REPORT OF

THE TENTH MEETING OF
SYSTEM WIDE INFORMATION MANAGEMENT TASK FORCE
(SWIM TF/10)

Bangkok, Thailand
20-23 May 2025

The views expressed in this Report should be taken as those of SWIM TF/10 Meeting and not of the Organization.

Approved by the Meeting
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HISTORY OF THE MEETING

1. Introduction

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

2. Attendance

2.1 The Meeting was attended by **109** participants from **23** States/Administrations**, 2** International Organizations and one industry partner, including Australia, Bangladesh, Bhutan, Cambodia, China, Hong Kong China, France, Japan, Lao PDR, Malaysia, Nepal, New Zealand, Pakistan, Philippines, the Republic of Korea, Singapore, Sri Lanka, Thailand, USA, Vietnam, CANSO, ICAO, and Frequentis. The list of participants is provided in **Attachment 1**.

3. Opening of the Meeting

3.1 Dr. Amornrat Jirattigalachote, Expert (Director Level), Corporate Strategy and Sustainability Office of Aeronautical Radio of Thailand Ltd. (AEROTHAI), Co-Chair of the SWIM Task Force (SWIM TF), opened the Meeting. Dr. Amornrat Jirattigalachote outlined the key agenda items, expected discussions and key deliverables for the Meeting. She expressed her appreciation to the participants, particularly for their proactive contributions in preparing and submitting papers on essential agenda items to support the progress the SWIMT TF's work.

3.2 Dr. Soniya Nibhani, Regional Officer, ANS (CNS) Implementation, warmly welcomed all participants and appreciated the support of Member States/Administrations for the ongoing works of the SWIM TF and ICAO regional activities. She also shared gratitude to all Task Leads for supporting the SWIM TF and doing tremendous work.

4. Officers and Secretariat

4.1 Dr. Amornrat Jirattigalachote, Expert (Director Level), Corporate Strategy and Sustainability Office of Aeronautical Radio of Thailand Ltd. (AEROTHAI), chaired the Meeting.

4.2 Dr. Soniya Nibhani, Regional Officer ANS (CNS) Implementation, acted as the Secretary of the Meeting with the support of Ms. Xu Jian, Associate Programme Officer (CNS) Implementation, and Ms. Varapan Meefuengsart, the Programme Assistant from ICAO Asia and Pacific Regional Office.

5. Organization, working arrangement, language and documentation

5.1 The SWIM TF/10 met as a single body. The working language for the Meeting was English, inclusive of all documentation and this report. A total of **thirty-two (32) Working Papers, four (4) Information Papers, four (4) flimsies,** and **two (2) Presentation** were considered by the Meeting. The List of Papers is provided in **Attachment 2** to this Report**.**

6. Draft Conclusions, Draft Decisions and Decisions of SWIM – Definition

6.1 SWIM recorded its actions in the form of Draft Conclusions, Draft Decisions and Decisions within the following definitions:

> **Draft Conclusions** deal with matters that, according to APANPIRG's terms of reference, require the attention of States or action by the ICAO in accordance with established procedures;

Draft Decisions deal with the matters of concern only to APANPIRG and its contributory bodies; and

Decisions of the SWIM TF that relate solely to matters dealing with the internal working arrangements of the SWIM TF.

7. List of Conclusions/Decisions from SWIM TF/10

	Reference Number	Title of (Draft) Conclusions/Decisions
1.	Decision SWIM TF/10/01	- Revised ToR of SWIM Implementation Pioneer Ad-Hoc Group
2.	Draft Decision SWIM TF/10/02	- Adoption of APAC Common SWIM Information Services
3.	Draft Conclusion SWIM TF/10/03	- Asia/Pacific Regional FIXM Version 4.3 Extension

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REPORT ON AGENDA ITEMS

Agenda Item 1: Adoption of the Agenda

Adoption of Agenda – Sec (WP/01)

1.1 The provisional agenda presented in **WP/01** was adopted as the agenda for the Meeting.

Agenda Item 2: Election of Co-Chair

2.1 It was recalled that at the SWIM TF/9, an agenda item addressed the election of Co-Chair, and Dr. Amornrat Jirattigalachote was re-elected. The Meeting acknowledged that Ms. Kristin Cropf, SWIM Programme Manager, Federal Aviation Administration (FAA), had served as the Co-Chair of SWIM TF for the last four years. The Meeting noted the achievements of the SWIM TF under the leadership of Dr. Amornrat Jirattigalachote and Ms. Kristin Cropf. The floor was then opened for nomination of the second Co-Chair position. However, no other nomination was received at the Meeting. As a result, the position remains vacant. It was suggested that the election be held again at a future SWIM TF Meeting.

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

- ICAO APAC CNS/other relevant Meetings
- SWIM Implementation Pioneer Ad-hoc Group
- Regional Coordination Meeting

Review of Relevant CNS Meetings – Sec (WP/02)

3.1 The paper summarized relevant information and updates, highlighting the outcomes of the Thirty-Fifth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/35), the Twenty-Eighth Meeting of Communications, Navigation, and Surveillance Sub Group (CNS SG/28) and the Ninth Meeting of the SWIM Task Force (SWIM TF/9).

3.2 The CNS SG/28 meeting adopted 4 Conclusions and 2 Decisions. In addition, based on the outcome of discussions on various agenda items, the CNS SG/28 meeting developed 4 Draft Conclusions and 1 draft Decision for consideration by APANPIRG/35 Meeting, which were further adopted by APANPIRG/35. The Meeting particularly noted the SWIM-related Decisions adopted by the CNS SG/28 and the APANPIRG/35, namely *Decision CNS SG/28/03 (SWIM TF/08/02)* Candidate Baseline SWIM Discovery Service Standard for APAC, *Decision CNS SG/28/04 (SWIM TF/09/01)* APAC SWIM Technical Infrastructure Profiles v1.0, and *Decision APANPIRG/35/6 (CNS SG/28/02, SWIM TF/08/01)* Information Management Panel to Consider Adoption of SWIM Discovery Service as a Global Standard for Globally Interoperable Service Delivery.

Outcomes of ACSICG/12 Meeting – Sec (WP/03)

3.3 The paper summarized relevant information and updates on the outcomes of *AMC Workshop and the Twelfth Meeting of the Aeronautical Communication Services Implementation Coordination Group (ACSICG/12)* held at the ICAO APAC Regional Office, Bangkok, Thailand, from 25 to 28 March 2025, including the outcomes of *CRV Workshop for PSIDS* held from 3-4 March 2025 and the *Thirteenth Meeting of the Common aeRonautical Virtual Private Network Operations Group of APANPIRG (CRV OG/13)* held from 5 to 8 March 2025. The meeting report, working papers, information papers, and other resources can be accessed by the following link:
https://www.icao.int/APAC/Meetings/Pages/2025-AMC-ACSICG12.aspx

3.4 It was noted that the CRV OG/13 meeting reviewed the outcomes of the First Working Session of the SWIM Implementation Pioneer Ad-Hoc Group (SIPG WS/1) held from 14 to 17 January

2025. The CRV OG/13 expressed concern regarding routing to be handled by EMS within the SWIM architecture discussed at SIPG WS/1. The discussion at CRV OG/13 concluded that this architecture would not meet the purpose of SWIM implementation, as routing at the EMS/application level is not recommended. Moreover, the CRV OG/13 deliberated on the three possible options, discussed at the SIPG WS/1, for establishing the APAC regional SWIM over CRV and the Internet. The CRV OG/13 indicated that the option where the CRV service provider is to provide connectivity to the Internet is not feasible. The other two options were also found to have shortcomings, possibly stemming from misunderstandings on how SWIM EMS would be connected over CRV and the Internet. It was agreed at the CRV OG/13 that there was a need for further discussion among CRV and SWIM experts to clarify the shortcomings of the options and to raise a better understanding for SWIM experts on the integration of SWIM with CRV. This matter was clarified and further discussed at the CRV OG Ad-hoc Experts and SWIM TF Task Leads Online Meeting on 13 March 2025. It was confirmed that EMS's physical connectivity to the CRV is well understood by SWIM experts. In addition, it was clarified that the IP-based routing would not be managed by the SWIM Technical Infrastructure (SWIM TI). Instead, it would handle message routing, which is layer 7 of the OSI model.

3.5 The SWIM TF/10 Meeting was informed that the procedure for adding SWIM services over CRV could be defined by the CRV OG meeting once the APAC SWIM architecture is finalized and other necessary details for SWIM implementation are available.

3.6 The SWIM TF/10 Meeting was presented with information about ongoing work on the addition of CRV implementation status in AMC by Eurocontrol. It was recalled that, during the Joint Meeting of CRV OG Experts and SWIM TF TLs on 12 November 2024, it was shared that the COM chart available at the AMC portal only shows interconnections between various ANSPs in the APAC region but does not specify the type of network used. CRV and SWIM experts recommended that the ICAO Secretariat coordinate with AMC to explore adding CRV network information to the AMC portal. In response, the ICAO Secretariat communicated this request to Eurocontrol, which agreed to update the AMC application to incorporate pan-regional networks for each ICAO region, instructing states to populate the "Supplier" field with "CRV" in the Network Inventory/Connections section. Eurocontrol informed that it aimed to align with the PENS approach by May 2025 and will notify ICAO upon completion.

3.7 It was noted that Hong Kong China presented at the CRV OG/13 a study on the bandwidth used for the ADS-B data transmitted over the SWIM/CRV environment and shared the analyzed outcomes. The CRV OG/13 was requested to encourage States/Administrations using SWIM/CRV to share their experience in conducting similar monitoring and analysis. It was concluded in this study that the bandwidth requirement highly depended on use cases. Several other aspects, particularly the frequency of data sent, should also be considered by States/Administrations when calculating the bandwidth requirements. The CRV OG/13 appreciated the study done by Hong Kong China, and agreed that it was beneficial to the CRV OG/13 and that the formula used to calculate bandwidth would be helpful for CRV Users to evaluate the bandwidth requirements for ADS-B data. Hong Kong China would continue working on deriving a formula based on this analysis to compute the bandwidth required for surveillance data sharing and would suggest it to the CRV OG Ad-hoc Expert Group for incorporation into the CRV OG Operations Manual.

3.8 The CRV OG/13 was informed by New Zealand that PCCWG built a "pseudo CRV" (using Package D connections with 2 Mbps bandwidth) to support the SWIM TF, SIPG, and S3TIG in conducting SWIM trials and demonstrations. The SWIM TF found pseudo CRV beneficial for SWIM-related tests, and its use was extended twice until 30 March 2025. PCCWG was asked by CRV OG/13 for indicative pricing to continue supporting pseudo CRV for APAC States/Administrations. In response, PCCWG provided two additional options for pricing of the current Package D. It was expressed by PCCWG that they were willing to negotiate the proposed prices with each State/administration needing the Pseudo CRV and they also offered to provide support to new members wishing to join the pseudo CRV network. It was agreed that CRV OG would discuss the expected

timelines for the future pseudo CRV setup and plans with SWIM TF. PCCWG shared their willingness to extend the availability of pseudo CRV until June 2025 to facilitate CRV OG in conducting discussions with SWIM TF.

3.9 The Meeting was shared that, as per the agreement between CRV OG and SWIM TF, all CRV-related matters or discussions must go through CRV OG and the CRV service provider should not be directly contacted by SWIM TF or SIPG. The Meeting noted that the SIPG meetings discussed the need for retention of pseudo CRV and the possibility of SIPG members in paying the monthly cost. It was added that the 21st online Meeting of the SIPG discussed the offer of extending the availability period of pseudo CRV that was presented to the CRV OG/13. That SIPG meeting decided to convey this information to the SWIM TF for deliberation. Further discussion on the use of pseudo CRV with proposed monthly cost and the use of residual bandwidth of operational CRV was conducted under agenda item 5 (b).

3.10 It was recalled that, recognizing a lack of information on the AMHS to SWIM transition at the Asia/Pacific regional level, ACSICG/11 in 2024 agreed to form an APAC AMHS to SWIM transition Correspondence Group (ATSCG), comprising experts from States/Administrations, industry partners and concerned international organizations, on a voluntary basis, to study the AMHS to SWIM transition strategy. It was acknowledged from the start that the terms of reference for ATSCG were essential, as the transition from AMHS to SWIM would be a joint responsibility of ACSICG and SWIM TF. Clearly delineating the tasks to be managed under the leadership of ACSICG and SWIM TF was necessary. Following the formation of ATSCG, the ATSCG Terms of Reference (ToR) were drafted by its members, led by Singapore. Within the draft ToR, the scope, objectives, and deliverables of ATSCG were also outlined. The drafted ToR was then reviewed by the SWIM TF Task Leads. The ACSICG/12 meeting adopted the ATSCG ToR through **Decision ACSICG/12/07** - *Terms of Reference for the AMHS to SWIM Transition Correspondence Group*, as presented in **Appendix A** to the report.

Outcomes of SURICG/10 Meeting – Sec (WP/04)

3.11 The Tenth Meeting of the Surveillance Implementation Coordination Group (SURICG/10) was held at the ICAO APAC Regional Office, Bangkok, Thailand, from 21 – 23 April 2025. The meeting was attended by 53 participants from 18 Member States/Administrations and 1 International Organization. The meeting report, working papers, information papers, and other resources can be accessed by the following link:

https://www.icao.int/APAC/Meetings/Pages/2025-SURICG10.aspx

3.12 The Meeting was informed that the SURICG/10 reviewed the proposed initial set of APAC Common SWIM Surveillance Information Services, in particular surveillance data sharing services. With assistance from Hong Kong China, the list was modified and further consulted with SURSG/4 delegates through email correspondence. After incorporating all inputs, the *updated list of APAC Common SWIM Surveillance Information Services* was prepared by the SURICG/10 meeting for consideration by SWIM TF/10.

3.13 Hong Kong China shared the progress of the SURSG's work after 2024. It was informed that, after the successful conduct of the Joint Event of SWIM-over-CRV demonstration and surveillance data sharing in SWIM technical trial held in Hong Kong, China, from 28 – 29 May 2024, SURSG has started to prepare the last deliverable, i.e., guidance material, based on the previously proposed framework. It is expected that the draft will be ready by mid-2025 for review by the SURSG members. The finalized version is targeted for endorsement by SURICG/11 in 2026. During the discussion of the next meeting date of SURSG, it was stated that the next meeting would be planned before the SURICG/11 meeting in 2026.

3.14 The Meeting was informed that the next SURICG meeting would be held for 3 days, tentatively planned for 23-25 March 2026. It was suggested that the SURSG/5 meeting be scheduled back-to-back with the SURICG/11 meeting for participants' convenience. In such a scenario, 23-24

March 2026 can be the SURSG/5 meeting, and SURICG/11 can be conducted from 25-27 March 2025. ICAO Secretariat informed that the date of the SURSG/5 meeting has not yet been finalized. If SURSG/5 decides to meet in March 2025, the proposed dates will be considered.

Outcomes of the Joint Event of SWIM over CRV Demonstration and Surveillance Data over SWIM Trial – Hong Kong China (WP/05)

3.15 Hong Kong China presented the report of the Joint Event of SWIM over CRV Demonstration and Surveillance Data over SWIM Trial, held from 28 – 29 May 2024. The report captured the details of the Joint Event, including (*i*) the SWIM services developed; (*ii*) the SWIM infrastructure used; (*iii*) the development and testing process; (*iv*) the data format for surveillance data sharing; and (*v*) the observations and lessons learnt.

3.16 It was informed that the Joint Event was successfully conducted with the system setup and rehearsal on the 1st day and the actual event on the 2nd day. The lessons learned from the Joint Event, including both SWIM and CRV perspectives, were shared with the Meeting. As the lessons learnt from the Joint Event, the Meeting was informed that message headers/metadata, including the names of the fields and format of the contents, must be properly considered and standardized to maintain interoperability within the region and across different regions. It was also shared that some participants of the Joint Event expressed uncertainty regarding whether the hierarchical architecture is the appropriate SWIM TI architecture for the APAC region. Several observations with this architecture were identified during the preparation of the Joint Event, such as specific configuration required for different brands of EMS, potential message loop back if source and recipient checking was not implemented properly, combining byte message and text message into a single queue, single point of failure of the current architecture, etc. Moreover, there was some confusion between the use of AMQP Topics and Queues by participants, which needs to be further examined in order to be able to use them in a more efficient way. In addition, it was learnt that the push and pull approach for message consumption needs to be standardized to maintain interoperability.

3.17 It was noted that the 2 Mbps bandwidth, tentatively offered to each State/Administration, through the pseudo CRV was insufficient for sharing surveillance data at a 1-second data rate for some States/Administrations, The amount of required bandwidth required for sharing of such data type would depend on the traffic volume with State/Administration's FIR as well as their roles in sharing/consuming ADS-B surveillance data within the SWIM environment in the future. This situation may result in the need to subscribe for a higher CRV bandwidth.

3.18 It was informed that, with reference to the AMQP surveillance messages carrying both ADS-B data and FPL information, 32 data fields comprising 14 fields for the message header and 18 fields for the message body were the highest number of data items contained in one message. The size of such a message was around 1.1K bytes, which was nominally the largest size among all types of surveillance messages. Based on the figure observed from these messages, further analysis was conducted with traffic level based on Hong Kong's operational environment of approximately 300 received ADS-B targets during peak hours within the Hong Kong FIR. Total bandwidth required for transmission of these messages would be around 360K bytes (300 x 1.2K) per second, i.e. 2.88 Mbps. For the network packets captured, it was observed that around 8% of network traffic was attributable to transmission overhead. With overhead included, the size required for transmitting such a message increased to around 1.2K bytes.

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

3.19 The paper presented outcomes of SWIM TF Task Leads (TLs) Meetings and Joint CRV OG experts and SWIM TF TLs Meetings, after the SWIM TF/9 meeting, held in 2024-2025. The Meeting noted that a total of **two** (2) SWIM TF TLs coordination meeting was held after SWIM TF/9

to review the outstanding SWIM TF/7 and SWIM TF/8 action items, which included various updates such as APAC SWIM implementation roadmap, SIPG and editorial ad-hoc group updates, joint event preparation, SWIM TI-related specifications, etc. The SWIM TF TLs Minutes of the Meetings (MoM) of the two meetings on 13 August 2024 and 07 January 2025 were shared with the Meeting.

