International Civil Aviation Organization

The Ninth Meeting of System Wide Information Management Task Force (SWIM TF/9)

Bangkok, Thailand, 14 – 17 May 2024

Agenda Item 3: Outcomes of relevant meetings on SWIM-related matters

REVIEW OF RELEVANT CNS MEETINGS- 2023

(Presented by the Secretariat)

SUMMARY

The paper presents the relevant outcomes of the pertinent meetings held in 2023 including the Thirty-Fourth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/34), the Twenty Seventh Meeting of Communication, Navigation, and Surveillance (CNS SG/27) and eight meeting of SWIM TF (SWIM TF/8) along with relevant discussions in other meetings.

1. INTRODUCTION

1.1 The Thirty-Fourth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/34) was held at the Hong Kong Civil Aviation Department (HKCAD) Headquarters Auditorium *from 11 to 13 December 2023*, which was graciously hosted by Hong Kong, China. The Meeting was attended by **146** participants from **26** Member States, 2 Special Administrative Regions of China, and **7** International Organizations. The APANPIRG/34 meeting report, working papers, information papers, and other resources can be accessed by following link:

https://www.icao.int/APAC/Meetings/Pages/2023-APANPIRG-34.aspx

1.2 The Twenty Seventh Meeting of the Communications, Navigation and Surveillance Sub-group (CNS SG/27) of Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) was held at the ICAO APAC Regional Office, Bangkok, Thailand, from *28 August to 1 September 2023.* The Meeting was attended by **108** participants (94 In Person + 14 virtual) from **24** States/Administrations, **3** International Organizations, and **2** industry partners. The Meeting report and other documents of the meeting can be accessed at ICAO APAC Meeting webpage at: https://www.icao.int/APAC/Meetings/Pages/2023-CNS-SG-27.aspx

1.3 The Tenth Meeting of the Aeronautical Communication Services (ACS) Implementation Coordination Group (ACSICG/10) was held at ICAO APAC Regional Office, Bangkok, Thailand, *from 24 to 26 May 2023*. The Meeting was attended by 62 participants from 19 States/Administrations, 2 International Organizations, namely IATA, and ICAO, and 1 industry partner, namely Frequentis. The ACSICG/10 meeting report, working papers, information papers, and other resources can be accessed by following link: https://www.icao.int/APAC/Meetings/Pages/2023-CRV-OG-Ad-hoc-Governance-Group-and-the-ACSICG10.aspx

1.4 The Eleventh Meeting of the Common aeRonautical Virtual Private Network Operations Group of APANPIRG (CRV OG/11) was held from *1 to 3 February 2023* in ICAO Asia and Pacific Regional Office, Bangkok, Thailand. The Meeting was attended by 65 participants from 19 Member States/Administrations. The meeting report, working papers, information papers, and other resources can be accessed by the following link:

https://www.icao.int/APAC/Meetings/Pages/2023-CRV-OG11-.aspx

1.5 The Seventh Meeting of System Wide Information Management Task Force (SWIM TF/7) was held *from 9 to 12 May 2023* in ICAO Asia and Pacific Regional Office, Bangkok, Thailand. The Meeting was attended by **73** participants from **16** States/Administrations, **2** International Organizations and **1** telecommunication service provider. The SWIM TF/7 meeting report, working papers, information papers, and other resources can be accessed by https://www.icao.int/APAC/Meetings/Pages/2023-SWIM-Seminar-and-SWIM-TF7.aspx.

1.6 The Third Meeting of the Surveillance Study Group (SURSG/3) was held in Hong Kong, China, with the hybrid option (In-Person and Virtual Participation) from *22 to 24 March 2023*. The Meeting was attended by **102** participants (25 In-Person and 77 Virtual) from **14** States/Administrations, **2** International Organizations, and **3** industry partners. The Meeting Report, Working Papers, Information Papers, and other resources can be accessed by following the link: https://www.icao.int/APAC/Meetings/Pages/2023-SURSG-3.aspx

1.7 The APANPIRG/34 Meeting reviewed the outcomes of CNS SG/27, 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/34 also discussed CNS related matters and acted on the Report of the CNS SG/27 meeting and other papers presented under Agenda Item 3.4.

1.8 After CNS SG/27, the Eighth Meeting of the System Wide Information Management Task Force (SWIM TF/8) was held *from 8 to 10 November 2023* in ICAO Asia and Pacific Regional Office, Bangkok, Thailand. The Meeting was attended by **79** participants from **15** States/Administrations, 3 International Organizations and **1** telecommunication service provider. The SWIM TF/8 meeting report, working papers, information papers, and other resources can be accessed by https://www.icao.int/APAC/Meetings/Pages/2023-workingSessionandSWIMTF8.aspx

1.9 This paper summarised relevant information and updates with the highlight on the reviewed outcomes of CRV OG/11, ACSICG/10, SWIM TF/7&8, SURSG/3, and relevant discussions of other meetings of CNS SG/27 and APANPIRG/34.

2. DISCUSSION

The actions taken by APANPIRG/34 & CNS SG/27 meetings on CNS related matters are highlighted below:

2.1 The CNS SG/27 meeting adopted following **8** Conclusions and **2** Decisions:

Reference	Subject
Conclusion CNS SG/27/01 *(ACSICG/10/01)*	- Adoption of the Asia/Pacific Regional ATN Documentation Tree
Conclusion CNS SG/27/02 *(ACSICG/10/04)*	- Telecommunication Infrastructure Table
Decision CNS SG/27/03 *(ACSICG/10/06)*	- Revised ToR of Aeronautical Communication Services Implementation Coordination Group (ACSICG)

Conclusion CNS SG/27/05 *(SRWG/7/1)*	-	Asia Pacific Regional Aeronautical Radio Frequency Management Guidance Material Edition 1.0
Conclusion CNS SG/27/06	-	Revised GBAS safety assessment guidance document related to anomalous ionospheric conditions
Conclusion CNS SG 27/07	-	Revised SBAS safety assessment guidance document related to anomalous ionospheric conditions
Conclusion CNS SG/27/08	-	Extension of the Asia/Pacific GBAS/SBAS Implementation Task Force to complete tasks as per ToRs of GBAS/SBAS ITF
Conclusion CNS SG/27/11 *(SURICG/8/2 (Mode S and DAPs WG/6/2))*	-	Mode S DAPs IGD Edition 5.0
Decision CNS SG/27/12 *(SURICG/8/4)*	-	Revised ToR of Surveillance Implementation Coordination Group (SURICG)
Conclusion CNS SG/27/13	-	Regional Guidance Document for Addressing Human Factor Issues of ATSEP

2.2 The contents of above Conclusions/Decisions adopted by the CNS SG/27 are provided in **Attachment A** to this paper.

2.3 Based on the outcome of discussions on various agenda items, the CNS SG/27 meeting developed **3** Draft Conclusions for consideration by APANPIRG/34 Meeting, which were further adopted by APANPIRG/34. The Conclusions/Decisions adopted by APANPIRG/34 are as follows:

Reference		**Subject**
Conclusion APANPIRG/34/9 *(CNS SG/27/04 (SWIM/TF/07/04))*	-	Asia/Pacific Regional FIXM version 4.2 Extension
Conclusion APANPIRG/34/10 *(CNS SG/27/09)*	-	Revised Navigation Strategy- APAC
Conclusion APANPIRG/34/11 *(CNS SG/27/10 (SURICG/8/1 (Mode S and DAPs WG/6/1)))*	-	General Strategy on Assignment of and Migration to SI Code in the APAC Region

2.4 All APANPIRG/34 Conclusions related to CNS are provided in **Attachment B** to this paper.

Outcomes of the First Meeting of the Asia and Pacific (APAC) Air Navigation Service Provider (ANSP) Committee (AAC/1) – Sec (WP/04)

2.5 The paper presented the outcomes of the First Meeting of the APAC ANSP Committee (AAC/1) held at the Regional Office in Bangkok, Thailand, on 17-18 April 2023. The Meeting was informed that the APAC ANSP Committee adopted a framework to organise the work of the Committee

into four work streams based on areas of priority. These streams are step up investments in ANS capacity and capabilities and share requirements and best practices in the procurement of ANS systems; accelerate the development and implementation of Seamless ANS and collaborate on green initiatives to enhance ANS Sustainability; collaborate on business continuity and contingency planning, and formation of an Oceanic Working Group specifically focusing on the operations of the oceanic ANSPs. Member States/Administrations were invited to coordinate with national ANSP to appoint representatives to the APAC ANSP Committee. USA shared the significant tasks being done by various streams of AAC, such as contingency procedure development that will support every Member State, and encouraged Member States to join and contribute to the group.

Tenth Meeting of the Aeronautical Communication Services Implementation Coordination Group (ACSICG/10) and Eleventh Meeting of the Common aeRonautical Virtual Private Network Operations Group (CRV OG/11)

Eleventh Meeting of the Common aeRonautical Virtual Private Network Operations Group (CRV OG/11)

Key Outcomes of ICAO APAC Idea Generation Workshop: CRV Governance and the Draft ToR of CRV OG Ad-Hoc Governance Group

2.6 The ACSICG/10 noted the key outcomes of the *ICAO Asia Pacific Idea Generation Workshop: CRV Governance* held at the ICAO APAC Office, Bangkok, Thailand, on **31 January 2023**, and the draft ToR of CRV OG Ad-Hoc Governance Group. The Workshop agreed to create the **CRV OG Ad-hoc Governance Group** for preparing and presenting the **potential CRV OG Governance model** to future CRV OG Meetings. The First Meeting of CRV OG Ad-hoc Governance Group held on *22-23 May 2023* agreed that while defining modified CRV Governance, it is crucial to consider AMHS/SWIM Transition over CRV. The CRV OG Ad-hoc Governance Group Meeting reviewed and adopted the draft ToR of CRV OG Ad-hoc Governance Group.

Update to CRV Implementation Plan and CRV OG Operations Manual Status

2.7 The CNS SG/27 Meeting noted the **Decision CRV OG/11/01** - *Publish the updated APAC CRV Operations Manual (CRV OG OM v1.2)* and the **Decision CRV OG/11/02** - *Update to the CRV Implementation Plan*. The latest version of the documents has been published on ICAO APAC e-docs under CNS, ICAO APAC CRV Secure portal, and on the CRV portal hosted by Airways New Zealand.

Outcomes of CRV OG Experts Ad-hoc Group Meetings

2.8 The CRV OG/11 meeting noted that a total of seven virtual Ad-hoc Meetings were held between CRV OG/9 organised from *25-27 January 2022* till CRV OG11 and one distinct Meeting was held with the SWIM Task Force task leads on 28 October 2022. The outcomes of the Ad-Hoc Group Expert Group discussions on contract extension, upgrade/downgrade CRV circuits subscribed, different CRV Users and their joining process, and Package D+ formalisation were presented.

ATN Documentation Tree Update

2.9 The CRV OG/11 meeting deliberated the proposed **APAC ATN Documentation Tree** and various CRV documents suggested to be placed in the Tree. Supplementary consultation requirements with more Member States for further modifications and updates were sensed. The CRV OG/11 Meeting agreed that the CRV OG Ad Hoc Expert Group will work on modifying relevant CRV

documents and updating the CRV OG Operations Manual to ensure that any changes within CRV consider modifications required to the document tree.

2.10 The proposed Asia/Pacific Regional ATN Documentation Tree, which was reviewed, updated and endorsed by ACSICG/10, was further updated and adopted by CNS SG/27 through **Conclusion CNS SG/27/01** *(ACSICG/10/01) – Adoption of the Asia/Pacific Regional ATN Documentation Tree*. It was agreed that ACSICG will update the tree every year based on latest development of relevant ICAO documents mentioned in the ATN Documentation Tree.

