International Civil Aviation Organization

THE ELEVENTH MEETING OF SYSTEM WIDE INFORMATION MANAGEMENT TASK FORCE (SWIM TF/11)

Bangkok, Thailand, 25 – 29 May 2026

Agenda Item 3: Outcomes of relevant meetings on SWIM-related matters
- ICAO APAC CNS/other relevant Meetings

REVIEW OF RELEVANT CNS MEETINGS

(Presented by the Secretariat)

SUMMARY

The paper presents the relevant outcomes of the meetings held in the year 2025 including the Thirty-Sixth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/36), the Twenty Ninth Meeting of Communication, Navigation, and Surveillance Sub Group (CNS SG/29), and the Tenth meeting of SWIM TF (SWIM TF/10) along with relevant discussions

1. INTRODUCTION

1.1 The Thirty-Sixth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/36) was held at the ICAO APAC Regional Office, Bangkok, Thailand, from 24 to 26 November 2025. The Meeting was attended by **188** participants from **26** Member States, **2** Special Administrative Regions of China, and **6** International Organizations. The APANPIRG/36 meeting report, working papers, information papers, and other resources can be accessed on the APANPIRG/36 Meeting webpage.

1.2 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 to 20 June 2025. The Meeting was attended by **100** participants from **23** States/Administrations, **2** International Organizations, and **3** industry partners. The Meeting report and other documents of the meeting can be accessed on the CNS SG/29 Meeting webpage.

1.3 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/meetingdocs?fid=577

1.4 CRV Workshop for PSIDS was held from 3-4 March 2025 and the Thirteenth Meeting of the Common aeRonautical Virtual Private Network Operations Group of APANPIRG (CRV OG/13) was held from 5 to 8 March 2025, in Wellington, New Zealand. The Meeting was attended by 74 participants from 26 Member States/Administrations, 3 International Organizations and 2

telecommunication providers. The meeting report, working papers, information papers, and other resources can be accessed by the following link:
https://www.icao.int/APAC/meetingdocs?fid=593

1.5 The half-day AMC Workshop and the Twelfth Meeting of the Aeronautical Communication Services (ACS) Implementation Coordination Group (ACSICG/12) was held at the ICAO APAC Regional Office, Bangkok, Thailand, from 25 to 28 March 2025. The AMC workshop and ACSICG/12 Meeting were attended by 75 participants from 18 States/Administrations, 2 international organizations and 1 industry partner. The meeting report, working papers, information papers, and other resources can be accessed by the following link:
https://www.icao.int/APAC/meetingdocs?fid=917

1.6 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/meetingdocs?fid=710#block-icao-page-title

1.7 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/meetingdocs?fid=711#block-icao-page-title

1.8 The Special Session - Fourteenth Meeting of the Common aeRonautical Virtual Private Network Operations Group of APANPIRG (CRV OG/14) was held from 27 to 31 October 2025 in Tokyo, Japan. The Meeting was attended by 70 participants from 28 Member States/Administrations, 1 International Organizations and 3 telecommunication providers. The meeting report, working papers, information papers, and other resources can be accessed by the following link:
https://www.icao.int/APAC/meetingdocs?fid=553

1.9 The APANPIRG/36 Meeting reviewed the outcomes of CNS SG/29, noted with appreciation the following work done and achievements by the CNS SG and the contributory bodies reporting to APANPIRG through the CNS SG. APANPIRG/36 also discussed CNS-related matters and acted on the Report of the CNS SG/29 meeting and other papers presented under Agenda Item 3.4.

1.10 This paper summarized relevant information and updates with a highlight of the reviewed outcomes of relevant discussions of other meetings of CNS SG/29 and APANPIRG/36.

2. DISCUSSION

The actions taken by APANPIRG/36 & CNS SG/29 meetings on Aeronautical Spectrum and Frequencies related matters are highlighted below:

2.1 The CNS SG/29 meeting adopted the following **5** Conclusions and **6** Decisions:

Reference		Subject
Conclusion CNS SG/29/02 *(Conclusion ACSICG/12/03 (CRV OG/13/07))*	-	Adopt the CANSO Standard of Excellence in Cyber Security for CRV

Decision CNS SG/29/03 *(Decision ACSICG/12/04)*	-	Adoption of SOP to update the AMC AFTN/AMHS Routing Table in the Asia/Pacific Region
Conclusion CNS SG/29/04 *(Conclusion ACSICG/12/05)*	-	Educational material to manage the distribution of IWXXM information for COMM experts in the event of primary link failure
Conclusion CNS SG/29/05 *(Conclusion ACSICG/12/06)*	-	Checklist of steps required for operational IWXXM exchange
Decision CNS SG/29/08 *(GBAS-SBAS ITF 07/01)*	-	Guidance Document for Implementation of SBAS in the Asia/Pacific Region
Conclusion CNS SG/29/09 *(SURICG/10/02)*	-	Workflow for the request and coordination of IC codes with the ICAO APAC Office
Decision CNS SG/29/10 *(ATMAS TF/06/01)*	-	Adoption of the Air Traffic Management Automation System Implementation and Operations Guidance Document Edition 1.5
Decision CNS SG/29/11 *(ATMAS TF/06/02)*	-	Adoption of the AIDC Implementation and Operations Guidance Document (IGD) Edition 2.0
Conclusion CNS SG/29/12 *(ACSICG/12/01(CRV OG/13/04), ACSICG/12/08, SURICG/10/01, SRWG/09/01)*	-	Update the CNS Tables of ICAO APAC e-ANP Vol II
Decision CNS SG/29/13	-	Adoption of Regional Guidance Material for Addressing Human Factor Issues of ATSEP v2.0
Decision CNS SG/29/14	-	Creation of ANS Information Assurance Task Force (ANSIA TF)

2.2 The contents of the above Conclusions/Decisions adopted by the CNS SG/29 are provided in **Attachment A** to this paper.

2.3 Based on the outcome of discussions on various agenda items, the CNS SG/29 meeting developed 3 Draft Conclusions and 1 Draft Decision for consideration by APANPIRG/36 Meeting, which were further adopted by APANPIRG/36. The Conclusions/Decisions adopted by APANPIRG/36 are as follows:

Reference		**Subject**
Conclusion APANPIRG/36/10 *(CNS SG/29/01 (ACSICG/12/02 (CRV OG/13/06)))*	-	Implementation of CRV for small Pacific Islands and small ANSPs in the region using CRV Solution, CRV SLA Package D+
Decision APANPIRG/36/11 *(CNS SG/29/06 (SWIM TF/10/02))*	-	Adoption of APAC Common SWIM Information Services, v1.0
Conclusion APANPIRG/36/12 *(CNS SG/29/07*	-	Asia/Pacific Regional FIXM version 4.3 Extension

(SWIM TF/10/03))

Conclusion APANPIRG/36/13 - Decision on CRV II contract Management Process
(CNS SG/29/15
(ACSICG/12/09
(CRV OG/14/01)))

2.4 All APANPIRG/36 Conclusions related to CNS are provided in **Attachment B** to this paper.

Outcome of ACSICG/12

Review the Report of the Thirteenth Meeting of Common aeRonautical VPN Operations Group (CRV OG/13)

2.5 Mr. Vaughan Hickford was unanimously re-elected as the CRV OG Co-Chair (Asia).

2.6 Singapore requested the ICAO Secretariat to prepare a list of regional IP networks in various ICAO regions, their service provider, and contract duration for working on harmonizing these dates in the future so that interconnection of regional networks can be planned strategically. The ICAO Secretariat prepared the following list in coordination with other regional offices:

SN	Region	Regional IP Network name	Service Provider	Contract start year	Contract end year
1.	APAC	CRV	PCCW Global	2017	2028
2.	MID	In process	NA	NA	NA
3.	WACAF/ESAF	No dedicated IP network AFISNET NAFISAT SADC networks	 ASECNA ATNS and IATA ATNS and IATA	NA	NA
4.	SAM	REDDIG II	Cirion/Intelsat	2015	2025
5.	NACC	MEVA III	FREQUENTIS AG	2015	March 2026
		CARSNET	Contract process ongoing	2026	2036
6.	EUR/NAT	New PENS	British Telecom	2018	2028

2.7 Some details of AFI networks were as follows:

1. **AFISNET**: The AFI Satellite Telecommunications Network covers Central and Western African States as well as Southern African and Indian Ocean States (ASECNA Member States).
2. **SADC VSAT/2**: A network launched by the Southern African Development Community (SADC) States in 2008.
3. **NAFISAT**: A network designed for the North-Eastern African States.
4. **CAFSAT:** The Central Atlantic FIRs Satellite Telecommunications Network, which involves African, European, and South American States

Note: AFISNET, SADC VSAT/2 and NAFISAT are capable of IP technology. Upgrades are still undergoing for CAFSAT for the integration of IP-based services.

2.8 CARSNET is the Caribbean Air Navigation Services Network, which is the replacement contract for MEVA. CARSNET will be a combination of dual networks, a primary one MPLS and a satellite network as a backup.

Outcomes of ICAO APAC-MID CRV Workshop

2.9 The CRV OG/13 Meeting reviewed the ICAO APAC-MID CRV Workshop held in Jeddah, Saudi Arabia, from 20-23 October 2024. The Workshop noted the benefits of implementing an IP Network for voice and data, recalled past ICAO MID Meetings and related decisions relevant to CRV implementation and discussed the roadblocks for CRV implementation efforts from MID States from 2017-2019. It was noted that price was one of the critical factors in the decision-making process. The ICAO Secretariat outlined reasons for encouraging MID States to join CRV and the associated benefits.

2.10 The CRV OG/13 Meeting noted that the CRV contract mandates States to join CRV for an initial term of a minimum of 5 years. However, as the current CRV contract is expiring on 31 December 2028, a special exception has been provided to MID States in the offer presented by PCCWG. Most MID States expressed interest in Package A and agreed to contact PCCWG individually for negotiations, with coordination support available from the ICAO MID office.

2.11 The CRV OG/13 Meeting proposed that Pakistan and India encourage Oman's higher authorities to join CRV by sharing letters detailing successful implementation experiences..

Outcomes of SIPG WS/1

2.12 The CRV OG/13 Meeting reviewed the outcomes of the First Working Session of the SWIM Implementation Pioneer Ad-Hoc Group (SIPG WS/1) held from 14 to 17 January 2025 in the ICAO Asia Pacific Regional Office, Bangkok, Thailand. The session 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/MeetingDocs?fid=577

2.13 The CRV OG/13 Meeting shared the concern of routing to be done by EMS in the proposed SWIM architecture. It was agreed that such architecture would not meet the purpose of SWIM implementation, as routing will need to be done at the EMS/application level, which is not recommended.

2.14 For the three possible options to establish the APAC regional SWIM over CRV and the Internet, the Meeting deliberated the proposal mentioned in the SIPG WS/1 report from sections 3.12 to 3.13. The CRV OG/13 Meeting indicated that the third proposed option is not feasible, and it was noted that the two remaining options have flaws due to misunderstandings regarding how SWIM EMS will be connected over CRV and the Internet. It was agreed that there is a need for further discussion among CRV and SWIM experts to clarify the shortcomings of proposed options and make SWIM experts understand the integration of SWIM with CRV. This matter was further discussed and clarified in CRV OG Ad-hoc Experts and SWIM TF Task Leads Online Meeting on 13 March 2025.

2.15 During the 13 March meeting, it was clarified that EMS for SWIM physical connectivity to the CRV is well understood by SWIM experts. In addition, it was clarified that SIPG is not doing IP based routing but message routing, which is in layer 7.

Proposed SOP for Dispute Resolution on CRV Matters

2.16 Fiji presented the Proposed Standard Operating Procedure (SOP) for Dispute Resolution on CRV Matters to be adopted in the CRV Operations Manual. The CRV OG/13 Meeting reviewed and modified the proposed SOP for dispute resolution on CRV matters, and the final SOP was endorsed by the CRV OG/13 Meeting by the **Conclusion CRV OG/13/01- Standard Operating Procedures (SOP) for Dispute Resolution on CRV Matters**. The adopted SOP is provided in **Appendix A**. It was informed that the SOP had been incorporated into the CRV OG Operations Manual v1.4, adopted by **Decision CRV OG/13/02**.

Criteria to add a new service in the Operations Manual

2.17 New Zealand presented a procedure to connect **a non-ANSP system** to the CRV for data communication. The CRV OG/13 Meeting noted that CRV OG will allocate an IP address to the new non-ANSP from the dedicated address block for other service providers. The CRV OG/13 Meeting deliberated the proposed procedure and adopted it to incorporate it into the CRV OG Operations Manual. The procedure is incorporated in CRV OG Operations Manual v1.4, adopted by **Decision CRV OG/13/02**. The procedure for adding SWIM services over CRV could be defined once the APAC SWIM architecture is finalized and other necessary details for SWIM implementation are available. The ICAO Secretariat will share this information with SWIM experts.

CRV OG Operations Manual Status

2.18 New Zealand presented the status of the CRV OG Operations Manual. The CRV OG/13 meeting adopted CRV OG OM v1.4 by **Decision CRV OG/13/02** - Publish the updated APAC CRV Operations Manual. The latest version of the CRV OG Operational Manual was published on ICAO APAC e-docs under CNS, ICAO APAC CRV Secure portal, and on the CRV portal hosted by Airways New Zealand.

Update to the CRV Implementation Plan

2.19 Singapore presented the proposed updates, editorial changes, and formatting adjustments to the CRV Implementation Plan. The CRV OG/13 Meeting reviewed the proposed updates and adopted the **Decision CRV OG/13/03 – Update to the CRV Implementation Plan v2.3**.

Common Package Update - New Zealand (WP/11)

2.20 New Zealand presented an update to the Common Package document naming convention. It was reported that the current naming convention for the documents in the Common Package is mixed. The CRV OG/13 Meeting noted that as discussed at the APAC CRV Ad Hoc Expert Meeting on 12 December 2024, it was proposed to standardize the document naming, with each document being prefixed with an Owner number followed by a Document number. The proposed Owner numbers were 1. ICAO, 2. CRV OG and 3. PCCWG. The CRV OG/13 Meeting reviewed the common package and agreed to adopt a revised common package. The revised common package can be accessed on the New Zealand-hosted CRV Portal.

Outcomes of Fifth Ad-Hoc Governance Meetings

2.21 The Fifth Meeting of the CRV OG Ad-hoc governance group was conducted on 5 March 2025. The Meeting further reviewed the list of tasks and problem statement. The CRV OG/13 Meeting discussed the New PENS and REDDIG II governance models, agreeing that REDDIG II better suits the APAC region. The ICAO Secretariat was requested to organize a Meeting with REDDIG network administration members to discuss and understand the current structure and governance model. The ICAO Secretariat coordinated with the ICAO SAM Office to schedule an online Meeting in October 2025.

2.22 The CRV OG/13 Meeting realized the need to know the total amount APAC States/Administrations pay for CRV contracts. It was agreed that CRV users would share their monthly CRV contract price with the ICAO Secretariat. It was stated that the ICAO Secretariat will share the total price for the region in a future forum for discussion. No individual data shared by each State will be disclosed with other States/Administrations.

Review and update the APAC CRV Implementation Table and Telecommunication Infrastructure Table

2.23 The latest updates presented on the planning and implementation status of CRV were as follows:

- **Under Operation**
  Australia, Bhutan, Cambodia, China, Hong Kong China, Fiji, French Polynesia, India, Indonesia, Japan, Macau China, Malaysia, Mongolia, Myanmar, Nepal, New Zealand, Pakistan, Philippines, PNG, Republic of Korea, Singapore, Sri Lanka, Thailand, USA and Vietnam

- **Under Provisioning**
  New Caledonia and Maldives

- **Hot Prospects in 2025**
  Bangladesh, Brunei, Cook Island, Lao PDR, Oman, Niue, Samoa and Tonga

- **Not joined yet**
  Afghanistan, DPRK, Kiribati, Marshal Islands, Micronesia, Nauru, Palau, Solomon Islands, Timor Leste, Tuvalu, Vanuatu, Russia, ICAO MID States

2.24 Lao PDR informed ACSICG/12 Meeting that it is in contact with the CRV service provider to implement CRV. However, there is a delay in the internal The CRV OG/13 Meeting reviewed the APAC CRV Implementation Table and agreed that after the Telecommunication Infrastructure Table, CRV Implementation Table updates are not required. The meeting updated the Telecommunication Infrastructure Table, which can be accessed on the New Zealand-hosted CRV Portal.

Review of CRV Information in TABLE CNS II-2 Required ATN Infrastructure Routing Plan In e-ANP Vol II

2.25 The ICAO Secretariat summarized the need for review and update to the **TABLE CNS II-2**- *REQUIRED ATN INFRASTRUCTURE ROUTING PLAN* specified in ICAO APAC e-ANP Vol II by APAC States/Administrations. It reminded States/Administrations to review the data affecting their administration and provide feedback to ICAO on the data's accuracy in the requisite format to update the relevant CNS requirements in all volumes of e-ANP.

2.26 The CRV OG/13 Meeting was requested to deliberate on **three options** and choose the appropriate one: 1) the need to change the template of TABLE CNS II-2 of e-ANP Vol II as per the agreed revised ATN Infrastructure Table, 2) add a table to incorporate CRV under specific regional requirements or 3) utilize the existing template of TABLE CNS II-2 of e-ANP Vol II to incorporate CRV at the appropriate place. The pros and cons of all three options were explained at the Meeting. After discussion, the Meeting agreed on **option three** and suggested that **CRV information be added to column number 7**.