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

3.21 It was informed that the *ICAO Workshop for the preparation of new CRV requirements and specifications for future SWIM/other aviation services* was held from 17-19 September 2024 in Guam, USA. The workshop reviewed the outcomes of the joint event of SWIM-over-CRV demonstration and surveillance data sharing over the SWIM technical trial held on 28-29 May 2024 in Hong Kong China. The lessons learnt from this joint event were taken as inputs to the new CRV technical specifications. The workshop also deliberated on the current AMHS and other data flows, including the planned future data flows for SWIM messages, and further modified the new CRV requirements. It was noted that this workshop allowed APAC States/Administrations to formulate the enhanced CRV specifications to meet future SWIM needs, based on their firsthand experience in utilizing CRV. The report and other resources of the workshop can be accessed at the following webpage:

https://www.icao.int/APAC/Meetings/Pages/2024-New-CRV-and-Future-SWIM-WS.aspx

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

3.22 Singapore presented the work done by the SWIM Implementation Pioneer ad-hoc Group (SIPG) since the last SWIM Task Force meeting (SWIM TF/9) held in May 2024. It was informed that the SIPG supported the joint event of the SWIM-over-CRV demonstration and surveillance data sharing in the SWIM technical trial hosted by the Hong Kong Civil Aviation Department on 28 -29 May 2024. The Meeting noted that the SIPG constructed SWIM TI for this joint event using a hierarchical architecture, an agreed-upon design since SWIM TF/8, on pseudo CRV. The primary objectives were to test the feasibility of operating SWIM in a CRV-like environment and the feasibility of sharing surveillance data, e.g., ADS-B tracks, in a SWIM environment. Both objectives were met with success, and many lessons were learnt to inform the SIPG of the way forward towards an operational Asia-Pacific SWIM.

3.23 It was stated that following the SWIM TF/9 meeting, the SIPG conducted eight online meetings to maintain the momentum of the SWIM implementation. Through these meetings, a set of work items was developed for the SIPG to complete. These work items were seen as work that the SIPG needs to complete to get to an operational SWIM. The list of items is captured in the table below.

Policy Type	Construction Type
Performance Metrics	SWIM Architecture
SWIM Architecture	REST Type Services
AMHS / AFTN migration Plan	Registry
Standardize Nomenclature	AMHS / AFTN Data Translation
AMHS / AFTN Data Translation	Security
Security	Information Services Implementation
Conditions of SWIM Operationalization	

Table 1- The Work List of SIPG

3.24 The Meeting noted that the list was divided into two categories, Policy Type and Construction Type. Policy-type work items are work items that require standards, recommendations, and/or plans to be developed, while the construction-type work items are those that require infrastructure to be built or software to be developed or migration to be effected. This list contains what the SIPG currently understands to be necessary for SWIM implementation and may grow as the SIPG's work progresses.

3.25 It was informed that as part of the Registry work item, the SIPG also embarked on a trial of the SWIM Discovery Service based on the SWIM Discovery Service specifications developed by the FAA. This trial, conducted between China, Japan, Korea, Singapore and Thailand, was successfully completed in January 2025.

3.26 The Meeting was recalled that the SIPG conducted its first working session (SIPG WS/1) from 14 – 17 January 2025 at the ICAO Regional Office in Bangkok, Thailand, which resulted in 13 action items for the SIPG and ICAO Secretariat to work on. The Meeting also noted that another outcome of the SIPG WS/1 was the need to conduct a trial using self-signed certificates. The purpose of this trial is to explore and understand how certificates can be used in the SWIM environment to enhance the safety and security of the message transfer. Malaysia has volunteered to lead this effort with Singapore and Thailand as participants.

3.27 SIPG lead encouraged more SWIM TF members to join the group and contribute to building the first version/prototype of the APAC SWIM. Given the increasing workload and the limited number of SIPG members, the Meeting suggested prioritizing SIPG's tasks to ensure effective outcomes. In response to a query on the possibility of distributing work more broadly among SIPG members, the SIPG lead explained that, so far, only the topic of security, i.e., using a self-signed certificate, had reached consensus, with Malaysia designated to lead this area. For other aspects of the SWIM TI, common solutions still need to be agreed upon before responsibilities can be effectively distributed within the group. To support a more focused discussion during the second working session of SIPG (SIPG WS/2), which will be held on 26 – 30 May 2025, it was agreed that the SWIM TF/10 Meeting would review and approve the prioritized SIPG work areas. This would enable the group to formulate its work plan and proceed with implementation accordingly. Australia, Japan, New Zealand, Singapore, and Thailand volunteered to prepare a draft prioritization of the SIPG work areas. However, it was acknowledged that additional time and in-depth discussions are required to finalize the list. It was agreed that this matter would be further deliberated during SIPG WS/2, and the finalized list of prioritized SIPG work areas would be shared with SWIM TF members for review via email. Once email coordination is completed, the revised work program will be provided in **Appendix B** to the report.

3.28 The Meeting noted that, given the lessons learnt by SIPG so far, a modification to the SIPG ToR was adopted at the SWIM TF/7 meeting. The draft modified ToR was prepared by the group formed to prepare a draft prioritization of the SIPG work areas, and it was presented to the Meeting through Flimsy/01. The Meeting reviewed and agreed to the revised ToR, **Appendix C**, and adopted the following decision.

Decision SWIM/TF/10/01 – Revised Terms of Reference of the SWIM Implementation Pioneer Ad-hoc Group	
What: To agree on the revised Terms of Reference (ToR) of the SWIM Implementation Pioneer Ad-hoc Group, as provided in **Appendix C**.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical

Why: To reflect the necessary changes in the group's work scope, based on lessons learnt since its establishment.	Follow-up: ☐Required from States
When: 23-May-25	Status: Adopted by SWIM TF
Who: ☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: SWIM TF	

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

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

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

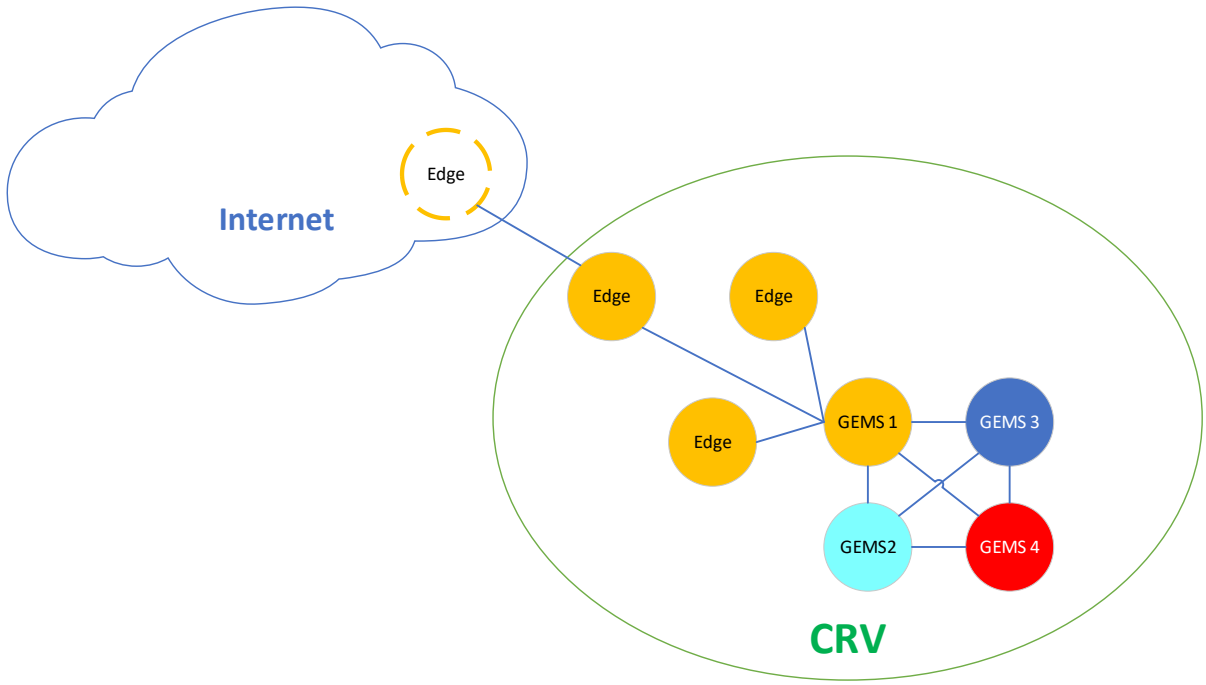

Figure 1- Option 1 SWIM Architecture

3.31 Option 2 is to have the SWIM TI constructed over both the CRV and the Internet. Each Gateway EMS provider will need to span the Gateway EMS over both CRV and the Internet with an appropriate security mechanism to segregate between the two zones. Essentially, there is no significant difference between options 1 and 2. The only difference is that in option 2, the Internet access is at the Gateway EMS.

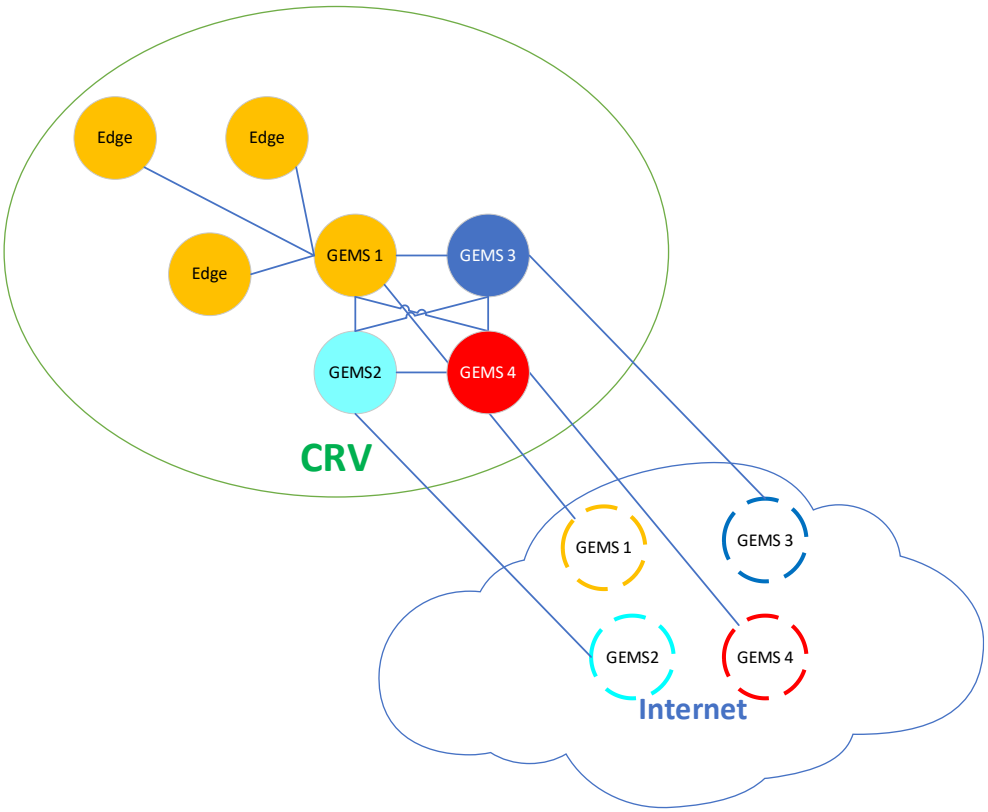

Figure 2- Option 2- SWIM Architecture

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

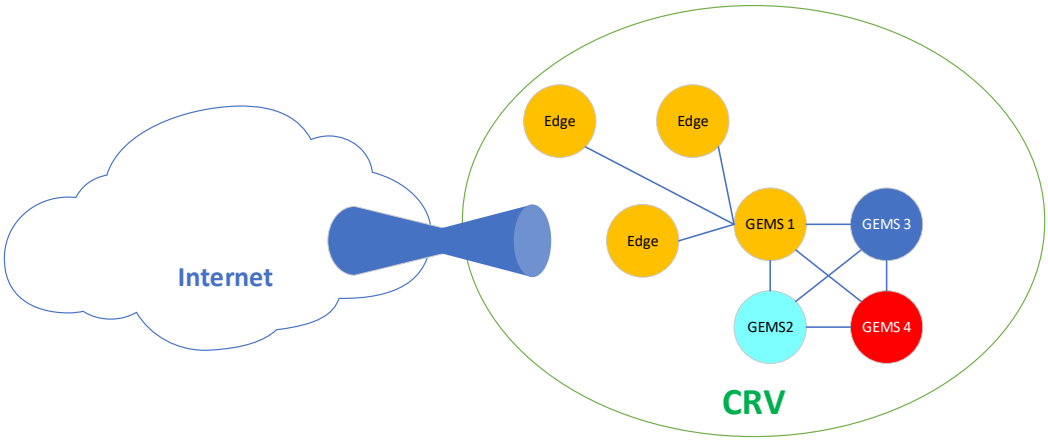

Figure 3- Option 3- SWIM Architecture

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

3.34 The Meeting discussed and agreed to the need to define the functionalities and requirements of edge EMS and gateway EMS to support States/Administrations in understanding and determining the appropriate level of SWIM TI capabilities required for their implementation. SIPG was

assigned the task of developing the definitions as well as identifying the minimum functionalities and requirements for edge EMS and gateway EMS. **ACTION ITEM 10-1**

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

3.36 Further discussion on the options for Internet connectivity for the Asia/Pacific SWIM was conducted under agenda item 5 (b).

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

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

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

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

Recommendation 3: Consider the use of legacy formats in the Asia-Pacific SWIM. This is to enable existing data to be quickly onboarded onto SWIM. The ATM Information Reference Model should be used to maintain semantic interoperability.

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

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

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

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

3.40 The MET/IE WG Chair informed that the 6th meeting of the ICAO Meteorological Panel (METP) was held in March 2025. At this meeting, the Panel was informed that, while the IWXXM format had become a standard format for the international exchange of aeronautical meteorological information since November 2020, it had not yet reached a sufficient level of global implementation. A key reason for this slow implementation of the IWXXM format was attributed to the fact that Annex 3 continued to require States to issue and disseminate products also in TAC format

and/or in abbreviated plain language. To encourage global progress towards IWXXM format, it was proposed to amend Annex 3, to specify the removal of TAC and plain text language forms as the standard format for the international exchange of aeronautical meteorological information with an applicability date of November 2030 (i.e. to align with the expected applicability date of Amendment 84 of Annex 3). The METP agreed to the proposed removal of the use of TAC and plain text language forms for the international exchange of aeronautical meteorological information such as METAR, SPECI, TAF, trend forecasts, SIGMET and AIRMET information, volcanic ash advisory (VAA) information, tropical cyclone advisory (TCA) information, and space weather advisory (SWXA) information.

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

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

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

Agenda Item 4: Outstanding SWIM TF/7, SWIM TF/8 and SWIM TF/9 Action Items Review

- Review and Reproduction of the SDS Implementation Specification Document for the APAC Region
- Finalization of proposed APAC Common SWIM Information Services
- Evaluation of FIXM v4.3's suitability to support ATFM, A-CDM, and integrated ATFM/A-CDM operations
- Update of SOWs of Tasks
- Update on APAC SWIM Implementation Guidance materials (IGD)

4.1 For the finalization of proposed APAC Common SWIM Information Services, **WP/10, WP/11, WP/12, WP/19, and WP/32** were presented back-to-back. All discussions for these five papers are recorded under WP/11.

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

4.2 Australia proposed the need for more guidance in defining APAC Common Surveillance Information Services proposed under Task 6. The Meeting was informed that initial Surveillance Information Services intended to support ATFM applications should utilize a reduced track update rate, and that further guidance should be sought on defining future additional Surveillance Information Services to support differing business requirements. The Meeting noted that APAC Common SWIM Information Services incorporated with two distinct surveillance data sharing services, as recently updated by SURICG/10 with SURSG's input via SURICG/10 – Flimsy 01 in April 2025.

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

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

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

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

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

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

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

4.9 The Meeting recalled the information shared at SWIM TF/9 that IMP is working on an Information Service Definition (ISD) template for subject-matter-expert Panels, e.g., ATMRPP, METP, to develop domain-specific ISDs. It was suggested that the progress of these works in the IMP, ATMRPP, and METP is monitored to align regional descriptions with the global guidance. While considering the need to develop an APAC version of ISDs for some of the APAC Common SWIM

Information Services, the Task 6 team will assess whether the necessary ISDs are covered by the templates/guidance developed at the global-level Panels and indicate this information in a new column of the table for APAC Common SWIM Information Services.

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

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

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

APAC Common SWIM Aeronautical Information Services		
1.	ATIS distribution service	Provides continuous and automated broadcast of recorded aeronautical information in airport and terminal areas.
2.	Search and rescue service	Allows Rescue Coordination Centres (RCCs) to exchange information with neighbouring RCCs and ATS units for coordination during SAR operations.
APAC Common SWIM Flight Information Services		
3.	ADP Distribution Service	Supports publication and distribution of ATFM Daily Plan (ADP), based on information included in the APAC ADP Exchange Procedure[1]. The published ADP is designed to inform for stakeholders on upcoming demand/capacity constraints and possible ATFM measures.
4.	Flow-Specific ATFM Measure Service	Supports *notification* of information related to "flow-specific" ATFM measures, i.e. measures whose control mechanisms apply to a "group of flights" on a particular traffic flow. An example is the Minutes-in-Trail (MINIT) requirement applied on an eastbound traffic using A1 from VT*, VV* to RK*.

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

		Recipients of this information should take actions to comply with the ATFM measure contained herein.[2]
APAC Common SWIM Meteorological Information Services		
5.	Special Air Report (ARS) service	Provides reports of special observations made by aircraft when they encounter special weather phenomena, such as moderate/severe turbulence or icing. (Note: Currently there is no plan to implement this information service at MET Panel)
6.	MET derived from Mode S DAPs service	Provides upper air winds and temperatures derived from Mode S Downlinked Aircraft Parameters (DAPs) (e.g. true airspeed, ground speed, magnetic heading, true track angle) and facilitates exchange of derived winds and temperatures among MET service providers.

Table 2- List of APAC Common SWIM Information Services removed from the first adopted version

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

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

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

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

4.17 The Meeting recommended that States/Administrations submit suggestions regarding any services to the relevant expert groups. Any subsequent modifications to services, if deemed

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

necessary by the expert groups, could then be proposed to the SWIM TF for consideration at its future meetings.

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

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

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

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

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

Draft Decision SWIM TF/10/02 - Adoption of APAC Common SWIM Information Services, v1.0	
What: The first version of APAC Common SWIM Information Services, provided in **Appendix D**, be adopted for immediate use by APAC States/Administrations. The set of APAC Common SWIM Information Services, and the associated performance of SWIM Technical Infrastructure underpinning these	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental

services, is not specified to support the provision of aircraft separation.	☒ Ops/Technical
Why: To assist APAC States/Administrations in planning and implementing their SWIM information services.	Follow-up: ☐Required from States
When: 23-May-25	Status: Draft to be adopted by PIRG
Who: ☒Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other: MET SG, ATM SG, AOP SG	

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

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

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

4.25 It was added that the group decided to retain Runway Condition Report Service due to operational importance, despite noting possible redundancy with SNOWTAMs. It also agreed to include REQ/REP as an additional message exchange pattern for Aerodrome Feature Service and Digital NOTAM Distribution Service. Besides, the Ad Hoc Group agreed that both ATIS Distribution Service and Search and Rescue Service should be considered for implementation in a future phase, as the information exchange model and message types are yet to be defined and are currently marked as 'TBD'.