Risk Assessment Framework for CRV OG

2.11 New Zealand presented a risk assessment framework for CRV. Over years of CRV operations, various installations and CRV processes issues have been encountered. These issues can be considered as the risk impacting the availability of CRV networks and services. The CRV OG/11 meeting noted that these risks were documented in the Airways New Zealand risk evaluation template, which can be accessed on the portal APAC CRV - Risk Register.docx, which has criteria that suit and reflect Airways New Zealand. The CRV OG/11 meeting noted it would be prudent to create a Risk Evaluation Framework against the ICAO DOC 9859 Safety Management that would suit the particular environment for CRV.

Mandate Firewall

2.12 New Zealand presented information on the potential to mandate the use of a firewall as part of the CRV implementation. Referring to the APAC CRV Operations manual and the System Design Document (SDD), the CRV OG/11 meeting noted the router with an ACL can only provide very limited security and it is recommended that external security advice is sought. Three options for mandating a firewall were presented for consideration. Other proposals were also discussed during the CRV OG/11 meeting.

Update the APAC CRV Implementation Table

2.13 The CRV OG/11 meeting reviewed and updated the APAC CRV Implementation Table. The latest updates presented on the planning and implementation status of CRV were as follows:

- **Under Operation**
  Australia, Bhutan, China, Fiji, Hong Kong China, India, Indonesia, Japan, Malaysia, New Zealand, Philippines, PNG, Republic of Korea, Singapore, Thailand, and USA.

- **Under Provisioning**
  Nepal, Mongolia, Vietnam

- **Hot Prospects in 2023**
  Sri Lanka, Pakistan, and New Caledonia

Upgrade/Downgrade of CRV Circuits Subscribed and Addition of New Sites and Services in the CRV Contract

2.14 The paper summarised the outcomes of the discussion of the ICAO CRV Steering Group formed in the CRV OG/9 to devise the terms and conditions for the addition of new services, upgrade/downgrade of Packages along with the addition of new sites by the CRV contracted States into their contract. The CRV OG/11 meeting **reviewed, modified and endorsed** the Addendum to Terms And Conditions between PCCW Global and CRV Authority **v3**, High-Level Individual Site Questionnaire **v2.2**, PCCWG System Design Document **v4.6**, and Service Order Form (**v2**), which can

be accessed on ICAO CRV Secure portal, and CRV portal hosted by Airways New Zealand. The CRV OG Operations Manual v1.2 has also been updated to incorporate an agreed Addendum to Terms and Conditions between PCCW Global and CRV Authority.

Various CRV users and their joining process

2.15 The Meeting was informed that to close Action Item 9-9 of the CRV OG/9 and Action Item 6-1 of SWIM TF/6, CRV OG/11 adopted the following definition of CRV users in concurrence with MET SG experts.

> **CRV USER – State/Administration:** An entity officially designated by the State to provide the air traffic or air navigation services the State is obligated to provide according to the ICAO provisions.
>
> **CRV USER – Industry:** An entity not officially designated by the State but authorised by the State to provide aviation or related services commercially.

2.16 It was approved that State's ANSPs will assign IP addresses to any entities joined CRV, and all entities will sign their contract individually. Additionally, for the difference in the joining process, CRV Users- State/Administration **will follow the same process** as mentioned in CRV OG Operational Manual and CRV Landing Page, while industries will **need sponsorship** by States.

Extension of CRV Contract

2.17 The Meeting noted the **Conclusion APANPIRG/33/7 - *Extension of CRV Contract for one year***. Member States are urged to initiate a service order with the PCCW Global for CRV implementation as early as possible, on or **before 31 December 2023** and synchronise the implementation of CRV in the APAC region.

Flexibility in CRV Contract Renewal

2.18 With some States approaching the five-year anniversary of their contracts with PCCWG, questions were being asked about the ability to sign for different periods. Therefore, it was proposed that the CRV OG Operations Manual is updated to allow contract extensions of two or three years. The CRV OG/11 meeting agreed on the proposed clauses and added them to CRV OG Operations Manualv1.2.

New Package D+ in CRV

2.19 The CNS SG/27 Meeting noted a new Package D+, intended to enhance the existing Package D option. The collective modified CRV common Package document agreed for the upgrade/downgrade/addition of new sites and services, and Package D+ is provided on the ICAO CRV Secure portal and CRV portal hosted by Airways New Zealand.

CRV Post-Implementation Issues in Bhutan

2.20 The paper updated the progress of the issues faced by Bhutan related to CRV post-implementation in 2021 due to the non-readiness of peer States and the actions taken by CRV OG and ACSICG for its resolution. Bhutan and Thailand confirmed that the CRV connectivity among them had been implemented. Therefore, the ad-hoc group formed to resolve this issue was **dissolved**. The relevant action items resulting from past CRV OG and ACSICG Meetings were marked as closed.

PASNet for the Pacific Islands CRV connectivity

2.21 The paper presented an overview of the options for using PASNet to connect the Pacific Islands to CRV. Considering the options for network connectivity to some Pacific Islands are limited and, in some cases expensive, the World Bank implemented the **Pacific Aviation Safety Network (PASNet)** in 20xx. The PASNet was built in a similar way to the CRV, focusing on immediate needs. The CRV OG/11 meeting discussed the significance of PASNet project, its potential benefits after implementation and noted the project's progress. New Zealand will share further updates on the project in CRV OG Meetings.

Progress of CRV Implementation by APAC Member States

2.22 Fiji, India, Indonesia, Japan, Malaysia, and the Republic of Korea presented the CRV implementation status through different Papers.

MPLS/IP-Based Inter-Regional Connection

2.23 The paper provided the current status of discussion being done for potential interconnection of CRV and REDDIG II and CRV and New PENS and requested APAC Member States to record their interest, willingness, or need for interconnection of the CRV with other regional networks such as REDDIG II / New PENS with the ICAO secretariat. It was noted that there is no concert technical proposal ready to work further for CRV and REDDIG II interconnection, while the interconnection proposal for CRV and New PENS is in progress.

The inter-regional connection between Russian and APAC AMHS Centers

2.24 Considering the restrictions on the use of Cisco equipment at Moscow and Khabarovsk COM centers, the Russian Federation shared the 3 proposed solutions to be studied for connecting Moscow and Khabarovsk COM centers to CRV to ensure the transition to AMHS technology with COM centers of the APAC region (Japan and China). With due consideration to the time needed to study the available solutions, Russia proposed to implement an interim connection between COM centers via a dedicated L2 VPN link to expedite the transition to AMHS. Japan informed that as it had already implemented CRV, instead of establishing an additional L2 VPN link, Japan would prefer to wait for Russia to join CRV. Russia shared its willingness to discuss with Japan other proposals for interconnection individually.

Update on Using the Rest of CRV MSA

2.25 The Meeting noted the latest status of **Conclusion APANPIRG/33/6** - Revised Amendment of the Management Service Agreement for CRV project (RAS14801). It was informed that all pioneer Member States countersigned the Revised amended Project Document and provided consent to utilise the remaining funds for the CRV.

Using the rest of the money: ToR of Safety Assessment

2.26 The CNS SG/27 Meeting noted that the CRV OG/11 and ACSICG/10 Meetings adopted Option 2 - *Penetration test of the PCCWG implementation only* and Option 5 - *Engage a Security consultant to review the Common Package, RFP documentation including the response, Implementation Plan and the Operations Manual and provide a Security recommendation based on this review* by the **Conclusion ACSICG/10/02** *(CRV OG/11/03)* – Selection of Security Review Options 2 and 5 and Develop a ToR, for utilisation of remaining money from CRV Project. The Meeting also noted the **Conclusion ACSICG/10/03** – Adoption of ToR for CRV Security Review using Options 2 and/or 5.

(New) PENS and the EATM CERT Cybersecurity Considerations

2.27 EUROCONTROL generically introduced the security management practices from the PENS Community perspective and the activities of the European Air Traffic Management Computer Emergency Response Team (EATM CERT) with a focus on penetration testing (ethical testing).

(New) PENS IPv6 Addressing Considerations

2.28 EUROCONTROL shared that PENS is IPv6 enabled (dual IPv4/IPv6 stack available) and each individual PENS User is assigned upon request 4x /48 IPv6 public ranges by EUROCONTROL.

AFTN/ATSMHS Routing Directory in APAC

2.29 The paper presented a brief history of the ICAO APAC AFTN Routing Directory which was based on the existing AFTN circuits in the Asia and Pacific regions. The ACSICG/10 Meeting was reminded again that the Region would follow the AFTN/ATSMHS routing directory during transition period, for inter-regional traffic, it is required to follow the existing entry/exit points and procedure. The AFTN/ATSMHS CONNECTIONS_ASIA/PAC Routing Directory reviewed and updated by ACSICG/10.

APAC AMHS Implementation Status from AMC

2.30 The paper presented the AMHS implementation status information in Asia/Pacific Region updated in ATS Messaging Management Centre (AMC) (OPER 247) as of 3 May 2023 in Attachment A of the paper. EUROCONTROL implemented AMC to provide off-line network management services in support of the ground ATS Messaging network of Air Navigation Service Providers (ANSPs). It was informed that AMC round 248 had been canceled due to technical failure, and the next round for AMC data update will be AMC round 249 on 18 May. The Meeting was invited to review and update information to AMC via AEROTHAI if necessary, including points of contact.

Proposal for Transition from AFTN to AMHS between Indonesia (Jakarta) and Australia (Brisbane)

2.31 Indonesia presented the proposal for the transition from AFTN to AMHS between Indonesia (Jakarta) and Australia (Brisbane). Several issues of message distribution between Jakarta and Brisbane due to mix used of AMHS and AFTN systems were introduced, while as a solution, a transition from AFTN to AMHS between Jakarta and Brisbane via CRV was proposed. The ACSICG/10 Meeting noted in March 2023, there were discussions between Indonesia and Australia regarding to the transition process of the AMHS. It was acknowledged to propose the connection between AMHS to AMHS and the interoperability Test is planned for June 2023. The ACSICG/10 Meeting also advised Indonesia to update the AMHS implementation with AMC in time.

AMHS/ATN Implementation Status of Thailand

2.32 The paper presented information about the AMHS/ATN implementation status of Thailand as well as the summary of link configuration after the successful implementation of the CRV network in May 2022. Thailand shared the work plan to consider solutions for Business Continuity Plan (BCP) for CRV connections, use ATS Direct Speech Circuit over CRV with Malaysia, and experiment on using CRV to relay ATFM messages with relevant stakeholders. The Meeting noted that the AMHS link between Thailand and Bhutan has been migrated from the Internet to CRV. Thailand and Bhutan informed that CRV provided a better performance to both parties.

Repository of AIDC Implementation Status in APAC

2.33 The paper presented the latest repository of AIDC Implementation Status in APAC region, the preliminary analysis of the current status, and invites States/Administrations to review and continue to update the AIDC implementation status if necessary.

Telecommunication Infrastructure Plan for APAC

2.34 It was noted that AMHS had been centric on telecommunication infrastructure before CRV was implemented. CRV now allows direct connection over Internet Protocol (IP) networks without the need for an AMHS routing plan. As such, the current tracking table developed for AMHS should be modified to reflect CRV infrastructure. For better management and coordination, a draft version of the Telecommunication Infrastructure table, which compiles all tables developed by CRV OG and includes a section for AMHS coordination with AMC, was proposed for review and recommendation.

2.35 The CNS SG/27 Meeting was informed that CRV OG/11 and ACSICG/10 modified and posted the Telecommunication infrastructure table on the CRV OG website hosted by New Zealand for members to update. The **Conclusion CNS SG/27/02** *(ACSICG/10/04)* **- Telecommunication Infrastructure Table** formulated by ACSICG/10 was adopted by CNS SG/27. The Meeting agreed to stop updating Table CNS II-1 and II-2 in APAC e-ANP Volume II in the APAC region. All Member States were requested to update the Telecommunication infrastructure table on priority.