2.27 It was noted that the current CNS-related table in ICAO APAC e-ANP is outdated and has not been updated by States/Administrations for many years. The CRV OG/13 Meeting urged states to verify and update **the TABLE CNS II-2- REQUIRED ATN INFRASTRUCTURE ROUTING PLAN** of e-ANP Vol II following the PfA process, as data provided in e-ANP must be up-to-date. It was suggested that data updated in the Telecommunication Infrastructure Table on the New Zealand-hosted CRV Portal can be utilized to update the required information. The ICAO Secretariat informed that **all CNS tables in the Word file** mentioned in ICAO APAC e-ANP Vol II are uploaded to the ICAO APAC ANP Webpage with instructions on how to file a PfA.

CRV contract management

2.28 Due to the confidentiality of the CRV contract management process, the report under agenda item 7 was published on the ICAO APAC CRV Secure portal under the CRV group.

CRV Additions in AMC

2.29 The CRV OG/13 Meeting was presented with information about ongoing work on the addition of CRV implementation status in AMC by Eurocontrol. It was added that Eurocontrol informed that it aimed to align with the PENS approach by May 2025 and will notify ICAO upon completion.

Package D+ For PSIDS/Small ANSPS

2.30 Fiji proposed CRV SLA Package D+ for PSIDS and small ANSPs in the APAC region for implementation for CRV. Fiji informed that CRV Package D+ was formalized and incorporated in the CRV Operations manual. CRV Package D+ was presented to the Meeting as the preferred CRV Package for the PSIDS and small ANSP Member States in the APAC region through the following Draft Conclusion. **Conclusion APANPIRG/36/10** *(Conclusion CNS SG/29/01 (ACSICG/12/02 (CRV OG/13/06)))* - Implementation of CRV for small Pacific Island and small ANSP in the region using CRV Solution, PCCWG SLA Package D+ was endorsed by CNS SG/29 and adopted by APANPIRG/36.

CRV Operational Performance Report

2.31 PCCW Global presented the CRV Operational Performance Report, which analyzed the reliability and overall performance of the CRV network in 2024. The CRV OG/13 Meeting discussed various incidents that resulted in unserviceability in various APAC States/Administrations and their impact on the operational environment. The CRV OG/13 Meeting suggested that PCCW Global provide an analysis of various incidents in all APAC States/Administrations that have severely impacted SLA.

Analysis of APAC CRV Bandwidth Utilization

2.32 The paper presented the bandwidth utilization of each member State in 2024, providing a comprehensive understanding of how network bandwidth is utilized within the organization. PCCWG informed that the reporting tool captured and recorded the average traffic value from the NID interface at 5-minute intervals and averaged the collected data to generate the monthly traffic report. The Meeting reviewed the monthly traffic report and it was observed that the average utilization rate cannot share peak bandwidth utilization. Member States/Administrations were requested to make additional efforts to measure and monitor CRV network performance and share it with CRV OG regularly.

CRV Post Implementation issues in Sri Lanka

2.33 Sri Lanka informed that the CRV circuit for Sri Lanka was interrupted by two major service failures. The CRV OG/13 Meeting deliberated on the root cause of the two incidents and the

issues Sri Lanka faced in resolving them. It was advised that PCCW Global should notify their support desk staff to respond to filed tickets promptly and clearly make them understand the responsibilities for managing the serviceability of Package D, where PCCW Global and ISP of States are responsible for maintaining operational performance required for the CRV network. PCCW Global informed that they have initiated an educational process for their customer support staff to enhance service and improve communication.

2.34 It was advised that the maintenance window should be agreed upon between PCCW Global and the State to avoid peak traffic periods. The CRV OG Operations Manual outlines the maintenance notification process, which should be referenced. Regarding the proposal to establish a maintenance window at the sub-regional level in the APAC region, it was agreed that further discussions are necessary, and this topic will be included in the CRV OG Ad-hoc Expert Group discussions.

Proposed CRV Connections to the Cloud

2.35 Singapore highlighted that a cloud platform offers scalability, cost efficiency, performance optimization, and reliability for handling workloads. It was proposed that the CRV service provider establish interconnectivity between Government Commercial Cloud and Commercial Cloud platforms with the CRV. The CRV OG/13 Meeting agreed that there are some complexities in the implementation of the cloud within the CRV network and integration of it with another cloud network. PCCW Global stated that it is technically feasible, but security concerns must be addressed while implementing it in current or future CRV networks. It was agreed that there is a need to understand various options for this implementation and recommend a path with the support of cloud service providers such as Microsoft, AWS, Azure, etc. It was agreed that New Zealand will facilitate this discussion with the cloud service provider to progress on this matter.

Space-based ADS-B on CRV

2.36 The CRV OG/13 Meeting noted that ground-based ADS-B and space-based ADS-B are equally vulnerable to GNSS RFI and spoofing. However, space-based ADS-B services provided by Aireon have the capability to detect unauthenticated GNSS signals. The CRV OG/13 Meeting requested documentation on the process to follow if they want to utilize CRV for space-based ADS-B data transmission. The Philippines will draft the procedure and present it at the next CRV OG Ad-hoc Expert Group Meeting on 12 June 2025. The procedure will be reviewed and adopted by the CRV OG/15 Meeting in June 2026.

Japan's support for PSIDS and international collaboration

2.37 Japan presented its efforts to enhance ATS network capacity and build sustainable capacity in the Pacific Small Island Developing States (PSIDS). Additionally, Japan invited operational and technical personnel designated by the PSIDS to participate in training programs in Japan (with costs covered by Japan) in December 2024. Japan proposed to host a PSIDS capacity-building workshop along with Special Session- CRV OG/14 on 27 October 2025 week. They informed that they will cover the cost of PSIDS to attend the workshop along with Special Session- CRV OG/14. The Meeting appreciated the offer of Japan and shared their support to the workshop.

Outcomes of the ICAO Workshop for the preparation of new CRV requirements and specifications for future System Wide Information Management (SWIM)/other aviation services

2.38 New Zealand presented a summary of the *Outcomes of the ICAO Workshop for the preparation of new CRV requirements and specifications for future System Wide Information Management (SWIM)/other aviation services*. This detailed information can be found in the Report of the Meeting.

Retention of Pseudo CRV for SIPG

2.39 New Zealand informed that PCCWG built a "Pseudo CRV" (using Package D connections with 2MBps bandwidth) to support the SWIM TF, SIPG, and S3TIG with SWIM trials and demonstrations. The SWIM TF found it useful, and its use was extended twice until 30 March 2024.

2.40 During the 12 November 2024 APAC CRV Ad-Hoc Experts and SWIM Taskforce Team Leaders Meeting, the SWIM TF Task leads requested the possibility of retaining the Pseudo CRV for continued testing, which requires agreement from either all or some of the currently connected states of Thailand, Singapore, China, Malaysia, India, Republic of Korea, Japan and Hong Kong China, or any states wishing to contribute to this connectivity. PCCWG was asked by CRV OG for indicative pricing, and PCCWG provided two further options for the current pricing of Package D.

a) USD500/month per connection with no SLA.
b) USD900/month with a limited SLA

2.41 Both options were deliberated in the CRV OG/13 Meeting. Some states found the costs high for infrequent testing. Alternatives were considered to support ongoing testing for SWIM TF and SIPG, with SIPG WS/1 noting that using operational CRV residual bandwidth was not feasible for many states and that moving to the internet would require significant effort. The best way to move forward was to find a way to keep Pseudo CRV till needed. PCCW Global expressed willingness to negotiate the proposed prices with each State/administration needing the Pseudo CRV and offered support to new members wishing to join the network. It was agreed that CRV OG will discuss the expected timelines for the setup and future plans with SWIM TF. PCCW Global shared their willingness to extend Pseudo CRV till June 2025 to facilitate CRV OG to conduct discussions with SWIM TF.

2.42 The CRV OG Co-Chair (Asia) informed that currently, there is no procedure in the CRV OG Operations Manual for utilizing CRV residual bandwidth for testing. It was agreed that the procedure would be incorporated into the CRV OG Operations Manual after discussion in the CRV OG Ad-hoc Expert Group.

2.43 Japan shared a request with PCCW Global to prepare a document explaining the configuration of Pseudo CRV to make States understand this network along with the procedure to request connection to this network. It was agreed that this document would be beneficial for States. PCCW Global will draft the document and share it in the next CRV OG Ad-hoc Group Meeting on 12 June 2025.

2.44 The CRV OG/13 Meeting noted that Hong Kong China uses residual bandwidth to conduct testing on CRV.

Use of L2 VPN channels to support interaction between AMHS centers of the Russian Federation and APAC Region

2.45 The CRV OG/13 Meeting noted that the most challenging situation involved the transition to AMHS between the Moscow and Fukuoka communication centers. Japan informed that it is continuing to commit to the implementation of AMHS with Russia.

2.46 Japan shared progress on this matter during the CRV OG/13 Meeting. As requested by the CRV OG/13 Meeting, Japan presented WP/18 and Russia presented WP/20 at the ACSICG/12 Meeting to request to resolve the issues on priority.

Updates on Using the Rest of CRV Pioneer State Contribution to the ICAO Managed Service Agreement (MSA)

2.47 The ICAO Secretariat informed the CRV OG/13 Meeting about the utilization of the balance fund from the MSA, following up on the adopted Terms of Reference (ToR) for a CRV Security Review.

Cyber-safety/security and resilience – Review of the CANSO Cyber Security Guide

2.48 The CANSO Standard of Excellence in Cyber Security, endorsed by ACSICG/12 for CNS SG/29 adoption, CNS SG/29 adopted **Conclusion CNS SG/29/02** ***(Draft Conclusion ACSICG/12/03 (CRV OG/13/07))***- Adopt the CANSO Standard of Excellence in Cyber Security for CRV, with slight changes in the title and body of the conclusion to clarify that the proposed framework is recommended for the CRV network only.

2.49 The CRV OG/13 Meeting noted that many States/Administrations have their own cybersecurity framework and standards to follow. However, it was agreed that the proposed maturity assessment on the CRV is not time-consuming and challenging, and it is recommended that all CRV users do it. The ACSICG/12 Meeting discussed concerns about further actions for States/Administrations where the maturity assessment on the CRV is below Target Score 'C.' It was recommended that CRV OG create guidelines for the next steps in these cases, including associated timelines to achieve Target Score 'C.'.

Doc 10169: ACCP Development Update and SWIM TF's need for PKI

2.50 The paper presented the development of the ICAO Document 10169: Aviation Common Certificate Policy (ACCP) and the need for a Trust Framework Instance (TFI) for the Asia and Pacific SWIM Implementation. The CRV OG recommended establishing additional contributory bodies to assist APAC States with these provisions and further discussion on this at the ACSICG/12 Meeting. New Zealand agreed to prepare a working paper advocating for dedicated contributory bodies to implement cybersecurity provisions for consideration at CNS SG/29, scheduled for June 16-20, 2025.

CRV Security Evolutions in AMHS

2.51 France provided a recap of the DSNA security context within the CRV framework and shared information about the standardization progress regarding AMHS security through the recent publication of ICAO Doc 9880 Edition 3, Part II (end of 2024). Additionally, France highlighted the work done at various levels (ICAO, Eurocontrol, and Europe) to establish a PKI dedicated to ANSPs.

2.52 France recommended that the implementation of security at the application level or at least with end-to-end network encryption mechanism aside from the ICAO Regional IP network should be given the level of priority corresponding to the level of threat against organization integrity and air traffic control safety. Security might have a substantial impact on safety. It was added that the standardization is available in the ICAO Doc 9880 to provide a high level of security for AMHS, and a PKI deployment is a prerequisite to deploying AMHS security to meet the ICAO standards. The CRV OG/13 Meeting appreciated France for such vital information, and as requested, this information was shared with the ACSICG/12 Meeting.

Review of the CANSO Cyber Security Risk Assessment Guide

2.53 The CRV OG/13 Meeting noted that the CANSO cyber security risk assessment guide is freely available on the CANSO website.

2.54 It was informed that whilst the cyber security risk assessment guide focused on cybersecurity risk, the concepts in this document could be used to provide a risk assessment framework for the CRV. The CRV OG/13 Meeting noted that the guide guides risk assessment scope, risk assessment, risk mitigation and monitoring, risk acceptance, and risk communication and consultation.

In addition, the risk assessment matrix focuses on whether the risk is Unacceptable, Tolerable or acceptable. It was added that whilst the ICAO Doc 9859 - Safety Management Manual (SMM) covers the same concepts, it is possible to use the CANSO framework to create a CRV Risk assessment and associated process and procedure at an acceptable level for the CRV.

PCCWG Re-organization

2.55 The CRV OG/13 Meeting noted that PCCW Global informed the ICAO APAC Office about an internal reorganization effective 1 April, 2024, involving the novation and transfer of services agreements to PCCW Global Limited and HKT Global Operation (HK) Limited. This information was communicated to APAC States through ICAO APAC State Letter Ref.: T 8/2.15 – AP141/24 (CNS) dated 3 December, 2024.

2.56 Some States shared their concerns about the current approach of information sharing by PCCW Global about the PCCW Global reorganization to the States only a few weeks before the next billing cycle, resulting in several legal issues within the States. The CRV OG/13 Meeting agreed that such changes must be discussed bilaterally rather than directly informing the states to avoid problems in the contract. PCCW Global shared that they will enhance communication with States and do advance coordination for any organizational changes that affect States in the future.

Date and Venue for the Next Meeting

2.57 The CRV OG/13 Meeting agreed on the need to organize the **Special Session- CRV OG/14** as an In-Person Meeting for **5 days** to progress to the next stage of the CRV contract management process from **27-31 October 2025**.

2.58 Japan offered to host the **Special Session- CRV OG/14** in Tokyo, Japan, along with the PSIDS capacity-building workshop planned from 23-24 October 2025. It was noted that Japan will organize and manage the PSIDS capacity-building workshop. Japan added that it would also support the cost for one member from each PSIDS to attend the workshop and *Special Session- CRV OG/14* in Tokyo, Japan.

Election of Co-Chair of ACSICG

2.59 Mr. Augustine Lau, Head (Communications Systems), Civil Aviation Authority of Singapore, was unanimously elected as a Co-Chair of the Aeronautical Communication Service Implementation Group of APANPIRG.

CNS Deficiency

2.60 In response to the latest status of an outstanding issue on the list of Air Navigation Deficiencies in the CNS field, which was related to the unreliability of AFS communication between Afghanistan and Pakistan, Pakistan informed that the link with Afghanistan has already been established. The AMHS system installation is in progress at Afghanistan's end. It was also added that Afghanistan had not given any tentative timelines for the completion of the AMHS installation in Afghanistan. The Meeting requested that Pakistan follow up with Afghanistan in a timely manner and inform the ICAO APAC Office about the progress made.

2.61 APANPIRG/36 noted that the only outstanding issue was the unreliability of AFS communication between Afghanistan and Pakistan. Pakistan requested that this deficiency be removed from Pakistan's side. APANPIRG/36 deliberated on the request of removal of one-party name from the deficiency responsible parties, even if the deficiency was not resolved yet, following the procedure of removal of deficiency defined in APANPIRG Procedural Handbook. APANPIRG/36 agreed that the deficiency related to a reliable AFS link could not be removed from the list until the link is established.

However, it was agreed to add a note to the deficiency list provided in Appendix C to the Report on Agenda Item 3.4 of APANPIRG/36, mentioning the significant efforts made by Pakistan to resolve the deficiency, and no further action could be taken by Pakistan due to the absence of a non-functioning AFS system and air traffic on the Afghanistan side.

Review of outcomes of the CRV Workshop for PSIDS- Sec (WP/04)

2.62 The paper presented the key outcomes of the ICAO APAC CRV Workshop for Pacific Small Island Developing States (PSIDS), which was held from 3-4 March 2025 in Wellington, New Zealand. CRV OG/13 Meeting report, working papers, information papers, and other resources can be accessed by the following link. The report and other documents of the Workshop can be accessed at the ICAO APAC Meeting webpage at:

https://www.icao.int/APAC/meetingdocs?fid=593

2.63 The ACSICG/12 Meeting noted and discussed the proposal of a white paper to explain CRV benefits. However, it was agreed that CRV benefits had been explained by the ICAO Secretariat, PSIDS partner States and many other States in various forums such as CRV OG, ACSICG, CNS SG, and APANPIRG. In addition, DGCA Conferences have also recognized the importance of CRV and agreed to implement CRV by formulating various action items in past conferences. In addition, until now, ICAO has not considered not implementing CRV a deficiency. Therefore, the existing mechanism is sufficient to promote the benefits of CRV in the APAC region, and there is no need for a separate white paper.

2.64 CRV OG Co-Chair Asia informed that, as per the current plan shared by the USA in past Meetings, Micronesia, Palau, and the Marshall Islands will not join CRV.

2.65 The Meeting updated the plan and tentative timelines for each PSIDS to join CRV.

2.66 Several bilateral and trilateral discussions were organized among PSIDS in the process of implementing CRV, their partner States, and PCCWG to progress on the next stage of CRV implementation.