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

Proposed addition of information service reference for APAC Common SWIM Information Services – Australia (WP/19)

4.27 Australia proposed the addition of a reference as an attribute for each information service provided in the list of APAC Common SWIM Information Services. In particular, it was suggested that, where available, a reference for each information service be included to establish a clearer link to the definition of its functionality. It was shared that this addition would also provide clearer insight into whether the service is intended to align with a global or regional concept.

4.28 It was noted that, while the global standard would refer to an Information Service Definition (ISD), the maturity of services may vary. In such a case, the most relevant document can be referenced. Additionally, a reference source for each information service would also support the future development of the associated ISDs. The discussion on this proposal was recorded under WP/11.

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

4.29 This paper presented outcomes of discussions on SWIM-related working papers and draft conclusions thereof in the ATFM/SG/15 meeting. The Meteorology/Air Traffic Management (MET/ATM) Seminar and the Fifteenth Meeting of Air Traffic Flow Management Steering Group (ATFM/SG/15) were held in Bangkok, Thailand, from 28 April to 2 May 2025. The meeting also included a joint plenary session with the 14th Meeting of Meteorological Requirements Working Group (MET R/WG/14). It was recalled that SWIM TF/9 had requested the ATFM/SG to develop a detailed process for revising a mutually agreed FIXM version for cross-border ATFM-related information exchange during the ATFM/SG/15 meeting and share with the SWIM TF/10 meeting for further discussion.

4.30 In addition, the ICAO Secretariat presented a working Paper on APAC Common SWIM Information Services (ATFM SG/15-WP/17). Particularly, the ATFM SG/15 was requested to review and provide comments and input to the portion of APAC Common SWIM Flight Information Services, specifically the "ATFM/A-CDM integrated service" and "Traffic flow status service".

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

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

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

4.33 Australia provided the following additional considerations:

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

and therefore, whether the proposed TMC should be between States (countries) or specified agencies requires further discussion.

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

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

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

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

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

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

4.35 The Meeting also noted the following on specific wording contained within the draft TMC:

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

- Reference to Introduction, paragraph 3, the conditions of what quantifies ‘successful completion’ in recommended for inclusion, preferably specified in the

'SWIM TI' document as per 2.5.2 above. 'Partial success', or wording to that effect, is also recommended for inclusion to cater for ANSP/agencies that have completed one or more SWIM Information Services (e.g., FF-ICE Filing Service) and are working towards implementing other SWIM Information Services (e.g., Digital NOTAM Distribution Service).

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

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

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

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

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

Agenda Item 5: Updates on the assigned tasks by task leads/contributors, including progress reports and issues

a) Implementation Planning

- Task 1: Regional Implementation Philosophy & Roadmap

5.1 The work of SIPG currently covers this Task. Hence, no separate papers were discussed.

b) SWIM Infrastructure

- Task 2: Regional SWIM Infrastructure

- Task 3: Security Services

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

5.2 Australia presented an update on two options being considered by the ICAO Meteorological Panel for the implementation of a function in the SWIM environment to "aggregate" or "concentrate" information from multiple meteorological information services for distribution to downstream users. It was informed that the 6th Meeting of METP endorsed version 3 of the Roadmap for Meteorology in SWIM (MET-SWIM Roadmap). The MET-SWIM Roadmap described the transition plan and associated timelines for implementing MET in SWIM (MET-SWIM). The SWIM Aggregator function was intended to simplify users' access to multiple MET information services and the METP is investigating whether this SWIM Aggregator function should be a regulated or unregulated function.

5.3 It was informed that the information exchange flow for MET information in the current environment is fixed. In the future SWIM environment, however, the information exchange flow can be dynamic (e.g. directly from producers to consumers). Given users' wish to retain access to global MET information, MET-SWIM services will benefit from an aggregator function. It was noted that details related to the entity responsible for aggregation are being developed. For this purpose, the term "SWIM Aggregator" is used.

5.4 The table describes the expected mechanisms over each Aviation System Block Upgrade (ASBU) as the exchange of MET information is modernized. Capabilities deemed as "optional" indicate that the early adoption of SWIM is encouraged by States that are able to do so. It was expected that the MET domain would achieve a full SWIM environment in Block 4 (2037+).

	Capabilities Expected During Block 1 (2019-2024)	**Capabilities Expected During Block 2 (2025-2030)**	**Capabilities Expected During Block 3 (2031-2036)**	**Capabilities Expected During Block 4 (2037+)**
Communication Protocols	AMHS FTBP	AMHS FTBP AMQP/HTTP (optional)	AMHS FTBP AMQP/HTTP	AMQP/HTTP
Information Exchange Services	RODB TAC request/reply RODB IWXXM request/reply	RODB TAC request/reply RODB IWXXM request/reply OGC Standardized Services (optional)	RODB IWXXM request/reply OGC Standardized Services	OGC Standardized Services
Data Addressing	AFS Addressing	AFS Addressing IP (optional) SWIM Registry (optional)	AFS Addressing IP SWIM Registry	IP SWIM Registry
Information Exchange Flow	NOC, ROC, RODB, IROG	NOC, ROC, RODB, IROG Dynamic (optional)	NOC, ROC, RODB, IROG Dynamic	Dynamic
Data Aggregator	NOC, ROC, RODB, IROG	NOC, ROC, RODB, IROG	NOC, ROC, RODB, IROG	SWIM Aggregator

		SWIM Aggregator (optional)	SWIM Aggregator	

Table 3- Expected mechanisms over each ASBU

5.5 The Meeting noted that it is not the intention to duplicate the current function of the NOC, ROC, etc., as the premise of SWIM is that the user access the information they require directly from the producer (or publisher) of the service, but rather that the process a user employs to find the necessary information in the SWIM environment, be as simple as possible. The absence of aggregation functions may result in:

- All States need to design and implement SWIM infrastructure that supports a larger number of unique users.
- All States manage a large number of unique users accessing SWIM services.
- Users identify and manage access (e.g., agreements, access keys, etc.) to a large number of service providers, particularly in flight planning.

5.6 For these reasons, METP has decided that this aggregation function will be necessary, and clarity on how this function will be performed will assist States and regions in designing and implementing meteorological SWIM services. Two main options were shared with the meeting:

1) **Option 1: Regulated** – Aggregation should be a regulated function by allocated providers under the ICAO framework. This option would ensure the function is performed in a consistent manner globally and offers the possibility of formal oversight and reporting of the function. The process for selecting States to provide this service is unknown at this time and may result in delays in the implementation of this capability.

2) **Option 2: Unregulated** – Each MET service provider makes their information available, and any aggregation function would be a purely commercial undertaking, unregulated by ICAO (although the provision of the information services is defined in Annex 3 and therefore under a State's oversight). It is anticipated that in the absence of a regulated service, commercial (or State) entities may provide this service for the globe or their region/s. The availability, cost and quality of such services from different aggregation entities may vary.

5.7 It was added that the European Meteorological SWIM Services Sub-Group (EUR MET3SG) has been discussing the same issue in a regional context, and whilst not reaching any firm consensus yet, the following important points have been noted:

- The term "aggregator" may be misleading, particularly if the intent is to aggregate the locations (e.g., a catalogue-type function) as opposed to aggregating the payloads. There is an urgent need for an alignment of terminology used, especially considering the various options to simplify service access.
- The MET3SG recognised that other domains are having similar discussions, and it will be important for MET to keep apprised of these developments, and, where appropriate, to align to the greatest extent possible to ensure consistency for users.
- The MET3SG is also investigating whether the functionality of the existing EUR SWIM Registry can be repurposed to add new fields to aid users searching for specific meteorological services.

5.8 It was informed that METP's Working Group on Meteorological Information Exchange (WG-MIE) is continuing this work in consultation with user groups.

5.9 The Meeting noted the Roadmap for Meteorology in SWIM (MET-SWIM Roadmap) adopted by the 6th Meeting of METP. It was agreed that forming an action or task to progress this work from an APAC perspective falls outside the scope of the SWIM TF. In addition, the Meeting discussed that the SWIM TF is not in a position to comment on the possible options of the SWIM aggregator for MET information services, specifically options 1 and 2, as the discussion is still ongoing at the global level. It was considered that such evaluations would be appropriately conducted by relevant operational expert/user groups.

5.10 The Meeting was also informed that METP has endorsed a guideline for MET-SWIM Implementation which will be distributed to the PIRGs to support SWIM Implementation.

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

5.11 Japan recalled that, based on discussion within the SIPG, the hierarchical architecture has been proposed for APAC SWIM implementation, in comparison to centralized and decentralized approaches. Therefore, certain concerns regarding reliable message delivery in a hierarchical architecture need to be addressed and clarified. Japan proposed an approach for constructing the hierarchical architecture, analyzed methods to enhance reliable message delivery for APAC SWIM implementation, and identified the required functionalities for Gateway and Edge Enterprise Messaging Services (EMSs).

5.12 The Meeting noted that the hierarchical architecture consists of multiple EMSs, which are key components in constructing the APAC SWIM Technical Infrastructure (TI). These EMSs are categorized into Gateway EMS and Edge EMS and are connected to form sub-communities. A Gateway EMS serves as an interconnecting broker between different sub-communities and provides message routing functions. An Edge EMS provides connectivity service for SWIM-enabled users and routes SWIM messages between the upper-level Gateway EMS and SWIM-enabled users. In addition, the Edge EMS offers connectivity to external IP-based networks, including the Internet, allowing approved aviation partners who cannot directly connect to the CRV to provide existing and emerging SWIM information services (e.g. MET information services).

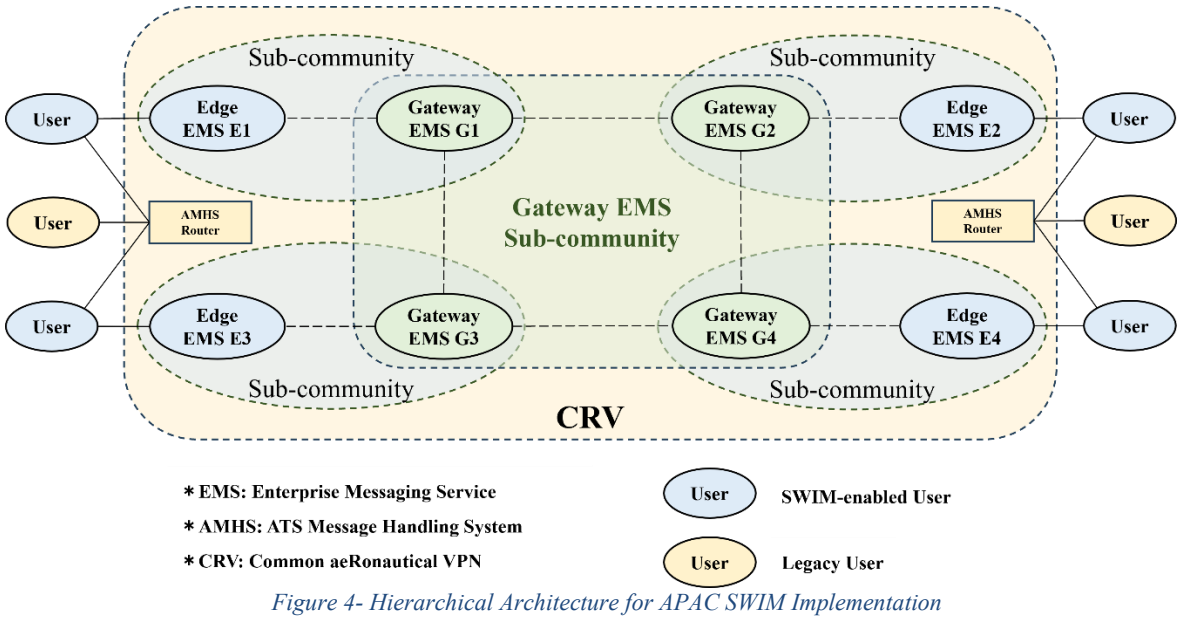

Figure 4- Hierarchical Architecture for APAC SWIM Implementation

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

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

Problem	Use Case	Solution
1. Priority messaging cannot be applied based on the importance of the information.	Surveillance messages caused queue overflow and loss of FF-ICE messages.	· Deliver surveillance messages using a separate queue and logical network · Set a message TTL for surveillance messages
2. Guaranteed message delivery is disrupted if a message broker malfunctions within the message delivery chain.	When the message broker reaches the maximum number of messages, it drops subsequent messages.	· Set up a persistent or replicated message queue · Support automatic failover and failback
3. Compensation transactions cannot be performed to recover from transaction failure in the message delivery chain.	The publisher is not aware of failures that occurred in the EMS afterwards.	· Implement retry logic for failed message deliveries · Record Forward Failure List for traceability
4. Message rerouting is not possible in the event of a failure within the message delivery chain.	The publisher is not able to change delivery responsibility even if the publisher recognizes a failure in the message delivery chain.	· Set a backup EMS for each publisher and Edge EMS · Each Gateway EMS has at least two connections to other Gateway EMS
5. The edge node cannot know which message to resend when message loss occurs.	In the case of a missing message that occurs in a subsequent EMS, the publisher cannot specify the message and try to resend it.	· Publish the Forward Failure List, making it accessible to publishers · Subscriber responds “Submission Response” to the publisher

Table 4- Considerations for Reliable Message Delivery in Hierarchical Architecture

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

Functionality	Description
Message Persistence	· Ensure messages are stored reliably until they are successfully delivered · Support durable (replicated) queues and persistent message storage
Acknowledgment & Confirmation	· Implement publisher acknowledgments to confirm message reception · Support consumer acknowledgments to confirm message subscription
Retry & Redelivery Policies	· Support automatic message retries upon failure · Implement exponential backoff and dead-letter queues for failed messages
High Availability & Redundancy	· Deploy in a clustered mode to avoid a single point of failure · Ensure failover/failback mechanisms and redundant EMSs for resilience
Routing & Security	· Support metadata-based message routing between EMSs · Support Transport Layer Security (TLS) encryption for secure communication
Monitoring & Logging	· Provide real-time monitoring for message status and EMS health · Enable logging and auditing for troubleshooting and compliance
Network Failure Handling & Auto-Recovery	· Detect network failures and re-establish connections automatically · Implement message deduplication to prevent duplicate processing

Table 5- Required Functionalities for Gateway and Edge EMSs

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

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

5.17 Japan informed that, to protect the safety of flight operations from cyber threats and ensure business continuity, the Manual on Aviation Information Security (MAIS, Doc 10204) has been published by the ICAO Trust Framework Panel (TFP). Moreover, to implement an aviation information security framework, the Aviation Common Certificate Policy (ACCP, Doc 10169) for trusted identity management, and the Manual on Trust Framework Implementation for different trust framework

instances are being drafted by TFP working groups. Therefore, as a critical technical infrastructure for regional and global aviation information exchange, the requirements of SWIM to support the implementation of an appropriate trust framework instance should be clearly defined.

5.18 Japan shared that, as described in the MAIS, compared to other approaches, the Public Key Infrastructure (PKI) standard can provide a best practice for system-to-system authentication using digital certificates, secure data exchange with digital signatures, and encrypted communication through secure protocols. When developing a PKI policy and implementation strategy, several categories should be considered to establish a robust PKI capability. The categories include capabilities, processes and responsible entities essential for implementing an interoperable PKI framework across multiple aviation stakeholders.

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

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

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

5.22 As this area is relatively new for the APAC region, Flimsy/03, prepared by Singapore, provided an overview of the prerequisites for States/Administrations to participate in a Trust Framework Instance (TFI), as being developed by TFP. This Flimsy/03 also outlined how SWIM TF members can begin preparing for participating in the APAC SWIM TFI once it is established.

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

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

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

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

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

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

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

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

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

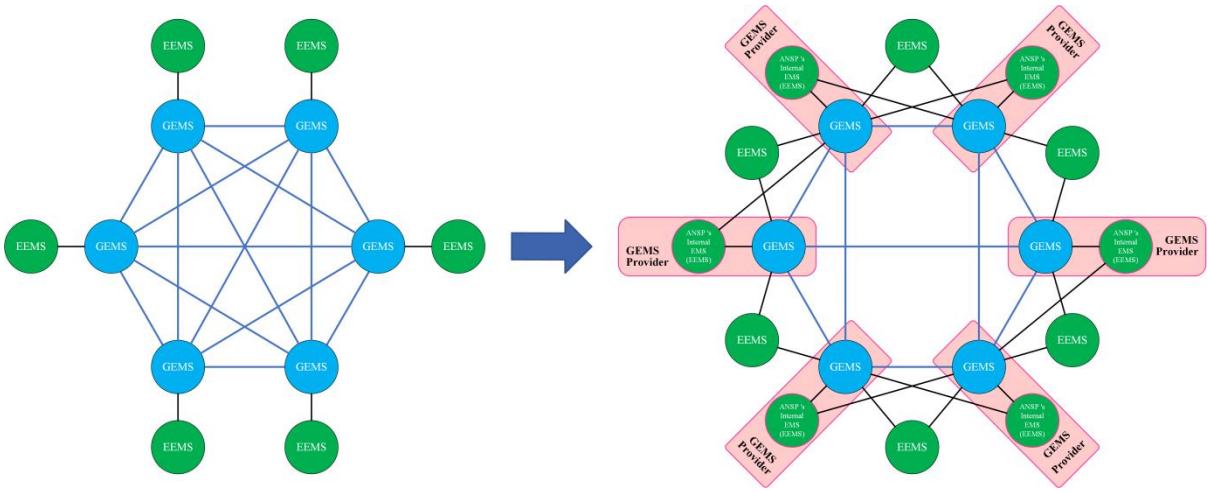

Figure 5- A modified version of the hierarchical architecture

5.30 It was added that the modified version of the hierarchical architecture could address the issue of "Detouring cannot be performed if a failure occurs in the message delivery chain,"

highlighted in SWIM TF/9-WP/10. It has the potential to reduce the complexity of the Gateway EMS, the regional SWIM backbone network, and avoid a single point of failure. The potential improvement brought by the modified version of the hierarchical architecture was shared with the meeting.