Outcomes of MET/IE WG/21

2.36 The Twenty-first Meeting of the ICAO APAC Meteorological Information Exchange Working Group (MET/IE WG/21) noted that the capability for inter-regional exchange presented a significant obstacle in progressing the global availability of IWXXM. The lack of global availability of OPMET in IWXXM form is inhibiting system suppliers and users from switching to IWXXM and, therefore, delaying the realisation of benefits from implementing IWXXM. MET/IE WG/21 also identified the need for the establishment of inter-regional IWXXM exchange with the MID and AFI regions, alternate (secondary) paths to each region, adequate capacity and bandwidth to support IWXXM exchange, and interconnecting of the CRV with future equivalents in the MID and AFI regions for the global IWXXM exchange to succeed. The ACSICG/10 Meeting supported the MET/IE WG/21 proposal for action on the global dissemination of meteorological information in IWXXM form, and formulated modified the Draft Conclusion CNS SG/27/03 (ACSICG/10/05)- *Global Dissemination of IWXXM*, which is a modification of the proposal by MET/IE WG/21, for further endorsement by CNS SG/27.

2.37 The CNS SG/27 shared its support for the global dissemination of meteorological information in IWXXM format by prioritising the implementation of intra- and inter-regional aeronautical communication services and network circuits, including support for the implementation of AMHS with File Transfer Body Part (FTBP) and Interpersonal Message Heading Extension (IHE), and facilitating, through inter-regional consultation, the enhancement of inter-regional network redundancy (i.e., primary circuits and backup paths). Yet, the CNS SG/27 observed that a similar titled draft conclusion, with slightly different contents, will also be considered by MET SG/27 for endorsement and further adoption by APANPIRG/34. As the IWXXM dissemination related Conclusion is more relevant to MET SG and to avoid confusion caused by submitting two draft conclusions, with the same title but different contents, to APANPIRG, the Meeting agreed that the proposed draft Conclusion CNS SG/27/03 (ACSICG/10/05) - Global Dissemination of IWXXM should be withdrawn, and the ICAO

Secretariat would forward the CNS SG's support to MET SG/27 for further follow-up. The Member States were requested to enhance network capabilities to support these requirements.

AFTN/AMHS Connection between APAC Region and Other Regions

2.38 The paper summarised the status of the AFTN/AMHS connection between the APAC region and other regions (Europe, Mideast, Africa, North America, and South America) with reference to the information contained in ASIA/PAC ROUTING DIRECTORY and the COM Charts by EUROCONTROL AMC. It was also noted there is no direct connection between South America and Asia/Pacific, the aeronautical messages are routed via USA.

2.39 The ACSICG/10 Meeting reminded that global SWIM implementation should be the real push for the interconnection of regional IP networks in the future. But for now, AMHS connections between regions are the feasible solution to support global dissemination of meteorological information in IWXXM form, which implies additional costs for concerned States if they need to enhance the inter-regional AMHS connections to support XML format messages.

Protecting the Integrity and Efficiency of CRV Time-Sensitive Exchanges

2.40 USA presented considerations for CRV information exchanges as CRV usage increases and evolved to support SWIM. The ACSICG/10 Meeting reviewed the challenges faced by CRV regarding defined exchanges, edge protection, network user governance, network contingencies, migration to swim information exchanges, information transport priorities, and SWIM information security, and summarised the proposed suggestions for the introduction of SWIM traffic for consideration.

CRV-Evolution of Services

2.41 USA presented CRV-Evolution of Services. USA explained that different types of traffic are marked with Differentiated Services Code Points (DSCPs), which help PCCW apply different priorities and transport processing in the network. Considering a network Access Point may support multiple tunnels to different partners, PCCW will engineer the network so that the minimum required bandwidth is available for each defined path. It was also suggested that as paths and traffic grows, ANSPs may have to increase access bandwidth. It's recommended that CRV OG coordinate with CRV vendor, PCCW Global, and SWIM Task Force to set the priority of the traffic types: voice service, time-sensitive message, advisory message, etc.

Review Terms of Reference of ACSICG

2.42 Through a joint effort by Thailand and the Secretariat, a draft of ToR was proposed for ACSICG consideration. The Meeting reviewed and updated the proposed ToR against the new direction given by APANPIRG in the fields of Aeronautical Communication Services. The CNS SG/27 Meeting reviewed the updated ACSICG ToR prepared by ACSICG/10 and adopted as **Decision CNS SG/27/03** *(ACSICG/10/06)* **- Revised ToR of Aeronautical Communication Services Implementation Coordination Group (ACSICG)**. The the Revised Terms of Reference of ACSICG is provided in **Appendix A** to this paper.

Election of Co-Chair

2.43 Nominated by the USA and seconded by Thailand and Philippines, Mr. Kelepi Dainaki, General Manager Assets & Infrastructure, Fiji Airport Limited, Co-Chair (Pacific) of CRV OG, was elected as Co-Chair of ACSICG.

AMHS Upgrade in Jordan

2.44 The paper presented the AMHS implementation status in Jordan and the plan for full migration. The ACSICG/10 Meeting noted Amman COM Center implemented AMHS in 2009 to ensure seamless and interoperable Aeronautical Ground/Ground communication. Furthermore, Jordan expressed their willingness to join the Regional IP Network projects (CRV or New PENS) pending the technical and financial details that make a positive business case.

Note of Appreciation

2.45 The ACSICG/10 Meeting extended sincere gratitude to Mr. Hoang Tran for his dedication and contributions towards the planning and implementation of Aeronautical Communications Infrastructure and Services in APAC Region as the Chairman of Aeronautical Telecommunication Network (ATN) Implementation Coordination Group of APANPIRG (ATNICG) from May 2006 to March 2013 and as the Chairman of Aeronautical Communication Services Implementation Coordination Group of APANPIRG (ACSICG) from May 2014 to June 2023.

Seventh Meeting of System Wide Information Management Task Force (SWIM TF/7)

Outcomes of SWIM TF Task Leads (TLs) Meetings and Joint CRV OG Ad-hoc Expert Group and SWIM TF TLs Meetings after SWIM TF/6 – Sec (WP/05)

2.46 The paper presented outcomes of SWIM TF TLs Meetings and Joint CRV OG Ad hoc Expert Group and SWIM TF TLs Meetings after SWIM TF/6.

Outcomes of the MET SG and its Contributory WGs on SWIM-Related Matters – Sec (WP/14)

2.47 The paper presented recent SWIM-related discussions and outcomes from the MET SG and its contributory bodies and invited the Meeting to further discuss any relevant matters as appropriate. The Meeting noted the discussions on the use of the Internet for meteorological information services when designing the regional SWIM architecture and the consideration on organising and conducting a MET-focused workshop on SWIM in MET SG/26, the addition of a new agenda item on SWIM and the updated terms of reference related to the SWIM/TF in MET/IE WG/21, and development of APAC Use Case and User Requirements for SWIM-based MET Information Services Supporting ATFM in MET/R WG/12.

2.48 Furthermore, the conjoint Meeting session of MET/IE WG/21 and MET/S WG/13 (27-29 March 2023) reviewed the ICAO State letter, Ref.: AN 2/36-23/6, dated 13 February 2023, which presented the details of the proposals for the amendment of Annex 3 concerning SWIM and a first edition of PANS-IM concerning aeronautical information management, SWIM and information security. The proposed amendment recommends States should ensure that the meteorological information supplied to the users is provided through "information services". Therefore, the conjoint Meeting session noted that, according to the proposed amendment, by November 2024, States, operators and service providers in the aviation system may need to implement significant changes to ensure the meteorological information is provided to users through information services (SWIM).

2.49 The Meeting noted that ICAO METP is considering removing the (legacy) Annex 3 requirements for the global exchange of MET information in the traditional alpha-numeric code (TAC) form in 2029.

2.50 The Meeting also noted the compatibility table showing IWXXM versions, associated report packages, and relevant ICAO Annex 3 requirements. MET/IE WG/21 (27-29 March 2023) formulated Draft Conclusion MET/IE WG/21-01: IWXXM version compatibility, for consideration by the upcoming MET SG/27, requesting States to ensure systems are upgraded to support the IWXXM version which complies with the latest amendment to Annex 3 (as stated in the IWXXM compatibility table) and prepare for future system upgrades to support future IWXXM versions. Hong Kong China suggested that if States have not yet implemented IWXXM version 2021-2, they should implement IWXXM version 2023-1. It was added that proposed amendments of Annex 3 (Amendment 81) are envisaged for applicability in Nov 2024, and an updated IWXXM version will be released accordingly. However, updates to the existing MET products in future IWXXM versions are expected to be less frequent.

2.51 The Meeting requested information about tentative timelines for the organisation of a MET-focused workshop on SWIM. The ICAO Secretariat informed that the workshop is in early stages of planning. SWIM TF Co-Chair suggested adopting a coordinated approach with various groups while conducting the workshop, as MET Service Providers will probably require support from Air Navigation Service Providers (ANSPs) to implement MET information services on SWIM.

SWIM Task Force Work Programme Timeline- China, Japan, Singapore, and Thailand (WP/11)

2.52 The Thirty-Third Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/33), which was held on 22 – 24 November 2022, adopted the Asia/Pacific SWIM Implementation Timeframe to be between 2024 and 2030 with 2030 being the target timeline for implementation completion through Conclusion APANPIRG/33/9. The SWIM TF Task Leads Meeting held on 2 December 2022 agreed on the target to have a set of regional implementation guidance materials ready for adoption by the SWIM TF Meeting to be held in 2024 and that these regional implementation guidance materials will be based on the various deliverables of the Task groups that are relevant to the implementation of SWIM.

2.53 At the SWIM TF Task Leads Meeting, it was discussed that to ensure the readiness of the regional implementation guidance materials at the next SWIM TF Meeting timeframe as agreed, a collation of the various deliverables from different Task groups together with the associated deadlines for each deliverable was necessary. The job of collating these deliverables to create the SWIM TF work programme timeline was assigned to Task 1.

2.54 The Meeting noted that Task 3 deliverables and timelines are not updated because of the lack of Asian contributor(s) to this Task group. Without the views from the Asia side, it would be challenging to conclude the security services specifications, i.e. Task 3 deliverables and timelines, for implementing SWIM in the Asia/Pacific region.

2.55 The Meeting was informed that there are no deliverables focused on producing and editing the consolidated regional SWIM Implementation Guidance Material in the updated deliverables

and timelines. It was added that currently, this task is being handled by the ICAO Secretariat alone and not a specific Task group. This is not considered a tenable position. Therefore, a group responsible for gathering the guidance materials produced by all the related Task groups and consolidating/editing them into a coherent document for review and adoption by the SWIM TF Meeting in 2024 with the support of the ICAO Secretariat was needed.

2.56 The Meeting also noted that the group proposed to be established will only be the ad-hoc group and it will be dissolved once the first version of Asia/Pacific regional SWIM implementation guidance is adopted by the SWIM TF.

2.57 In response to a question, SWIM TF Co-Chair informed that the proposed Asia/Pacific regional SWIM implementation guidance would focus on SWIM implementation roadmap, SWIM Technical Infrastructure specifications, registry model, security framework, service specifications, information exchange model, and governance framework.

2.58 The following Decision for the Formation of an editorial Task group for the APAC SWIM Implementation Guidance document was proposed for the consideration of SWIM TF, which was adopted by the Meeting.