Updates on regional IP network addition in AMC – Sec (WP/06)

2.67 This paper presented information about the ongoing work on adding the CRV Implementation status in AMC by Eurocontrol. The Meeting was informed that concerning the data entry, the Supplier field in the Network Inventory/Connections has to be populated with "CRV" by all applicable states. However, no action has been requested from the ICAO APAC States as of today. It was also informed that **backup sites are not added to the Com Charts**, and in case of **updating bandwidth**, if this needs to be done for an AMHS connection, it should be **amended in the Background Network Inventory area** for the respective Com Centre, under the connections tab. The Meeting was invited to review and update the information to AMC via AEROTHAI, if necessary, including points of contact.

Outcomes of ICAO APAC AMC Workshop – Sec (WP/03) and SOP for updating AMC AFTN/AMHS Routing Table in Asia/Pacific Region- Thailand (WP/19)

2.68 A half-day AMC Workshop was held on 25 March 2025 to help AMC users refresh their knowledge of the standard procedures for using the AMC tool. The AMC tool, managed by Eurocontrol, provides support for AMHS operations, address management, and user capabilities management. The workshop was moderated and chaired by Aerothai, Thailand.

2.69 It was recommended that States/Administrations download the AFTN/AMHS Routing Directory after each AIRAC cycle and verify the consistency of the data. If any discrepancies are discovered, they should be reported to the Aerothai focal point and the ICAO Secretariat.

2.70 It was recommended that any proposed modifications to the AFTN/AMHS Routing directory should be preceded by thorough coordination with all concerned States/Administrations by the proposer. If any assistance is needed, States/Administrations are advised to seek support from the ICAO APAC Office. The ACSICG/12 Meeting reviewed and modified the proposed SOP that CNS SG/29 endorsed and adopted by the **Decision CNS SG/29/03** ***(Draft Decision ACSICG/12/04)*** **-** Adoption of SOP to update the AMC AFTN/AMHS Routing Table in the Asia/Pacific Region.

Educational material to manage the distribution of IWXXM information for Comm Experts in the event of primary link failure- Australia, Fiji, Hong Kong China, Singapore, and the USA (WP/10)

2.71 Australia, Fiji, Hong Kong China, Singapore, and the USA provided educational material for COM Centre operators to understand that distribution of IWXXM information requires links to possess specific capabilities, and in the event of a primary link failure, any alternate/secondary links must also possess the same or similar specific capabilities. The ACSICG/12 Meeting adopted the draft educational material as a living document, CNS SG/29 endorsed and adopted **Conclusion CNS SG/29/04** ***(Draft Conclusion ACSICG/12/05)*** - Educational material to manage the distribution of IWXXM information for COMM experts in the event of primary link failure.

Checklist of steps required to operationalize IWXXM exchange- Singapore (WP/11)

2.72 The ACSICG/12 Meeting adopted the draft checklist as a living document, CNS SG/29 endorsed and adopted **Conclusion CNS SG/29/05** ***(Draft Conclusion ACSICG/12/06)*** - Checklist of steps required to operational IWXXM exchange.

Brainstorming Session

2.73 During this session, the following agenda item was discussed. The session was moderator by the MET IE WG Chair.

1. *Operational exchange of IWXXM in a hybrid AMHS/SWIM environment*
2. *Use of the Internet for MET-SWIM*
3. *A list of MET-SWIM information services which will be/preferred to be transmitted over CRV*
4. *The benefit of aggregation functions for MET-SWIM in APAC*

2.74 The Joint Meeting noted the intention of some States to move to SWIM directly without implementing AMHS. The benefits and disadvantages of bypassing AMHS and migrating directly to SWIM were discussed. However, due to limited time and knowledge about SWIM implementation, the discussion could not be completed. The meeting requested SWIM TF to discuss this topic during any SWIM event and share information, if possible, in future ACSICG and MEIT IE WG meetings.

2.75 It was stated that currently, various States/Administrations use multiple methods to transmit MET information. It included AFTN/AMHS, IP links, public internet, web-based applications, etc. Some States shared that for their ANSP, MET, information is critical and transmitted through a secure channel. However, some have the view that MET information can be exchanged over the public internet with encryption and PKI implementation to meet security requirements.

2.76 One State informed that **ICAO Annex 3** *Meteorological Service for International Air Navigation*, Chapter 11, section 11.2 *Use of aeronautical fixed service communications and the public Internet — meteorological bulletins* mentioned public Internet and AFS for MET message exchanges.

> **11.2 Use of aeronautical fixed service communications and the public Internet — meteorological bulletins**
>
> Meteorological bulletins containing operational meteorological information to be transmitted via the aeronautical fixed service or the public Internet shall be originated by the appropriate meteorological office or aeronautical meteorological station.
>
> *Note.— Meteorological bulletins containing operational meteorological information authorized for transmission via the aeronautical fixed service are listed in Annex 10, Volume II, Chapter 4, together with the relevant priorities and priority indicators.*

2.77 However, the Joint Meeting was informed that the current ICAO Annex 3 is not modified to meet future SWIM requirements, and a new version of ICAO Annex 3 will provide updated information.

2.78 Due to the limited time available, it was concluded that the discussion could not be finalized during the ongoing plenary. In addition, operational experts need to be involved in these discussions to understand operational experts' views on the criticality and sensitivity of various MET information services in future SWIM environments. To further progress on this topic, it was suggested that offline discussions be held on the effective way to bring CRV, MET, SWIM, and operational experts together to discuss this topic further. ACSICG and MET IE WG Secretariat will discuss this matter and inform the Meeting about further updates.

2.79 The Meeting participants shared the value of conducting the joint session. However, it was stated that there is a need **for a joint session of MET and SWIM experts in the future**. Therefore, it was agreed that offline discussion would be done among ACSICG, MET IE WG and SWIM TF chairs and secretariat for agreement on a way forward for an effective way of close collaboration among these groups to discuss various common topics in future joint Meetings.

Updates on the progress of the APAC AMHS to SWIM transition Correspondence Group (ATSGC) – Singapore (WP/12)

2.80 In 2024, ACSICG/11 noted that there was a lack of information on the AMHS to SWIM transition at the Asia Pacific regional level and agreed to form an APAC AMHS to SWIM transition Correspondence Group (ATSCG) to study the transition strategy by experts from States/Administrations, industry partners and concerned international organizations, on a voluntary basis.

2.81 Initially, it was essential to establish the terms of reference for ATSCG since the transition from AMHS to SWIM is a joint responsibility of ACSICG and SWIM TF. Consequently, following the formation of ATSCG, the members, led by Singapore, drafted the group's terms of reference. Additionally, ATSCG outlined its scope, objectives, and deliverables within the ToR. The drafted ToR was then reviewed and commented upon by the SWIM TF Task Leads. The ACSICG/12 meeting reviewed and adopted the ATSCG ToR through Decision ACSICG/12/07 - Terms of Reference for the AMHS to SWIM Transition Correspondence Group.

AMHS/SWIM Gateway - Building a Bridge: Transition from AMHS to SWIM in a mixed environment- Frequentis (SP/03)

2.82 Frequentis described the mixed environment during the transition from AMHS to SWIM, emphasizing the need for measures to prevent service disruptions. It was informed that the

AMHS/SWIM Gateway can support this transition, considering the requirements for stateless and stateful operations, conversion, and context. Additionally, it was added that there was no universal gateway implementation that fits all scenarios. The latest AMHS security improvements can also enhance security at the AMHS/SWIM Gateway.

Transition to the AMHS procedures between the COM centers of Russia and Japan – Russia (WP/20)

2.83 The Meeting noted that during CRV OG/13 from 5 to 8 March 2025 in Wellington, New Zealand, a Working Paper (WP/21) was presented regarding the use of L2 VPN channels for the interaction between Russian and APAC AMHS centers. The paper highlighted challenges in the transition between Moscow and Fukuoka communication centers. The CRV OG/13 Meeting, in its report (para. 2.76), requested Russia to submit a working paper at the ACSICG/12 Meeting to address this issue as a matter of priority.

2.84 The Meeting noted that Japan confirmed in February 2024 the possibility of using L2 VPN channels for AMHS procedures between Moscow and Fukuoka, but implementation has been delayed. Russia and Japan agreed on the need for further communication exchanges with their service providers on this matter.

The ICAO Doc 9880: Manual on detailed technical specifications for the ATN using ISO/OSI Standards and Protocols- Sec (WP/14)

2.85 This paper presented the development and latest status of ICAO Document 9880: Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols for the information and reference of Member States. The Meeting noted that the latest edition, the third edition, was published in 2024 and specified enhancements to AMHS security standardization. It was highlighted that three significant security upgrades were introduced in Document 9880 Edition 3. At the Meeting, it was recommended that the latest version of ICAO documents be downloaded from the ICAO Secure portal on "ICAONET" and that a plan be prepared for the implementation of new provisions.

ICAO Doc 9896- Manual on the ATN using Internet Protocol Suite (IPS) standards and protocols- Sec (WP/15)

2.86 This paper presented the development and latest status of the ICAO Document 9896: Manual on the Aeronautical Telecommunication Network (ATN) using Internet Protocol Suite (IPS) Standards and Protocols. It was noted that the latest published edition of Document 9896 is edition 2, released in 2015. The Meeting was informed that a third revision was anticipated to be issued this year.

Date and Venue for the Next Meeting

2.87 The Meeting decided to conduct the ACSICG/13 Meeting as an in-person Meeting with a tentative date in the third week of April 2026 to further progress the tasks listed in the Terms of Reference. Fiji proposed hosting the Meeting from April 20-24, 2026, in Fiji. The ICAO Secretariat will coordinate with Fiji for further host agreements. It was informed that a State Letter would be issued 3 months before the Meeting.

Outcomes of SWIM TF/10

Election of Co-Chair

2.88 It was recalled that at the SWIM TF/9, an agenda item addressed the election of Co-Chair, and Dr. Amornrat Jirattigalachote was re-elected. The floor was then opened for nomination of

the second Co-Chair position. However, no other 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.

Outcomes of SWIM TF Task Leads Meetings and Joint Meeting of SWIM TF Task Leads and CRV OG Experts in 2024-25 – Sec (WP/06)

2.89 The paper presented outcomes of SWIM TF Task Leads (TLs) Meetings and Joint CRV OG experts and SWIM TF TLs Meetings, after the SWIM TF/9 meeting, held in 2024-2025. The Meeting noted that a total of **two** (2) SWIM TF TLs coordination meeting was held after SWIM TF/9 to review the outstanding SWIM TF/7 and SWIM TF/8 action items, which included various updates such as APAC SWIM implementation roadmap, SIPG and editorial ad-hoc group updates, joint event preparation, SWIM TI-related specifications, etc. The SWIM TF TLs Minutes of the Meetings (MoM) of the two meetings on 13 August 2024 and 07 January 2025 were shared with the Meeting.

2.90 In addition, a total of four (4) Joint Meetings of the CRV OG experts and SWIM TF TLs were conducted on 12 June 2024, 17-20 September 2024, 12 November 2024, and 13 March 2025. Out of four meetings, the 17-20 September 2024 meeting was an in-person meeting entitled the ***ICAO Workshop for the preparation of new CRV requirements and specifications for future System Wide Information Management (SWIM)/other aviation services.***

2.91 It was informed that the *ICAO Workshop for the preparation of new CRV requirements and specifications for future SWIM/other aviation services* was held from 17-19 September 2024 in Guam, USA.

SWIM Implementation Pioneer Ad-hoc Group Progress Report – Singapore (WP/07)

2.92 Singapore presented the work done by the SWIM Implementation Pioneer ad-hoc Group (SIPG) since the last SWIM Task Force meeting (SWIM TF/9) held in May 2024.

2.93 The SWIM TF/10 Meeting noted that, given the lessons learnt by SIPG so far, a modification to the SIPG ToR was adopted at the SWIM TF/7 meeting. The draft modified ToR was prepared by the group formed to prepare a draft prioritisation of the SIPG work areas, and it was presented to the SWIM TF/10 Meeting through SWIM TF/10 -Flimsy/01. The SWIM TF/10 Meeting reviewed and agreed to the revised ToR and adopted the **Decision SWIM/TF/10/01** – Revised Terms of Reference of the SWIM Implementation Pioneer Ad-hoc Group.

SIPG Action WS-1-9: Options for internet connection in the Asia-Pacific SWIM – SIPG (WP/08)

2.94 This paper presented the deliberations of the SIPG on the possible options for Internet connectivity for the Asia/Pacific SWIM. Based on the SWIM TF's ToR, the APAC regional SWIM is to be constructed principally over CRV and other Internet Protocol (IP) based networks. The Internet is one such possible IP-based network. Therefore, the possible options for establishing the APAC SWIM over both CRV and the Internet were discussed. In particular, after the SIPG WS/1 held in January 2025, further deliberation on how the APAC regional SWIM can be implemented over both types of network was conducted within the SIPG. Eventually, three options for how this can be achieved were proposed.

2.95 Option 1 is to have one or more Edge EMS connect to the CRV as well as the Internet. The Edge EMS can then publish and consume services from both the Internet and CRV. The Edge EMS is responsible for routing any messages that need to flow between the Internet zone and the CRV zone. It is expected that the Edge EMS should keep the two zones separate and only exchange the necessary messages.

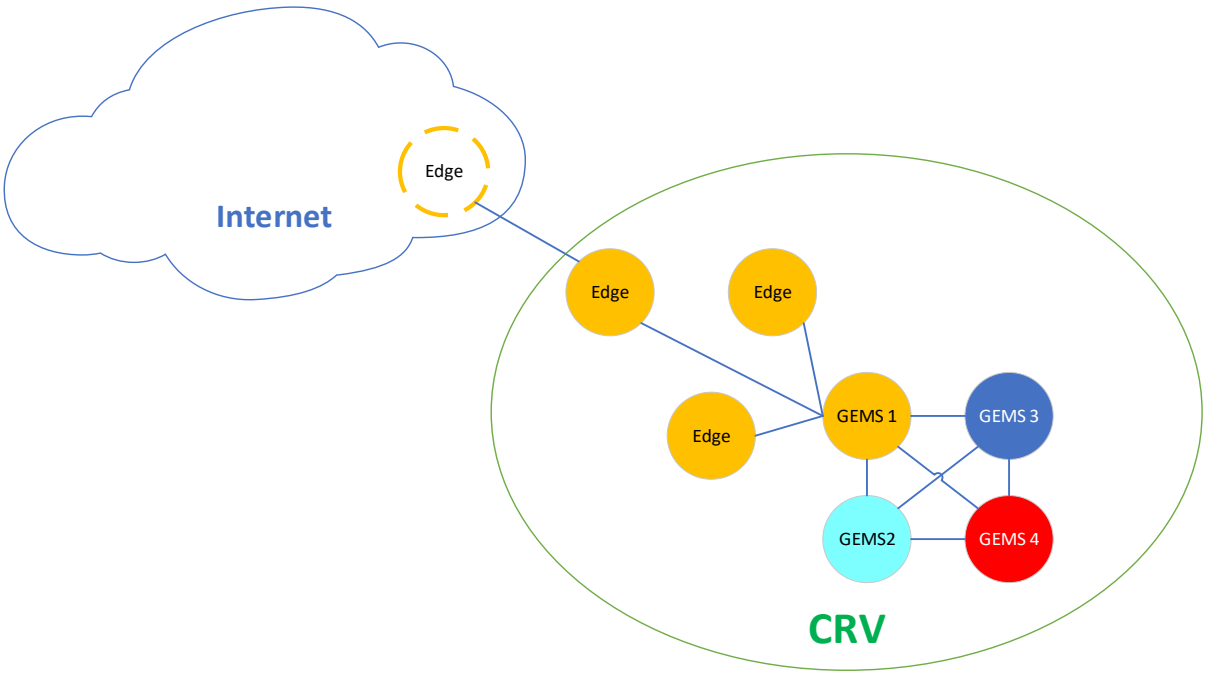

Figure 1- Option 1 SWIM Architecture

2.96 Option 2 is 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. Essentially, there is no significant difference between options 1 and 2. The only difference is that in option 2, the Internet access is at the Gateway EMS.