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

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

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

Table 6- Suggestions of QoS metrics recommended values for Gateway EMS

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

b) The latency of Gateway EMS is part of the end-to-end SWIM latency, which includes delays from Gateway EMS, Edge EMS, and CRV. The latency of Gateway EMS is primarily determined by system hardware and software performance. Through a comprehensive analysis of latency in multiple scenarios, such as surveillance data transmission, flight plan updates, and meteorological information sharing, it is recommended to define the individual Gateway EMS processing delay on the order of seconds for operational use cases and on the order of minutes for post-operational or non-operational use cases.

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

5.33 The calculations supporting the abovementioned specifications were presented in the appendices of the paper.

5.34 The Meeting recalled that the availability value agreed at the SIPG WS/1 was 99.0%. Given that it has been agreed that the initial APAC SWIM will support information exchange not for the purpose of providing aircraft separation, the Meeting agreed to set the availability of ≥ 99.0% as a

starting point. Moreover, as the functions and requirements of gateway EMS and edge EMS are still under development by SIPG, it was suggested that SIPG further deliberate on the draft requirements, especially with regard to availability, as part of its continued work. **ACTION ITEM 10-15**

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

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

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

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

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

5.39 The Meeting was informed that an API Gateway is a proxy gateway that routes service requests from endpoints to appropriate backend services based on user-defined routing configurations, and then delivers the processed response back to the requesting endpoint. Several commonly used API Gateway deployment patterns in the ICT industry were introduced, along with approaches that map these cases to the context of the APAC SWIM architecture for the request/reply message exchange pattern.

5.40 The Meeting noted that, to achieve SWIM implementation by 2030, APAC SWIM architecture needs to consider not only the Publish/Subscribe MEP, but also the Request/Reply MEP. Given the current emphasis on the regional SWIM prototype architecture using an EMS being developed by SIPG in the APAC region, the primary issue is to discuss how the Request/Reply MEP should be implemented. If an HTTP (REST) API-based web service to enable Request/Reply MEP is adopted for the regional architecture, the adoption of an API GW would also be essential in a distributed and heterogeneous environment like the APAC region. API GW provides a scalable and flexible mechanism to manage routing and traffic control for the Request/Reply MEPs that are not covered by GEMS, which is primarily designed for Publish/Subscribe MEPs. Additionally, as a two-layered hierarchical architecture is under consideration for GEMS, the deployment of the regional API GW should also align with this topology. Such alignment is critical to ensure consistency in routing policies, message flow, and governance in the region. A misalignment between GEMS and API GW topology may lead to complexity, inefficiency, and potential fragmentation of the APAC SWIM architecture.

5.41 The Meeting was recommended to consider that future implementations of the Request/Reply MEP in APAC SWIM architecture should be strategically planned with API GW topology that reflects and complements the architectural direction of GEMS.

5.42 The Meeting deliberated on various topics presented in the paper and agreed that further information is required for consideration of the proposal. ROK informed that its intention was to initiate a discussion on the gateway API in the SWIM TF. It was agreed that SIPG will further explore this topic. **ACTION ITEM 10-20**

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

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

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

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

5.45 The Meeting recalled that, at the SWIM TF/7 meeting, the SIPG was established with the mandate to implement the first or prototype version of APAC SWIM. It was added that in May 2024, a Joint Event of the SWIM-over-CRV demonstration and surveillance data sharing in the SWIM environment technical trial was conducted in Hong Kong, China. During this event, relevant performance metrics were measured to gain insights into the characteristics of data exchange over SWIM, especially bandwidth-intensive surveillance data. Bandwidth analysis and latency analysis of participating States were shared with the Meeting.

5.46 It was stated that the data collected from the joint event provided a valuable starting point for developing the recommended technical requirements for EMS. Based on the initial data recorded by Malaysia and Singapore, it may be inferred that an EMS system should support a bandwidth of at least 576.741 kbps and a latency of no more than 235 msec. However, when incorporating data observed by Thailand, the result, particularly regarding latency, exhibited significant variability. This suggests that the current data set is insufficient to form reliable, region-wide recommendations. Therefore, it was suggested that the SWIM TF/SIPG encourage their members to share EMS usage and performance data for further analysis. It was emphasized that the aforementioned bandwidth and latency values were presented solely as indicative minimum technical performance requirements. The actual technical performance requirements will ultimately depend on the specific needs of SWIM users and the service level agreements established between SWIM service providers and consumers.

5.47 The Meeting was informed of the correction of Table 1 in the paper that the peak bandwidth of Malaysia would be 2,562.8 kbps, while that of Singapore would be 938.0 kbps.

5.48 The Meeting noted the issue of insufficient data sets and recognized the need for more data to finalize technical performance requirements. It was also discussed that testing involving the concurrent execution of multiple information services would be essential to simulate an environment

close to actual SWIM operations. However, conducting such comprehensive testing would require additional demonstrations. Given the current workload of SIPG, it was agreed that these tests would be deferred to a later stage. Additionally, Japan shared that it had previously conducted performance measurements of current operations using AMHS. While it remains necessary to monitor changes in information exchange orientation under future operations such as FF-ICE, the Meeting requested Japan to share its measurement data, as it would be valuable for further performance studies**. ACTION ITEM 10-22**

c) Technical Architecture

- Task 4: Development and Maintenance of Regional Information Exchange Models

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

5.49 The Meeting was presented with the update on FIXM version 4.3 Extension development to support cross-border ATFM operation, A-CDM, ATFM/A-CDM integration, and traffic synchronization in the Asia/Pacific region. Thailand informed that these efforts aimed to ensure the readiness of the FIXM Extension in alignment with the *Conclusion APANPIRG/35/4*, which agreed on the adoption of FIXM version 4.3 as the standard format for the region.

5.50 The Meeting noted that the Technical Sub-Group (TSG) of AMNAC, together with members of SWIM TF, examined the feasibility of using FIXM version 4.3 Core to support cross-border ATFM operation, A-CDM, ATFM/A-CDM integration, and traffic synchronization. It was found that FIXM version 4.3 Core can support the exchange of certain data attributes originally included in the Asia/Pacific FIXM version 4.1 Extension. Specifically, it was considered that FIXM version 4.3 Core can be used for the exchange of CTOT, Calculated Time Over (CTO), and Calculated Landing Time (CLDT). It was concluded that trajectory and aircraft track data attributes included in the Asia/Pacific FIXM version 4.2 Extension would be removed from the subsequent version of the Extension due to the availability of alternative data formats.

5.51 To facilitate a smooth transition from the use of ADEXP Slot Allocation Message (SAM), Slot Revision Message (SRM), and Slot Cancellation Message (SLC) over AFTN/AMHS to ATFM information exchange over SWIM, mandatory data fields and some optional fields currently in use in SAM/SRM/SLC were identified for inclusion in the FIXM version 4.3 Extension.

5.52 The Meeting noted that TSG members successfully conducted technical validation of the FIXM version 4.3 Extension in April and May 2025. Details of this Extension are provided in **Appendix E**. Recognizing the need for the timely availability of FIXM version 4.3 Extension to support cross-border ATFM operation, A-CDM, ATFM/A-CDM integration, and traffic synchronization in the Asia/Pacific region in line with *Conclusion APANPIRG/35/4*, it was proposed that this FIXM version 4.3 Extension be adopted as the Asia/Pacific FIXM version 4.3 Extension and be made available for use by the Asia/Pacific Administrations. It was further proposed that the Extension be presented to the FIXM Change Control Board (CCB) for review and publication on the FIXM official website.

5.53 The Meeting noted the use of alternative data formats, e.g., JSON, to be more efficient in terms of the network bandwidth for exchanging such bandwidth-intensive information over SWIM, based on insights from the surveillance data sharing over SWIM technical trial conducted in May 2024. However, it was agreed that this current arrangement is applicable only at the regional level, and there is a need for a global surveillance information exchange format. In response to the suggestion on requesting the Surveillance Panel to develop a globally standardized information exchange model for surveillance data sharing over SWIM, the Meeting was informed that SURSG has already been working on this task as per their ToR as follows:

Review, identify and provide expert views and recommendations to address major issues raised to the SURSG by ICAO APAC in the technical, operational or

regulatory aspects of surveillance data sharing to facilitate the implementation of surveillance from "departure to destination" in APAC.

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

5.55 With the abovementioned, the following draft conclusion was proposed, which was endorsed by the SWIM TF/10 Meeting for APANPIRG/36 adoption through CNS SG/29 endorsement.

<table>
<tr><td colspan="3">Draft Conclusion SWIM/TF/10/03 – Asia/Pacific Regional FIXM version 4.3 Extension</td></tr>
<tr><td colspan="2">What: The FIXM version 4.3 Extension described in SWIM/TF/10 WP/30 and provided in Appendix E to the report be:

a) adopted as the Asia/Pacific FIXM version 4.3 Extension;
b) uploaded to the ICAO Asia/Pacific Regional Office website for use by Asia/Pacific Administrations, to support cross-border ATFM operation, A-CDM, ATFM/A-CDM integration, and traffic synchronization; and
c) presented to the FIXM CCB for review and publication on the FIXM official website.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To provide the information exchange model necessary to support cross-border ATFM operation, A-CDM, ATFM/A-CDM integration, and traffic synchronization in the Asia/Pacific Region, in line with Conclusion APANPIRG/35/4.</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: 23-May-25</td><td colspan="2">Status: Draft to be adopted by PIRG</td></tr>
<tr><td colspan="3">Who: ☒Sub groups ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other: SWIM TF</td></tr>
</table>

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

5.56 This paper presented outcomes of discussions on SWIM-related working papers and draft conclusions thereof in the ATFM/SG/15 meeting. The Meteorology/Air Traffic Management (MET/ATM) Seminar and the Fifteenth Meeting of Air Traffic Flow Management Steering Group (ATFM/SG/15) were held in Bangkok, Thailand, from 28 April to 2 May 2025. The meeting also included a joint plenary session with the 14th Meeting of Meteorological Requirements Working Group (MET R/WG/14). It was recalled that SWIM TF/9 had requested the ATFM/SG to develop a detailed process for revising a mutually agreed FIXM version for cross-border ATFM-related information exchange during the ATFM/SG/15 meeting and share with the SWIM TF/10 meeting for further discussion.

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

a. Submit the proposed change to the FIXM version, in the form of a Working Paper, to ATFM SG for review and assessment of its operational impacts and suitability in supporting regional operational requirements;

b. Upon adoption by ATFM SG, submit the proposal to SWIM TF for review and assessment of its technical implications; and
c. Following agreement by SWIM TF, submit a summary of the change proposal to ATM SG for approval, and subsequently to APANPIRG for endorsement.

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

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

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

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

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

d) Governance

- Task 5: Regional SWIM Governance Framework

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

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

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

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

e) Information Services

- Task 6: Information Services

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

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

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

5.67 The meeting noted different methods to implement Request/Reply MEP, including Web Service (synchronous), Message Broker (asynchronous), WebSocket (asynchronous) and gRPC (asynchronous). It was recalled that, at the SWIM/TF 9, Revision of APAC SWIM Technical Infrastructure Profiles (WP/09) was presented, and in the Appendix B "APAC SWIM Technical Infrastructure Profiles", SOAP was described in the *3.3.3.2 - As most users have not applied SOAP to current web applications, this standard is not recommended for the development of SWIM services*. Considering this background, the European region has implemented the SOAP-based web services for Request/Reply MEP, whereas the APAC region was expected to adopt a technical profile that does not recommend the use of the SOAP approach. Accordingly, ROK presented an implementation approach for the Request/Reply MEP using HTTP API-based web services, which were widely adopted and commonly used in the ICT industry.

5.68 The paper shared details of methods for implementing FF-ICE services using web service-based Request/Reply MEP. It was shared that given the current emphasis on the regional SWIM prototype architecture using an EMS, which the SIPG is developing in the APAC region, the primary issue to be discussed is whether the FF-ICE service will be provided solely through the Pub/Sub MEP or whether it will also support the Request/Reply MEP. The Meeting was informed that, if a decision is made to support the Request/Reply MEP, it will also be essential to discuss how the Request/Reply MEP should be implemented. It was also recommended that future trials and implementations explore both MEPs in parallel to assess their operational suitability and technical feasibility. The Meeting noted that collaborative engagement among regional FF-ICE-related implementors (e.g., SWIM TF, SIPG, and FF-ICE Ad-hoc Group) is essential to refine the architecture and messaging strategies for FF-ICE implementation in the APAC region.

5.69 The Meeting was informed that FF-ICE Ad-hoc Group had already shared that, for some APAC Common SWIM Flight information Services related to FF-ICE, both Pub/Sub and Req/Rep MEP will be required. It was agreed that China, Japan, and ROK will study the four cases shared by the paper as methods for implementing FF-ICE services using web service-based Req/Rep

MEP and share their recommendations at the next SWIM TF Task Leads meeting. Further information will be shared with the FF-ICE Ad-hoc Group for further consideration at its 3rd meeting, planned to be held in March 2026. **ACTION ITEM 10-26**

f) Validation & Demonstration

- Task 7: SWIM Demonstration
- Task 8: SWIM Services and Application Validation

Expected Capabilities of CRV for APAC SWIM Implementation – Japan (WP/20)

5.70 The Meeting recalled that to understand the required capabilities of CRV in supporting APAC SWIM construction, the Joint Event of SWIM over CRV Demonstration and Surveillance Data Sharing in SWIM Trial was held on 28 – 29 May 2024, at HKCAD. Japan presented the validation results of message exchange using the hierarchical SWIM architecture built on the pseudo CRV. Additionally, based on the QoE (Quality of Experience) from the demonstration, the expected capabilities and QoS (Quality of Service) parameters required for CRV to meet APAC SWIM requirements were analyzed by Japan and shared with the meeting.

5.71 Japan informed that, according to the analysis of validation results, the following capabilities and QoS parameters for CRV are expected to support SWIM-based applications and operations, as shown in the table below. As surveillance data sharing is a continuous and real-time service, a lower packet delay budget is expected. However, because of its large volume and high frequency, a lower packet error rate and higher priority level are not required. Moreover, it was recommended that to avoid affecting other event-based SWIM messages, including FIXM, AIXM and IWXXM messages, it is better to separate the surveillance data into a different logical network layer and message queue.

Network	Application		Capability
Bandwidth	For SWIM applications		> 10 Mbps
Latency	For SWIM information services		< 200 ms
Packet Loss	For SWIM information sharing		< 0.1%
QoS	Packet Delay Budget	For SWIM message	300 ms
		For surveillance data	200 ms
	Packet Error Rate	For SWIM message	10^{-3}
		For surveillance data	10^{-3}
	Priority Level	For SWIM message	High
		For surveillance data	Low

Table 7- Expected Capabilities and QoS Parameters for CRV

5.72 The Meeting was informed that additional validation and evaluation tests will be conducted in cooperation with SIPG and other working groups, and the results will be reported at upcoming SWIM TF meetings. Moreover, the Meeting noted that the paper was also presented during the joint meeting of CRV and SWIM Experts held in Guam, USA, in September 2024. It was further noted that the information contained in the paper would serve as input for the development of new CRV specifications.

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

5.73 ROK outlined strategic approaches to support the operationalization of SWIM in the APAC region, with a specific focus on the validation aspect. It was informed that the SWIM Implementation (Doc 10203) does not specifically address the validation of the SWIM Technical Infrastructure (TI). However, as described in SWIM TF/1 – WP/06 *"FAA: 10 Years of SWIM Experience – Introductory Best Practices and Lessons Learned*, Brief Overview of the SWIM Program", there is precedent for classifying the core functions of the SWIM TI – such as messaging, interface management, enterprise service management, and service security – as core services. In terms of service, GEMS validation could also refer to information service validation, as GEMS could be considered a core service of the APAC SWIM architecture. Accordingly, for validation of GEMS, reference could be made to ***Section 4.6: Validation of information services of SWIM Implementation (Doc 10203).*** The document defined validation as "the activity whereby an information service is checked for conformance against the objectives and requirements stated in the information service overview. Validation provides assurance of conformance to the information service consumer."

5.74 From a regional perspective, three possible approaches to developing test cases were shared with the Meeting. It was suggested that to enhance the objectivity of validation, software quality certification conducted by 3rd party in each Member State based on ISO/IEC 25010 can be utilized. It was added that the information exchanged through the global SWIM services currently identified by APAC SWIM TF at the regional level is **non-safety-critical**, and therefore, software safety certifications based on RTCA DO-278A under IEC 61508 – *Electronic Functional Safety Package* are not considered at this moment. However, such certifications may need to be considered in the future if safety-critical information is to be exchanged via the SWIM.

5.75 It was suggested that once the validation process is completed, an appropriate authority must authorize the GEMS for operational use. To prepare materials for authorization, two possible approaches to prove that GEMS meets the specified requirements were shared.

5.76 It was suggested that, given the estimated lead time for the final approval process, it is critical that the validation and preparation activities be initiated well in advance — ideally completed by early 2029 — to ensure the timely submission of materials to SWIM TF and subsequent endorsement by the appropriate higher-level body. It was concluded that the strategy described in this paper helped to ensure that the SWIM services and infrastructure, particularly GEMS, meet the required quality and reliability, enabling safe, consistent, and trusted operational deployment across the region.

5.77 The meeting shared appreciation with ROK for sharing very useful information. The SIPG lead suggested that the paper should also be considered in future SIPG discussions.

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

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

g) Coordination and Promotion

- Task 9: Monitoring of Panels' Work
- Task 10: Regional Coordination and SWIM-related Information Sharing
- Task 11: SWIM Implementation Education and Promotion

Updates from IMP – Japan (IP/02)

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

5.81 It was informed that the Air Navigation Commission (ANC) designated several Job Cards, and a WG has been established under the IMP to study them (excluding AIM-related Job Cards). The job card details were as follows:

- IMP.011.01 Information Services for Air/Ground SWIM
- IMP.012.01 SWIM Registry Interoperability
- IMP.013.01 Information Service Definition
- IMP.014.01 SWIM Governance enhancements
- IMP.015.01 Information Management Vocabulary

5.82 The details of each job card and associated tasks were shared at the Meeting. It was informed that PANS-IM (Doc 10199) has just become applicable, and while countries are building SWIMs based on it, most regulations and guidance are targeted for review in 3Q, 2028.

5.83 The Meeting appreciated Japan's continued efforts in sharing updates from other ICAO panels during each SWIM TF meeting and acknowledged the value these updates have provided to the SWIM TF members.

Agenda Item 6: SWIM requirements for regional network

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

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

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

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

6.4 It was informed that PANS-IM required an audit by the regulatory department (regulator) to confirm the continued viability of the SWIM. Although the concept of auditing the APAC SWIM needs to be clarified, Japan shared that it is appropriate to include the requirements of the APAC SWIM in the audit of the State's SWIM to be conducted by the regulatory department of each State participating in the APAC SWIM. It was suggested that it would be appropriate for each country to

bring the part of the audit results related to the APAC SWIM to the body that manages the APAC SWIM operation and discuss the necessary actions to be taken.