<table>
<tr><td colspan="3">Decision SWIM/TF/07/01 – Formation of an Editorial Task Ad-Hoc Group for the Asia/Pacific SWIM Implementation Guidance Documentation</td></tr>
<tr><td colspan="2">What: To establish an Editorial Task ad-hoc group under SWIM TF, through coordination with other Task groups, to create the consolidated Asia/Pacific regional SWIM implementation guidance with the support of the ICAO Secretariat.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To ensure the readiness of the Asia/Pacific regional SWIM implementation guidance in time for review and adoption by the SWIM TF/9 in 2024.</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: 12-May-23</td><td colspan="2">Status: Adopted by SWIM TF</td></tr>
<tr><td colspan="3">Who: ☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: SWIM TF</td></tr>
</table>

2.59 A Breakout Session was organised to get willingness to participate in the group from delegates, discuss potential content for guidance document, and finalise a way forward to execute this task along with timelines. China, Hong Kong China, India, Singapore, Thailand, and USA volunteered to participate in the Task group. It was agreed that the editorial task ad-hoc group, led by Thailand, would complete the task in one-year timeline.

2.60 The Meeting conferred that SWIM TF should review the draft guidance materials prepared by the Editorial Task Ad-Hoc Group and provide immediate feedback before presenting final draft materials for the review and adoption of the SWIM TF Meeting in 2024. Therefore, an additional SWIM TF plenary session was proposed to be held in the 2nd half of 2023 by a draft decision for SWIM TF adoption.

2.61 The Meeting agreed that an additional plenary session would provide a better chance for the adoption of these materials at the SWIM TF plenary in 2024. Therefore, the Meeting adopted the following Decision SWIM/TF/07/02 - Additional SWIM TF Plenary Meeting in the 2nd Half of 2023 for the proposal to conduct the next SWIM TF/8 Meeting in November 2023.

SWIM Implementation Pioneer Group - China, Japan, Singapore, and Thailand (WP/12)

2.62 This paper proposed establishing a SWIM Implementation Pioneer Group under the SWIM TF to kick-start the Asia/Pacific regional SWIM implementation based on the SWIM architecture discussed at the SWIM TF/2 Meeting. The Meeting was informed that while developing the Asia/Pacific Regional SWIM Roadmap, Task 1 recognised that, besides the regional guidance material being developed by the SWIM TF, there is a need for other mechanisms to help kick-start the SWIM implementation in the region. Considering the progress made by some ANSPs within the Asia/Pacific region, Task 1 concluded that one possible approach to accelerate SWIM implementation in the Asia/Pacific region is establishing a SWIM Implementation Pioneer Group.

2.63 The Meeting was informed that the role of the SWIM Implementation Pioneer Group would be to start building the initial version/prototype of the regional SWIM following the SWIM architecture previously discussed and agreed upon at the former SWIM TF Meetings, using the Common aeRonautical Virtual Private Network (CRV) as the baseline IP infrastructure. This proposal also ties in with the goals and objectives of the Surveillance Sharing in SWIM Trial Implementation Group (S3TIG). As such, this group is also proposed to be working closely with S3TIG. It was proposed that group members may consist of ANS stakeholders, including ANSPs, MET service providers, interested international organisations, and commercial vendors.

2.64 It was added that the lessons learned during the construction of this regional SWIM prototype could be used as input for developing the Asia/Pacific regional SWIM Guidance document. Importantly, the regional SWIM prototype, once created, can then serve as a seed for further SWIM development and better information exchange supporting regional operations. Eventually, this prototype can be extended and become the full-fledged Asia/Pacific SWIM with all the necessary features and governance applied to it. Task 1 proposed the formation of a SWIM Implementation Pioneer Group under the SWIM TF to establish a prototype SWIM for the Asia/Pacific region by a draft decision for consideration of SWIM TF.

2.65 The Meeting was informed that the group proposed to be established will only be the ad-hoc group and it will be dissolved once the deliverables outlined in its Terms of Reference (TOR) are reviewed and adopted by the SWIM TF. The ToR of the proposed SWIM Implementation Pioneer Ad-hoc Group were presented to the Meeting by Flimsy/02. The Meeting reviewed, modified and agreed to the ToR. The Meeting adopted the Decision SWIM/TF/07/03 – Formation of the SWIM Implementation Pioneer Ad-hoc Group to form SWIM Implementation Pioneer Ad-hoc Group by following Decision. Hong Kong China, Japan, Malaysia, Republic of Korea, Singapore, Thailand, and IATA volunteered to join the group. In the Breakout Session, an initial scope of work and a way forward of the Ad-hoc Group were discussed by volunteered Member States.

2.66 SWIM TF Co-Chair requested more Member States to join the group as it will be an excellent opportunity to learn from other group members. That, in turn, will contribute to the implementation of SWIM in their respective States. Moreover, increased participation will allow for a broader range of views within the region to be obtained and addressed early on while the group builds a regional SWIM prototype. Given the importance of the task and strict timelines for completion of this task, the Meeting suggested that ICAO Secretariat should share information about the formation of the SWIM Implementation Pioneer Ad-hoc Group with APAC Member States by a State Letter by 17 May 2023 and Member States should be requested to respond for their willingness to join the group and nominate experts by 31 May 2023. The action is completed.

Overview of APAC SWIM-TI Profiles- Japan (WP/07)

2.67 Japan presented overviews of the content list of the draft APAC SWIM Technical Infrastructure Profiles document. The SWIM Technical Infrastructure (TI) is a collection of software and hardware used to enable the provision and consumption of information services over an IP-based network. The information service provider and the consumer are responsible for implementing their own infrastructure.

2.68 In the APAC region, a Common aeRonautical Virtual Private Network (CRV) is an IP-based VPN using a private commercial network to provide service for exchanging AMHS data and potentially other data types. In addition, as a strong candidate to provide the network connectivity service for supporting the transition from AMHS to SWIM, how to construct the CRV-based regional SWIM and achieve interoperability during the transition period has been discussed between the CRV OG and SWIM TF.

2.69 In the APAC region, due to the different levels of operational needs and the limited capabilities of current CRV, various options can be contemplated for the transition period regarding interoperability. Some Member States and third-party SWIM service providers have developed some information services on their local SWIM-enabled systems that cannot currently connect directly to the CRV. In addition, to support cost-effective and efficient utilisation, some non-safety critical information services, such as less-sensitive meteorological information services, have been made accessible on the Internet. Therefore, during the transition period, the different design models for the SWIM TI are required for the different services and implementation levels.

2.70 To eliminate technical barriers to the realisation of regional SWIM, the APAC SWIM Technical Infrastructure Profiles contain basic requirements for the implementation of SWIM TI, optional system design models for the integration of the CRV, and common technical standards for the specification of interface bindings to implement the regional SWIM during the transition period.

2.71 The structure of APAC SWIM Technical Infrastructure Profiles and details about User-based Access without AMHS/SWIM Gateway and Infrastructure Bindings and User-based Access with AMHS/SWIM Gateway and Infrastructure Bindings were presented at the Meeting.

2.72 The Meeting requested Member States and Task 3, 5, and 6 leads to review the APAC SWIM Technical Infrastructure Profiles- Draft Version attached in Appendix F to the SWIM TF/7 Report and provide comments/feedback to the Task 2 lead by 31 August 2023. The Task 2 lead

compiled and reviewed all comments and feedback and submitted the revised draft document to SWIM TF/8 Meeting held from 8-10 November 2023.

Draft AMHS/SWIM Gateway Technical Specification - SWAMWAY Study Group (WP/17)

2.73 AMHS/SWIM Gateway Study Group (SWAMWAY SG) presented a draft of AMHS/SWIM Gateway technical specifications. The paper introduced the work done by SWAMWAY SG to develop a draft of the technical specifications for the AMHS/SWIM Gateway, providing a minimum set of requirements ensuring the exchange of information during the transition to SWIM as well as ensuring the interoperability with AMHS and with SWIM. SWAMWAY SG informed that the target of the study group is to get the endorsement of ICAO EUR/NAT AFS to the SWIM Transition Task Force (AST TF) Meeting, held from 14-16 June 2023, for the proposed AMHS/SWIM Gateway technical specification as a previous step to be recognised by ICAO and considered as an international standard. Therefore, the Meeting was requested to provide comments on the draft version of the AMHS/SWIM Gateway technical specification by the end of May 2023.

Update on Information Exchange Model Development to Support ATFM Operations, ATFM/A-CDM Integration, and FF-ICE/TBO in Asia/Pacific Region – Thailand (WP/16)

2.74 The paper presented the update on Flight Information Exchange Model (FIXM) version 4.2 Extension development to support the Air Traffic Flow Management (ATFM) information exchange required for cross-border ATFM operations, ATFM/A-CDM (Airport-Collaborative Decision Making) integration and FF-ICE/TBO (Flight and Flow Information for a Collaborative Environment / Trajectory Based Operation) in the Asia/Pacific Region. It also provided the details of FIXM version 4.2 Extension developed and tested and the update on the possible usage of the Flow Information Exchange Model (FLXM) to support the exchange of ATFM Daily Plan (ADP).

2.75 The Meeting noted that FIXM version 4.2 Core, released in February 2021, can support the exchange of some data attributes originally included in the Asia/Pacific FIXM version 4.1 Extension. The system-to-system interconnection test among Japan, Singapore, and Thailand was successfully conducted in May 2022 to validate the exchange of developed FIXM version 4.2 Extension. Following the test, the FIXM version 4.2 Extension has been further developed to include more alternatives to exchange aircraft position to support the exchange of aircraft track information.

2.76 Noting the need for system-to-system ATFM information exchange between enabled ATFM Nodes as well as for ATFM/A-CDM integration as described in the Asia/Pacific Regional Framework for Collaborative ATFM, version 4 (October 2022) and discussion at the ATFM SG/13 held in April 2023 of the need to identify the specific FIXM version to support the harmonised implementation across the Asia/Pacific region in the future, it was proposed that this FIXM version 4.2 Extension be adopted as the Asia/Pacific FIXM version 4.2 Extension and be made available for immediate use by Asia/Pacific Administrations. It was further proposed that this FIXM Extension be presented to the FIXM Change Control Board (CCB) for review and publication on the FIXM official website.

2.77 Thailand presented Flimsy/01 sharing the details of specific FIXM version 4.2 Core data attributes proposed to be used for supporting cross-border ATFM information exchange in the Asia/Pacific region together with parts of sample messages containing these data attributes.

2.78 With the aforementioned, the Meeting formulated the Draft Conclusion SWIM/TF/07/04 – Asia/Pacific Regional FIXM version 4.2 Extension for CNS SG/27 and APANPIRG/34 consideration which was further adopted by APANPIRG/34 by Conclusion APANPIRG/34/9(CNS SG/27/04 (SWIM/TF/07/04)) Asia/Pacific Regional FIXM version 4.2 Extension.

2.79 India questioned about the FIXM version used by other regions and shared opinion on a need to harmonise the implementation of FIXM version to ensure interoperability between regions. On a query regarding the FIXM version used by other regions, ICAO Secretariat coordinated with other regional offices. However, it was informed by other regions officers that other regions have no specific FIXM version adopted by their PIRG.

2.80 ICAO Secretariat agreed to take necessary action to upload FIXM version 4.2 Extension on ICAO Asia/Pacific Regional Office website for immediate use by Asia/Pacific Administrations after proposed draft conclusion adoption by CNS SG/27 and APANPIRG/34.

2.81 USA shared support to coordinate and present FIXM version 4.2 Extension to the FIXM CCB for review and publication on the FIXM official website after proposed draft conclusion adoption, if adopted by CNS SG/27 and APANPIRG/34. Further updates on this action is being presented to this meeting by another working paper.

Proposal of Regional Interoperable SWIM Registry- China, Japan, Republic of Korea, and USA (WP/08)

2.82 The paper proposed the SWIM Discovery Service (SDS) specification as the regional specification to enable the regional interoperable SWIM Registry. The Meeting was informed that service discovery had been a major point of interest for APAC SWIM professionals. Since 2017, ICAO APAC SWIM TF has been working on the SWIM governance task, covering the SWIM registry and service discovery. It was recalled that at the SWIM TF/3 in 2019, Conclusion CNS SG/23/5 (SWIMTF/3/3): Interoperable Registry Model for SWIM Registry in APAC Region was adopted.