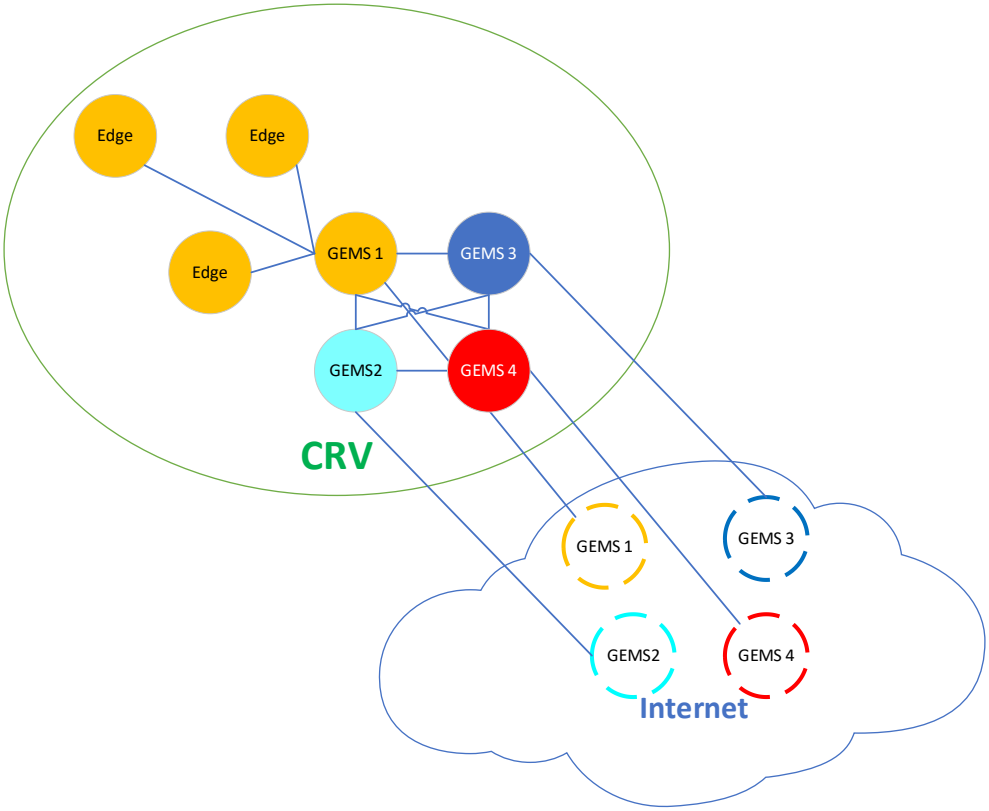

Figure 2- Option 2- SWIM Architecture

2.97 Option 3 is to have the CRV service provider also provide the connectivity to the Internet. This option was discussed during the CRV OG and SWIM TF coordination meeting, held via teleconference on 13 March 2025. The CRV OG informed that it was not a viable option and that the CRV OG does not provide or support an internet only connection.

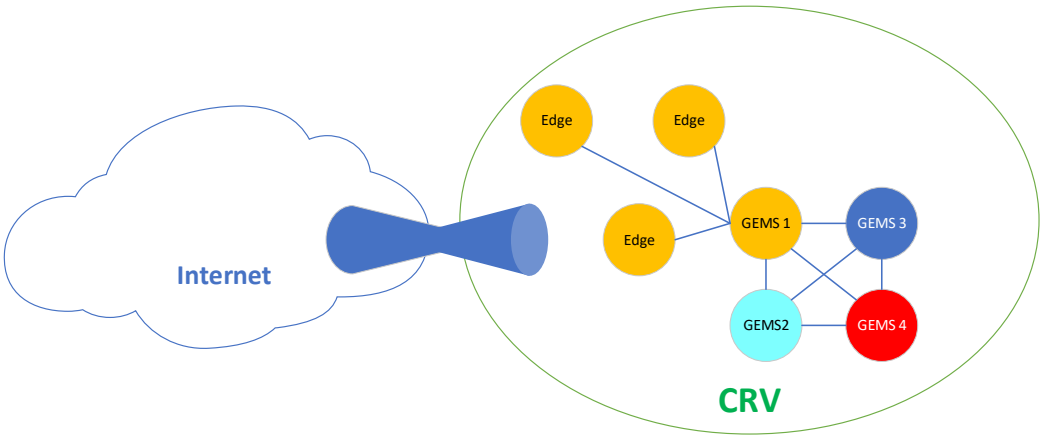

Figure 3- Option 3- SWIM Architecture

2.98 The SWIM TF/10 Meeting noted the need to determine which of the two remaining options would be the most viable for implementing Internet connectivity for the APAC Regional SWIM. It was suggested that option 1 was the simplest and could be implemented first as an interim solution, enabling an early implementation of the APAC Regional SWIM with accessibility via both the CRV and the Internet, while a more permanent solution is being developed.

2.99 The SWIM TF/10 Meeting discussed and agreed to the need to define the functionalities and requirements of edge EMS and gateway EMS to support States/Administrations in

understanding and determining the appropriate level of SWIM TI capabilities required for their implementation. SIPG was assigned the task of developing the definitions as well as identifying the minimum functionalities and requirements for edge EMS and gateway EMS. **ACTION ITEM 10-1**

2.100 Concern was raised regarding option 2, particularly in scenarios where SWIM traffic would always need to be routed through gateway EMS, even for domestic SWIM operations. This approach might not be efficient. SIPG will further discuss this option, taking into account the concern raised. **ACTION ITEM 10-2**

SIPG Action WS-1-12: Conclusions of the Asia-Pacific SWIM Transition Discussions – SIPG (WP/09)

2.101 This paper presented the deliberations of the SIPG for SWIM transition and shared the following 4 recommendations for the SWIM TF's consideration:

> **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 use of legacy formats 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.

2.102 The SWIM TF/10 Meeting deliberated the recommendations in detail and agreed to adopt recommendations 1, 2, and 4 as proposed. For recommendation 3, the SWIM TF/10 Meeting discussed whether SWIM TF or operational expert groups would be a more appropriate body to determine the data formats for information exchange within SWIM. Moreover, it was noted that referencing the use of legacy formats in the region could potentially hinder progress towards SWIM transition. As a result, recommendation 3 was revised and adopted by the Meeting as follows:

> **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.

2.103 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.

2.104 The SWIM TF/10 Meeting requested the ICAO Secretariat to coordinate with ICAO APAC Aeronautical Information Services − Aeronautical Information Management Implementation Task Force (AAITF) to share the plan for the AIS to AIM transition, particularly regarding the anticipated sunset date of exchanging aeronautical information over AFTN/AMHS. **ACTION ITEM 10-3**

2.105 In response to a query regarding the global strategy for AMHS to SWIM transition, it was shared that no such discussion is currently taking place within the Air Traffic Management Requirements and Performance Panel (ATMRPP). ATMRPP is presently focused on the transition strategy for FPL2012 to FF-ICE. Discussion on migration of other ATS messages, in addition to FPL2012, CHG, DLA, CNL, RQP, RQS, DEP, ARR, has only recently been initiated.

2.106 The SWIM TF/10 Meeting noted concern regarding the differing suggestions on communication infrastructure implementation provided to APAC States/Administrations. For instance, various MET meetings have emphasized the need for the timely implementation of capable primary and, where relevant, secondary links for the exchange of IWXXM messages. It was highlighted in these meetings that IWXXM, as the successor to Traditional Alphanumeric Code (TAC), can only be transported over links with specific capabilities, which AFTN links do not support. Readiness of AMHS with File Transfer Body Part (FTBP) and the Interpersonal Message (IPM) Heading Extension (IHE) to support the exchange of IWXXM messages/reports has been promoted in MET and ACSICG meetings. However, it had also been informed at these meetings that AMHS would not support the exchange of AIXM and FIXM messages and that SWIM would be required for such exchanges. This differing guidance for ANS communication capacity enhancements has created confusion among States/Administrations, particularly whether to transition from AFTN to AMHS, upgrade existing AMHS, or bypass AMHS entirely and implement SWIM directly.

Need for Additional Specificity in Defining APAC Common SWIM Surveillance Information Services – Australia (WP/10)

2.107 Australia proposed the need for more guidance in defining APAC Common Surveillance Information Services proposed under Task 6. The Meeting noted that APAC Common SWIM Information Services incorporated with two distinct surveillance data sharing services, as recently updated by SURICG/10 with SURSG's input via SWIM TF/10 -Flimsy/01 in April 2025.

2.108 It was proposed to add two additional columns for (*i*) *Tier 1 or Tier 2 Data Services* and (*ii*) *Update Rate* in the proposed APAC Common SWIM Surveillance Information Services. The discussion on this proposal was recorded under SWIM TF/10 -WP/11.

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

2.109 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.

2.110 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.

2.111 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.

2.112 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 SWIM TF/10 - WP/12.

2.113 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:

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

[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.

		weather phenomena, such as moderate/severe turbulence or icing. (Note: Currently there is no plan to implement this information service at MET Panel)
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.

Table 1- List of APAC Common SWIM Information Services removed from the first adopted version

2.114 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 to the Meeting that 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**

2.115 The SWIM TF/10 Meeting discussed the proposal presented in WP/10 and noted that the APAC Common SWIM Information Services includes multiple service types, which may not require these additional *Tier 1 or Tier 2 Data Services* and *Update Rate* columns. Therefore, it was not recommended to modify the overall structure of the APAC Common SWIM Information Services table solely to accommodate the needs of specific service types. However, it was noted that, as SURSG is currently drafting guidance material for surveillance data sharing in the SWIM environment, reference to this material, particularly regarding the tier of data services, could be included as part of the brief description of the service. Regarding update rate, the Meeting discussed that it would depend on both operational requirements and SWIM TI performance, and could be appropriately included as part of the information service overview.

2.116 Regarding the suggestion in SWIM TF/10 - 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 SWIM TF/10 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**

2.117 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**

2.118 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.

2.119 The SWIM TF/10 Meeting discussed a need for clear guidance to States/Administrations on the proposed first version of Common SWIM Information Services that it is considered as a guidance document for States/Administrations to support their SWIM development and implementation. Additionally, it was agreed that clarification as proposed in SWIM TF/10 - Flimsy/04

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.

2.120 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 SWIM TF/10 -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 SWIM TF/10 - Flimsy/04, Australia proposed that a Draft Decision be adopted by the SWIM TF 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.

2.121 The SWIM TF/10 Meeting suggested Task 6 Leads to consider information shared in SWIM TF/10 -Flimsy/02 and draft 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**

2.122 Due to the need for clear guidance to States/Administrations on the proposed first version of Common SWIM Information Services, and the Common SWIM Information Services will involve various domains, such as ATM, CNS and MET etc., under the APANPIRG, the following Draft Decision was adopted by SWIM TF/10 for CNS SG/29 and APANPIRG/36 consideration, which was endorsed by CNS SG/29 Meeting and adopted by APANPIRG/36:

<table>
<tr><td colspan="3">Decision APANPIRG/36/11 (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, be 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, is 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: 26-Nov-25</td><td colspan="2">Status: 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>

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

2.123 The APAC Common SWIM AIS Ad Hoc Group presented the outcomes of the discussions held within the Ad Hoc Group. The SWIM TF/10 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.

2.124 It was added that the group decided to retain Runway Condition Report Service due to operational importance, despite noting possible redundancy 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'.

2.125 The SWIM TF/10 Meeting noted that matters relating to the Search and Rescue (SAR) service are 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 will inform the SWIM/TF of any proposed changes arising from the APSAR/WG discussions. The outcomes will be reported to relevant meetings, including AAITF/20, AOP/SG/19, and ATM/SG/13.

ATFM SG Outcomes – ATFM SG Chair (WP/32- Part 1) (Only APAC Common Information Services related Discussion)

2.126 This paper presented outcomes of discussions on SWIM-related working papers and draft conclusions thereof in the ATFM/SG/15 meeting. The ATFM SG/15 meeting reviewed the document and advised further verification of the terminology used in the "Proposed business functionality of APAC Common SWIM Information Services" against the draft PfA of future PANS-ATM (Doc 4444). It was informed at the ATFM SG/15 meeting that the ATFM SG would revert to the SWIM TF/10 with proposed updates, if deemed necessary. It was noted that, after the ATFM SG/15 meeting, the ATFM SG members shared their feedback with the ICAO Secretariat via email. The revised section of the table related to ATFM and A-CDM was presented for further review and deliberation by SWIM TF/10. The Meeting discussed the proposed changes and incorporated the revision in the revised list of APAC Common SWIM Information Services.

Comments on TMC Document for ATM Information Exchange through SWIM – Australia (IP/04)

2.127 Australia shared comments on the draft Technical Memorandum of Cooperation (TMC) document for ATM Information Exchange through SWIM, in response to Action Item 9-5 from SWIM TF/9. The Meeting recalled that Malaysia drafted the TMC to assist States in bilateral cooperation/agreement for ATM Information Exchange through SWIM and feedback was provided by New Zealand on the draft TMC via SWIM TF/9-WP/06. The Meeting was informed that the draft SWIM TMC is a guidance document that can be used as a template for discussion between ANSPs.

2.128 Australia provided the following additional considerations:

- SWIM services, by their nature, will include agencies other than ANSPs, either as service originators or service consumers, e.g., Meteorological or ATFM agencies (as service originators) or commercial entities such as EFB providers and flight planners, whose functions may not be provided by a State's ANSP. It was therefore unclear whether ANSPs would be expected to enter into such an arrangement on behalf of other agencies within their State's jurisdiction. Australia informed that it

has not yet formed its position on the allocation of responsibility for SWIM TI (e.g., ANSP being the primary service provider and consumer, or another agency), and therefore, whether the proposed TMC should be between States (countries) or specified agencies requires further discussion.

- Australia informed that SWIM, as a concept, should be seeking to shift away from bilateral agreements, particularly with respect to TI. While there is an expectation that agencies will need to administer their SWIM services (including authorizing other SWIM consumers to subscribe to their service), another alternative could be establish a non-binding head agreement at the Regional level (e.g. MOU) for defining high level policies and principles of common understanding, e.g. Parties, Purpose, Dispute Resolution, Definitions or Interpretation, Information Sharing (including Confidentiality, Data Protection, Privacy etc.), Financial Arrangements, Record Keeping, Duration, Variation, Extension, Termination etc. The head agreement principles would ideally not change for the duration of the arrangement. Individual ANSPs/States/agencies could then sign up to the regional head agreement, avoiding the need to manage individual agreements between other ANSPs/States.

- Pursuant to 2.3.2, if there was still a need for ANSPs or agencies to deal with specific, detailed procedural and administrative matters such as Technical Specifications, Technical Testing, Day-to-Day Management/Reporting/Liaison Responsibilities, Specific Legal or Regulatory Specifications or Limitations etc., signatories to the head agreement could execute a non-binding subordinate agreement subject to the terms of the head agreement such as a letter of agreement or letter of exchange (LOA or LOE) or an annex, which could be varied at any stage throughout the duration of the head agreement on an as-needs basis.

- Australia would be supportive of the establishment of a dedicated group (e.g., SWIM OG) to administer the transition to SWIM, which could be used to progress relevant processes (such as MOU) and governance in establishing SWIM services in the APAC region.

2.129 Australia provided the following comments and observations based on feedback from legal experts:

- It was unclear how the proposed arrangement would fit in with other international and domestic aviation-related information sharing arrangements and initiatives, e.g., working groups and joint agreements.

- If the agreement/signatories were intended to be “State to State” (or country to country), Country-to-Country agreements attract additional effort to ensure that they are very clearly drafted and administered so as not to be construed as having treaty status that is legally binding and subject to international law. Country-to-country arrangements are also more complex and time-consuming to negotiate due to different bureaucratic processes and formalities within each jurisdiction.

2.130 The SWIM TF/10 Meeting also noted the following on specific wording contained within the draft TMC:

- Reference to Introduction, paragraph 2, ‘SWIM TI’ is ambiguous and should ideally reference a version-controlled APAC publication, whether that be a modified EUROCONTROL Yellow Profile or other endorsed publication.

- Reference to Introduction, paragraph 3, the conditions of what quantifies 'successful completion' in recommended for inclusion, preferably specified in the 'SWIM TI' document as per 2.5.2 above. 'Partial success', or wording to that effect, is also recommended for inclusion to cater for ANSP/agencies that have completed one or more SWIM Information Services (e.g., FF-ICE Filing Service) and are working towards implementing other SWIM Information Services (e.g., Digital NOTAM Distribution Service).

- With reference to Paragraph 3, the definition of a connection point or boundary is expected to vary between countries and within countries. This may depend on a contractual agreement (e.g., PCCW may provide and monitor an on-premise router and associated international circuits to other ANSPs). This also applies, in some cases, to ISPs that provide a router as part of the contract and service level agreements, though there are ISPs that allow bring-your-own (BYO) devices.

- In reference to paragraph 4, section 4.1, it was noted that the EUROCONTROL Yellow Profile TI is outdated (published 5 July 2020) and should be modified where needed to capture the SIPG APAC agreed specifics and be governed as such. Such a document would be a consolidated view of what constitutes an APAC Yellow Profile that reflects APAC nuances, such as distributed ANSP/agency/country-specific rules and regulations versus the centralised EUROCONTROL model. Other aspects of the Yellow Profile include the updating/removal of specific details (e.g., SOAP with AMQP and Publish/Subscribe patterns and service registries expanded upon). There are likely to be other specificities that will be identified by subject matter experts in assessing the suitability of the Eurocontrol Yellow Profile TI for applicability in APAC.

- Reference to Paragraph 5, contingency arrangements should ideally be linked back to the actual type of information exchange and required quality of service and associated supporting service level agreements. More time-sensitive data exchanges (e.g., sharing of surveillance tracks versus sharing Aeronautical data such as airspace or route definitions) are expected to have differing contingency requirements that have differing costs.