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

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

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

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

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

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

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

Agenda Item 7: SWIM Task Force ToR, Programme, Work Plan, and Action Items Review

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

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

7.2 To ensure that the objectives set in the ToR can be achieved, the Statement of Work (SOW) of each Task was updated by the Meeting. The finalised SOWs are provided in **Appendix G** to this report.

7.3 The Meeting was informed of the current Task leads as follows:

Groups	Task No.	Subject/Task	Task Leads
Implementation Planning	1	Regional implementation philosophy & roadmap	David Leow (Singapore) Amornrat Jirattigalachote (Thailand)
SWIM infrastructure	2	Regional SWIM infrastructure	Xiaodong Lu (Japan), ~~Yasushi Iwasawa (Japan)~~ Yosuke MORO (Japan) Henry Chan (Hong Kong, China)
	3	Security service	Jim Laymon (USA)
Technical Architecture	4	Development and maintenance of regional information exchange models	Amornrat Jirattigalachote (Thailand) Wen Zhu (USA)
Governance	5	Regional SWIM Governance Framework	Young Jin Ha (ROK) Mark Kaplun (USA), ~~Yasushi Iwasawa (Japan)~~ Yosuke MORO (Japan) Xiaodong Lu (Japan), Honglei Gao (China)
Information Services	6	Information services	Marco Kok (Hong Kong, China) Jeremy Bienkowski (Australia)
Validation & Demonstration	7	SWIM Demonstration	David Leow (Singapore) Amornrat Jirattigalachote (Thailand)
	8	SWIM services and application validation	Yosuke MORO (Japan) Xiaodong Lu (Japan), Honglei Gao (China), Young Jin Ha (ROK)
Coordination and Promotion	9	Monitoring of Panels' work	~~Yasushi Iwasawa (Japan)~~ Yosuke MORO (Japan)
	10	Regional coordination and SWIM-related information sharing	John Moore (IATA)
	11	SWIM implementation education and promotion (New task)	~~Thomas Green (USA)~~ Vacant

Table 8- The current Task leads

7.4 It was added that Task 3 required a co-lead from the APAC region to be able to suggest better and incorporate the security requirements specific to the APAC region. Similarly, additional support was required for Task 6 and Task 11. As the current ToR of SWIM TF has significantly increased the work of SWIM TF and recognizing the importance of effective communication of SWIM-

related understanding with relevant groups, the Meeting encouraged States/Administrations to nominate lead/co-leads for Task 11 on a priority basis.

7.5 **Appendix H** of the Report provides the latest version of the SWIM TF Work Plan. The Meeting also updated the action item list. The updated action item list is provided in **Appendix I** of the Report.

Agenda Item 8: State, Regional and Global SWIM Updates

IWXXM: Latest developments and future plans – Hong Kong China (WP/24)

8.1 Hong Kong China highlighted the latest status on the updating of the ICAO Meteorological Information Exchange Model (IWXXM) and the publication plan in connection with the proposed changes to ICAO Annex 3 from the 5th Meeting of the ICAO Meteorological Panel (METP/5). It also briefly mentions the development direction regarding new Annex 3/PANS-MET requirements brought up for discussion at METP/6.

8.2 The Meeting was informed that the targeted publication date of the approved new IWXXM schemas is November 2025, which is in line with the applicable date of Amendment 82 to ICAO Annex 3. It was added that discussions were made at METP/6 in early March 2025 on the development of new information services, viz the Aerodrome Meteorological Observation, Aerodrome Meteorological Forecast and Hazardous Weather Information Services, for the provision of such information on the SWIM environment. A new IWXXM design is required to establish an overarching framework that will ensure global consistency of information provision.

8.3 It was informed that an object-based approach is taken in the design of IWXXM WAFS Significant Weather Forecast back in IWXXM Version 2021-2 and the concept has been taken forward in the design of VONA and QVACI in IWXXM Version 2025-2. The idea is to use a WxObject (iwxxm: MeteorologicalFeature). Future development will focus on enriching the list of reusable elements as well as WxObjects describing specific phenomena to allow a flexible yet formal way to present "a story" through a WxObject collection.

8.4 While from a phenomena description perspective, defining reusable WxObjects and their associated properties is trivial, the actual representation (e.g., a time series of WxObjects or a WxObject with time series) will depend on use cases, as the cost for consumers to utilise the data will be different. IWXXM designers at this point can only note the existence of possible alternative representations, identify similarities and differences of these representations and determine whether these representations can be used interchangeably under specific situations. Further discussions will have to be made by ICAO METP Working Group on Meteorological Requirements and Development (WG-MRAD) and Working Group on Meteorological Information Exchange (WG-MIE) on the "reporting practices" to be adopted, bearing in mind that if the practices are too restrictive (i.e. only a single representation can be used), it may be limit flexibility and hinder Application Program Interface (API) development. Conversely, if the practices are too permissive (i.e., allowing the use of all equivalent representations), ensuring interoperability will be challenging.

8.5 The Meeting reminded States/Administrations to ensure that systems being developed or procured will work with current and upcoming versions of IWXXM.

Progress update on SWIM Implementation in Malaysia – Malaysia (IP/03)

8.6 Malaysia presented a progress update on the implementation of SWIM. The new update incorporated information regarding work and activities carried out in 2024 up to Q1 of 2025. Malaysia also highlighted future works involving SWIM implementation in the State, which is relevant to the APAC regional implementation plan.

8.7 The Meeting was informed Malaysia's approach to SWIM operationalization is fully aligned with the objectives set forth by the ICAO APAC Office, particularly the updated SWIM Implementation Roadmap (Version 2, issued 2024) which include a **Dual-System Operation Strategy** that is by maintaining operational compatibility with both legacy AMHS/AFTN systems and modern SWIM services, Malaysia supported the ICAO APAC strategy of phased coexistence until 2035, thereby reducing transition risks.

8.8 The Meeting appreciated Malaysia for sharing the progress and congratulated them for the tremendous progress made so far.

Agenda Item 9: Next Meetings and Any Other Business

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

9.1 The Second Asia Pacific Ministerial Conference on Civil Aviation was held from 11 - 12 September 2024 in New Delhi, India. In the Conference, the APAC Ministers reviewed commitments made under the Beijing Declaration and agreed to another set of commitments to high-priority aviation strategic objectives in the form of the Asia Pacific Ministerial Declaration on Civil Aviation (Delhi). The Conference endorsed the Second Asia and Pacific Ministerial Declaration on Civil Aviation (Delhi), also known as the Delhi Declaration, which is provided in **Appendix J.**

9.2 The Meeting noted that the Delhi Declaration generates the political will needed to support the organization's various objectives for an effective and efficient aviation system. The Declaration incorporated various critical aspects that required immediate attention from the APAC States. It included substantial commitments needed from the APAC States for effective implementation of ICAO global plans, implementation of aviation safety and air navigation services priority elements, and addition of resilience to health-related disruptions. Furthermore, it has highlighted commitments required for gender equality, resourcing for civil aviation, aviation environment protection, and ratification of international air law treaties.

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

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

9.5 The Meeting agreed that the proposal required more deliberation, and the task was assigned to the SWIM Co-Chair and the ICAO Secretariat. It was agreed that the ICAO Secretariat will inform the DGCA/60 Conference that indicators to measure SWIM implementation in the APAC region are under development, and the latest status of APAC States/Administrations' readiness for SWIM implementation will be shared with the DGCA/61 Conference. **ACTION ITEM 10-31** SWIM TF Co-Chair and ICAO Secretariat will define the first draft of indicators by the end of 2025, and share with SWIM TF Task Leads for review. A survey will then be conducted in Q1 2026 to finalise the preferred indicators for the APAC region. **ACTION ITEM 10-32**

CNS-Related ASBU in Asia/Pacific Seamless ANS Plan – Sec (WP/26)

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

9.7 The Meeting was informed that recently, it was observed that the priorities of some CNS ASBUs finalized by CNS-related ASBUs review Ad-hoc Group for the next edition of the Seamless ANS Plan were not correctly reflected in the published Asia/Pacific Seamless ANS Plan Version 4.0. This discrepancy could be due to an inadvertent mistake when compiling feedback from all sources. It was also added that if a Priority 1 were assigned to the NAVS ASBU elements, it would require a consequential review and amendment to the following paragraphs in the Asia/Pacific Seamless ANS Plan Version 4.0.

9.8 To resolve this issue, after internal coordination within the ICAO Secretariat, it was decided that the responsible ICAO Secretariat would share the issues associated with proposed changes in the priorities of NAVS ASBUs with the responsible contributory bodies. These included GBAS-SBAS ITF and PBNICG. It was also decided that the ICAO secretariat will share this information with all contributory bodies under CNS for their information and necessary action, if any. Based on the outcomes of the discussion with relevant contributory bodies, the plan to correct the list of CNS-related ASBUs and other impacted ASBUs, if any, will be finalized and shared with the CNS SG/29 meeting planned to be held from 16-20 June 2025. The Meeting was requested to review CNS/other ASBUs in the Seamless ANS plan and share any discrepancies, if any.

9.9 The information was shared with the GBAS SBAS ITF/7 meeting held from 14-16 May 2025 in the ICAO APAC Office, Bangkok, Thailand by WP/02. The Meeting was informed about a comparison of the priorities adopted by CNS SG/28 based on a proposal from the CNS-related ASBUs Review Ad-hoc Group for the next edition of the Seamless ANS Plan and the priorities published in the Asia/Pacific Seamless ANS Plan Version 4.0. Recognizing the fact that not all ASBU NAVS module Block 0 elements may be implemented as Priority 1 in the Asia/Pacific Region, the ICAO Secretariat proposed considering the splitting of the elements from a 'Thread' into individual elements to ensure that appropriate Priority is assigned to each element.

9.10 The GBAS SBAS ITF/7 discussed the revised priorities and agreed to modify them as follows and publish as amendments in the plan v4.0.

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

Table 9- Revised priorities of NAVS in Seamless ANS Plan v4.0

9.11 It was informed that the ICAO Secretariat is debating the way forward and the need for change in Seamless ANS Plan v4.0. The outcomes of the discussion will be shared with the CNS SG/29 meeting planned to be held from 16 to 20 June 2025.

Date and Venue for the Next Meeting

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

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

9.14 In closing the Meeting, the Co-Chair and ICAO Secretariat thanked all participants for their active participation in the Meeting and valuable contributions to the work programme of the SWIM TF.

AMHS to SWIM transition Correspondence Group (ATSGC)

Terms of Reference ("TOR")

Establishment

The Asia and Pacific ("APAC") AMHS to SWIM transition Correspondence Group ("ATSGC") was established during the Eleventh Meeting of the Aeronautical Communication Services Implementation Coordination Group (ACSICG/11) held from 19 March to 22 March 2024 at the ICAO APAC Office to study the transition strategy from AMHS to SWIM for the APAC Region.

Objectives

a) Identify challenges in transitioning from AMHS to SWIM in the APAC Region and monitor States' development and implementation of action plans to address these challenges, ensuring a safe, smooth, and continuous flow of message and/ or data exchange;

b) Formulate the implementation plan for transitioning from AMHS to SWIM in the APAC region and revise it as required;

c) Track and consider APAC regional developments in AMHS and SWIM and incorporate them in the ICAO APAC AMHS to SWIM Implementation plan as required;

d) Coordinate with APAC regional groups (such as CRV OG, MET IE, SWIM TF, etc.) for a smooth transition from AMHS to SWIM in the APAC Region while maintaining operational continuity;

e) Monitor the development of SWIM in the APAC Region and track the implementation status of those projects;

f) Provide regular progress reports to the ACSICG; and

g) Consider other issues as directed by the ACSICG.

Composition of the ATSCG

a) Experts (e.g., AMHS and SWIM) nominated by APAC States; and

b) Other stakeholders, including the aviation system manufacturing Industry, may be invited as observers.

Meetings

ATSCG will conduct its work using teleconferences and other electronic means of communication. The ICAO Regional Office will provide secretariat support for the ATSCG.

Finalized SIPG task list with associated priorities

Task ID	Task	
Task 1	Define Functionality and requirements for Edge and Gateway EMS	Priority 1
Task 2	Refine the revised hierarchical architecture	
Task 3	SWIM Architecture – Req/Rep MEP and guidance for Async and Sync	
Task 6	SWIM Security Implementation – Self-signed certs	
Task 7	SWIM Registry Interconnection	
		Priority 2
Task 5	SWIM Technical Infrastructure Integration	
Task 9	APAC SWIM Integration Testing	Priority 3
Task 10	Measurement of performance metrics	
Task 11	Conditions for SWIM Operationalization	

Table of Task Assignments

Task ID	Tasks Description	Team

Task 1	Requirements and Functionalities of the Edge EMS and Gateway EMS
	- Coordinate with Task 2 for requirements on Topics.
	- Standardizing of the topic structure and / or message properties.
	- Consider the treatment of message TTL within the Gateway EMS and Edge EMS
	- How to do guaranteed message delivery. Push vs Pull method.
	- To include maintenance requirements and procedures for the Gateway and Edge EMS
	  o Updates of software
	  o Updates of the configuration
		Lead:
		Thailand
		
		Members:
		Australia,
		China,
		Hong Kong China,
		India,
		Japan,
		Fiji,
		Singapore,
		Malaysia,
		USA,

Task ID	Tasks Description	Team
	○ Updates of certificates	Republic of Korea, New Zealand, CANSO
Task 2	New proposed hierarchical architecture refinement - Use SWIM TF/10 WP/17 as inputs - Routing via Topics - Explore the use of Multiple Queues and how that can be configured. (e.g. by data domain, by QoS) - How is message priority going to be implemented. SIPG's task is to look at how priority can be achieved. What priorities should each message type have is up to the domain and operational expert groups - Message transmission retry mechanism. ○ What is the logic for failover ○ Scope is limited to Edge-Gateway-Gateway-Edge message transmission ○ Methodology for redelivery. Who gets informed of the tx failure? How many retries? What are the rules for rerouting? - Comparison between use of Message Properties and Message Topics for Routing.	**Lead:** **China** **Members:** Australia, Hong Kong China, India, Japan, Fiji, Singapore, Thailand, Malaysia, USA, Republic of Korea, New Zealand CANSO
Task 3	Guidance for the Sync Req / Rep and Async Req / Rep Message Exchange Pattern - Most important task is to get alignment within the SIPG on what we mean by Sync Req /Rep and Async Req / Rep. Need to tie back to the definition found in Doc 10203 - Should not pose technical questions to other expert groups but rather ask them to state how they believe their information services should behave.	**Lead:** **Republic of Korea** **Members:** Australia, China, Hong Kong China, India, Japan, Fiji, Singapore,

Task ID	Tasks Description	Team
	- Use Korea's paper SWIM TF/10 WP 18 as inputs - Consider the use of API Gateways and how they can be deployed. - How to support RESTful Req/Rep MEP?	Thailand, Malaysia, USA, New Zealand CANSO
Task 5	SWIM Technical Infrastructure Integration	**Lead:** **Singapore** **Members:** Australia, China, Hong Kong China, India, Japan, Fiji, Thailand, Malaysia, USA, Korea, New Zealand CANSO
Task 6	SWIM Security Requirements and Implementation - Review of the ACCP when published by the TFP - Continue with the Self-signed certificate testing with more participants - Explore how trust can be established across different entities using self-signed certificates - To consider how the renewal of certificates should be handled. - To use Malaysia's presentation at SIPG as input to this task	**Lead:** **Malaysia,** **Members:** Singapore, Thailand, Vietnam, Hong Kong, USA, Japan Philippines, China (Observer), New Zealand (Observer)
Task 7	SWIM Registry Requirements and Implementation	**Lead:** **USA** **Members:** China, Sri Lanka, Philippines, Republic of Korea,

Task ID	Tasks Description	Team
		Thailand, Singapore, Japan, *Hong Kong China (Observer)*
Task 9	APAC SWIM Integration Testing - To develop Use Cases and test scenarios to test the SWIM TI. - Propose to use the TBO Pathfinder Use Case as a starting point. - To remember to include Surveillance Use cases	**Lead: TBD** **Members:** Australia, China, Hong Kong China, India, Japan, Fiji, Singapore, Thailand, Malaysia, USA, Republic of Korea, New Zealand CANSO
Task 10	Performance Testing SWIM TI - Latency - Functional Capacity - Data Integrity	**Lead: TBD** **Members:** Republic of Korea, India, Singapore, USA.
Task11	Regional SWIM TI Production Readiness Document - Scope: 1) Propose the test procedures for the SWIM TI 2) Report of the test results based on agreed test procedures - To include the requirements, test procedures and key performance indicators as captured in the above tasks 1, 2, 3, 6 & 7. - Prepare the acceptance criteria for the SWIM TI	**TBD?**

Timelines	**25 June**	**25 July**	**25 August**	**25 September**	**25 October**	**25 November**	**25 December**	Remarks
Task 1 - Req of Edge and Gateway EMS								
Task 2 - New hierarchical architecture								
Task 3 - Req/Rep guidance (Async and Sync)								
Task 5 - SWIM TI Integration								
Task 6 - SWIM Security requirements and implementation.								Aug - End of self-signed certificate trial. Review ACCP after trial.
Task 7 - SWIM Registry req and implementation								

(Legend)

Requirements Group	Sys Engineering Group	Test and Validation Group

Timelines	Jan 26	Feb 26	Mar 26	Apr 26	May 26	Jun 26	
Task 5 - SWIM TI Integration							
Task 7 - SWIM Registry Interconnection							

Timelines	26 July	26 August	26 September	26 October	26 November	26 December	
Task 5 - SWIM TI Integration							
Task 9 - APAC SWIM Integration testing							
Task 10 - Performance Testing							
Task 11 - SWIM Operationalization Guidance Material							

(Legend)

Requirements Group	Sys Engineering Group	Test and Validation Group

"TERMS OF REFERENCE

SWIM IMPLEMENTATION PIONEER AD-HOC GROUP

Objective

To implement a seed/prototype version of the Asia/Pacific SWIM within 2026 as a means of kick-starting SWIM adoption in the region.

Responsibilities

Deliverables for this group are as follows:

1) A regional SWIM Technical Infrastructure (TI) prototype built on the architecture that utilizes the CRV and the Internet. The architecture has been agreed by the SWIM Task Force;

2) Evaluation of the capability of the prototype SWIM TI using a selection of representative SWIM Information Services; and

3) Provide recommendations to the SWIM Task Force on the viability and performance of the SWIM TI.

Composition

- Experts from ATM, AIM, MET, and CNS Service Providers from at least three Asia/Pacific States having the following desirable characteristics:

  1) Having access to or will have access to the Common aeRonautical VPN (CRV);

  2) Having implemented an EMS or having access or will have access to an EMS;

  3) Able to provide some of the common information services agreed by the SWIM Task Force; and

  4) Able to provide or have access to a SWIM registry.