2.83 The first version of the SDS implementation specification and Service Description Model for JavaScript Object Notation (JSON) (SDM-J) was developed by the FAA SWIM program. At the SWIM TF/5 in 2021, ROK and USA conducted a demonstration using respective SDS instances developed by ROK and USA. In 2023, Japan and China joined the collaboration and developed their registries and SDS instances. Brazil was considering the development of an SDS instance.

2.84 To facilitate the collaboration in the SDS community, a common repository was created in the GitHub (faa-swim/swim-discovery-service) in 2022. Also in 2022, the virtual teleconference was held to discuss the development of the second version of the SDS specification. The development of the second version of the SDS specification is in progress to provide additional capability (e.g., caching

or nested environment). In addition, the third version of the Service Description Conceptual Model (SDCM), which reflects the governance needs in the global aspect, is currently under review.

2.85 It was proposed that to facilitate information exchange in the interoperable service-driven environment without problems, there should be a regional framework enabling service metadata exchange to facilitate the discoverability and understanding of a SWIM service or information delivered. The paper recommended that, as the first version of the SDS specification proved its maturity and benefit, the SWIM TF should consider adopting the SDS specification as the regional specification and proposed Draft Decision SWIM TF/7/xx: SDS specification to enable interoperable SWIM registry in the APAC Region for the Meeting's consideration.

2.86 The Meeting noted that the proposed SDS implementation specification document belongs to FAA. Therefore, a review and a reproduction of the document is required to accommodate the purpose and requirements of the APAC Region. After the document is modified to accommodate all key requirements of the APAC region, it can be presented to SWIM TF Meeting for adoption as a regional guidance. Therefore, Task 5 will work to prepare SDS specification for the APAC Region.

Enabling SWIM Service Composition with REST-based API- USA (WP/10)

2.87 USA shared experiences using Representational State Transfer (REST) APIs in SWIM to deliver context-driven information, improve developer productivity, and streamline service deployment, including data fusion, service composability, and filtering mechanisms. It also shared key lessons learned from these experiences, including the importance of REST APIs for interoperability, scalability, security, and developer-friendliness.

2.88 Service Oriented Architecture (SOA) is a design principle that has been widely adopted in the development of SWIM infrastructures. By following the SOA principle, SWIM services can be used across different systems, independent of the underlying technologies, programming languages, or platforms. Representational State Transfer (REST) is an architectural style for building web services that is consistent with the design principles of the World Wide Web. By using standardised protocols and operations, RESTful web services can achieve interoperability across different systems and platforms, further reducing communication and collaboration barriers across different regions, languages, and platforms.

2.89 SWIM Discovery Service (SDS) is a joint effort to facilitate the exchange of service metadata among independently developed and autonomously managed SWIM programs and leveraged standard-based REST API extensively. Further details of SDS and Open Geospatial Consortium (OGC) testbed initiatives and lessons learned from testbed initiatives were shared with the Meeting.

SWIM Discovery Service Demonstration – Republic of Korea, USA, China, Japan (WP/09)

2.90 The paper described SWIM Discovery Service (SDS) demonstration between ROK, USA, and Japan. It provided capabilities of SDS, SDS instances used for demonstration, service registry used, topologies between SDS instances, and test-case for the demonstration.

2.91 The Meeting noted that the demonstration conducted in 2021 used two respective SDS instances developed by the KAC and FAA, while the demonstration, which was conducted at the SWIM TF/7, used three respective SDS instances developed by the KAC, FAA, and ENRI. Detailed steps, presented in the form of Data Flow Diagram, of the executed test scenario, were also shared with the Meeting.

2.92 Following the paper, the demonstration was done to the Meeting. The Meeting appreciated the joint paper and demonstration.

Information to be exchanged through APAC Common Information Services- Hong Kong China (WP/18)

2.93 Hong Kong China presented the updates on the work of Task 6 to identify the catalog of basic data elements to be shared and exchanged via APAC Common SWIM Information Services based on operational needs in APAC. The Meeting noted that to support the development of a list of the common set of SWIM information services for APAC as recommended based on the outcome of the SWIM survey conducted in 2022, SWIM TF Task 6 team undertook the work to identify the basic information to be exchanged via APAC Common SWIM Information Services.

2.94 The proposed list of information to be exchanged via Common Flight Information Services, Common Aeronautical Information Services, Common Meteorological Information Services, and Common Surveillance Information Services in APAC was shared with the Meeting. The Meeting deliberated in length about additional potential list of information, such as surveillance quality data, DAPs, Space Weather, Search and Rescue region, etc., that could be incorporated into various categories of information services provided in the paper. Therefore, it was recommended to have coordination and involvement of various domain experts to list all potential information for APAC Common Information Services. Moreover, the Meeting suggested that the study on the proposed data catalog to be continued in coordination with the relevant groups and subject matter experts should also include determining whether the data element to be exchanged in APAC Common Information Services are mandatory or optional, which would depend on the user group concerned and their use cases or operational scenarios. Additionally, it was advised that the naming of APAC Common Information Services should be identified based on the data elements to be shared/exchanged as well as the functions they will support.

2.95 The Meeting noted that the terminology used in the paper to define different types of information services is not formulated by any ICAO panels. It was therefore recommended to name them Common SWIM Flight Information Services, Common SWIM Aeronautical Information Services, Common SWIM Meteorological Information Services, and Common SWIM Surveillance Information Services, to emphasize the fact that these are SWIM services.

2.96 The Meeting was requested to review the proposed data catalog and provide suggestions on additional information that should be exchanged through APAC Common Information Services.

2.97 ICAO Secretariat was tasked to coordinate with the Secretary of Metrology Sub Group (MET SG), Aerodromes Operations and Planning Sub-Group (AOP SG) and the ICAO Aeronautical Information Services- Aeronautical Information Management Implementation Task Force (AAITF) to

request to nominate ATM, MET, and AGA Experts to prepare a comprehensive list of information for Common SWIM Flight Information Services, Common SWIM Aeronautical Information Services, Common SWIM Meteorological Information Services, and a Common SWIM Surveillance Information Services.

2.98 The Meeting discussed the utilisation of Mode S DAPs in developing an integrated SWIM service incorporating MET information derived from Mode S DAPs. It was stated that detailed consideration of exchanging MET information derived from Mode S DAPs through IWXXM should be made in consultation with MET SG (MET/IE WG). The ICAO Secretariat was tasked to coordinate with the Secretariat of MET SG (MET/IE) to explore options for this matter.

2.99 However, after internal coordination within the ICAO APAC office, it was concluded that the available information in the working paper is insufficient to present in detail to another contributory body, explain the issues, and participate in further discussion. Therefore, it is advised that the SWIM TF representative present a paper on this topic in MET IE WG.

A Joint Event for SWIM over CRV Demonstration and Surveillance Data Sharing in SWIM Trial - Hong Kong China, Singapore and Thailand (WP/13)

2.100 The paper presented the proposal to combine the SWIM Demonstration over CRV ("the Demo") and the surveillance data sharing in the SWIM trial ("the Trial") as a joint event for States' consideration. It was informed that the proposal on combining the two events would save effort in preparing similar network and system infrastructure for the Trial, demonstrate data exchange of different throughput and examine such bandwidth requirements on CRV, and enhance user experience with more types of SWIM services and data demonstrated. The Meeting was invited to support the combing of the Demo and Trial and participate in the joint event.

2.101 The Meeting noted that pseudo CRV would be used as the network infrastructure for the Demo/Trial and the ATFM scenario, based on the ASEAN Demonstration, will be refined and enriched to be used in the Demo, which is considered a suitable use case to demonstrate the operational benefits brought by SWIM. The Meeting also noted that S3TIG is conducting a survey to gauge States' interest in participating in the joint event. A questionnaire for the Survey was shared with the Meeting for further deliberation. The Meeting reviewed and modified the questionnaire.

Introducing Use Cases of A SWIM Service for Surveillance Data in the Republic of Korea (IP/03)

2.102 ROK presented the SWIM testbed, which was able to support two message exchange patterns, i.e., request/response and publish/subscribe. The paper shared use cases of the SWIM information service for surveillance data provided in various formats in ROK. It described how SWIM could improve the usability of surveillance data for stakeholders who couldn't receive surveillance data before and can improve their work efficiency. It was concluded that local or regional governance and technical group should be established to define a topology as well as an information model to convey surveillance information (e.g. ASTERIX or high level representation format such as JSON)) and discuss any other considerations.

2.103 Task 10 Lead shared the objectives and key activities of Task 10. It was explained that this task required identifying SWIM related activities as well as their interdependencies in planning or development within other Working Groups (WGs)/Task Forces (TFs) and liaise with relevant regional WG/TF to refine operational and communications requirements, including ATFM SG, MET IE, AAITF, ACSICG, CRV OG, etc. Additionally, the scope of this task is also to provide guidance to APANPIRG WG/TF using SWIM, and to influence outcomes from other WGs and TFs that will support the successful expansion of SWIM. Due to the importance of this task, Task 10 lead alerted all Task Leads to share information about SWIM-related discussions in other forums, such as ICAO, CANSO, APEC, etc., when IATA SWIM TF Members are not participating. Moreover, support from Task Leads is requested to identify as well as share key outcomes of SWIM-related activities and project initiatives that are not currently covered in current SWIM TF discussions and advise discoveries of any newly published SWIM training material or courses.

Review of SWIM TF ToR, Programme, Work Plan, and Outstanding Action Items – Sec (WP/06)

2.104 The paper presented the current SWIM TF's ToR, the revised SWIM TF's work plan, and a proposal to amend 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 there is no need to revise the ToR.

2.105 To ensure that the objectives set in the ToR can be achieved, the Statement of Work (SOW) of each Task needs to be further reviewed to be consistent with revised SWIM TF ToR. It was agreed that all Task Leads will review and modify the SOW to accommodate the latest requirements from SWIM TF ToR and share it with ICAO Secretariat before SWIM TF/8 Meeting.

2.106 The Meeting updated Task leads information 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), ~~Yukinobu Ryu (Japan),~~ Yasushi Iwasawa (Japan) 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)

Groups	Task No.	Subject/Task	Task Leads
Governance	5	Regional SWIM Governance Framework	Dongkie Park (ROK) Mark Kaplun (USA), ~~Yukinobu Ryu (Japan),~~ Yasushi Iwasawa (Japan) Xiaodong Lu (Japan), Honglei Gao (China)
Information Services	6	Information services	Marco Kok (Hong Kong, China) Vacant
Validation & Demonstration	7	SWIM Demonstration	David Leow (Singapore) Amornrat Jirattigalachote (Thailand)
	8	SWIM services and application validation	~~Yukinobu Ryu (Japan),~~ Yasushi Iwasawa (Japan) Xiaodong Lu (Japan), Honglei Gao (China), Mr. Dongkie Park (ROK)
Coordination and Promotion	9	Monitoring of Panels' work	~~Yukinobu Ryu (Japan),~~ Yasushi Iwasawa (Japan)
	10	Regional coordination and SWIM-related information sharing	~~Vacant~~ John Moore (IATA)
	11	SWIM implementation education and promotion (New task)	Thomas Green (USA)

2.107 The Meeting was informed that Task 3 required a co-lead from the APAC region in order to be able to better suggest and incorporate the security requirements specific to APAC region. Similarly, additional support is required for Task 6 and Task 11. The importance of Task 10 in coordinating between SWIM TF and other contributory body under APANPIRG was also highlighted. As the revised ToR of SWIM TF has significantly increased the work of SWIM TF, the Meeting were encouraged to nominate Task Leads of Task 10, co-leads of Task 3, Task 6, and Task 11 on priority basis. Mr. John Moore from IATA agreed to lead Task 10 as done in the past. The Meeting appreciated IATA to take the responsibility. Moreover, more contributors were requested for Task 1 to Task 11.