2.131 The SWIM TF/10 Meeting reviewed the draft TMC incorporated with Australia's comments. Given the significant changes anticipated in the operational environment under SWIM, compared to current operations, it was agreed that further discussion is required to assess the need and applicability of TMC in the SWIM context. In light of the current stage of regional SWIM development and implementation, the Meeting agreed that the proposed comments would be taken into account during future SWIM TF meetings, as part of the review of the TMC's relevance and applicability. **ACTION ITEM 10-11**

2.132 Recognizing the importance of the document, the Meeting agreed to include the TMC template as an appendix to the draft regional SWIM Implementation Guidance Document (IGD). Australia, New Zealand and Malaysia agreed to collaborate in compiling the relevant content for the IGD related to TMC. **ACTION ITEM 10-12**

Aggregation Function for MET Information Services – Australia (WP/13)

2.133 Australia presented an update on two options being considered by the ICAO Meteorological Panel for the implementation of a function in the SWIM environment to "aggregate" or "concentrate" information from multiple meteorological information services for distribution to downstream users. 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, specifically options 1 and 2, as the discussion is still ongoing at the global level. It was considered that such evaluations would be appropriately conducted by relevant operational expert/user groups.

Enhancing Reliable Message Delivery in Hierarchical Architecture for APAC SWIM Implementation – Japan (WP/14)

2.134 Japan recalled that, based on discussion within the SIPG, the hierarchical architecture has been proposed for APAC SWIM implementation, in comparison to centralized and decentralized approaches. The SWIM TF/10 Meeting noted that the hierarchical architecture consists of multiple EMSs, which are key components in constructing the APAC SWIM Technical Infrastructure (TI). These EMSs are categorized into Gateway EMS and Edge EMS and are connected to form sub-communities.

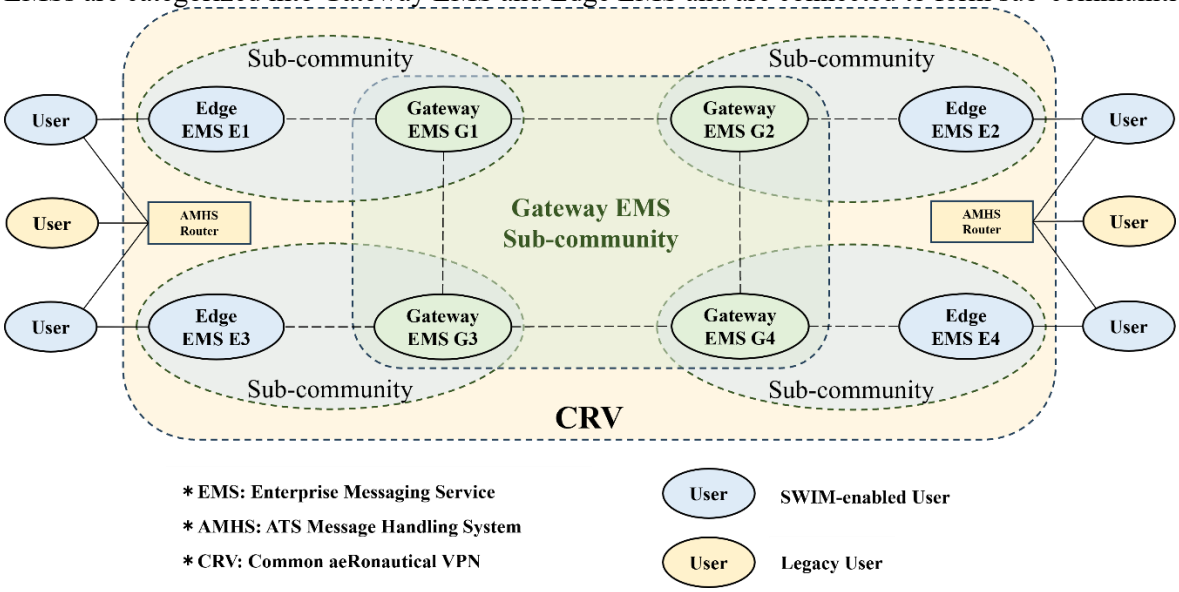

Figure 4- Hierarchical Architecture for APAC SWIM Implementation

2.135 Based on different implementation levels, hierarchical architecture is considered an appropriate option for APAC SWIM to satisfy the various requirements of Member States and achieve interoperability during the transition.

2.136 The SWIM TF/10 Meeting also noted that the concerns regarding reliable message delivery within a hierarchical architecture have been identified and discussed at previous SWIM TF meetings. The problems, use cases and corresponding solutions for enhancing the reliability of message delivery were summarized in the table below. It was suggested to establish a collaborative environment where all Gateway and Edge EMS service providers agree on a common set of functions and settings to provide a reliable, secure and efficient message exchange service for SWIM-enabled end users.

Problem	Use Case	Solution
1. Priority messaging cannot be applied based on the importance of the information.	Surveillance messages caused queue overflow and loss of FF-ICE messages.	・Deliver surveillance messages using a separate queue and logical network ・Set a message TTL for surveillance messages

2. Guaranteed message delivery is disrupted if a message broker malfunctions within the message delivery chain.	When the message broker reaches the maximum number of messages, it drops subsequent messages.	· Set up a persistent or replicated message queue · Support automatic failover and failback
3. Compensation transactions cannot be performed to recover from transaction failure in the message delivery chain.	The publisher is not aware of failures that occurred in the EMS afterwards.	· Implement retry logic for failed message deliveries · Record Forward Failure List for traceability
4. Message rerouting is not possible in the event of a failure within the message delivery chain.	The publisher is not able to change delivery responsibility even if the publisher recognizes a failure in the message delivery chain.	· Set a backup EMS for each publisher and Edge EMS · Each Gateway EMS has at least two connections to other Gateway EMS
5. The edge node cannot know which message to resend when message loss occurs.	In the case of a missing message that occurs in a subsequent EMS, the publisher cannot specify the message and try to resend it.	· Publish the Forward Failure List, making it accessible to publishers · Subscriber responds "Submission Response" to the publisher

Table 2- Considerations for Reliable Message Delivery in Hierarchical Architecture

2.137 To ensure reliable message delivery in the hierarchical architecture, the required functionalities for Gateway and Edge EMSs were listed. The at-least-once delivery configuration was always applied to support retry and redelivery policies. It was suggested that since at-least-once delivery may result in duplicate messages, SWIM information services should be idempotent, ensuring that processing a message multiple times does not cause any issues.

Functionality	Description
Message Persistence	· Ensure messages are stored reliably until they are successfully delivered · Support durable (replicated) queues and persistent message storage
Acknowledgment & Confirmation	· Implement publisher acknowledgments to confirm message reception · Support consumer acknowledgments to confirm message subscription
Retry & Redelivery Policies	· Support automatic message retries upon failure · Implement exponential backoff and dead-letter queues for failed messages
High Availability & Redundancy	· Deploy in a clustered mode to avoid a single point of failure

	· Ensure failover/failback mechanisms and redundant EMSs for resilience
Routing & Security	· Support metadata-based message routing between EMSs · Support Transport Layer Security (TLS) encryption for secure communication
Monitoring & Logging	· Provide real-time monitoring for message status and EMS health · Enable logging and auditing for troubleshooting and compliance
Network Failure Handling & Auto-Recovery	· Detect network failures and re-establish connections automatically · Implement message deduplication to prevent duplicate processing

Table 3- Required Functionalities for Gateway and Edge EMSs

2.138 The SWIM TF/10 Meeting was requested to share the information as contained in this working paper with the related Working Groups/Task Forces for further deliberation. However, considering that SIPG is currently working on the development of regional SWIM TI, it was deemed more appropriate for this information to be first reviewed and deliberated by SIPG. The possibility of sharing of the information with other groups would be reconsidered once the APAC SWIM TI architecture has reached a more mature stage.

Requirements for Implementing Aviation Information Security Framework in the APAC Region – Japan (WP/15)

2.139 The SWIM TF/10 Meeting noted that it is necessary to establish a 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 is needed to support the implementation of Trust Framework Instances for various applications. Collaboration with the SWIM TF is also essential to support the implementation of a Trust Framework Instance for SWIM, enabling secure, interoperable, and resilient aviation information exchange and flight operations.

2.140 It was also highlighted that there is a need for States/Administrations to conduct a mapping of their national/organizational certificate policy and information security management policy against the ICAO Aviation Common Certificate Policy (ACCP, Doc 10169) and the Manual on Aviation Information Security (MAIS, Doc 10204), respectively. Singapore informed the Meeting that their mapping activity is currently in progress. In light of Singapore's experience and ongoing efforts in this domain, the Meeting requested Singapore to share an example of their mapping at future SWIM TF meetings, if possible. **ACTION ITEM 10-13**

2.141 The SWIM TF/10 Meeting recalled that New Zealand is leading the drafting of a paper from CRV OG to propose the need for dedicated contributory bodies to implement cybersecurity provisions arising from the Trust Framework Panel and Communication Panel for CNS SG/29 consideration. Considering that the implementation of an information security framework for SWIM would require an authentication approach based on digital certificates, it was proposed that SWIM TF co-author a paper and prepare a joint proposal with CRV OG for consideration by CNS SG/29. **ACTION ITEM 10-14**

Using a Self-Signed Certificate for Secure SWIM Communication Exchange – Malaysia (WP/16)

2.142 The paper examined the potential for experimenting with Transport Layer Security (TLS) between SWIM EMS nodes' communications under a situation where a centralised Certificate Authority (CA) for TLS certificates is not feasible. Particularly, the paper reported on the exploration activities on the use of self-signed certificates, which were required in order to establish encrypted TLS transport between SWIM EMSs, and the trials using such certificates to ensure secure information exchange within the APAC SWIM environment.

2.143 It was informed that Europe, with its centralized regulatory bodies, has established a single CA for SWIM. In contrast, the absence of such central governance in APAC necessitates a decentralized approach with no single CA. It was added that the purpose of this task is to study the feasibility of using a self-signed certificate for enabling TLS communication between SWIM EMSs, with the main purpose of enabling encryption at the IP transport layer (TCP).

2.144 The SWIM TF/10 Meeting noted that currently, Hong Kong, New Zealand, Vietnam and Pakistan have expressed their interest in joining the test. After sharing the prerequisites for joining the test with these four states, New Zealand has agreed to participate. The proposed method for certificate generation for neighboring states is via the Certificate Signing Request (CSR) method, where the private key of each state remains secret and never leaves the country. During the preliminary testing, Malaysia and Singapore managed to establish a TLS connection between their SWIM EMSs using self-signed certificates. The other States are still in the discussion stage and experimenting on how the performance metrics should be compared, and what tools are suitable for message simulation testing. Once these matters have been finalized, the full testing can be started.

2.145 It was clarified that the use of a self-signed certificate is an initial step adopted by SIPG to initiate the work on security. Until a dedicated group is established by CNS SG to provide further guidance on cybersecurity implementation within the APAC region, efforts to explore the use of self-signed certificate will continue.

SIPG ACTION WS-1-4, WS-1-5- Improvement of the hierarchical architecture for Regional SWIM implementation and requirements for Gateway EMS – China and Hong Kong China (WP/17)

2.146 This paper presented the modified version of the hierarchical architecture for regional SWIM to address the issues highlighted in SWIM TF/9-WP/10 and promote the implementation of regional SWIM.

2.147 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.

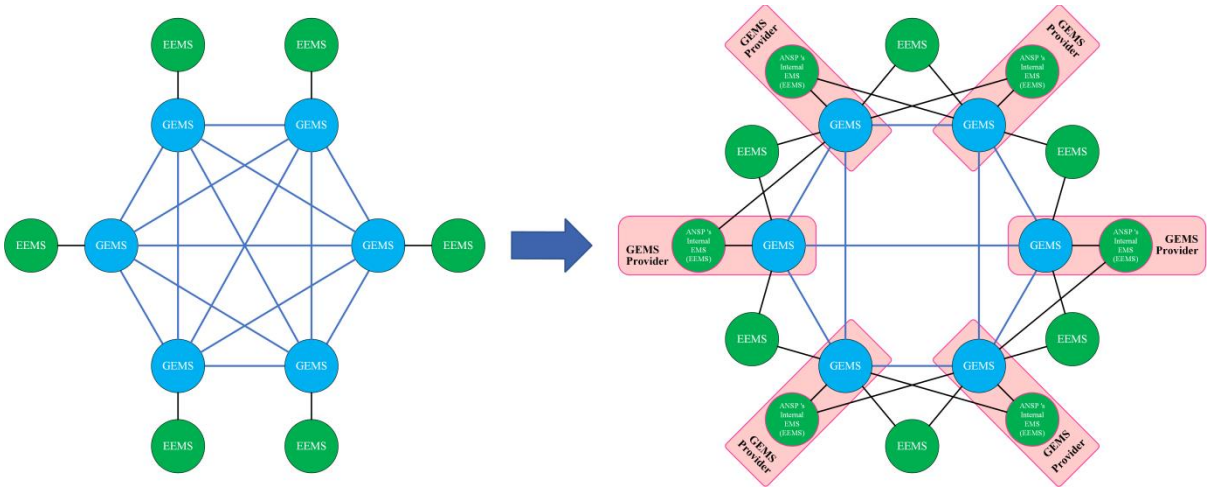

Figure 5- A modified version of the hierarchical architecture

2.148 It was added that the modified version of the hierarchical architecture could address the issue of "Detouring cannot be performed if a failure occurs in the message delivery chain," highlighted in SWIM TF/9-WP/10. It has the potential to reduce the complexity of the Gateway EMS, the regional SWIM backbone network, and avoid a single point of failure. The potential improvement brought by the modified version of the hierarchical architecture was shared with the meeting.

2.149 A draft of Gateway EMS requirements in the hierarchical architecture, including both functional and non-functional requirements of Gateway EMS was presented at the Meeting.

2.150 The SWIM TF/10 Meeting was informed that, since the Gateway EMS needs to provide services for multiple Edge EMSs, particular attention should be given to QoS metrics such as availability, latency, and throughput. With reference to the metric information of ATM-related services and systems, the Meeting was provided the following suggestions:

Metrics	Recommended values
Availability	≥99.9% (annual allowable unplanned downtime of 8.76 hours)
Latency	For operational use cases: In the order of seconds. For post-operational or non-operational use cases: In the order of minutes.
Throughput	depends on the Edge EMSes connecting to the Gateway EMS, data size, and data update rate, and can be measured in two primary units（KB/unit time or messages/unit time）

Table 4- Suggestions of QoS metrics recommended values for Gateway EMS

a) The availability metric requires balancing between benefits and costs. Each additional "9" in availability (e.g., from 99.9% to 99.99%) poses exponential challenges across hardware, software, testing, and operations, necessitating higher technical expertise, more rigorous governance, and substantial resource allocation. The resource investment grows exponentially as the availability level increases.

b) The latency of Gateway EMS is part of the end-to-end SWIM latency, which includes delays from Gateway EMS, Edge EMS, and CRV. The latency of Gateway EMS is primarily determined by system hardware and software performance. Through a

comprehensive analysis of latency in multiple scenarios, such as surveillance data transmission, flight plan updates, and meteorological information sharing, it is recommended to define the individual Gateway EMS processing delay on the order of seconds for operational use cases and on the order of minutes for post-operational or non-operational use cases.

c) In technical terms, throughput refers to the total volume of data processed or transferred within a specified time frame. The throughput of a Gateway EMS is heavily dependent on operational scenarios, requiring consideration of a number of targets to be updated (related to the Edge EMSes connecting to the Gateway EMS), data size (determined by the data schema) and update rate (dictated by data source characteristics and scenario requirements)

2.151 The SWIM TF/10 Meeting recalled that the availability value agreed at the SIPG WS/1 was 99.0%. Given that it has been agreed that the initial APAC SWIM will support information exchange not for the purpose of providing aircraft separation, the Meeting agreed to set the availability of $\geq$ 99.0% as a starting point. Moreover, as the functions and requirements of gateway EMS and edge EMS are still under development by SIPG, it was suggested that SIPG further deliberate on the draft requirements, especially with regard to availability, as part of its continued work. **ACTION ITEM 10-15**

2.152 The SWIM TF/10 Meeting discussed the revised hierarchical architecture and considered the appropriate Internet connectivity option presented in WP/18 in the context of this architecture. It was agreed that SIPG would review this revised architecture, along with option 1 for Internet Connectivity for the APAC SWIM, for further deliberation and development. **ACTION ITEM 10-16**

2.153 After detailed discussion on the options for connectivity of Gateway EMS, i.e., using pseudo CRV or the residual bandwidth of the operational CRV, the SWIM TF/10 Meeting agreed to proceed with the latter option. This option will be submitted for further consideration by CRV OG **ACTION ITEM 10-17**. To support the APAC SWIM TI test to be conducted by SIPG using this agreed-upon option, the Meeting requested CRV OG to provide guidance on using the residual bandwidth of the operational CRV for SWIM testing purposes. **ACTION ITEM 10-18**

2.154 It was agreed that various recommendations/options suggested in WP/14 and discussed during the SWIM TF/10 Meeting, such as whether all ATN Backbone Sites can serve as Gateway EMSs, the existing network topology can be reused, a connection policy based on adjacent Flight Information Region (FIR) or air traffic volume priorities can be used to establish connections between Gateway EMSs, as well as the appropriate number of EMS required in the region, etc. will be further explored by SIPG. **ACTION ITEM 10-19**

Approach to a Global API Gateway for Web Services – ROK (WP/18)

2.155 ROK introduced de-facto API Gateway topologies commonly used in the ICT industry – particularly in cloud computing environments, where various heterogeneous systems interact – and proposed an approach for implementing a regional API Gateway as a counterpart to GEMS, in order to support the Request/Reply Message Exchange Pattern (MEP) within the APAC SWIM architecture.