- Any other international organizations such as IATA and ICCAIA and industries

Conduct of the Work

The group will conduct its work through regular web conferences, other electronic means of communications, and face-to-face meetings.

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

First Version (May 2025)

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

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

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

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

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

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

Business functionality of the information service	**Brief description of the service**	**Type of information to be exchanged**	**Information exchange model / Message type**	**Message exchange pattern**	**Priority ~~of Recommended sService in iInitial APAC Common SWIM IS~~ (1) / (2) / (3)**
FF-ICE filing service	Provides a means to submit, update or cancel flight plans through a SWIM-based interface using FIXM.	Flight plan for registration, update or cancellation	FIXM	Req/Reply Pub/Sub	1
FF-ICE ~~data~~ publication service	Provides harmonised sharing of flight ~~plan~~ information in a global standard supporting common situation awareness.	Flight ~~plan~~ information for publication	FIXM	Pub/Sub	2
FF-ICE trial service	Allows operators to test the effect of a potential change in a flight plan prior to committing to the change.	Proposed changes in a flight plan	FIXM	Req/Reply	2
FF-ICE flight data request service	Allows an operator to request the current status of a flight plan, or an ANSP can request an operator to submit the latest version of their flight plan.	Current status of a flight plan, a copy of flight plan or supplementary plan	FIXM	Req/Reply	1
FF-ICE notification service	Provides notification of a change in flight state, such as Departure (DEP) and Arrival (ARR) Air Traffic Service (ATS) messages.	ARR, DEP messages	FIXM	Pub/Sub Req/Reply	1
FF-ICE planning service	Allows operators to submit preliminary flight plans for early Air Traffic Flow Management (ATFM) planning and to obtain feedback regarding restrictions/constraints affecting the flight.	Preliminary flight plan for early ATFM planning	FIXM	Req/Reply Pub/Sub	2
Flight-Specific ATFM Measure Service	Supports *notification* of information related to "flight-specific" ATFM measures, i.e. measures whose control mechanisms apply to a single flight. An example is the Ground Delay Program (GDP), whose control mechanism is a Calculated Take-Off Time (CTOT), or an ATFM measure for airborne flight,	CTOT, CTO, CLDT, and fields currently included in APAC	FIXM	Pub/Sub Req/Reply	1

Business functionality of the information service	Brief description of the service	Type of information to be exchanged	Information exchange model / Message type	Message exchange pattern	Priority ~~of~~ ~~Recommended sService in iInitial APAC Common SWIM IS~~ (1) / (2) / (3)
	whose control mechanism is a Calculated Time Over (CTO). Recipients of this information should take actions to comply with the ATFM measure contained herein.	AFTN/AMHS-Based ICD for ATFM[1]			
ATFM/A-CDM Integration Service	Supports exchanges of flight-specific ATFM measure information and A-CDM milestone parameters among stakeholders, including arrival/departure ATFM units, airspace users, and airport operators, to integrate A-CDM process with ATFM operations.	ATFM measure information: CTOT A-CDM departure planning information: TOBT, TTOT, TSAT	FIXM	Pub/Sub Req/Reply	1
APAC Common SWIM Meteorological Information Services					
FOR AERODROME					
METAR/SPECI ~~information~~ service	Provides ~~of~~ IWXXM-formatted METAR/SPECI product specified in ICAO Annex 3.	Provision of the existing Annex 3 product via an information service ~~in Annex 3. Information service will be enabled through Amendment 81 to Annex 3 as recommended practice with applicability from Nov 2024.~~	IWXXM	Pub/Sub Req/Reply	1
TAF ~~information~~ service	Provides ~~of~~ IWXXM-formatted TAF product specified in ICAO Annex 3.		IWXXM	Pub/Sub Req/Reply	1
Aerodrome Meteorological Observation Information Service ~~observation information service~~	Provides continuous observations of weather parameters at an aerodrome. Advanced meteorological SWIM (MET-SWIM) service being developed by MET Panel.	To be introduced as recommended practice in Annex 3 (Amd 84~~83~~) in Nov 2030~~2027~~ tentatively (Note: Level of standardisation needs to be considered, as different	IWXXM	Pub/Sub or Req/Reply	2*

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

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

Business functionality of the information service	**Brief description of the service**	**Type of information to be exchanged**	**Information exchange model / Message type**	**Message exchange pattern**	**Priority ~~of~~ ~~Recommended s~~Service in ~~i~~Initial ~~APAC Common SWIM IS~~ (1) / (2) / (3)**
Aerodrome Meteorological Forecast Information Service ~~forecast information service~~	Provides information of the expected meteorological conditions, including probability, at an airport during a specified period. Advanced meteorological SWIM (MET-SWIM) service being developed by MET Panel.	aerodrome information services may be required for different use cases.)	IWXXM	Pub/Sub or Req/Reply	2*
FOR ENROUTE					
SIGMET ~~information~~ service	Provides ~~of~~ IWXXM-formatted SIGMET product specified in ICAO Annex 3.	SIGMETs for thunderstorm, tropical cyclone, turbulence, icing, mountain wave, duststorm, sandstorm, volcanic ash and radioactive cloud	IWXXM	Pub/Sub Req/Reply	1
AIRMET ~~information~~ service	Provides ~~of~~ IWXXM-formatted AIRMET product specified in ICAO Annex 3.	Provision of the existing Annex 3 product via an information service	IWXXM	Pub/Sub Req/Reply	~~1~~2
Tropical Cyclone Advisory ~~information~~ service	Provides ~~of~~ IWXXM-formatted Tropical Cyclone Advisory product specified in ICAO Annex 3. (Designated provider: States with Tropical Cyclone Advisory Centre)		IWXXM	Pub/Sub Req/Reply	1
Volcanic Ash Advisory ~~information~~ service	Provides ~~of~~ IWXXM-formatted Volcanic Ash Advisory product specified in ICAO Annex 3. (Designated provider: States with Volcanic Ash Advisory Centre)		IWXXM	Pub/Sub Req/Reply	1
Space Weather Advisory ~~information~~ service	Provides ~~of~~ IWXXM-formatted Space Weather Advisory product specified in ICAO Annex 3. (Designated provider: States with Space Weather Advisory Centre)		IWXXM	Pub/Sub Req/Reply	1
Volcano Observatory Notice for Aviation	Provides ~~of~~ IWXXM-formatted VONA specified in ICAO Annex 3. Provision of VONA ~~will become the~~		IWXXM	Pub/Sub Req/Reply	2

Business functionality of the information service	**Brief description of the service**	**Type of information to be exchanged**	**Information exchange model / Message type**	**Message exchange pattern**	**Priority ~~of~~ ~~Recommended sService in iInitial APAC Common SWIM IS~~ (1) / (2) / (3)**
(VONA) ~~information~~ service	is a recommended practice in Annex 3 (Amd 82) ~~in 2025~~. (Designated provider: States with a designated State Volcano Observatory)				
Quantitative volcanic ash ~~(QVA)~~ concentration information (QVA) service	Provides detailed information of significant volcanic ash in the atmosphere, including probabilities of ash concentration thresholds over space and time. Advanced meteorological SWIM (MET-SWIM) service being developed by MET Panel. (Designated provider: States with ~~VAAC~~ Volcanic Ash Advisory Centre (VAAC))	QVA ~~grids grid point~~ gridded forecasts including probabilities~~,~~ and IWXXM QVA objects. ~~To be introduced as~~ A recommended practice for significant ash clouds in Annex 3 (Amd 82) ~~in Nov 2025 tentatively~~ for VAACs in a position to do so from Nov 2025, and for all VAACs from Nov 2026.	Gridded data (e.g. NetCDF), IWXXM	Pub/Sub ~~or~~ Req/Reply	~~1~~2[#]
WAFC (World Area Forecast Centres) gridded ~~grid point~~ forecast service	Provides global gridded weather forecasts. (Designated provider: WAFCs (UK and US))	Global gridded forecasts of CB, icing, turbulence, upper winds, upper-air temperatures and humidity, flight level and temperature of tropopause, and direction, speed and flight level of maximum wind	Gridded data in GRIB2	Pub/Sub ~~or~~ Req/Reply	1
WAFC significant weather (SIGWX) forecast service	Provides global WAFC SIGWX data sets with coverage expressed in polygons. (Designated provider: WAFCs (UK and US))	Significant weather forecast such as tropical cyclone, ~~severe squall lines,~~ turbulence, icing, etc.	IWXXM	Pub/Sub ~~or~~ Req/Reply	1
Satellite image service	Provides satellite observational information.	Satellite derived MET information (e.g. significant convection)	Gridded format (e.g. NetCDF) and image format	Req/Reply	2

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

Business functionality of the information service	**Brief description of the service**	**Type of information to be exchanged**	**Information exchange model / Message type**	**Message exchange pattern**	**Priority ~~of Recommended sService in iInitial APAC Common SWIM IS~~ (1) / (2) / (3)**
Weather radar image service	Provides two- or three-dimensional radar observational information.	Weather radar reflectivity to visualise the intensity of convection	Gridded format (e.g. NetCDF) and image format	Req/Reply	2
APAC Common SWIM Surveillance Information Services					
Surveillance data **only** sharing service	Provides surveillance data of aircraft. ~~Provides three-dimensional position, time and identification of aircraft and other data as appropriate.~~	~~Position~~ latitude, longitude, ~~altitude,~~ flight level, ground speed (optional), ~~track angle,~~ magnetic heading (optional), ~~call sign, Mode S address,~~ target identification, target address, **mode 3/A code** (optional), **date**, time of message reception for position, ~~data quality~~, quality indicators, ~~Mode S DAP~~, **SAC, SIC**	ASTERIX Cat 21 (payload in JSON or RAW format)	Pub/Sub	~~2~~1
Surveillance data with flight plan information sharing service	Provides surveillance data of aircraft with flight plan information.	globally unique flight identifier, aircraft identification, departure aerodrome, destination aerodrome, aircraft type (optional), wake turbulence category **(optional)** latitude, longitude, flight level, ground speed **(optional)**, magnetic heading **(optional)**, target identification, target address, mode 3/A code **(optional)**, date, time of message reception for position,	ASTERIX Cat 21+FPL (payload in JSON or RAW format)	Pub/Sub	2

Business functionality of the information service	**Brief description of the service**	**Type of information to be exchanged**	**Information exchange model / Message type**	**Message exchange pattern**	**Priority ~~of~~ ~~Recommended s~~Service in i~~Initial APAC Common SWIM IS~~ (1) / (2) / (3)**
		quality indicators, SAC, SIC			

Appendix E1

FIXM version 4.3 Core Data Attributes to Support Cross-Border ATFM Information Exchange

Data Attribute	FIXM version 4.3 Core
EOBT (Estimated Off-Block Time)	FlightType.departure.estimatedOffBlockTime = (EOBT)
ETO (Estimated Time Over)	FlightType.routeTrajectoryGroup.desired.element.point4D.time = (ETO) FlightType.routeTrajectoryGroup.desired.element.elementStartPoint = (point at which ETO is specified)
ELDT (Estimated Landing Time)	FlightType.routeTrajectoryGroup.desired.element.point4D.time = (ELDT) FlightType.routeTrajectoryGroup.desired.element.point4D.pointProperty.propertyType = WHEELS_ON FlightType.routeTrajectoryGroup.desired.element.elementStartPoint.aerodromReferencePoint.locationIndicator = FlightType.arrival.destinationAerodrome.locationIndicator
EIBT (Estimated In-Block Time)	FlightType.routeTrajectoryGroup.desired.element.point4D.time = (EIBT) FlightType.routeTrajectoryGroup.desired.element.point4D.pointProperty.propertyType = IN_BLOCKS FlightType.routeTrajectoryGroup.desired.element.elementStartPoint.aerodromReferencePoint.locationIndicator = FlightType.arrival.destinationAerodrome.locationIndicator
CTOT (Calculated Take-Off Time)	FlightType.routeTrajectoryGroup.negotiating.element.constraint.time.timeSpecification.timeValue = (CTOT) FlightType.routeTrajectoryGroup.negotiating.element.point4D.pointProperty.propertyType = WHEELS_OFF FlightType.routeTrajectoryGroup.negotiating.element.elementStartPoint.aerodromReferencePoint.locationIndicator = FlightType.departure.aerodrome.locationIndicator
CTO (Calculated Time Over)	FlightType.routeTrajectoryGroup.negotiating.element.constraint.time.timeSpecification.timeValue = (CTO) FlightType.routeTrajectoryGroup.negotiating.element.elementStartPoint = (point at which CTO is specified)
CLDT (Calculated Landing Time)	FlightType.routeTrajectoryGroup.negotiating.element.constraint.time.timeSpecification.timeValue = (CLDT) FlightType.routeTrajectoryGroup.negotiating.element.point4D.pointProperty.propertyType = WHEELS_ON FlightType.routeTrajectoryGroup.negotiating.element.elementStartPoint.aerodromReferencePoint.locationIndicator = FlightType.arrival.destinationAerodrome.locationIndicator

Appendix E2

FIXM version 4.3 Extension Data Attributes

Data Attribute	FIXM version 4.3
EOBT (Estimated Off-Block Time)	Core
ETO (Estimated Time Over)	Core
ELDT (Estimated Landing Time)	Core
EIBT (Estimated In-Block Time)	Core
CTOT (Calculated Take-Off Time)	Core
CTO (Calculated Time Over)	Core
CLDT (Calculated Landing Time)	Core
TOBT (Target Off-Block Time)	Extension
TSAT (Target Start-up Approval Time)	Extension
TTOT (Target Take-Off Time)	Extension
TTO (Target Time Over)	Extension
TIBT (Target In-Block Time)	Extension
AOBT (Actual Off-Block Time)	Extension
ATO (Actual Time Over)	Extension
AIBT (Actual In-Block Time)	Extension
Taxi time*	Extension
REGUL* (designation of the ATFM measure affecting the flight)	Extension
REGCAUSE* (reason for the ATFM measure)	Extension
REASON* (reason to explain an action by ATFM personnel, e.g. rejection, cancellation)	Extension
COMMENT* (additional information for ATFM purpose)	Extension

**For more information, refer to Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic Flow Management, version 3.0*

Appendix E3

Apac XSD Description

Namespace	Description
Apac	FIXM Extension containing data attributes to support cross-border Air Traffic Flow Management (ATFM) operations, the integration between ATFM and Airport-Collaborative Decision Making (A-CDM), and traffic synchronization in accordance with Distributed Multi-Nodal ATFM Network concept and the Airport-Collaborative Decision Making operations in the Asia/Pacific region.

Class	Definition	Reference/Remark
ApacDepartureType	Class containing flight data related to departure aerodrome	This class is to be included in extension field under DepartureType class.
Data Attribute	**Definition**	**Reference/Remark**
actualOffBlockTime	A time the aircraft is pushed back / vacates parking position (equivalent to airline/handlers ATD – Actual Time of Departure and ACARS=OUT)	ICAO Doc 9971 Manual on Collaborative ATFM, 3rd Edition, 2018
targetOffBlockTime	A time that an Aircraft Operator or Ground Handler estimates that an aircraft will be ready to receive start-up approval/push-back clearance	ICAO Asia/Pacific Regional Framework for Collaborative ATFM, Version 4, October 2022
targetStartupApprovalTime	A time provided by ATC taking into account TOBT, CTOT, and/or the traffic situation that an aircraft can expect start-up/push back approval	ICAO Asia/Pacific Regional Framework for Collaborative ATFM, Version 4, October 2022
targetedTakeOffTime	A time that an aircraft is targeted to be airborne, taking into account TOBT, TSAT, and other factors such as EXOT, wake turbulence, SID, etc.	● ICAO Asia/Pacific Regional Framework for Collaborative ATFM, Version 4, October 2022 ● EUROCONTROL A-CDM Implementation Manual, Version 5.0, March 2017
taxiTime	The difference in time between the ‘off blocks time’ and the ‘take-off time’. The times referred to could be actual or estimated depending upon the context.	Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic Flow Management, version 3.0

Class	Definition	Reference/Remark
ApacArrivalType	Class containing flight data related to destination aerodrome	This class is to be included in extension field under ArrivalType class.
Data Attribute	Definition	Reference/Remark
actualInBlockTime	The time that an aircraft arrives in-blocks (equivalent to airline/handler ATA – actual time of arrival, ACARS = IN)	ICAO Doc 9971 Manual on Collaborative ATFM, 3rd Edition, 2018
targetInBlockTime	A time, calculated by an automation system, that an aircraft is expected to be at its first parking position	This time value is not EIBT (Estimated In-Block Time) – The estimated time that an aircraft will arrive in blocks (Ref. EUROCONTROL A-CDM Implementation Manual, Version 5.0, March 2017)

Class	Definition	Reference/Remark
ApacRouteTrajectoryElementType	Class containing flight data related to specific element	
Data Attribute	Definition	Reference/Remark
actualTimeOver	An actual time of the aircraft over a fix, waypoint, or particular location	
targetTimeOver	A time, calculated and issued by an ATS unit, that an aircraft is requested to be over a fix, waypoint, or particular location	Use case: a time progressively calculated and issued by arrival management (AMAN) system

Class	Definition	Reference/Remark
ApacRouteTrajectoryGroupContainerType	Class contains actual trajectory information	
Data Attribute	Definition	Reference/Remark
actual	A list of actual trajectory	

Class	Definition	Reference/Remark
ApacAtfmMeasureCodeType	Indication of the cause of the ATFM measure	Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic Flow Management, version 3.0, section 3.2.1.15(a)

Class	Definition	Reference/Remark
ApacAtfmMeasureLocationType	Indication of the constraint location for which the ATFM measure is implemented	Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic Flow Management, version 3.0, section 3.2.1.15(b)
Class	Definition	Reference/Remark

ApacDelayCodeType	Indication of IATA numeric delay code	Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic Flow Management, version 3.0, section 3.2.1.15(d)

Class	Definition	Reference/Remark
ApacRegulationConstraintAreaType	Area of constraint. Format: [A-Z]{4}	Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic Flow Management, version 3.0

Class	Definition	Reference/Remark
ApacRegulationConstraintLocationType	Location of constraint. Format: [A-Z0-9]{1,5}	Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic Flow Management, version 3.0

Class	Definition	Reference/Remark
ApacRegulationCauseType	Class contains the cause of the ATFM measure	This is equivalent to REGCAUSE field in the Slot Allocation Message (SAM) as per Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic Flow Management, version 3.0
Data Attribute	**Definition**	**Reference/Remark**
atfmMeasureCode	Indication of the cause of the ATFM measure	Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic Flow Management, version 3.0, section 3.2.1.15(a)
atfmMeasureLocation	Indication of the constraint location for which the ATFM measure is implemented	Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic Flow Management, version 3.0, section 3.2.1.15(b)
iataDelayCode	Indication of IATA numeric delay code	Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic Flow Management, version 3.0, section 3.2.1.15(d)