2.108 The Meeting reviewed the SWIM TF Work Plan and the action item list. There was no updates to the Work Plan.

APAC Use Cases and User Requirements for SWIM-Based MET Information Services Supporting ATFM - MET/R WG Ad-hoc Group (WP/15)

2.109 The paper presented the recent updates on the work to identify and document use cases and user requirements for SWIM-based MET information services supporting ATFM in the APAC region in coordination with other working groups and provided an updated draft version of the regional document for consultation.

2.110 The Meeting noted that MET/R WG/11 adopted the updated version of the draft reference document, which included comments from MET/R WG/10 and an addition of a use case on volcanic ash avoidance and diversion due to fog, and the proposed updates to its ToR to reflect key deliverables identified in the MET/R WG Work plan. To promote further development of ATFM-specific use cases and user requirements, ATFM/SG/13 held on 3-7 April 2023 reviewed the updated draft reference document and agreed to add an action item on contributing to the MET/R WG on further refining SWIM-based MET information service scenarios and developing other scenarios. It was also proposed to further update the draft reference document to add two use cases that demonstrate the potential benefits of MET information services to APAC ATFM operations in SWIM. The follow-up activities that would be carried out as outlined in the MET/R WG Work plan by the ad hoc group through consultation with ATFM experts were shared. The Meeting was invited to review the draft reference document and provide comments, in particular suggestions on additional use cases, if any, for further analysis.

2.111 The Meeting appreciated the paper and shared that used cases could be potentially included in the Asia/Pacific regional SWIM implementation guidance material which is being drafted by the Editorial Task Ad-hoc Group.

2.112 India shared the importance of India to join MET/R WG Ad-hoc Group as a vast oceanic airspace, which may have different MET conditions from a continental airspace, is controlled by India. MET/R WG Ad-hoc Group rapporteur informed that any Member States can join the group on volunteer basis and requested volunteer Member States to contact ICAO Secretariat.

Update on SWIM Service Registry Design & Development of ATMB – China (IP/02)

2.113 The paper presented the design and development progress of the SWIM Service Registry of ATMB in China, including information service lifecycle design, information service description metadata extension, SWIM Service Registry functional framework design, and SWIM Service Registry demo development. The Meeting noted that testing and verification work on the SWIM Service Registry demo would be carried out, and the SWIM Service Registry Functional Configuration Guidance of ATMB will be compiled and released, which will be the technical foundation to carry out SWIM Service Registry planning and construction of ATMB afterward.

Date and Venue for the Next Meeting

2.114 The Meeting agreed to schedule another plenary of SWIM TF, i.e. SWIM TF/8, as an In-Person Meeting in Bangkok, Thailand in November 2023 to ensure that the SWIM TF would achieve the target date of regional guidance document development in 2024. The Meeting arranged that the SWIM TF/8 would be conducted for Three (3) days in continuation to SWIM Business Requirement Brainstorming Working Session for Two (2) days. In addition, the Meeting agreed to conduct the full plenary of SWIM TF/9 along with another SWIM activity for one day from 13-17 May 2024.

Current status of CRV Implementation in India (WP/34)

2.115 India provided its latest progress of AMHS/CRV implementation and suggested extending the existing CRV network to the MID Region to facilitate smooth connectivity and exchange of Aeronautical/meteorological and other traffic from the APAC region. The CNS SG/27 Meeting

supported the suggestion for MID States to join CRV and the potential benefits to both regions. The ICAO Secretariat will coordinate with the MID office and PCCWG to take follow-up actions.

Challenges and Requirements for IPS Environment (WP/29)

2.116 The paper from USA addressed challenges and requirements for supporting future services, including SWIM, in an Internet Protocol Suite (IPS) environment. The requirements were suggested from ICAO, network, and user perspectives. Regarding ICAO requirements mentioned in the paper, ICAO HQ has informed about the creation of a new inter-panel task force to address the IPv6 addressing and other related mutual concerns. This may include the global guidelines for IPv6 dedicated address block for fixed service and A/G mobile service. ICAO Secretariat will further coordinate with appropriate ICAO HQ panels to update on the latest developments.

2.117 Furthermore, the Meeting noted that CRV OG is already deliberating on the way forward to efficiently utilise available CRV bandwidth to disseminate obligatory critical aeronautical messages. Further guidelines related to this aspect may be prepared by CRV OG for ACSICG consideration and adoption by CNS SG. The ICAO Secretariat will share the pertinent information mentioned in the paper with CRV OG for further action.

Distribution of XML Based Messages in AMHS and SWIM Environment (IP/14)

2.118 The FAA informed about its plan to support the distribution of Extensible Markup Language (XML) based information using AMHS messaging as an interim step towards transition to a SWIM environment. This effort should support the exchange of XML-based messages such as FIXM and IWXXM. Other plans related to IWXXM-formatted data and a smooth transition to direct SWIM-SWIM exchanges were shared with the Meeting.

Multi-Regional TBO Demonstration - Japan, Singapore, Thailand, and USA (WP/32)

2.119 The joint paper presented an overview of the Multi-Regional TBO Demonstration, a collaborative project undertaken by Japan, Singapore, Thailand, USA, and Canada to validate the TBO concept as well as to showcase the TBO operational values and key capabilities, both operational and technical, required to support TBO. The CNS SG/27 Meeting was encouraged to provide guidance and collaborate on establishing the crucial TBO building blocks, i.e., SWIM and FF-ICE, to support the development and realisation of TBO in Asia/Pacific.

2.120 In response to a query, Thailand informed that the MR TBO Demo has been concluded with the live-flight demonstration in June 2023, and at present, there is no plan to conduct any other phase of the MR TBO demonstration. However, another discussion in APAC SWIM TF among the MR TBO ANSP partners to conduct such a demo in Asia/Pacific in the future is going on.

2.121 The Meeting agreed to support the collaboration and coordination between the SWIM TF and FF-ICE Operational Requirements Small Working Group (SWG) under ATM SG as well as Workstream 2 - Accelerate the Development and Implementation of Seamless ANS and Collaborate on Green Initiatives to Enhance ANS Sustainability under Asia and Pacific ANSP Committee (AAC) in building the TBO enablers, i.e. SWIM and FF-ICE, in Asia/Pacific. The Meeting also requested SWIM TF to share with CNS SG the progress on this collaboration toward the goal of implementing TBO in the region.

Outcomes of System Wide Information Management Seminar – Sec (IP/17)

2.122 The paper presented the outcomes of the SWIM Seminar held on 8 May 2023 at the ICAO Asia and Pacific Regional Office, Bangkok, Thailand, for Meeting information. The Meeting noted that the theme of the Seminar was Asia/Pacific SWIM: Where are We Now? The Seminar focused on sharing SWIM implementation status across the Asia/Pacific region and aimed to foster the exchange of views on how the ICAO Asia/Pacific SWIM Task Force can best support the regional SWIM Implementation.

Outcomes of SWIM TF/8 Meeting

Proposal of Technical Memorandum of Cooperation (TMC) Document for ATM Information Exchange through SWIM – Malaysia (WP/02)

2.123 Malaysia presented the proposal to develop the SWIM Technical Memorandum of Cooperation (TMC) for ATM Information Exchange in response to Action Item SWIM/TF/SIPG/AI-05 from the SWIM Implementation Pioneer Ad-Hoc Group (SIPG) Meeting for potential inclusion in the APAC SWIM Implementation Guidance material. It was informed that, as the SWIM implementation is nearly similar to the AMHS/ATN implementation philosophy, the draft SWIM TMC clauses were drafted based on the AMHS/ATN TMC clauses. Malaysia added that as the technicality of SWIM implementation is very different compared to AMHS/ATN implementation, the test procedures specific to SWIM needed to be established to generate supporting information, which will be attached to the SWIM TMC document. It was suggested that the test procedures should be created independently from the SWIM TMC and should also become part of the ICAO APAC SWIM Implementation Guidance Document (ICAO APAC SWIM IGD).

2.124 Thailand supported the preparation of the draft TMC template. However, Thailand shared that, considering the current status of SWIM implementation within the region, it was still premature to adopt the use of TMC at this stage. It was also added that, based on Thailand's experience in implementing AMHS TMC, signing TMC is a critical and lengthy process and it should be executed once bilateral operations of information exchange over SWIM are ready. New Zealand shared that there is a need to consult with the legal experts of respective States before adopting the TMC at the Meeting. Singapore informed that the objective of Action Item SWIM/TF/SIPG/AI-05 was to provide a TMC template but not to initiate agreement on its usage for the time being. The Meeting was informed that the document is only a template presented for further revision by SWIM TF. The finalized template will be part of the ICAO APAC SWIM IGD, which will then be presented for adoption by SWIM TF and, consequently, endorsement by CNS SG in the future. States/Administrations will have an opportunity to review and provide their feedback before such adoption and endorsement.

2.125 The Meeting noted needs raised by some States/Administrations for consultation with their respective legal experts and for discussion with their relevant stakeholders on the scope of the proposed TMC template, which covers the sharing of ATM information. Considering that these consultation and discussion processes take time, the Meeting thus agreed to defer consideration of the proposed Draft Decision to the SWIM TF/9 Meeting to be held from 14-17 May 2024. To achieve this target, the Meeting requested all States/Administrations to conduct the required deliberation among their related stakeholders and provide feedback to the draft TMC template document provided in Appendix A to the SWIM TF/8 Report, to the ICAO Secretariat before 29 February 2024.

Updates of APAC SWIM Technical Infrastructure Profiles – Japan (WP/03)

2.126 Japan, Task 2 Lead, presented the updated draft of the APAC SWIM Technical Infrastructure Profiles document incorporating comments received from SWIM TF task leads and members after the SWIM TF/7. The modifications done on the previous draft version presented at the SWIM TF/7 were highlighted and the future plans were also shared.

2.127 Singapore shared a list of comments on the draft APAC SWIM TI Profiles document. The Meeting reviewed and discussed each comment. It was agreed that for comments considered being able to be addressed by editorial changes, Task 2 Lead will take action to revise the draft document.

2.128 For some of the comments required further deliberation among other related stakeholders and experts within States/Administrations, the Meeting agreed on the following action items to obtain feedback for additional modifications, if needed, to the draft APAC SWIM TI Profiles document.

Action Item Reference No	**Reference to the draft APAC SWIM TI profile document**	**Action Item**	**Deadline**
ACTION ITEM 8-4	Table 3. Profile Package of SDCM Version 3.0.0	States/Administrations to review SDCM Version 3.0.0 and inform Task 2 Lead, Japan, of: • Comments/observations on the current draft content of this Table 3; and • Requirements for additional mandatory fields, if any.	**15 December 2023**
ACTION ITEM 8-5	Table 9. Message Capabilities Table 11. TI Management Capabilities	States/Administrations to provide Task 2 Lead with: • Feedback on whether "Persistence" should be included as part of Message Capabilities (Table 9) or TI Management Capabilities (Table 11) or both (Tables 9 and 11); • Comments on the description of "Persistence."	**15 December 2023**

2.129 The Meeting requested the ICAO Secretariat to share the revised document after the Task 2 Lead finishes revision work in December 2023, with the Task 5 group and SIPG of the SWIM TF as well as CRV OG for further deliberation.

2.130 In response to the clarifications about the term limited capabilities of CRV, Task 2 lead notified that the current available CRV subscription packages come with limited bandwidth and that there is a user type restriction to join CRV. ICAO Secretariat informed that CRV OG has already modified the definition of CRV users to include also others who are not ANSPs and that the non-ANSP

users can join CRV following the procedure described in the CRV OG Operations Manual. PCCWG, the current CRV provider, shared that CRV has no bandwidth limitation. CRV users subscribing to any available packages can request more bandwidth at an additional cost based on their needs. The Meeting agreed to submit the request, through the ICAO Secretariat, to CRV OG to consider deliberating the enhancement of CRV bandwidth and the cost optimization associated with supporting operational SWIM implementation over CRV.