2.156 The SWIM TF/10 Meeting was recommended to consider that future implementations 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.

2.157 The SWIM TF/10 Meeting deliberated on various topics presented in the paper and agreed that further information is required for consideration of the proposal. ROK informed that its

intention was to initiate a discussion on the gateway API in the SWIM TF. It was agreed that SIPG will further explore this topic. **ACTION ITEM 10-20**

Requirements Specification Template for GEMS and Global SWIM Service – ROK (WP/29)

2.158 The paper presented a structured approach to defining software requirements for SWIM implementation, drawing from internationally recognized standards such as ISO/IEC 12207, ISO/IEC 15288, ISO/IEC 25010, and IEEE STD 830. It was informed that while existing standards provide comprehensive frameworks for system and software life cycle processes, there remains a gap in detailed guidance on specifying individual requirements, especially non-functional ones, within the SWIM context. To address this, ROK informed that it has defined an extended classification and a detailed field structure for software requirement specifications, reflecting best practices and aligning with key quality attributes. Relevant international standards, principles to follow when defining requirements, and templates that can be used as a reference were shared with the Meeting. It was added that these contributions will support the ongoing efforts of regional and global SWIM stakeholders by offering reusable guidelines and templates that ensure clarity, completeness, and consistency in requirement documentation.

2.159 The SWIM TF/10 Meeting discussed the guidelines and examples presented in the paper. It was agreed that SIPG, utilizing the Software Requirement Specification Template designed by ROK, will populate the template with specifications related to SWIM TI. These SWIM TI specifications examples will be included as part of the regional SWIM IGD. **ACTION ITEM 10-21**

Recommended Technical Performance Requirements for EMS – Thailand (WP/31)

2.160 The SWIM TF/10 Meeting noted the issue of insufficient data sets and recognized the need for more data to finalize technical performance requirements. It was also discussed that testing involving the concurrent execution of multiple information services would be essential to simulate an environment close to actual SWIM operations. However, conducting such comprehensive testing would require additional demonstrations. Given the current workload of SIPG, it was agreed that these tests would be deferred to a later stage. Additionally, Japan shared that it had previously conducted performance measurements of current operations using AMHS. While it remains necessary to monitor changes in information exchange orientation under future operations such as FF-ICE, the Meeting requested Japan to share its measurement data, as it would be valuable for further performance studies**.** **ACTION ITEM 10-22**

Updates on the Asia/Pacific FIXM v4.3 Extension – Thailand (WP/30)

2.161 The SWIM TF/10 Meeting was presented with the update on FIXM version 4.3 Extension development to support cross-border ATFM operation, A-CDM, ATFM/A-CDM integration, and traffic synchronization in the Asia/Pacific region. The SWIM TF/10 Meeting noted that TSG members successfully conducted technical validation of the FIXM version 4.3 Extension in April and May 2025. Recognizing the need for the timely availability of FIXM version 4.3 Extension 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*, it was proposed that this FIXM version 4.3 Extension be adopted as the Asia/Pacific FIXM version 4.3 Extension and be made available for use by the Asia/Pacific Administrations. It was further proposed that the Extension be presented to the FIXM Change Control Board (CCB) for review and publication on the FIXM official website.

2.162 The SWIM TF/10 Meeting noted the use of alternative data formats, e.g., JSON, to be more efficient in terms of the network bandwidth for exchanging such bandwidth-intensive information over SWIM, based on insights from the surveillance data sharing over SWIM technical trial conducted in May 2024. However, it was agreed that this current arrangement is applicable only at the regional

level, and there is a need for a global surveillance information exchange format. In response to the suggestion on requesting the Surveillance Panel to develop a globally standardized information exchange model for surveillance data sharing over SWIM, the Meeting was informed that SURSG has already been working on this task as per their ToR as follows:

> *Review, identify and provide expert views and recommendations to address major issues raised to the SURSG by ICAO APAC in the technical, operational or regulatory aspects of surveillance data sharing to facilitate the implementation of surveillance from "departure to destination" in APAC.*

2.163 The SWIM TF/10 Meeting requested the SURICG meeting to share tentative timelines for this task based on the plan shared by SURSG to SURICG. ICAO Secretariat will coordinate with SURICG and SURSG for the required information. **ACTION ITEM 10-23**

2.164 With the abovementioned, APANPIRG/36 was presented with the update on FIXM version 4.3 Extension development, and the following Conclusion as endorsed by CNS SG/29 was adopted by the APANPIRG/36.

<table>
<tr><td colspan="3">Conclusion APANPIRG/36/12 (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: 26-Nov-25</td><td colspan="2">Status: Adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☒Sub groups ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other: SWIM TF</td></tr>
</table>

ATFM SG Outcomes – ATFM SG Chair (WP/32- Part 2) – only FIXM related Discussion

2.165 This paper presented outcomes of discussions on SWIM-related working papers and draft conclusions thereof in the ATFM/SG/15 meeting. The Meteorology/Air Traffic Management (MET/ATM) Seminar and the Fifteenth Meeting of Air Traffic Flow Management Steering Group (ATFM/SG/15) were held in Bangkok, Thailand, from 28 April to 2 May 2025. The meeting also included a joint plenary session with the 14th Meeting of Meteorological Requirements Working Group (MET R/WG/14). It was recalled that SWIM TF/9 had requested the ATFM/SG to develop a detailed process for revising a mutually agreed FIXM version for cross-border ATFM-related information

exchange during the ATFM/SG/15 meeting and share with the SWIM TF/10 meeting for further discussion.

2.166 Noting the potential necessity to revise the Cross-Border FIXM operating version, the ATFM SG/15 agreed on the following change process as proposed by AMNAC TSG:

a. Submit the proposed change to the FIXM version, in the form of a Working Paper, to ATFM SG for review and assessment of its operational impacts and suitability in supporting regional operational requirements;
b. Upon adoption by ATFM SG, submit the proposal to SWIM TF for review and assessment of its technical implications; and
c. Following agreement by SWIM TF, submit a summary of the change proposal to ATM SG for approval, and subsequently to APANPIRG for endorsement.

2.167 The ATFM SG/15 also agreed to the content of the change proposal as recommended by AMNAC TSG as below:

a) Name of State(s) or collaboration group, including the specific names of organizations proposing the change;
b) Proposed FIXM version;
c) Reason(s) for the proposed change(s);
d) Testing result of the proposed version; and
e) Proposed timeframe for the change to take effect (a minimum lead time of 2 years is required)

2.168 Based on the deliberation on the proposed process, the ATFM SG/15 endorsed the **Draft Conclusion ATFM/SG/15-X: Change Process of the FIXM Version used for Asia/Pacific Cross-Border Operational ATFM System-to-System Information Exchange in SWIM** for ATM SG/13 adoption.

2.169 A concern regarding a minimum 2 years lead time identified the proposed change process was raised. Considering that the major change of FIXM version may occur during the 2-year timeframe, further deliberation to explore shortening the timeline was proposed. However, after it was shared that adopting a FIXM version for use in APAC solely in response to the release of a new FIXM version is not recommended, as such an update has implications for resources required to implement the change across the region, the proposed process was agreed upon by SWIM TF/10.

2.170 The SWIM TF/10 Meeting noted the need to discuss the change process for other information exchange model versions, such as AIXM and IWXXM. The ICAO Secretariat was requested to coordinate with other groups to share the requirements for formulating such processes. **ACTION ITEM 10-24** SWIM TF/10 Meeting shared its agreement to the drafted change management process and endorsed the ATFM SG/15 draft conclusion.

Comparison of SWIM Discovery Service (SDS)Implementation Specification Between V1.0 and V2.0 – ROK (WP/21)

2.171 The SWIM TF/10 Meeting recalled that, at the APAC SWIM TF/9, the SWIM TF requested to verify whether differences between SDS implementation specifications v1.0 and v2.0 would result in the update required for the developed SDS Jump Starter Kit and suggested to share findings with the future SWIM TF meeting. ROK shared updates on ACTION ITEM 9-13 and compared the differences between SDS implementation specifications v1.0 and v2.0. The basic comparison of concepts and objectives, and the technical comparison of resources and operations, were shared with the meeting.

2.172 The SWIM TF/10 Meeting was informed that the current SDS schema does not include all information service overview metadata fields identified in PANS-IM (Doc 10199), resulting in a need to modify the SDS schema. However, it was informed that the USA was a key contributor to this task, and there have been recent issues with the USA's participation in the SWIM TF. USA representation in the SWIM TF/10 meeting was requested to coordinate with the subject matter expert from USA to release the SDS schema so that other task members can further modify it. The USA was requested to consider continuing contribution to the SWIM TF, as their expertise is highly valuable for the APAC SWIM Implementation. **ACTION ITEM 10-25**

2.173 In addition, the SWIM TF/10 Meeting discussed the need to explore a common authentication mechanism among SWIM registries implemented with SDS. It was informed that IMP-WG/I-S is currently considering an appropriate approach to address this matter, as recommended by TFP.

Methods for implementing FF-ICE Services using Request/Reply Message Exchange Pattern – ROK (WP/27)

2.174 The SWIM TF/10 Meeting recalled that SWIM TF/9 WP/16 - *"Proposed Business Functionality of APAC Common SWIM Information Services"* proposed the global SWIM services to be implemented in the APAC region and, at the 2nd FF-ICE Ad-hoc Meeting and Workshop, Thailand presented APAC Common SWIM Information Services related to FF-ICE. It was added that in the APAC region, there have been multiple demonstrations and trials related to FF-ICE, most of which were based on the Publish/Subscribe (Pub/Sub) Message Exchange Pattern (MEP). Additionally, the SIPG has been focusing on implementing the regional SWIM prototype architecture, which supports messaging services based on the Pub/Sub MEP. However, regional implementation considerations for the Request/Reply MEP have been limited.

2.175 ROK described scenarios for implementing FF-ICE services using the Request/Reply Message Exchange Pattern (MEP). It also briefly explained Eurocontrol's implementation case of an FF-ICE service with the Request/Reply MEP using a web service. ROK illustrated web service-based FF-ICE service implementation scenarios with data flow diagrams and highlighted key considerations for each scenario.

2.176 The paper shared details of methods for implementing FF-ICE services using web service-based Request/Reply MEP. The SWIM TF/10 Meeting was informed that FF-ICE Ad-hoc Group had already shared that, for some APAC Common SWIM Flight information Services related to FF-ICE, both Pub/Sub and Req/Rep MEP will be required. It was agreed that China, Japan, and ROK will study the four cases shared by the paper as methods for implementing FF-ICE services using web service-based Req/Rep MEP and share their recommendations at the next SWIM TF Task Leads meeting. Further information will be shared with the FF-ICE Ad-hoc Group for further consideration at its 3rd meeting, planned to be held in March 2026. **ACTION ITEM 10-26**

Strategies to SWIM Operationalization in the Aspect of Validation – ROK (WP/28)

2.177 ROK outlined strategic approaches to support the operationalization of SWIM in the APAC region, with a specific focus on the validation aspect. The SWIM TF/10 Meeting shared appreciation with ROK for sharing very useful information. The SIPG lead suggested that the paper should also be considered in future SIPG discussions.

2.178 Regarding the suggestion to establish GEMS providers' group and a process for the approval of regional SWIM operationalization, including roles and responsibilities of relevant bodies, the meeting agreed that it is a premature stage for the SWIM TF to make a decision on this matter, given the current stage of SWIM development and implementation within the region.

2.179 For the proposed strategy to acquire the condition of operationalization after validation, the meeting agreed that China, Japan, and ROK will develop the SWIM information services validation process and share it with the SWIM TF/11 meeting for further consideration. **ACTION ITEM 10-27**

Updates from IMP – Japan (IP/02)

2.180 Japan presented key information discussed in the third Meeting of the Information Management Panel (IMP/3), held at ICAO HQs in Montreal, CANADA, from 30 September 2024 to 4 October 2024, focusing on updates to various documents, including Annex 15 and PANS-AIM.

Comparison of PANS Information Management (DOC 10199) Requirements and APAC SWIM – Japan (WP/22)

2.181 The SWIM TF/10 Meeting was informed that the requirement for SWIM is defined in the ICAO PANS-IM (Doc 10199), which is applicable to ICAO Contracting States and/or specific ANSPs. On the other hand, for "specific regions" such as APAC, the Regional Supplemental Procedure (Doc 7030) has been established, and a mechanism exists to publish the necessary matters as an ICAO document in case of any differences with the PANS method. Japan compared the PANS-IM requirements with the responses currently being considered by the APAC SWIM and clarified what should be included as a Regional Supplemental Procedure.

2.182 The SWIM TF/10 Meeting was informed that the APAC Regional SWIM Implementation Guidance Document (IGD) is being prepared by the Editorial Ad Hoc Group, and it will include provisions not only for the implementation of the APAC SWIM but also for its operation. The Meeting noted it is necessary to document the mandatory items required of both information service providers and information service users, such as the requirements specified in PANS-IM, as well as the concept of governance for the sound operation of the APAC SWIM, in order to obtain the agreement of the APAC States.

2.183 The Japanese "SWIM Operating Rules" and other documents were shared with the Meeting. The Meeting noted that these documents are arranged based on the SWIM documents in Europe and the USA, but they are the minimum necessary for a small start. If necessary, Japan planned to revise them in conjunction with the establishment of the APAC SWIM implementation guidance documents.

2.184 It was informed that PANS-IM required an audit by the regulatory department (regulator) to confirm the continued viability of the SWIM. Although the concept of auditing the APAC SWIM needs to be clarified, Japan shared that it is appropriate to include the requirements of the APAC SWIM in the audit of the State's SWIM to be conducted by the regulatory department of each State participating in the APAC SWIM. It was suggested that it would be appropriate for each country to bring the part of the audit results related to the APAC SWIM to the body that manages the APAC SWIM operation and discuss the necessary actions to be taken.

2.185 The SWIM TF/10 Meeting discussed the need for regional SWIM operating rules and the concept of auditing for the APAC SWIM. It was considered that monitoring of performance requirements would be more appropriate for such a regional technical infrastructure, rather than conducting audits. The Meeting requested Japan to further study this matter and share it at future SWIM TF meetings. **ACTION ITEM 10-28** Regarding the overall SWIM governance framework, including regional SWIM operating rules, Japan agreed to participate in the work of the Editorial Ad-Hoc Group to draft a "Governance Framework" chapter for inclusion in the regional SWIM IGD. **ACTION ITEM 10-29**

Updates from Editorial Task Ad-hoc Group – SP/01

2.186 The Editorial Task Ad-hoc Group recalled the priority of topics discussed and agreed to be addressed in the APAC Regional SWIM Implementation Guidance Document (IGD) at SWIM TF/9, including:

- SWIM TI specifications;
- Information exchange models;
- Registry model; and
- Service specifications.

2.187 The SWIM TF/10 Meeting noted that APAC SWIM Technical Infrastructure Profiles, v1.0, has been published in 2024 and can be accessed by this link. This document fulfills the information required for SWIM TI specifications.

2.188 The SWIM TF/10 Meeting was reminded of *Conclusion APANPIRG/30/12* Asia/Pacific Regional FIXM v4.1 Extension and *Conclusion APANPIRG/34/9* Asia/Pacific Regional FIXM v4.2 Extension. It was acknowledged that the rapid evolution of FIXM versions in recent years had posed challenges in recommending a specific version for the region-wide implementation. However, with the adoption of *Conclusion APANPIRG/35/4* Adoption of FIXM v4.3 in the Asia/Pacific Region as the Standard Format, the FIXM v4.3 is considered stable. Furthermore, the Meeting was informed that WP/30 proposed the adoption of regional FIXM v4.3 Extension, which has been endorsed by SWIM TF/10 for adoption by APANPIRG/36 through the CNS SG/29 meeting. Once formally adopted by APANPIRG/36, details of FIXM version 4.3, including the regional Extension, will be included under the Information Exchange Model chapter of the regional SWIM IGD.

2.189 Moreover, for the Registry model, Service Description Conceptual Model (SDCM) 3.0, SDS Implementation Specification, Version 2.0.0, and Service Description Model for JSON, Version 2.0.0 can be used as references. Lastly, the list of APAC Common SWIM Information Services has been agreed upon by this Meeting to be added as part of the Service Specifications chapter of the IGD. It was agreed that the Editorial Ad-hoc Group would compile all this available information and draft the first version of ICAO APAC SWIM IGD to present at the SWIM TF/11 Meeting for further approval. **ACTION ITEM 10-30**

Review of SWIM TF ToR, SOW, Work Plan, and Outstanding Action Items – Sec (WP/23)

2.190 The paper presented the current SWIM TF's ToR, the revised SWIM TF's work plan, and the Action List to reflect the latest work status achieved. The Meeting reviewed the latest ToR of SWIM TF, which was adopted by CNS SG/26 through ***Decision CNS SG/26/07 (SWIM TF/06/05)*** – Revised SWIM TF Terms of Reference, and agreed that no revision to the ToR is required.

2.191 To ensure that the objectives set in the ToR can be achieved, the Statement of Work (SOW) of each Task was updated by the Meeting.