Class	Definition	Reference/Remark
ApacRegulationIdType	Class contains the designation of the ATFM measure	This is equivalent to REGUL field in the Slot Allocation Message (SAM) as per Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic Flow Management, version 3.0
Data Attribute	Definition	Reference/Remark
effectiveDate	The date and month when the ATFM measure is effective	Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic Flow Management, version 3.0
version	The version of the designation of the ATFM measure	Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic Flow Management, version 3.0
constraintArea	A constrained area	Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic Flow Management, version 3.0
constraintLocation	A specific constrained location	Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic Flow Management, version 3.0

Class	Definition	Reference/Remark
ApacRouteTrajectoryConstraintType	Class contains the ATFM measure information	
Data Attribute	Definition	Reference/Remark
comment	Additional ATFM measure information	Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic Flow Management, version 3.0
reason	Reason to explain an action by the FMP (e.g. rejection, cancellation, etc.).	Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic Flow Management, version 3.0
regulationCause	The information indicates the reason for the ATFM measure to assist in post-operations analysis.	Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic

		Flow Management, version 3.0
regulationId	The information indicates the designation of the ATFM measure, including the specific location of the constraint, affecting the flight.	Asia/Pacific Regional AFTN/AMHS-based Interface Control Documents for Air Traffic Flow Management, version 3.0

```
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xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:apac="http://www.fixm.aero/ext/apac/4.3"
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region.</xs:documentation>
	</xs:annotation>
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	<xs:import namespace="http://www.fixm.aero/base/4.3"
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	<xs:import namespace="http://www.fixm.aero/base/4.3"
schemaLocation="../../core/base/Types.xsd"/>
	<xs:import namespace="http://www.fixm.aero/base/4.3"
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			<xs:enumeration value="E"/>
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			<xs:enumeration value="M"/>
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3.2.1.15(b)</xs:documentation>
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information</xs:documentation>
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```

TERMS OF REFERENCE

SWIM Task Force

Objectives: In order to achieve the SWIM thread as specified in the Aviation System Block Upgrade (ASBU) of the Global Air Navigation Plan (GANP), the Asia/Pacific Seamless ANS Plan objectives, and the air navigation systems that are in compliance with ICAO global standards for the conceptualisation and exchange of aeronautical, flight and meteorological information, the SWIM Task Force will:

a) Benchmark the various successful implementations of SWIM in States and regions to promote best practices;

b) Develop and maintain the Asia/Pacific regional roadmap for SWIM implementation, including SWIM technical infrastructure, SWIM governance, SWIM information services;

c) Propose a high-level Asia/Pacific regional SWIM architecture, the corresponding SWIM technical infrastructure requirements, and the implementation approach to construct such architecture principally over CRV and other IP based networks to ensure interoperability among regional SWIM participants, to support transition for non-SWIM capable entities;

d) Develop the Asia/Pacific regional SWIM cyber security architecture framework and SWIM security strategy in line with ICAO International Aviation Trust Framework (IATF);

e) Support APANPIRG WGs/TFs regarding information exchange models and examine if any extension to the existing information exchange models, i.e. AIXM, FIXM, and IWXXM, and/or the new information exchange model(s) are required to support the Asia/Pacific regional operational requirements;

f) Establish a robust and sustainable governance model to ensure that a common set of policies, rules, and standards for identifying, designing, implementing, discovering, and operating SWIM-enabling components, including SWIM registries, is consistently applied and enforced throughout the Asia/Pacific region;

g) Develop and define the Asia/Pacific version of the SWIM information service overview specifications and the Asia/Pacific version of data catalogue for information services based on the regional operational needs;

h) Track and observe SWIM demonstrations and trials within the Asia/Pacific region as well as provide, if required, support for regional SWIM demonstrations;

i) Encourage and support interested APAC Member States to construct a platform for SWIM services and applications validation and to support the implementation of SWIM services and applications;

j) Monitor developments by the IMP and escalate the regional issues as required;

k) Identify, communicate, and liaise with relevant APANPIRG WGs/TFs in regard to SWIM-related activities, including providing support to refine SWIM operational and communications requirements;

l) Develop an educational and promotional materials required to support the regional SWIM implementation to ensure cohesiveness among regional SWIM participants;

m) Assist APAC Member States to implement the Asia/Pacific regional SWIM, as appropriate;; and

n) Undertake any other approved tasks related to SWIM implementation that may arise in the future.

Composition:

The SWIM TF will consist of experts from ATM, AIM, MET, and CNS from Asia/Pacific States and international organizations such as IATA and ICCAIA.

Conduct of the work:

The task force will conduct its work through web conferences, teleconferences, other electronic means of communications, and Face-to-Face meetings.

Reporting:

The group will report to CNS SG.

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Statement of Work

Task 1 Implementation Planning

Task Manager: David Leow and Amornrat Jirattigalachote

Project: SWIM Task Force	
Revision number: 04	**Approved:** Click here to enter a date.

Objective and scope of the project

- Maintain the Asia/Pacific regional roadmap for SWIM implementation.
- Track the work done by the SWIM Implementation ad-hoc Pioneer Group (SIPG) and update the regional roadmap.

Deliverables

- Maintenance of the Asia/Pacific regional roadmap until the SIPG completes the implementation of the Asia Pacific SWIM Technical Infrastructure.

Milestones

- The roadmap is updated according to the SIPG timelines.

Dependencies

- Dependencies with projects supervised by different SG (will be controlled by APANPIRG):
  - AAITF
  - MET/IE WG
  - ATFM SG
  - APA-CDM TF
- Dependencies with projects supervised by the SG (will be controlled by SG):
  - CRV OG
  - SURICG
- Dependencies between tasks in the project (will be controlled by the Task Force):
  - SIPG
- Other dependencies
  - IMP
  - TFP

Task participants

State/Organization	Name	Role/ Responsibility	Email	Phone
Thailand	Amornrat Jirattigalachote	Lead	amornrat.ji@aerothai.co.th	+66 2 287 8262
Singapore	David Leow	Lead	david_leow@caas.gov.sg	+65 812 6 9724
Sri Lanka/Airport & Aviation Services Limited	Asanga Senarath Bandara	Contributor	asanga.eane@airport.lk asangasenarath@gmail.com	+9476824 2654 +9411226 3619

State/Organization	Name	Role/ Responsibility	Email	Phone
Indonesia/ Directorate General of Civil Aviation	Maruli Tua Edison Saragih	Contributor	edisonsaragih@yahoo.com edisonsaragih.es@gmail.com m_t@dephub.go.id	+628129785067 +6281246569
Australia/ Airservices Australia	Tim Hailes	Contributor	Tim Hailes <tim.hailes@bom.gov.au>	
ICCAIA/ Frequentis	Harald Milchrahm	Contributor / Observer	harald.milchrahm@frequentis.com	+43 664 60850 3223
Thailand/ CAAT	Jakrin Kutantham	Contributor	jakrin.k@caat.or.th	+66 92 295 6174
Thailand/ CAAT	Papasarin Jirawiwatkul	Contributor	Papasrin.j@caat.or.th	
Thailand/ CAAT	Renuka Kunsakda	Contributor	renuka.k@caat.or.th	+66 0 86 550 5987
Thailand/Airport of Thailand PLC	Boosapa Tavichai	Contributor	boosapa@airportthai.co.th	66 95 952 8423
Thailand/ Airport of Thailand PLC	Paytye Junphuang	Contributor	paytye.j@airportthai.co.th	66 25352431
Fiji/ Fiji Met Service	Adil Ali	Contributor/Observer	adil.ali@met.gov.fj	+6796724 888
Thailand/TMD	Rassmee Damrongkietwattana	Contributor	rassmee@hotmail.com	+66 21340011 Ext 213
Thailand/TMD	Rungtiwa Ruechai	Contributor	rungtiwa_ruechai@yahoo.com	+66 21340007
Thailand/TMD	Aphinya Chitchaeng	Contributor	aphinya.tmd@gmail.com	+6621340 007
Thailand/TMD	Ms. Paweena Panikodom	Contributor	wpetsuwan@hotmail.com	+66 21340007
Thailand/TMD	Ms. Natthaporn Lertsamranpinit	Contributor	natthaporn.le@gmail.com	+66 23994596
China	Gao Honglei	Contributor	gaohonglei@atmb.net.cn	+8610877 86917

Working arrangements

☐ Face-to-face meetings

☒ Web conferences

☐ Needs an ICAO secured portal, name: Click here to enter text.

☒ Other: E-mail

Statement of Work

Task 2 Regional SWIM Infrastructure

Task Leader: ~~Yasushi Iwasawa~~Yosuke Moro, Xiaodong Lu, Henry Chan

Project: APAC SWIM Task Force	
Revision number: 03	**Approved:** Click here to enter a date.

Objective and scope of the project

- Define the high-level APAC SWIM Architecture including policies on implementation and distribution of SWIM services
- Define the requirements for the APAC SWIM Infrastructure with the goal of ensuring technical interoperability
- Outline policy to ensure backwards compatibility with non-SWIM capable entities
- Develop a roadmap for the implementation of APAC SWIM Infrastructure

Deliverables

- Develop APAC SWIM Architecture requirements and policy
  - Regional interoperability and connectivity
  - Common aeRonautical VPN (CRV) integration
  - Supporting Regional SWIM information services
  - SWIM mediation and backwards compatibility
  - APAC SWIM Architecture roadmap
- Develop APAC SWIM Infrastructure requirements
  - Messaging requirements
  - Security requirements
  - Technical Infrastructure Management requirements

Milestones

Indicate here the main milestones of the task or give a reference to a planning (Gantt chart etc)

- Milestone 1: Define a CRV-based APAC SWIM Architecture to ensure interoperability during the transition period (Related to the discussion of AMHS/SWIM Gateway Study Group)
- Milestone 2: Develop APAC SWIM Technical Infrastructure Profiles based on the related ICAO documents (Related to the discussion of IMP)
- Milestone 3: Propose an approach to implement secure APAC SWIM Infrastructure by cooperating with Task 3 Security Services (Related to the discussion of TFP and CYSECP)
- Milestone 4: Validate the APAC SWIM Infrastructure implementation via the joint demonstration with other task teams (Related to the discussion of ATMRPP)

Dependencies

Dependencies with projects supervised by different SG (will be controlled by APANPIRG):

- Manual on SWIM, SARPS, PANS and Guidance material from IMP, TFP, CYSECP, CP and ATMRPP

Dependencies with projects supervised by the SG (will be controlled by SG):

- Availability and capability of CRV implementation

Dependencies between tasks in the project (will be controlled by the Task Force):

- Task 3 – Security Services
  - Provide a trust framework for information services
- Task 5 – Governance
  - Integrate SWIM Governance requirements and policy
- Task 6 – Information Services
  - Support the implementation of SWIM Information Services
- Task 8 – SWIM Service and Application Validation
  - Get feedback for interoperability from SWIM Service and Application Validation

Task participants

State/Organization	Name	Role/Responsibility	Email	Phone
Japan	~~Yasushi Iwasawa~~Yosuke Moro	Co-Leader	~~iwasawa-y28j@mlit.go.jp~~ moro-y02vf@mlit.go.jp	+81-3-5253-8~~75~~111
Hongkong, China	Henry Chan	Co-Leader	hhlchan@cad.gov.hk	+852-2910-6574
Japan	Xiaodong Lu	Co-Leader	luxd@mpat.go.jp	+81-422-41-3528
Thailand	Amornrat Jirattigalachote	Member	amornrat.ji@aerothai.co.th	+66-2-287-8262
Thailand	Pipat Leawroongroj	Member	pipat.le@aerothai.co.th	+66-2-286-9252

Working arrangements

☒ Face to face meetings

☒ Web conferences

☐ Needs an ICAO secured portal, name: Click here to enter text.

☒ Other: Email

Statement of Work

Task – 3 Security Services

Task Manager: Jim Laymon (FAA); TBD

Project: APAC SWIM Task Force	
Revision number: 01	**Approved:** Click here to enter a date.

Objective and scope of the project

- Advises TF Chair and Task Leads in the area of cybersecurity for APAC. Specific objectives include:
    - Determining the scope of security responsibility of SWIM, consistent with SWIM technical infrastructures envisioned by the ICAO Information Management Panel (IMP) and the APAC regional network infrastructures, including the CRV.
    - Proposing a trust framework to ensure that the correct information is sent to the correct users, considering identity and access management initiatives (IAM) from member states.
    - Ensures interoperability of trust frameworks within the APAC region and with other ICAO regions.
    - Developing SWIM Cyber Security Architecture Framework and SWIM security strategy for the Asia-Pacific Region. Analyses and captures SWIM security risks.
    - Provide security guidelines and best practices to be incorporated in SWIM APAC Governance activities.

Deliverables

- APAC SWIM Security Scope and Context (Working Paper)
- APAC SWIM PKI Trust Framework (Working Paper)
- Cyber Security Architecture Framework for SWIM in ICAO Asia-Pacific Region (Final, working Paper)

Milestones

- Draft Cyber Security Architecture Framework for SWIM in ICAO Asia-Pacific Region by (TBD)
- Working paper on APAC SWIM Security Scope, due TBD
- Working paper on the trust framework for APAC SWIM, due TBD
    - Survey of IAM Initiatives relevant to APAC SWIM, due TBD
    - Development of framework, due TBD
- APAC Trust Interoperability Demonstration - Complete
- Cyber Security Architecture Framework for SWIM in ICAO Asia-Pacific Region (Final Version), TBD

Dependencies

Dependencies with projects supervised by different SG (will be controlled by APANPIRG):

- SARPS, PANS & Guidance material from the IMP & other relevant panels (ie, ATMRPP)
- Coordination with CRV OG

Dependencies with projects supervised by the SG (will be controlled by SG):

Dependencies between tasks in the project (will be controlled by the Task Force):

- SWIM Manual Vol. II- Implementation Guidelines provide SWIM Security Capability and Security Non-Functional Qualities requirements in 5.3 under Chapter 5-SWIM Technical Infrastructure (TI).
- Annex 17 – Security (tenth edition, April 2017), Doc 8973 Aviation Security Manual (9th edition, Oct.2014) and Doc 9985 ATM Security Manual (first edition, restricted, 2013) provide guidance for Cyber Security Architecture Framework of SWIM.
- Task 2 - Regional SWIM infrastructure
- Task 5 – Governance
- Task 6 – Information Services

Dependencies with projects at member states:

- SWIM Identity and Access Control projects

Task participants

State/Org-anization	Name	Role/Respon-sibility	Email	Phone
FAA	Jim Laymon	Task Lead	Jim.Laymon@faa.gov	(609) 485-6930
TBD	TBD	Task Lead	TBD	TBD
		Team Member		
…				

Working arrangements

☒ Face-to-face meetings

☒ Needs an ICAO-secured portal, name: SWIM Cyber Security

☒ Teleconference

☒ Other: Internet Cooperative Work

Statement of Work

Task 4 Technical Architecture

(Development and Maintenance of Regional Information Exchange Models)

Task Manager: Amornrat Jirattigalachote and Wen Zhu

Project: SWIM Task Force	
Revision number:03	**Approved:**Click here to enter a date.

Objective and scope of the project

- Support APANPIRG WG/TF regarding information exchange models and examine if any extension to the existing information exchange models, i.e. AIXM, FIXM, and IWXXM, and/or the new information exchange model(s) are required to support the Asia/Pacific regional operational requirements

Deliverables

- Support APANPIRG WG/TF regarding information exchange models
- Information exchange model gap identification, i.e. to examine if any extension to the existing information exchange models, i.e. AIXM, FIXM, and IWXXM, and/or the new information exchange model(s)are required for the Asia/Pacific operational use
- Strategy to maintain the artifacts required to support the regional development and maintenance of information exchange model(s) and the extensions
- Approaches for information exchange model interoperability within the region and with other aviation partners

Milestones

- Now – SWIM TF Dissolution
  - Review of operational requirements on data required to be exchanged to support the Asia/Pacific regional operations
  - Examine if the required data attribute(s) are currently available in the existing information exchange models
  - Develop and test the extension(s) and/or new information exchange model(s), if needed
- SWIM TF/5
  - The first version of strategy to maintain the artifacts required to support the regional development and maintenance of information exchange model(s) and the extensions

Dependencies

- Dependencies with projects supervised by different SG (will be controlled by APANPIRG):
  - ATFM SG
  - APA-CDM TF
  - MET/IE WG
- Dependencies with projects supervised by the SG (will be controlled by SG):
  - None
- Dependencies between tasks in the project (will be controlled by the Task Force):
  - Task 1 Implementation Planning

  - Task 2 SWIM Infrastructure
  - Task 5 Governance
  - Task 8 SWIM Services and Application Validation
  - Task 10 Regional Coordination and SWIM-related Information Sharing
- Other dependencies:
  - Information exchange model change control boards, e.g. FIXM Change Control Board (FIXM CCB)

Task participants:

State/Organization	Name	Role/Responsibility	Email	Phone
Thailand	Amornrat Jirattigalachote	Lead	amornrat.ji@aerothai.co.th	+66 2 287 8262
USA	Wen Zhu	Lead	wzhu@nira-inc.com	+1 (301) 452-8338
Thailand	Pipat Leawroongroj	Contributor	pipat.le@aerothai.co.th	+66 2 285 9252
Indonesia/ Directorate General of Civil Aviation	Maruli Tua Edison Saragih	Contributor	edisonsaragih@yahoo.com edisonsaragih.es@gmail.com m_t@dephub.go.id	+628129785067 +6281246569
Fiji/Fiji Met Service	Adil Ali	Contributor/Observer	adil.ali@met.gov.fj	+6796724888
Australia – Airservices Australia	Brent Flohr	Contributor	Brent.Flohr@AirservicesAustralia.com	+61738663263
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Working arrangements

☐Face-to-face meetings

☒ Webconferences

☐ Needs an ICAO-secured portal, name: Click here to enter text.

☒ Other: E-mail

Statement of Work

Task 5, SWIM Governance

Task Manager: Mark Kaplun (USA), TBD (ROK)

Project: SWIM Task Force	
Revision number: 02	**Approved:** Click here to enter a date.

Objectives

I. Establish a robust and sustainable Governance model to ensure that a common set of policies, rules, and standards for identifying, designing, implementing, discovering, and operating SWIM-enabling components is consistently applied and enforced throughout the APAC.
II. Develop or adopt standards, policies, and procedural guidelines to support the functional requirements for implementing all aspects of service-oriented development in the context of APAC SWIM.