Progress Update by S3TIG for the Joint Event of SWIM Demonstration over CRV and Surveillance Sharing in SWIM Trial – Hong Kong China (WP/06)

2.131 The paper presented the progress update of the joint event of SWIM Demonstration over CRV and Surveillance Data Sharing in the SWIM Trial (the Joint Event). The Meeting noted that the survey questionnaire prepared by SURSG/3 was shared with States by the ICAO APAC Office on 12 June 2023. A total of 16 questionnaire responses were received from 8 States to participate as surveillance data contributors and/or consumers, while 7 States were observers. The summary of the progress made between June-October 2023 to prepare for the Joint Event was also presented. It was highlighted that the surveillance data to be shared in the Joint Event will be mainly ADS-B data and the surveillance data payload will be in both ASTERIX and JSON formats. Additionally, the Meeting noted that to increase the appeal of the Joint Event and to promote SWIM, a self-service and purpose-built platform to support aviation community users is being explored for incorporation into the Joint Event, subject to availability and technical readiness. The Meeting was requested to provide input on future/potential SWIM services/applications for the Joint Event.

2.132 Sri Lanka and Vietnam expressed interest in joining the Joint Event as observers. In this regard, Hong Kong China, the Lead of Joint Event preparation, will share the survey questionnaire with Sri Lanka and Vietnam to collect the details of their interest in the level of participation.

Proposal of Regional Candidate Standard for Service Discovery - Governance Task (WP/07)

2.133 The paper proposed the SWIM Discovery Service (SDS) specification as a candidate standard for the APAC region. In SWIM TF/7, the SDS implementation specification document, authored by the FAA, was proposed as the regional specification to enable interoperable service discovery across the APAC region. To follow up on the suggestions from SWIM TF/7 to review and reproduce the document to accommodate the purpose and requirements of the APAC region, discussions were made in the governance task group.

2.134 The paper suggested that, as APAC SWIM is also part of the ICAO's larger initiative, the global aspect of service discovery should be considered rather than a regional scope. The Meeting was requested to request the Information Management Panel (IMP) to consider adopting the SDS as a global standard for globally interoperable service discovery, ask the FAA to confirm the license agreement of the SDS specification document, and request SWIM TF to position the SDS specification as a candidate standard of APAC SWIM for adaptation and keep in the loop for updates to the specification.

2.135 After detailed deliberation on the need for global standards on SDS, the following Draft Decision were adopted by SWIM TF/8 for CNS SG/28 and APANPIRG/35 consideration:

Draft Decision SWIM TF/08/01 Adoption of SWIM Discovery Service as a Global Standard for Globally Interoperable Service Discovery	
What: To propose to the Information Management Panel (IMP) to consider adopting the SWIM Discovery Service (SDS) as a global standard for globally interoperable service discovery.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Considering that Asia/Pacific regional SWIM will also be part of global SWIM and that SDS was studied and tested by the SWIM TF, the consideration of IMP on the possible adoption of SDS as a global standard is required to ensure cross-regional interoperability of SWIM service discovery,	Follow-up: ☐Required from States
When: 5-Jul-24	Status: Draft to be adopted by PIRG
Who: ☒Sub groups ☐APAC States ☒ICAO APAC RO ☒ICAO HQ ☒Other: SWIM TF	

2.136 Considering the current job card of the IMP regarding SWIM Service Registry Interoperability, specifying 2026 as the expected timeline for deliverable, the Meeting requested the IMP members within Asia/Pacific to consider presenting the SDS to the respective working groups under IMP, i.e., Governance Working Group and Information/Services Working Group, for further deliberation.

2.137 After thorough discussion and careful consideration of the need to have a candidate baseline standard for SDS to support Asia/Pacific SWIM implementation within the 2024-2030 target implementation timeframe, the following Draft Decision were adopted by SWIM TF/8 for CNS SG/28 consideration:

Draft Decision SWIM TF/08/02 Candidate Baseline SWIM Discovery Service Standard for Asia/Pacific	
What: To position the SWIM Discovery Service (SDS) specification as a candidate baseline standard for Asia/Pacific SWIM implementation.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: A candidate baseline standard for SDS is needed to support Asia/Pacific SWIM implementation within the regionally-agreed target implementation timeframe of 2024-2030.	Follow-up: ☐Required from States
When: 5-Jul-24	Status: Draft to be adopted by Subgroup
Who: ☒Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other: SWIM TF	

2.138 The Meeting noted that once IMP adopts the SDS as a global standard for globally interoperable service discovery, there will be no requirement to request the FAA to confirm the license agreement of the SDS specification document.

Proposed Business Functionality of APAC Common Swim Information Services and the Information to be Exchanged – Hong Kong China (WP/08)

2.139 The paper presented the updates on the work of the SWIM TF Task 6 group to prepare the catalog of basic data elements to be shared and exchanged via APAC SWIM and propose business functionality to be supported by APAC Common SWIM Information Services for addressing the operational needs in APAC. With suggestions on the additional potential list of information from the SWIM TF/7 meeting, the revised data catalog was shared for further consideration by the Meeting, which included information to be exchanged via APAC Common SWIM Aeronautical Information Services, Flight Information Services, Meteorological information services, and Surveillance Information Services. Furthermore, the draft list of the business functionality of APAC Common SWIM Information Services was developed and introduced. The Meeting was requested to review the proposed data catalog and the list of proposed business functionality of APAC Common SWIM Information Services and provide inputs and comments for further refinement.

2.140 The Meeting reviewed the data catalog and suggested adding filed trajectory and desired trajectory to the data catalog under Flight Information Services. Regarding business functionality, the Meeting suggested adding GUFI Service to the initial APAC Common SWIM Information Services list. Additionally, it was recommended to modify the flight plan service to FF-ICE Filing Service to align with FF-ICE services as identified in ICAO FF-ICE provisions. The Meeting requested States/Administrations to provide suggestions on additional information, if any, that should be exchanged through APAC Common SWIM Information Services to Task 6 before 15 December 2023 through an email to Task 6 Lead, Mr. Marco KOK, at mhkok@hko.gov.hk.

2.141 The Meeting also agreed to review the list of proposed business functionality of APAC Common SWIM Information Services provided in the following Table and provide inputs and comments for further refinement by filling out the online voting for proposed APAC Common SWIM Information Services accessible via this link before 15 December 2023.

2.142 During the Meeting, a total of 26 responses to the online voting were received. As the responses were only the initial ones, it was agreed that States/Administrations would share the link of online voting for proposed APAC Common SWIM Information Services with related experts within their States/Administrations to support the collection of a more comprehensive result to be used as an input for identifying and further refining the first version of APAC Common SWIM Information Services list. ICAO Secretariat shared State letter Ref.: T 8/13.1: AP163/23 (CNS) 17 November 2023 on Subject: Submission of Online voting for proposed APAC Common SWIM Information Services and their business functionality.

Update of the work done by the SWIM Implementation Pioneer Group – Singapore (WP/04)

2.143 The paper presented the work done by the SWIM Implementation Pioneer Ad-Hoc Group (SIPG) since the SWIM TF/7 Meeting in May 2023 to develop and deploy a prototype/initial version of the regional SWIM by June 2024. The Meeting noted that the work progress has not gone

according to plan and urgent action is required to ensure that the goals of having a regional SWIM prototype by the SWIM TF/9 meeting as well as the SWIM infrastructure to support the joint event can be achieved. As such, it was proposed that the SIPG postpone some of the activities in the timeline to a later date and focus on the activities that directly contribute to the demonstration and trial so that the Q1/2024 target timeline of this joint event can be met. However, it also means that, to complete all the identified activities, the work of the SIPG will likely extend beyond the SWIM TF/9 meeting.

2.144 The Meeting deliberated the work programme and timeline presented in the paper and agreed to adopt a hierarchy approach for EMS architecture as presented in WP/05. The Meeting noted that, based on the received questionnaire responses as presented in WP/06, nine States/Administrations, including Australia, China, Hong Kong China, Japan, India, Malaysia, the Republic of Korea, Singapore, and Thailand, would provide EMS for the joint event.

2.145 The discussion on the selection of gateway EMS in the hierarchy approach was initiated and the following initial criteria for the selection of gateway EMS provider were formulated.

- Gateway EMS provider must already have a pseudo-CRV installed.
- Gateway EMS providers must have EMS ready for deployment.
- Gateway EMS provider must be able to configure their EMS to process message headers to be agreed upon.
- Gateway EMS providers must have the capability to support the message routing for edge EMS.

2.146 The Meeting agreed that the nine States above would assess their readiness against the criteria mentioned above and share their willingness to be gateway EMS providers to the ICAO Secretariat before 22 November 2023.

2.147 Based on the responses received, the EMS-to-EMS connection strategy will be discussed at the next SIPG/S3TIG meeting to be held via video teleconference on 27 November 2023. It was also agreed that the performance requirements for gateway EMS and edge EMS for the purpose of supporting the joint event will be deliberated at the next SIPG/S3TIG meeting.

2.148 The Meeting discussed and agreed on the following tasks, identified as high priority, together with the respective timelines.

Timeline	**Task**	**Task owners**
November 2023	EMS-EMS connection test over Pseudo CRV	India, Malaysia, ROK, Singapore, and Thailand
December 2023	Identify gateway EMS providers and edge EMS provider	SIPG/S3TIG

January 2024	Gateway EMS-Edge EMS connection test	All participating States/Administrations of the joint event
February 2024	Edge EMS-Edge EMS message test	All participating States/Administrations of the joint event
March 2024	Scenario test and dry run	All participating States/Administrations of the joint event

2.149 The Meeting suggested that SIPG/S3TIG may continue to work on developing message headers and metadata in parallel with conducting the November 2023-January 2024 tasks stated above. It was also agreed to review the status of the re-prioritized work on 22 December 2023 to finalize the date of the joint event to be hosted by Hong Kong China so that an invitation letter can be issued in advance to prepare the on-site joint event. The joint event is planned for 28-29 May 2024.

Proposal for detailed Enterprise Messaging Service architecture and its impact on the use of message headers – Japan, Singapore, and Thailand (WP/05)

2.150 The paper presented and described three proposals, i.e., a decentralized approach, a centralized approach, and a hierarchy approach, for a detailed EMS architecture. For each proposal, the need for the use of message headers and metadata for message routing was shared. Comparing the pros and cons of the decentralized approach, centralized approach, and hierarchy approach, the Meeting noted that the hierarchy approach avoids the issue of having a single point of failure present in the centralized approach while at the same time avoiding the case of a very complex topology in the decentralized approach.

2.151 The Meeting discussed the similarity of the hierarchy approach and the BBIS/BIS architecture being followed in ATN in the APAC region. After a detailed discussion on the pros and cons of the proposed three approaches, the Meeting adopted the hierarchy approach for the detailed EMS architecture as the approach for APAC regional SWIM implementation. Additionally, as the hierarchy approach would require message headers to route messages, SIPG was requested to undertake the task of defining the message header format and contents. It was also discussed that, once SIPG delivers the message headers format and contents, SWIM TF may consider proposing this message header deliverable and sharing lessons learned to the IMP for further consideration to develop global deliverable to support the inter-regional message routing.

2.152 The Meeting encouraged States/Administrations to join the SIPG as it will be an excellent opportunity to learn from other group members and, in turn, will contribute to the implementation of SWIM in their respective States/Administrations. Moreover, increased participation will also allow for a broader range of views within the region to be obtained and addressed early on while the group builds a regional SWIM prototype. Sri Lanka and Vietnam shared the intention of joining the SIPG.