2.192 The SWIM TF/10 Meeting was informed of the current Task leads as follows:

Groups	Task No.	Subject/Task	Task Leads
Implementation Planning	1	Regional implementation philosophy & roadmap	David Leow (Singapore) Amornrat Jirattigalachote (Thailand)
SWIM infrastructure	2	Regional SWIM infrastructure	Xiaodong Lu (Japan), ~~Yasushi Iwasawa (Japan)~~ Yosuke MORO (Japan)

Groups	Task No.	Subject/Task	Task Leads
			Henry Chan (Hong Kong, China)
	3	Security service	Jim Laymon (USA)
Technical Architecture	4	Development and maintenance of regional information exchange models	Amornrat Jirattigalachote (Thailand) Wen Zhu (USA)
Governance	5	Regional SWIM Governance Framework	Young Jin Ha (ROK) Mark Kaplun (USA), ~~Yasushi Iwasawa (Japan)~~ Yosuke MORO (Japan) Xiaodong Lu (Japan), Honglei Gao (China)
Information Services	6	Information services	Marco Kok (Hong Kong, China) Jeremy Bienkowski (Australia)
Validation & Demonstration	7	SWIM Demonstration	David Leow (Singapore) Amornrat Jirattigalachote (Thailand)
	8	SWIM services and application validation	Yosuke MORO (Japan) Xiaodong Lu (Japan), Honglei Gao (China), Young Jin Ha (ROK)
Coordination and Promotion	9	Monitoring of Panels' work	~~Yasushi Iwasawa (Japan)~~ Yosuke MORO (Japan)
	10	Regional coordination and SWIM-related information sharing	John Moore (IATA)
	11	SWIM implementation education and promotion (New task)	~~Thomas Green (USA)~~ Vacant

Table 5- The current Task leads

2.193 It was added that Task 3 required a co-lead from the APAC region to be able to suggest better and incorporate the security requirements specific to the APAC region. Similarly, additional support was required for Task 6 and Task 11. As the current ToR of SWIM TF has significantly increased the work of SWIM TF and recognizing the importance of effective communication of SWIM-related understanding with relevant groups, the Meeting encouraged States/Administrations to nominate lead/co-leads for Task 11 on a priority basis.

Outcomes of Second APAC Ministerial Conference on Civil Aviation – Sec (WP/25)

2.194 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.

2.195 The 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.

2.196 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".

2.197 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 will 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 with SWIM TF Task Leads for review. A survey will then be conducted in Q1 2026 to finalise the preferred indicators for the APAC region. **ACTION ITEM 10-32**

Date and Venue for the Next Meeting

2.198 The Meeting discussed the next SWIM TF meeting dates. It was agreed that the need to conduct one-day SWIM event prior to the SWIM TF/11 meeting would be reviewed. The SWIM TF/11 meeting, along with the one-day SWIM event (if deemed necessary), is tentatively planned to be held from **25 to 29 May 2026**. Interested member states that were to host the Meeting were requested to inform the ICAO Secretariat at least six months before.

2.199 The Meeting shared concerns about the amount of work required during the SWIM TF meetings and four-day meeting timelines were insufficient to complete the required discussion. It was suggested that the meeting should be extended to 5 days. Nonetheless, it was agreed that knowledge sharing sessions are equally important as a separate event creates an additional burden for States/Administrations. It was agreed that the number of days required for next meeting will be discussed further and necessary action will be taken.

Outcomes of SIPG WS/2

Review of Action Items and Prioritization

Action Items from SWIM TF 10 – SIPG Lead (SP/08)
SWIM Timeline Proposal – SIPG Lead (SP/02)

2.200 SIPG Lead presented the new action items that had been assigned by the SWIM TF/10 meeting to the SIPG. A total of 9 additional action items were reviewed and categorized in SP/07.

2.201 The Meeting then considered the various tasks of the SIPG in light of these additional action items in an attempt to merge the action items into the SIPG tasks. The result is the list of tasks shown in the table below.

Task ID	Task
Task 1	Define Functionality and requirements for Edge and Gateway EMS
Task 2	Review of the revised hierarchical architecture
Task 3	SWIM Architecture – Req/Rep MEP and guidance for Async and Sync
Task 4	Use of CRV Residual Bandwidth or CRV Test network (If Provisioned)
Task 5	SWIM architecture construction
Task 6	SWIM Security Implementation – Self-signed certs
Task 7	SWIM Registry Interconnection
Task 8	AMHS Protocol converters
Task 9	Testing of the APAC SWIM Prototype
Task 10	Measurement of performance metrics
Task 11	Conditions for SWIM Operationalization

2.202 After further deliberation, the Meeting decided that Task 4 and Task 8 should be excluded from the prioritization. Task 4 was excluded as it required input from the CRV OG to confirm if and when a CRV Test Network would be provisioned, or, barring that, whether the CRV residual bandwidth could be used for testing. Task 8 was excluded as the Meeting decided that the AMHS Protocol conversion should not be treated as part of the SWIM Technical Infrastructure but rather as a service that an EMS provider may or may not offer.

2.203 The Meeting also proposed that Task 5 be renamed "SWIM Technical Infrastructure Integration" to properly reflect the nature of the task. Similarly, Task 9 is to be renamed "APAC SWIM Integration Testing."

2.204 The finalized task list with associated priorities is listed in the table below.

Task ID	Task	
Task 1	Define Functionality and requirements for Edge and Gateway EMS	Priority 1
Task 2	Refine the revised hierarchical architecture	
Task 3	SWIM Architecture – Req/Rep MEP and guidance for Async and Sync	
Task 6	SWIM Security Implementation – Self-signed certs	
Task 7	SWIM Registry Interconnection	
		Priority 2
Task 5	SWIM Technical Infrastructure Integration	
Task 9	APAC SWIM Integration Testing	Priority 3

Task 10	Measurement of performance metrics	
Task 11	Conditions for SWIM Operationalization	

2.205 Task 7 in the table spanned both priorities 1 and 2 because there were two stages to the task. The first stage was to determine the version of the SWIM Discovery Service (SDS) specification to use that would be most suitable for the APAC region and the second stage was the actual implementation of the SDS and the interconnection of the different registries in the APAC SWIM.

2.206 The Meeting then proceeded to develop a work plan based on the above-prioritized task list. The target deadline to complete Tasks 1 through 10 is the **end of December 2026**. Task 11 is the development of a set of acceptance criteria for the operationalization of the APAC SWIM and that work is likely to extend beyond the end of 2026.

2.207 The Meeting deliberated on the composition of the various task groups and task leads for each task group. It was decided that leads would be assigned for Tasks 1, 2, 3, 5, 6 and 7 at this Meeting since the work is starting almost immediately.

2.208 Task leads for tasks 9, 10, and 11 will be assigned at a later date once the earlier tasks are completed. This is so that the SIPG has enough resources to properly commit to a task.

SWIM Architecture: Routing Mechanism

APAC SWIM Routing – CANSO (SP08)
APAC SWIM Architecture and Message Exchange over CRV – Japan (SP04)

2.209 CANSO presented the use of Topics as a means of message routing to the Meeting. The presentation started with the definitions of terms like EMS, Message Broker, Message Properties, Message Header, Message Topic, and Message Topic Model. This is to establish a common understanding of what each of these terms mean.

2.210 The presentation then delved into the use of Message Properties for routing and compared that with the use of Message Topics. It was noted that some message brokers do not support routing via Message Properties directly, so additional work needs to be done to modify the message brokers to do so.

2.211 However, Message Topics are supported by virtually all messaging protocols and message brokers. Message Topics use far less space than Message Properties and are similarly extensible. Further advantages of using Message Topics are listed below.

- There is no need to establish a naming convention to prevent name collisions, but it does require a topic model to ensure proper usage.
- Topics have the same proven structure as file and URL paths
- Topics allow for simple parallel processing that enables hardware acceleration.

2.212 The presentation went on to show how message routing could be achieved with Message Topics in the Gateway EMS and how message routing would work across the whole architecture. This was followed by an example using FF-ICE filing as a use case to demonstrate how the routing of an FF-ICE flight plan would work with Message Topic Routing.

2.213 CANSO went on to highlight the challenges faced by SIPG when it comes to message routing.

- The SIPG is attempting to develop, test, operate, maintain, and govern the most difficult distributed and federated features of individual message broker products that have the luxury of extreme homogeneity.
- The SIPG needs to make this work across a diverse and likely changing set and number of message broker products, product versions and related capabilities.

2.214 Therefore, given these challenges, it was recommended in the presentation that the Gateway EMS be kept as simple as possible. Similarly, for the Edge – Gateway interface and service.

2.215 The Meeting proceeded to have a lengthy discussion about the pros and cons of using message topics versus message properties, with many queries about the potential drawbacks that topics might have. It was noted that Japan, Singapore and Thailand have used Message Topics in their local SWIM implementation. However, this mechanism has not been tried at the APAC level.

2.216 After much deliberation, it was decided that Task 2 would conduct a trial on the use of Message Topics and Message Header for message routing and coordinate with Task 1 to flesh out the necessary requirements on the Gateway and Edge EMS. ***ACTION ITEM WS2-1***

2.217 Japan presented on the APAC SWIM Architecture and Message Routing over CRV. This presentation covered two topics regarding APAC SWIM Architecture. Namely how internet connectivity should be provisioned in the APAC SWIM Architecture and how message routing can be implemented using Message Properties.

2.218 As this agenda item pertained to routing mechanisms, the record here will concern only the discussions on the use of Message Properties for routing.

2.219 Regarding the use of Message Properties as a routing mechanism, it was pointed out in the presentation that there may be advantages for specific use cases, specifically for the FF-ICE use case.

2.220 The presentation then showed how different configurations of Message Properties can affect message routing and the various trade-offs and considerations that we must make when deciding how Message Properties are to be used to address a particular use case.

2.221 The Meeting proceeded to discuss the presentation and the pros and cons of using Message Properties as a routing mechanism. It was pointed out that since the past SWIM demonstrations have already used Message Properties as a means of routing, the SIPG has an understanding of how that works. While we should not ignore the use of message properties, the focus is now on exploring the use of message topics, as that is an unknown area. The comparison between Message Properties and Message Topics will thus be work assigned to task 2. ***ACTION ITEM WS2-2***

SWIM Architecture: Requirements on Gateway EMS providers

SWIM Architecture – Requirements on Gateway EMS - Singapore (SP/03)
Requirements Specification Template for GEMS and Global SWIM Service – Korea (WP/04)

2.222 Singapore presented the Requirements for Gateway EMS. The presentation covered the following topics: SIPG APAC SWIM Architecture, Groupings for Gateway EMS Communities, Functional Requirements for Gateway EMS, Non-Functional Requirements for Gateway EMS, Testing Requirements and Procedures for Onboarding a Gateway EMS, Runtime Governance for Gateway EMS.

SIPG APAC SWIM Architecture

2.223 Under the SIPG APAC SWIM Architecture, the presentation looked at the revised hierarchical architecture compared with the original hierarchical architecture. It compared the vulnerabilities of the original hierarchical architecture as raised in SWIM TF/9 WP/10 against the solutions proposed by China and Japan in SWIM TF/10 WP17 and SWIM TF/10 WP14, respectively.

2.224 There were a lot of discussions on the requirements of Gateway EMS. Particular focus was given to the issue of assigning priorities to messages and how this could be done. It was pointed out to the Meeting that an agreed principle that this Meeting should abide by when considering requirements for Gateway EMS is that SWIM information services are not being used for aircraft separation. Therefore, any constraints and requirements proposed must consider the above principle. This is to prevent over-engineering of the requirements.

2.225 The Meeting decided that the discussions all boil down to 3 questions.

1. Can we use multiple queues in the Gateway and Edge EMS?
2. Is it acceptable for the Gateway EMS to delete a message whose TTL parameter is expired?
3. How should message priority be implemented?

2.226 The Meeting agreed that these questions should be undertaken by tasks 1 and 2 for an answer. There was a suggestion to look at the AFTN/AMHS priorities as inputs for this question. ***ACTION ITEM WS2-3***

2.227 Japan introduced the concepts of the Pull mechanism and Push mechanism for putting messages onto message queues. It was added that these have an impact on guaranteed message delivery and need to be properly explored. This is something for Task 1 to explore. ***ACTION ITEM WS2-4***

2.228 The Meeting proceeded to discuss the issue of a failure in the message delivery chain. Failure could occur at the network level or at the EMS level. These could be mitigated with a retry logic and message detouring. Both these solutions should work in concert, i.e., after a set number of retries, it should be deemed that the selected route is no longer viable and rerouting should occur. This was assigned to Task 2. ***ACTION ITEM WS2-5***

2.229 It was noted after all the discussion on the SIPG APAC SWIM Architecture that the material in this presentation, as well as the points discussed during the Meeting, should serve as inputs for Task 1 and Task 2. These tasks should then decide on the appropriate proof-of-concept trials to run to help progress their work. ***ACTION ITEM WS2-6***

Groupings of Gateway EMS communities

2.230 During the SWIM TF/10 meeting, it was proposed that the existing ATN Network Topology could be used as an initial reference for establishing the Gateway EMS providers. The proposal was for the current BBIS providers to take on the role of the Gateway EMS providers as well.

2.231 Australia highlighted that we should aim for a good geographical spread of Gateway EMS to reduce message transmission latency due to geographical distance. From the current ATN Topology, it seems that the candidate Gateway EMS providers are well spread out.

2.232 The SIPG Chair pointed out that the new hierarchical architecture only requires the Gateway EMS to connect to **2 or more other Gateway EMS** and does not mandate a mesh-type connection between all the Gateway EMS. Also highlighted was that this is the initial set of Gateway

EMS. There is nothing inherently preventing a state that is not a BBIS from volunteering to be a Gateway EMS.

2.233 The list of initial Gateway EMS providers was as follows:

- Australia (Tentative)
- China
- Fiji
- Hong Kong China
- India
- Japan
- Republic of Korea
- Singapore
- Thailand
- USA

2.234 Australia was listed as tentative as they still need to confirm if they are able to support this role. The Republic of Korea and USA have volunteered to be a Gateway EMS provider despite not being an ATN BBIS provider. Malaysia will be an edge EMS while New Zealand is planning to be the Edge EMS providers.

2.235 There was a question about whether a Gateway EMS provider needs to provide another Edge EMS. The SIPG chair reminded the Meeting that at the SIPG WS/1 session, it was highly recommended to keep the functions of the Gateway EMS dedicated to performing Gateway message routing functions. That means that a separate Edge EMS is recommended for the Gateway EMS providers.

Functional Requirements for Gateway EMS, Non-Functional Requirements for Gateway EMS, and Testing Requirements and Procedures for Onboarding a Gateway EMS

2.236 It was decided by the Meeting that the material for the three topics should serve as inputs to task 1. Further, all tasks that specify requirements should use the requirements specification template as provided in the SWIM TF/10 WP/29 to specify the requirements. ***ACTION ITEM WS2-7***

Runtime Governance

2.237 No material was presented on this topic; instead, the Meeting reminded that there is a Governance Task under the SWIM Task Force. Work on runtime governance needs to be taken under the Governance Task and not at the SIPG level.

2.238 Japan presented on APAC SWIM Architecture and Message Exchange over CRV. It covered the following topics: Internet Connectivity, SWIM Architecture, and Message Routing. The discussions on Message Routing have been captured in section 3. Therefore, only Internet Connectivity and SWIM Architecture discussions will be addressed in this section.

Internet Connectivity

2.239 The presentation compared the differences between the Internet and the CRV when implementing the SWIM Technical Infrastructure. It gave two options for providing Internet connectivity to the SWIM TI. It was recommended that the SWIM Technical Infrastructure should not be built on the Internet.

SWIM Architecture

2.240 The table listing SWIM Technical Infrastructure Principles was presented at the Meeting. It contained five proposed principles, their description, and what system needs the principles address.

2.241 Also shown was a diagram of how AMHS can integrate with the SWIM Technical Infrastructure.

2.242 The Meeting discussed both topics and noted the options provided for Internet connectivity. It was noted in the diagram showing how AMHS can integrate with the SWIM TI that the user/consumer is isolated from the Gateway EMS by the Edge EMS. It was agreed that this was a good design principle and should be followed.

2.243 In the same diagram, it was clarified that the AMHS Router is actually an AMHS protocol conversion Information Service and treated as outside of the SWIM TI.

2.244 It was decided that this presentation should serve as a reference and input to tasks 1 and 2. ***ACTION ITEM WS2-8***

SWIM Architecture: PKI Requirements for APAC SWIM Use Case

SWIM Self-Signed Certificate Trial – Malaysia (SP/10)

2.245 Malaysia presented the current results of the self-signed certificate trial that they have been conducting. The objective is to study the feasibility of using self-signed certificates to enable secured and encrypted communication between EMS.

2.246 Currently, the tests were carried out only between Malaysia and Singapore. It was expected that Thailand and Hong Kong China would join the trial soon. New Zealand expressed interest in joining the trial and China shared intention to be an observer.

2.247 The Meeting discussed the results of the trial so far and the pros and cons of using self-signed certificates. It was highlighted that the lack of a central certificate authority makes it difficult to manage the exchange of certificates and to establish trust between agencies.

2.248 It was further pointed out that the Aviation Common Certificate Policy (ACCP) document is due to be published by the ICAO by the end of June 2025.

