly:

- interregional (example: definition of an interregional AIDC standard)
- regional (examples: CRV, ATFM projects)
- sub-regional (example: Implementation of new PBN routes between States in a sub region)
- a collection of national projects driven by a State/Administration

Types of project

5 Depending on the objective of the project, 2 types of projects could be defined:



Documents and tools

1 Project: according to ISO 10006, unique process consisting of a set of co-ordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including constraints of time, cost and resources.

6 TORs of the Project should define timelines from start to completion. These timelines should be consistent with eANP Volume III main planning table, stating all deadlines for ASBU and regional objectives and related ANRF.

7 TORs will record also the project manager(s), the project team, the reporting lines (SG and APANPIRG) and scale (interregional, regional, sub-regional, or national) of the project.

8 Projects should be conducted using standardised and simple documents for which templates would be proposed on ICAO APAC RO website:

- Statements of work for the definition of tasks inside a project
- Action list for the allocation and follow-up of actions inside the project and outside the project (dependencies)
- Basic Risk table for the identification and mitigation of risks inside a project
- Project report (1 slide) to report to the SG(s)
- Summary of discussions of the meeting

9 At the creation of the project, the set of applicable documents would be proposed by the Project Manager according to the scale and type of project, endorsed by the SG, and recorded in the TOR.

10 The use of ICAO portal and teleconferences should be generalized to control and coordinate the activities conducted under a project.

Safety management

11 For inter-regional, regional and sub-regional projects undertaking major changes to the air navigation system in Asia Pacific Region, a safety analysis may have to be conducted[2] in the framework of the project. For national projects, the analysis would more probably be conducted inside the State/organizations involved. Such analyses have to comply with ICAO Doc 9859, Safety Management Manual, particularly the Safety risk probability table and the Safety risk severity table.

12 If no other process is available or preferred, the analysis could be based on:

- A Concept of Operations (CONOPS) and/or OSED identifying the new operational services/environments being envisaged;
- Operational Hazard Analysis (OHA) identifying hazards brought by the new operational services;
- Preliminary System Safety Assessment (PSSA) as per ARP 4761 identifying and mitigating the causes of hazards (people, equipment, procedures)
- System Safety Assessment (SSA) as per ARP 4761 establishing that the risk is acceptable according to ICAO Doc 9859.

Checking/Reporting

2 A criterion could be that if an initial Hazard Analysis identifies hazards with severity being major or more severe (significant reduction in safety margins, a reduction in the ability of the operators to cope with adverse operating conditions as a result of an increase in workload or as a result of conditions impairing their efficiency, Serious incident, Injury to persons) then an extensive process would have to be conducted. Otherwise a lighter process would be conducted.

13 It is proposed that interregional, regional and sub-regional projects report to their SG through a one page slide on their progress, issues and top risks. National projects would be tracked through the seamless ATM plan on-line reporting process.

14 In order to track the progress of implementation, data collection will be done through the seamless ATM plan on-line reporting process using the metrics defined.

15 A regional picture could be developed to graphically illustrate the progress by seamless ATM plan implementation item. The project was started but is frozen. ICAO's resources would need to be mobilized to support the regional picture.

Acting/correcting

16 A SG would have an overview of all its projects: objectives, achievements, issues, top risks. It will take action on issues escalated by any project supervised or identified between projects supervised. APANPIRG would have an overview of all the projects and will take corrective actions on issues escalated from SGs or identified between SGs.

17 SGs would monitor dependencies between projects. APANPIRG would monitor dependencies between projects supervised by different SG. APANPIRG could review periodically the top 10 risks. A table of projects for the region could be maintained by APANPIRG.

Change management

18 The project management principles presented in this Attachment and considered beneficial by ABSRTF should be refined and recorded in the APANPIRG Procedural Handbook**.**

19 All principles would need a certain time to be properly and homogeneously applied throughout the region. Selection and briefing of project managers would be necessary. Certain principles may be regarded as guidance/good practice first and later on become recommendations.

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