SWIM Implementation Progress in Malaysia (IP/02)

2.153 The paper presented the progress of SWIM implementation activities in Malaysia. The Meeting was introduced about the background and history of SWIM implementation in Malaysia, its current activities, and the plan envisaged in the SWIM Malaysia Roadmap. Malaysia also highlighted essential milestones in the implementation and its outcomes regarding regional and global objectives. The Meeting was informed that Malaysia is committed to becoming one of the pioneering states to adopt SWIM in its ATM information exchange paradigm. The Meeting complimented Malaysia on its progress in its SWIM implementation.

SWIM Implementation Plan in Japan (IP/03)

2.154 The paper presented information about the implementation plan of SWIM in Japan. The Meeting noted that the implementation plan of SWIM in Japan is based on the discussions and decisions made by the "SWIM Introduction Study Group" established in 2018 and the "Collaborative Actions for Renovation of Air Traffic Systems" (CARATS), which is a study group consisting of representatives from industry, academia, and government, and aiming for the start of operation in the first quarter of 2025. It was shared that, as part of an information sharing and management system, a new system called MASS (Messaging-system for ATM as SWIM Service) is being developed. This system is also part of the Integrated Air Traffic Control Data Processing System. Additionally, the Japan Civil Aviation Bureau (JCAB) plans to provide new information services based on the SWIM concept. The Meeting noted that currently, Japan is planning to initiate SWIM operations and proceeding with consideration of governance with related parties, including airlines, etc., at the Preparatory Meeting for SWIM, and will continue to take appropriate measures to respond to the increase in new SWIM users.

Implementation Status of Surveillance Messaging Service for S3TIG Demonstration – ROK (IP/04)

2.155 The paper presented the Republic of Korea (ROK) implementation status of the surveillance messaging service for the S3TIG demonstration. The Meeting was informed that the ROK joined the S3TIG demonstration as an information service provider and will provide real-time surveillance (scenario #1) and MET information (scenario #2) during the demonstration. The latest implementation status to support scenarios for the S3TIG demonstration was also shared.

ICAO Meteorological Information Exchange Model (IWXXM)-Based MET Scenario for S3TIG Demonstration – ROK (IP/05)

2.156 The paper presented a proposed scenario for the IWXXM-based MET information exchange using the SWIM messaging service to be conducted during the S3TIG demonstration. The topology, defined messaging headers, payload, and examples of each MET information type of this scenario were explained in detail. SWIM TF Co-Chair suggested utilizing the latest version of IWXXM, IWXXM version 2023-1, rather than IWXXM 2.0. In this regard, Hong Kong China shared that the information exchange model version to be supported by demonstration participants depends solely on the participant’s decision. It was also added that demonstrating the use of different versions may be beneficial to showcase the interoperability.

2.157 As agreed in the SWIM TF/7 Meeting, the Meeting agreed to conduct the full plenary (Four (4) days) of the SWIM TF/9 Meeting along with another SWIM activity for one day. The tentative agreed dates of the SWIM TF/9 and SWIM activity were 13-17 May 2024.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the outcome of the APANPIRG/34, CNS SG/27, and its contributory bodies, and take any necessary follow-up actions; and

b) discuss any relevant matters as appropriate.

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List of Conclusion/Decisions adopted by CNS SG/27

Conclusion CNS SG/27/01 *(ACSICG/10/01)* – Adoption of the Asia/Pacific Regional ATN Documentation Tree	
What: **a.** the ATN Technical Document be published in a loose-leaf form to include future amendments to the Document Tree; and **b.** The ATN Documentation Tree provided in **Appendix A** of the Report is adopted.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: The current ATN/AMHS Documentation Tree published on the ICAO APAC Website has not been updated for a few years. Therefore, it required updates. Additionally, some documents related to CRV are needed to be added, and others are required to be deleted from the Tree due to obsolete documentation.	Follow-up: ☒Required from States
When: 01-Sep-23	Status: Adopted by Subgroup
Who: ☒Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: CRV OG	

Conclusion CNS SG/27/02 *(ACSICG/10/04)* **- Telecommunication Infrastructure Table**	
What: TRACKING TABLE To have a single tracking table with online update capability to support implementing future services managing bandwidth. This table will supersede telecommunication tables maintained by CRV OG and ACSICG.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Managing Telecommunication Infrastructure	Follow-up: ☒Required from States
When: 01-Sep-23	Status: Adopted by Sub-group
Who: ☒Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: ACSICG	

Decision CNS SG/27/03 *(ACSICG/10/06)***: Revised ToR of Aeronautical Communication Services Implementation Coordination Group (ACSICG)**	
That, The Revised Terms of Reference of the Aeronautical Communication Services Implementation Coordination Group (ACSICG) provided in **Appendix B** to the Report is adopted.	Expected impact: ☐ Political /Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical

List of Conclusion/Decisions adopted by CNS SG/27

Why: The proposed ToR of the ACSICG includes the new direction given by APANPIRG in the fields of Aeronautical Communication Services.	Follow-up: ☐Required from States
When: 01-Sep-2023	Status: Adopted by Sub-Group
Who:☒Sub groups ☐ APAC States ☐ICAO APAC RO ☐ICAO HQ ☐APANPIRG ☒ Other: ACSICG	

Conclusion CNS SG/27/05 *(SRWG/7/1)* - Asia Pacific Regional Aeronautical Radio Frequency Management Guidance Material Edition 1.0	
What: Asia Pacific Regional Aeronautical Radio Frequency Management Guidance Material provided in **Appendix D** to the Report is adopted.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Per discussion from SRWG/7 for the region to utilize the Guidance Material	Follow-up: ☐Required from States
When: 01-Sep-2023	Status: Adopted by Subgroup
Who: ☒Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: SRWG	

Conclusion CNS SG/27/06 – Revised GBAS safety assessment guidance document related to anomalous ionospheric conditions	
What: That, the revised GBAS safety assessment guidance document related to anomalous ionospheric conditions (Edition 2.0) provided in **Appendix E** to the report is adopted.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Major updates to reflect the development of GAST D SARPs and the progress of GBAS development and implementation in the region.	Follow-up: ☐Required from States
When: 1-Sep-23	Status: Adopted by Subgroup
Who: ☒ CNS Sub group ☐APAC States ☒ ICAO APAC RO ☐ICAO HQ ☐Other:	

Conclusion CNS SG 27/07 – Revised SBAS safety assessment guidance document related to anomalous ionospheric conditions	
What: That, the revised SBAS safety assessment guidance document related to anomalous ionospheric conditions (Edition 2.0) provided in **Appendix F** to the report is adopted.	Expected impact: ☐ Political / Global ☐ Inter-regional

	☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Major updates to enrich the contents and reflect the progress of SBAS development and implementation in the Region and DFMC SBAS SARPs development.	Follow-up: ☐Required from States
When: 1-Sep-23	Status: Adopted by Subgroup
Who: ☒ CNS Sub group ☐APAC States ☒ ICAO APAC RO ☐ICAO HQ ☐Other:	

Conclusion CNS SG/27/08 - Extension of the Asia/Pacific GBAS/SBAS Implementation Task Force to complete tasks as per ToRs of GBAS/SBAS ITF	
What: To extend the period of Asia/Pacific GBAS/SBAS Implementation Task Force for another 3 years (i.e., up to 2026) for completing the following remaining tasks with high priority in the Action List and considered essential for fulfilling the objectives stated in the Terms of Reference (ToRs) of the APAC GBAS/SBAS ITF: - GBAS and SBAS implementation guidance documents; - Workshop/Meeting for APAC airspace users and regulators; and - Discussion and deliberation on technical issues in relation to GBAS/SBAS Safety Assessment and Performance Demonstration.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To complete tasks, such as guidance reference for GBAS/SBAS Implementation, under the TORs of Asia/Pacific GBAS/SBAS Implementation Task Force	Follow-up: ☒ Required from States
When: 1-Sep-23	Status: Adopted by CNS SG
Who: ☒ CNS Sub group ☒ APAC States ☒ ICAO APAC RO ☐ICAO HQ ☐Other:	

Conclusion CNS SG/27/11 *(SURICG/8/2 (Mode S and DAPs WG/6/2))***: Mode S DAPs IGD Edition 5.0**	
What: The Mode S DAPs Implementation and Operation Guidance Document Edition 5.0 provided in **Appendix I** of the Report is adopted	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Inclusion of new/supplementary content discussed in Mode S and DAPs WG/6.	Follow-up: ☐Required from States
When: 1-Sep-23	Status: Adopted by Subgroup

List of Conclusion/Decisions adopted by CNS SG/27

Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other: -

Decision CNS SG/27/12 *(SURICG/8/4)***: Revised ToR of Surveillance Implementation Coordination Group (SURICG)**	
What: That, the Revised Terms of Reference of the Surveillance Implementation Coordination Group (SURICG) provided in **Appendix J** to this paper be adopted.	Expected impact: ☐ Political /Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: The ToR from dissolved Mode S and DAPs WG was reviewed and necessary updates were identified.	Follow-up: ☐Required from States
When: 1-Sep-2023	Status: Adopted by Subgroup
Who:☒Sub groups ☐ APAC States ☐ICAO APAC RO ☐ICAO HQ ☐APANPIRG ☒ Other: SURICG	

Conclusion CNS SG/27/13 - Regional Guidance Document for Addressing Human Factor Issues of ATSEP	
What: a) ICAO APAC Guidance Document for Addressing Human Factor Issues of ATSEP provided in **Appendix M** is adopted.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: The Guidance document is prepared for the improvisation of existing human resource management process towards ATSEP for addressing the factors adding stress and fatigue, improve their job performance and for achieving organizational resilience and cost benefits.	Follow-up:☐Required from States
When: 1-Sep-23	Status: Adopted by Subgroup
Who: ☒Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other: XXXX	

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A List of Conclusions adopted by APANPIRG/34 Meeting related to CNS

<table>
<tr><td colspan="3">Conclusion APANPIRG/34/9 (CNS SG/27/04 (SWIM/TF/07/04)) – Asia/Pacific Regional FIXM version 4.2 Extension</td></tr>
<tr><td colspan="2">What: The FIXM version 4.2 Extension provided in Appendix A to Agenda Item 3.4 be:
a) adopted as the Asia/Pacific FIXM version 4.2 Extension;
b) uploaded to the ICAO Asia/Pacific Regional Office website for immediate use by Asia/Pacific Administrations, where the capability to do so exists, for cross-border ATFM information exchange and to support ATFM/A-CDM integration; 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>Why: To provide the information exchange model necessary to support cross-border ATFM and ATFM/A-CDM integration in the Asia/Pacific Region, in order to support the implementation of performance objectives of the Asia/Pacific Regional Framework for Collaborative ATFM</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: 13-Dec-23</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, ATFM SG</td></tr>
</table>

<table>
<tr><td colspan="3">Conclusion APANPIRG/34/10 (CNS SG/27/09) - Revised Navigation Strategy - APAC</td></tr>
<tr><td colspan="2">What: Draft Revised Navigation Strategy-APAC in view of the latest development in GNSS navigation provided in Appendix B to Agenda Item 3.4 be adopted.</td><td>Expected impact:
☒ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To update the revised Navigation Strategy-APAC</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: 13-Dec-23</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: -</td></tr>
</table>

<table>
<tr><td>Conclusion APANPIRG/34/11 (CNS SG/27/10 (SURICG/8/1 (Mode S and DAPs WG/6/1))): General Strategy on Assignment of and Migration to SI Code in the APAC Region</td></tr>
</table>

A List of Conclusions adopted by APANPIRG/34 Meeting related to CNS

What: The General Strategy on Assignment of and Migration to SI Code in the APAC Region provided in **Appendix C to Agenda Item 3.4** be adopted.	Expected impact: ☐ Political / Global ☒ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To synchronize the APAC region on the general principles applied for assignment of and migration to SI codes.	Follow-up: ☐Required from States
When: 13-Dec-23	Status: Adopted by PIRG
Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other: -	

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