2.249 After deliberation, it was decided that the continuation of the Self-Signed Certificate Trial should be assigned to Task 6 and continue until August 2025. At which point the ACCP document is expected to be published. The review of the ACCP document is also assigned to Task 6. ***ACTION ITEM WS2-9***

Request / Reply Architecture

Request-Reply Message Exchange Pattern – Singapore (SP09)
Approach to Global API Gateway For SWIM Web Services (WP01)

2.250 Singapore presented an explanation for the Request-Reply Message Exchange Pattern (MEP) in an attempt to define clearly what the Request-Reply MEP is. The concepts of Synchronous and Asynchronous Request-Reply were introduced and the differences between the two were listed in a table.

2.251 The presentation highlighted that there was confusion over the understanding of the Request-Reply MEP, using the FF-ICE use case to help highlight the source of confusion. Essentially, the confusion centered around the terms Synchronous and Asynchronous and how, depending on viewpoints, the understanding differs.

2.252 The Meeting debated what should be done to help resolve the matter and clear up the confusion.

2.253 It was concluded that there is a need for a common understanding among the SIPG members when these terms are used. Therefore, a clear definition of what is meant by Synchronous Request-Reply and Asynchronous Request-Reply needs to be developed. There is a high-level definition given in ICAO Doc 10203, and the SIPG definition should be aligned with the high-level definition in Doc 10203. ***ACTION ITEM WS2-10***

2.254 Secondly, a set of questions needed to be developed to query the different expert groups on how they expect their information services to behave. These questions should avoid using technical language such as Publish / Subscribe or Request / Reply. ***ACTION ITEM WS2-11***

2.255 These two tasks were assigned to Task 3.

2.256 SIPG lead reminded the Meeting that the Republic of Korea had presented the paper titled, Approach to API Gateway for SWIM Web Services, at the SWIM Task Force. This paper has been forwarded to the SIPG for consideration.

2.257 The paper highlighted that, to date, most of the trials and demonstrations have centered around the Publish / Subscribe MEP and the Request / Reply MEP was not explored. The paper also introduced the concept of an API Gateway and proposed various deployment models and approaches to how API Gateways could be deployed in SWIM. The paper stated that there was a need to agree on a consistent implementation of the Request / Reply MEP within the APAC SWIM and called for more work to be done in this Area.

2.258 The Meeting deliberated on the paper, especially on the need for API Gateways in the SWIM TI. It was decided that there was indeed a need for API Gateways in the SWIM TI. However, work needs to be done to explore how API Gateways should be deployed.

2.259 How HTTP RESTful Request / Reply can be done in the SWIM TI was discussed in the Meeting. It was agreed that more work also needed to be done to explore implementation options.

2.260 The above work to explore API Gateway deployment and HTTP RESTful Request / Reply implementation was assigned to Task 3. The SIPG WS/2 WP/01 should be used as input for these tasks. ***ACTION ITEM WS2-12***

Standardized Nomenclature – Naming Conventions

2.261 No material was submitted for this agenda item.

2.262 SIPG Led informed the Meeting that given the discussions from SWIM TF/10 and this Meeting, it was clear that this agenda item was not mature enough to be discussed. It has dependencies on the results of Task 2 before we can begin deliberations. Hence, this agenda item will be put on hold for now.

Conditions for SWIM Operationalization

Strategies To SWIM Operationalization in the Aspect of Validation – Republic of Korea (WP03)
Minimum Conditions for APAC SWIM Operationalization – Singapore (SP06)

2.263 SIPG Led listed the main points presented in WP/03, which was also presented in the SWIM TF/10 meeting. The paper highlighted that while Doc 10203 gives some guidance to the testing and validation of information services, no such guidance for testing and validation of the SWIM TI exists. However, reference could be made to the same guidance for testing information services when the SIPG develops test cases and procedures for testing the SWIM TI.

2.264 The paper then proposed three possible approaches to developing test cases. As well as the approaches to conducting these tests. The paper also recommends some form of certification to improve the objectivity of the tests.

2.265 SIPG Lead then went on to present the Minimum Conditions for APAC SWIM Operationalization. He informed the Meeting that this presentation was prepared prior to the SWIM TF/10 meeting and that since the rewriting of the SIPG Terms of Reference, some of the material in this presentation may no longer be relevant.

2.266 The presentation introduced the need for SWIM operationalization, stating that there needs to be an agreed method for determining the readiness and suitability of the APAC SWIM Technical Infrastructure for operational use. SWIM Architecture, SWIM Security, and SWIM Governance all need to be considered for testing and validation.

2.267 SWIM Information Services no longer needs to be considered since it is no longer the responsibility of the SIPG to implement Information Services.

2.268 The Meeting debated both the paper and the presentation. It was agreed that the paper and the presentation would serve as inputs to Task 11.

2.269 After further discussions, it was decided that the scope of Task 11 is as follows:

- Take the outputs from Tasks 1, 2, 3, 5, 6, and 7 and develop a set of test procedures for the SWIM TI.
- Present these procedures to the SIPG and SWIM Task Force for acceptance and approval.
- Work with Tasks 5, 9 and 10 to execute the test procedures and obtain the results.
- Prepare a test report based on the results and present them to the SWIM Task Force for acceptance.

2.270 It was noted that the consequence of accepting these test results would take the SWIM TI from a prototype phase into the production phase. There is still a need to transmit it into the operational phase. The SWIM Task Force should define what this operational phase should be. SIPG will share this information with SWIM TF. ***ACTION ITEM WS2-12***

2.271 There was a suggestion that the AFTN to AMHS transition document could be used as a reference to help define how SWIM should transition from Production into operation.

2.272 The Meeting also decided that the timeline for Task 11 should start in February 2026 and end no later than April 2027. This is so that the SWIM Task Force can meet its deadline of having an operational SWIM by the end of 2030. ***ACTION ITEM WS2-13***

Next Meeting Dates and Any Other Business

2.273 Japan presented a draft version of the proposed DGCA/60 paper. The paper highlighted the work being done by the SWIM Task Force and the SIPG. It also presented the future work of the SWIM Task Force and emphasized the importance of SWIM for global aviation.

2.274 The paper called for states to be more involved in APAC SWIM implementation and for states to participate in SWIM-related workshops and seminars.

2.275 The Meeting provided feedback and comments on the paper. Japan requested the Meeting to review the paper and to send them all feedback and comments before 6 June 2025. ***ACTION ITEM WS2-14***

2.276 The Meeting discussed the need for one more In-person working session after SIPG WS/3. It was reminded that the initial plan was to conduct three In-Person working sessions; however, based on progress in the next session, the need for another in-person session will be deliberated further. It was agreed that the next SIPG working session will be planned for 26-30 January 2026. The venue of the Meeting was tentatively set at the ICAO Regional Office in Bangkok, Thailand. A reply from Australia or Singapore regarding their availability to host the next SIPG Working Session is pending.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the outcome of the APANPIRG/36, CNS SG/29, and its contributory bodies, and take any necessary follow-up actions; and

b) discuss any relevant matter as appropriate

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List of Conclusion/Decisions adopted by CNS SG/29

Conclusion CNS SG/29/02 ***(Draft Conclusion ACSICG/12/03 (CRV OG/13/07))***- Adopt the CANSO Standard of Excellence in Cyber Security for CRV	
What: The CRV OG adopts the CANSO Standard of Excellence in Cyber Security for CRV and recommends that: a) CRV OG prefers an acceptable maturity level of Target Score 'C.' in carrying out the maturity assessment on the CRV. b) The CRV Service Provider carries out the maturity assessment. c) Each participating State/Administration carries out the maturity assessment. d) CRV OG/Each participating State/Administration creates a plan to address the gaps in the maturity score for the CRV.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To have a standard Cyber Security maturity applied to the CRV.	Follow-up: ☒Required from States
When: 20-Jun-25	Status: Adopted by Subgroup
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other: CRV OG	

Decision CNS SG/29/03 ***(Draft Decision ACSICG/12/04)*** **-** Adoption of SOP to update the AMC AFTN/AMHS Routing Table in the Asia/Pacific Region	
What: The proposed Standard Operating Procedures (SOP) for all ICAO Asia/Pacific (APAC) members who operate as CCC Operators (Coordination COM Centres) or External COM Centre Operators to update the AMC AFTN/AMHS Routing Table in the Asia/Pacific Region is adopted.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Enhance coordination between COM centers and ensure quality service for ATS Messaging.	Follow-up: ☒Required from States
When: 20-Jun-25	Status: Adopted by Subgroup
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: ACSICG	

Conclusion CNS SG/29/04 ***(Draft Conclusion ACSICG/12/05)*** - Educational material to manage the distribution of IWXXM information for COMM experts in the event of primary link failure	
What: The educational material to support COM/MET experts in managing the distribution of IWXXM in case of primary link failure is adopted as a living document.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic

	☐ Environmental ☒ Ops/Technical
Why: Educational material that identifies the required link capabilities to maintain IWXXM message distribution in the event of a primary link failure is necessary for uninterrupted service.	Follow-up: ☐Required from States
When: 20-Jun-25	Status: Adopted by Subgroup
Who: ☒Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other: ACSICG	

Conclusion CNS SG/29/05 ***(Draft Conclusion ACSICG/12/06)*** - Checklist of steps required to operational IWXXM exchange	
What: A checklist to facilitate the operational implementation of the IWXXM message exchange is adopted as a living document.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To support the prompt implementation of capable primary and, where relevant, secondary links for the exchange of IWXXM messages	Follow-up: ☐Required from States
When: 20-Jun-25	Status: Adopted by Subgroup
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: ACSICG	

Decision CNS SG/29/08 ***(GBAS-SBAS ITF 07/01)*** - Guidance Document for Implementation of SBAS in the Asia/Pacific Region	
What: The draft guidance document for implementation of SBAS in the Asia/Pacific Region, developed by the APAC GBAS/SBAS ITF, is adopted.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To provide guidance to States for the implementation of SBAS	Follow-up: ☐Required from States
When: 20-Jun-25	Status: Adopted by Subgroup
Who: ☒CNS Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:	

List of Conclusion/Decisions adopted by CNS SG/29

Conclusion CNS SG/29/09 *(SURICG/10/02)* - Workflow for the request and coordination of IC codes with the ICAO APAC Office	
What: Interrogator Codes (IC) of Mode S interrogators in the Asia Pacific region are to be coordinated and assigned through the ICAO APAC Regional Office. States/Administrations requiring ICs should request to the ICAO APAC Regional Office following the approved workflow to facilitate the request.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
	Follow-up: ☐Required from States
When: 20-Jun-25	Status: Adopted by Subgroup
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other: SURICG	

Decision CNS SG/29/10 *(ATMAS TF/06/01)* – Adoption of the Air Traffic Management Automation System Implementation and Operations Guidance Document Edition 1.5	
What: The Air Traffic Management Automation System Implementation and Operations Guidance Document, Edition 1.5, is adopted.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: New subsections have been added in the revised draft.	Follow-up: ☐Required from States
When: 20-Jun-25	Status: Adopted by Subgroup
Who: ☒Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: ATMAS TF	

Decision CNS SG/29/11 *(ATMAS TF/06/02)* – Adoption of the AIDC Implementation and Operations Guidance Document (IGD) Edition 2.0	
What: The AIDC Implementation and Operations Guidance Document (IGD) Edition 2.0 is adopted	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: New subsections have been added in the revised draft.	Follow-up: ☐Required from States
When: 20-Jun-25	Status: Adopted by Subgroup
Who: ☒Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: ATMAS TF	

<table>
<tr><td colspan="3">Conclusion CNS SG/29/12 (ACSICG/12/01(CRV OG/13/04), ACSICG/12/08, SURICG/10/01, SRWG/09/01) - Update the CNS Tables of ICAO APAC e-ANP Vol II</td></tr>
<tr><td colspan="2">What: The following tables of ICAO APAC e-ANP Vol II are outdated and require immediate updates.

<u>General Regional Requirements</u>

TABLE CNS II-1 AERONAUTICAL FIXED TELECOMMUNICATIONS NETWORK (AFTN) PLAN
TABLE CNS II-2 REQUIRED ATN INFRASTRUCTURE ROUTING PLAN
TABLE CNS II-3 ATS DIRECT SPEECH CIRCUITS PLAN
TABLE CNS II-4 HF NETWORK DESIGNATORS

<u>Specific Regional Requirements</u>

TABLE CNS II-APAC-1 ATS INTER-FACILITY DATA COMMUNICATION (AIDC) IMPLEMENTATION PLAN
TABLE CNS II-APAC-2 RADIO NAVIGATION AIDS
TABLE CNS II-APAC-3 SURVEILLANCE</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: The current TABLEs related to CNS are outdated and require immediate updates in order to update e-ANP Vol II.</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:</td></tr>
</table>

<table>
<tr><td colspan="3">Decision CNS SG/29/13 - Adoption of Regional Guidance Material for Addressing Human Factor Issues of ATSEP v2.0</td></tr>
<tr><td colspan="2">What: a) ICAO APAC Guidance Material for Addressing Human Factor Issues of ATSEP v2.0 be adopted.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td colspan="2">Why: The Guidance material for the improvement of the existing human resource management process towards ATSEP for addressing the factors adding stress and fatigue, improving their job performance and for achieving organizational resilience and cost benefits has been modified by adding a new chapter on “Supervisory and Managerial Role of ATSEP”.</td><td>Follow-up: ☒Required from States</td></tr>
</table>

List of Conclusion/Decisions adopted by CNS SG/29

When:	20 Jun 2025	Status:	Adopted by Subgroup
Who:	☒Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other: XXXX		

Decision CNS SG/29/14 - Creation of ANS Information Assurance Task Force (ANSIA TF)		
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.		Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: To provide consistent application of the requirements.	Follow-up: ☒Required from States	
When: 20-Jun-25	Status: Adopted by Subgroup	
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: ACSICG, CRV OG, SWIM TF		

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A List of Conclusions adopted by APANPIRG/36 Meeting related to CNS

Conclusion APANPIRG/36/10 *(Conclusion CNS SG/29/01 (ACSICG/12/02 (CRV OG/13/06)))* - Implementation of CRV for small Pacific Island and small ANSP in the region using CRV Solution, PCCWG SLA Package D+	
What: That, the CRV OG agreed to the following to assist small Pacific Islands & small ANSPs in APAC in the implementation of CRV: a) CRV SLA Package D+ is reliable and addresses lead time for acquiring spares and PCCWG to import licenses and clearance for customer sites b) Small Pacific Island and small ANSP in the region to consider using CRV SLA package D+ as the CRV solution to implement CRV for the exchange of voice & AMHS services c) With a target date to implement CRV by 2025, it was recommended that the CRV OG work closely with the small Pacific Islands, small ANSP in the region and PCCWG on a cost-effective CRV solution to implement CRV.	Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: To facilitate the implementation of CRV for the small Pacific Island & small ANSP in the region	Follow-up: ☒Required from States
When: 26-Nov-25	Status: Adopted by PIRG
Who: ☒Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other: XXXX	

Decision APANPIRG/36/11 *(Decision CNS SG/29/06 (SWIM TF/10/02))*- Adoption of APAC Common SWIM Information Services, v1.0	
What: The first version of APAC Common SWIM Information Services, be 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, is not specified to support the provision of aircraft separation.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To assist APAC States/Administrations in planning and implementing their SWIM information services.	Follow-up: ☐Required from States
When: 26-Nov-25	Status: Adopted by PIRG
Who: ☒Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other: MET SG, ATM SG, AOP SG	

Conclusion APANPIRG/36/12 *(Conclusion CNS SG/29/07 (SWIM/TF/10/03))* – Asia/Pacific Regional FIXM version 4.3 Extension	
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;	Expected impact: ☐ Political / Global ☒ Inter-regional ☐ Economic

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.	☐ Environmental ☒ Ops/Technical
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*.	Follow-up: ☐Required from States
When: 26-Nov-25	Status: Adopted by PIRG
Who: ☒Sub groups ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other: SWIM TF	

Conclusion APANPIRG/36/13 *(Conclusion CNS SG/29/15 (ACSICG/12/09 (CRV OG/14/01)))*- **Decision of CRV II Contract Management Process**	
What: Following the procurement process formulated by CRV OG to choose one of the two options for APAC States/Administrations for the CRV II contract management process, i.e., *current CRV contract extension* **vs** *initiate the CRV II RFP process:* a) States/Administrations agree to extend the current CRV contract for **5 years,** which will be referred to as the **CRV II Network.** After extension, the CRV II contract date would be from 1 January 2029 with expiry on **31 December 2033** b) The contract extension for the CRV network will include updated legal, commercial, financial and technical requirements of the current service provider and CRV network implementation. c) Considering internal procurement timelines of APAC States/Administrations, CRV OG should prepare baseline updates required for the CRV network **before 1 April 2027;**	Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: (1) The current CRV contract expires on 31 December 2028; (2) Some APAC States/Administrations, including PSIDS, are in the process of joining CRV, while some States have joined CRV within the last 1-2 years; (3) Transition to the new contract will take at least 1-2 years;	Follow-up: ☒Required from States

A List of Conclusions adopted by APANPIRG/36 Meeting related to CNS

(4) The CRV II contract management process executed by CRV OG resulted in the extension of the CRV contract for 5 years.	
When: 26 Nov 2025	Status: Adopted by PIRG
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: CRV OG and ACSICG	

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