III. Facilitate visibility and control for insight into all APAC SWIM-enabled services by supporting developments of flexible mechanisms for service discovery, including, but not limited to, service registries.

Deliverables

I. WP: APAC SWIM Service Discovery and Registry Interoperability Approach
II. WP: APAC SWIM Governance Policies: Status and Plans
III. WP: APAC SWIM Service Level Agreement (SLA): Template
IV. WP: SWIM Interoperability Assessment Matrix (SIAM): Template
V. IP: SWIM Metadata standards and taxonomies

Milestones

I. Operational deployment of SWIM Discovery Services (SDSs) produced by the FAA and KAC (March 2022)
II. Analysis and subsequent updates of SDS/registries network in APAC SWIM (August 2022)
III. APAC SWIM Governance Policies: Status and Plans (TBD)
IV. Release of SLA Template (June 2022)
V. Release of SIAM Template (July 2022)

Dependencies

Dependencies between tasks in the project (will be controlled by the Task Force):

- Task 2 – Technological solutions and architectural views to be utilized in support of APAC SWIM infrastructure
- Task 3 - Information and analysis about security solutions deployed in APAC regions
- Task 6 - Identified standards and technological approaches to be utilized for service validations

Task participants

State/Organization	Name	Role/ Responsibility	Email
Australia	Brent Flohr	Contributor	Brent.Flohr@AirservicesAustralia.com
USA	Mark Kaplun	Task Lead	mark.kaplun@faa.gov
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Japan	Yunkinoby Rye	Member	ryuu-y2ea@mlit.go.jp
China	Gao Honglei	Member	gaohonglei@atmb.net.cn
Japan	Xiaodong Lu	Member	luxd@mpat.go.jp

Working arrangements

☐ Face to face meetings

☒ Webconferences

☐ Needs an ICAO secured portal, name: Click here to enter text.

☐ Other: Click here to enter text.

Statement of Work

Task 6: Information Services

Task Manager: Marco Kok (Hong Kong, China), Jeremy Bienkowski (Australia)

Project: SWIM Task Force	
Revision number: 04	**Approved:** Click here to enter a date.

Objective and scope of the project

- To define the list of APAC Common SWIM Information Services based on operational needs in APAC
- To define the data catalog for APAC Common SWIM Information Services

Deliverables

- Develop the APAC Common SWIM Information Services and determine the priority of implementation for
  - APAC Common SWIM Aeronautical Information Services
  - APAC Common SWIM Flight Information Services
  - APAC Common SWIM MET Information Services
  - APAC Common SWIM Surveillance Information Services
- Develop the associated data catalog for APAC Common SWIM Information Services
- Document the above deliverables related to Information Services in "APAC SWIM Implementation Guidance Document"
- Provide input for the development of the sample use cases for inclusion in the "APAC SWIM Implementation Guidance Document" to demonstrate the operational benefits brought by the various SWIM information services within a State or between States.

Milestones

- Milestone 1: Present the results on the region-wide survey on APAC Common SWIM Information Services in SWIM TF/9 (May 2024)
- Milestone 2: Present the propose list of information to be exchanged via APAC Common SWIM Information Services, with the description of the business functionality, in SWIM TF/9 and seek comments (May 2024)
- Milestone 3: Seek comments from relevant groups (AAITF, ATFM SG, FF-ICE Ad-hoc group, MET/IE WG, SURSG, MET SG, AOP SG, and ATM SG) and subject matter experts on the proposed list of APAC Common SWIM Information Services updated by SWIM TF/9 (Jun 2024 to Apr 2025)
- Milestone 4: Revise the list of initial APAC Common SWIM Information Services and their data catalog based on feedback received from different contributory bodies and present it in SWIM TF/10 for further consideration (May 2025)

- Milestone 5: Monitor the global development of Information Service Definition (ISD) template for subject-matter-expert Panels, e.g. ATMRPP, METP, which is being progressed by IMP; and develop domain-specific ISDs for APAC Common SWIM Information Services according to the agreed priority of each service, with regional descriptions aligned with the global guidance (Nov 2025)

Dependencies

- Task Group #5 (Governance) – the work on interoperability of Registry and service discovery, which provides recommendations on the Information Service Overview.

Task participants

State/Organization	Name	Role / Responsibility	Email
Hong Kong China / HKO	Mr. Marco Kok	Co-Lead	mhkok@hko.gov.hk
Australia / Airservices Australia	Mr. Jeremy Bienkowski	Co-Lead	Jeremy.Bienkowski@AirservicesAustralia.com
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Thailand / TMD	Mr. Worapong Noothong	Contributor	pui-74@hotmail.com
Thailand / AEROTHAI	TBC	Contributor	TBC

Working arrangements

☐ Face to face meetings

☒ Webconferences

☐ Needs an ICAO secured portal, name: Click here to enter text.

☒ Other: emails

Statement of Work

Task 7 SWIM Demonstrations

Task Manager: David Leow (Singapore) and Amornrat Jirattigalachote (Thailand)

Project: SWIM Task Force	
Revision number: 1	**Approved:** Click here to enter a date.

Objective and scope of the project

- Track and observe SWIM demonstrations and trials within the Asia/Pacific region and ensure that reports of those demonstrations and trails are presented to the SWIM Task Force
- Provide, if requested, support for regional SWIM demonstrations
- Support trials and proof of concepts work as determined by the SIPG

Deliverables

- Reports from other SWIM demonstrations within the Asia/Pacific region
- Reports on SIPG trials and PoC activities

Milestones

- As needed: Reports from other SWIM demonstrations
- As needed: Reports from SIPG trials and PoCs

Dependencies

- Dependencies between tasks in the project (will be controlled by the Task Force):
  - All

Task participants

State/Org-anization	Name	Role/Respon-sibility	Email	Phone
Singapore	David Leow	Lead	david_leow@caas.gov.sg	+65 6595 6771
Thailand	Amornrat Jirattigalachote	Lead	amornrat.ji@aerothai.co.th	+66 2 287 8262
Hong Kong, China	Henry Chan	Leader	hhlchan@cad.gov.hk	+852-2910-6574

Working arrangements

☐ Face to face meetings

☒ Web conferences

☐ Needs an ICAO secured portal, name: Click here to enter text.

☒ Other: Click here to enter text.

Statement of Work

Task 8 SWIM Service and Application Validation

Task Leader: Yosuke Moro, Xiaodong Lu, Honglei Gao, Yong Jin Ha

Project: APAC SWIM Task Force	
Revision number: 03	**Approved:** Click here to enter a date.

Objective and scope of the project

- Construct a platform for SWIM service and application validation
- Support the implementation of SWIM service and applications
- Support the demonstration of SWIM based operations

Deliverables

- Develop validation requirements for APAC SWIM Infrastructure services
  - Interface Management
  - Messaging
  - Security
- Define and validate the required SWIM services and applications for supporting different operation levels under mixed-mode environment
  - SWIM based information sharing (ATFM, A-CDM and etc.)
  - FF-ICE/R1 operation
  - FF-ICE/R2 operation
  - Trajectory Based Operations
- Develop a common platform for SWIM service and application validation
  - Test system for FIXM, AIXM, and IWXXM message exchange
  - Technical support for regional validation and demonstration

Milestones

Indicate here the main milestones of the task or give a reference to a planning (Gantt chart etc)

- Milestone 1: ~2019.12 Construct a platform for SWIM service and application validation
- Milestone 2: ~2020.11 Conduct a demonstration for FF-ICE/R1 service validation
- Milestone 3: ~2023.12 Develop validation requirements for Regional SWIM Infrastructure
- Milestone 4: Validate the Regional SWIM Infrastructure with Security Services via the joint demonstration
- Milestone 5: Validate the required SWIM services and applications for different operation levels via the APAC TBO Pathfinder Project

Dependencies

Dependencies with projects supervised by different SG (will be controlled by APANPIRG):

- Manual on SWIM, SARPS, PANS and Guidance material from IMP, TFP, CYSECP, CP and ATMRPP

Dependencies with projects supervised by the SG (will be controlled by SG):

- The status of SWIM TI implementation in APAC Region

Dependencies between tasks in the project (will be controlled by the Task Force):

- Task 2 – Regional SWIM Infrastructure, Task 3 – Security Services
  - Provide a platform for SWIM-based operations
- Task 5 – Governance
  - Integrate SWIM Governance requirements and policy
- Task 6 – Information Services
  - Support the validation of SWIM Information Services

Task participants

State/Organization	Name	Role/Responsibility	Email	Phone
Japan	Yosuke Moro	Co-Leader	moro-y02vf@mlit.go.jp	+81-3-5253-8111
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China	Hongming Ren	Member	renhongming@atmb.net.cn	+86-010-84247276
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ROK	Younghoon Kim	Member	yh89@airport.co.kr	+82-2-2660-2878
PCCW Global	Bono Ng	Member	bcng@pccwglobal.com	+85-2-3419-2103

Working arrangements

☒ Face to face meetings

☒ Web conferences

☐ Needs an ICAO secured portal, name: Click here to enter text.

☒ Other: Email

Statement of Work

Task 9 Monitoring of Panel work

Task Manager: Yosuke Moro

Project: SWIM Task Force	
Revision number: 02	**Approved:** Click here to enter a date.

Objective and scope of the project

- Monitor developments by IMP and escalate issues/inputs as required

Deliverables

- Monitor developments by the IMP and escalate issues as required
- Periodic updates to IMP from SWIM Task Force work plan

Milestones

Indicate here the main milestones of the task or give a reference to a planning (Gantt chart etc)

- Milestone 1: IMP/3 September 30 to October 4, 2024, in Montreal
- Milestone 2: IMP/WG/13, 15 to 19 September 2025 in Montreal
- Milestone 3: IMP/4, 20 to 24 April 2026, TBD

Dependencies

- ATM SG
- ATFM SG
- CNS SG
- MET SG

Task participants

State/Org-anization	Name	Role/Respon-sibility	Email	Phone
Japan	Yosuke Moro	Task manager	moro-y02vf@mlit.go.jp	+81-3-5253-8111

Working arrangements

☐ Face to face meetings

☐ Needs an ICAO secured portal, name: Click here to enter text.

☐ Other: Click here to enter text.

Statement of Work

Task 10 : REGIONAL COORDINATION AND SWIM-RELATED INFORMATION SHARING

Task Manager: John Moore

Project: SWIM Task Force	
Revision number: 2.0	**Approved:** Click here to enter a date.

Objective and scope of the project

- Monitor identified SWIM-related activities being undertaken in Asia & Pacific Region outside of the ongoing direct SWIM discussions and initiatives
- Liaise with relevant regional TF/WGs to refine operational and communications requirements, provide guidance to those WG/TFs developing and using SWIM, and influence outcomes from other WGs and TFs that will support successful expansion of SWIM

Deliverables

- Identify and monitor SWIM related activities (and their interdependencies) in planning or development within other Working Groups (WGs) and Task Forces (TFs).
- Update other groups on the activities of the SWIM TF
- Update SWIM TF on the activities of other groups outside of the direct activities of the SWIM TF or related groups

Milestones

- Updates where relevant at other WG/TF meetings and a Working Paper update at each SWIM TF meeting
- Updates (WP/IP) to APANPIRG WG/TF as needed

Dependencies

- All relevant WGs, TFs or initiatives unrelated to ICAO group activities (eg: CANSO, OEM or individual State activities)

Task participants

State/Org-anization	Name	Role/Respon-sibility	Email	Phone
IATA	John Moore	Task Lead	moorej@iata.org	

Working arrangements

☐ Face to face meetings

☐ Needs an ICAO secured portal, name: Click here to enter text.

☒ Other: Web meetings and Phone Calls

Statement of Work

Task 11 - SWIM Implementation Education and Promotion

Task Manager: Thomas Green

Project: APAC SWIM Task Force	
Revision number: V1	**Approved:** Click here to enter a date.

Objective and scope of the project

- Creation of an educational and promotional program needed to support SWIM implementation, operations, and facilitate cooperation among stakeholders within the region.
- Collaboration with other APAC SWIM TF task to ensure cohesiveness between the guidance materials and educational material deliverable from the APAC SWIM TF.
- Management, organization, and dissemination of all APAC SWIM educational material
- Creation of an APAC SWIM education and promotional catalog

Deliverables

- APAC Region SWIM Educational and Promotional Roadmap
- APAC Regional SWIM Brochure
- APAC Regional SWIM Symposium
- APAC SWIM Regional Outreach Plan
- APAC SWIM Education and Promotional Catalog

Milestones

Task Number	Activity	Estimated Date of Completion
1	Creation of Draft APAC SWIM Brochure	TBD
2	Draft 3 year SWIM Education and Promotional roadmap	September 10, 2021
3	Confirm date for APAC SWIM Regional Symposium	TBD
4	Complete Draft APAC SWIM Regional Outreach Plan	TBD
5	Complete Draft of APAC SWIM Education and Promotional Catalog	TBD

Dependencies

- ICAO Doc 10039 - Manual on SWIM Concept
- SWIM Manual and Technical Guidance Material
- Guidance Materials issued via the various APAC SWIM TF Task

Task Participants

State/Org-anization	Name	Role/Respon-sibility	Email	Phone
LST	Thomas Green	Task Lead	Thomas.green@lstechllc.com	
AEROTHAI	Jittima Asawachaiporn	Participant	jittima214@gmail.com	

Working arrangements

☐ Face to face meetings

☐ Needs an ICAO secured portal, name: Click here to enter text.

☐ Other: Click here to enter text.

SWIM TF Work Plan

Project Group	Old Task number	Old Task Description	New Task No	New Task Description	Objective and scope	Task Lead(s)	Planned Start	Planned completion	Dependencies	Guidance for SOW
Implementation Planning	1-1	Benchmarking of best practices	**1**	Regional implementation philosophy & roadmap	Develop and maintain the Asia/Pacific regional roadmap for SWIM implementation, including SWIM technical infrastructure, SWIM governance, aeronautical information service, flight information service, and weather information service	David Leow (Singapore) Dr. Amornrat Jirattigalachote (Thailand)	2017	2018	SWIM Task Force created, resources available Panels deliver as expected Task 1.7 (common vocabulary)	benchmark existing governance models (FAA, Europe), existing catalogues, existing arrangements for quality of service/SLA (availability/reliability), existing registries if any Benchmark mediation of legacy users Benchmark available existing SWIM and industry models for service descriptions ICCAIA IP13 to be included
		Guidance To States: Interregional workshop Develop SWIM implementation Guidance for phase 1 Develop SWIM implementation Guidance for phase 2 (dual operations) Regional workshops					2017 2017 2017 2019 As needed	2022 2017 2018 2020	SWIM iKit (if confirmed by IMP)	From the task 1-3 APANPIRG WG/TF planning to use or using SWIM may need guidance (ad hoc basis) Guidance to States Mediation of legacy users Lessons learnt from ASEAN SWIM demonstration
		Guidance for publishers/consumers;					2017	2018	Task 1.1 Task 1-5 and 1-6 Task 1-4 (service descriptions)	Common vocabulary requirement on publishers and suscribers to use the common controlled vocabulary Should include developing a guide for the preparation of service descriptions (dependency = 1.4) Could include guidance for developers/publishers on a set of protocols/formats to use See WP/5 appendices b and c for FAA guidance Analyse which guidnace is necessary from IP/6 and WP/6
	1-2	SWIM Regional roadmap					2019	2022	SWIM Manual 10039 and Technical Manual	Roadmap needs to be updated to reflect the changes and developments that have occured in the last SWIM TF meetings. It needs to be more granular and help direct the work of the other task groups for APAC regional SWIM implementation. To decide and agree on the target architecture for APAC SWIM that will address all the members' concerns
							2022	2024	New implementation Roadmap	1st Set the timeframe for implementation 2nd Discuss with the TF and decide on the elements for impelementation 3rd Develop new roadmap for SWIM implementation.
SWIM infrastructure	1-8	Regional SWIM Architecture	**2**	Regional SWIM infrastructure	• Define the high-level APAC SWIM Architecture including policies on implementation and distribution of SWIM services • Define the requirements for the APAC SWIM Infrastructure with the goal of ensuring technical interoperability • Outline policy to ensure backwards compatibility with non-SWIM capable entities • Develop a roadmap for the implementation of APAC SWIM Infrastructure	Mr. Xiaodong Lu (Japan) Mr. Yukinobu Ryu (Japan) Mr. Henry Chan (Hong Kong, China)	2017 2021	2020 2023	• Manual on SWIM, SARPS, PANS and Guidance material from IMP, CP or ATMRPP • Availability and capability of CRV implementation • Task 5 – Governance • Task 6 – Information Services • Task 8 – SWIM Service and Application Validation	Define a CRV-based APAC SWIM Architecture to assure interoperability during the transition period Develop APAC SWIM Infrastructure requirements based on the related ICAO documents Propose an approach to implement secure APAC SWIM Infrastructure by cooperating with Task 3 Security Services
	New	NA	**3**	Security service	• Advises TF Chair and Task Leads in the area of cybersecurity for APAC. Specific objectives include: • Determining the scope of security responsibility of SWIM, consistent with SWIM technical infrastructures envisioned by the ICAO Information Management Panel (IMP) and the APAC regional network infrastructures including the CRV. • Proposing a trust framework to ensure that the correct information is sent to the correct users, considering identity and access management initiatives (IAM) from member states. • Ensures interoperability of trust frameworks within APAC region and with other ICAO regions. • Developing SWIM Cyber Security Architecture Framework and SWIM security strategy for the Asia-Pacific Region. Analyses and capture SWIM security risks. • Provide security guidelines and best practices to be incorporated in SWIM APAC Governance activities.	Mr. Jim Laymon (USA)	2023	2025	ICAO 2022 approval of: 1. X.509 Certificate Policy for the International Aviation Trust Framework (IATF) Certification Authority 2. IATF CP Criteria and Methodology for Cross Certification Identity Management 3. IATF CP Life Cycle Management (CPLCM) Operating Rules, 4. International Aviation Trust Framework Bylaws 5. IATF Criteria and Methodology for Global Resilient Aviation Interoperable Network (GRAIN)	Objective: Proposing a trust framework to ensure that the correct information is sent to the correct users, considering identity and access management initiatives (IAM) from member states. Proposed Guidance: APAC establishment of a Regional SWIM PKI Policy Management Authority in alignment with ICAO IATF SARPS Objective: Ensures interoperability of trust frameworks within APAC region and with other ICAO regions. Proposed Guidance: APAC establishment of a Regional SWIM DT&E environment to conduct Interoperability testing with US FAA, EUROCONTROL and other Regional ANSPs. (MRTBO example) Objective: Developing SWIM Cyber Security Architecture Framework and SWIM security strategy for the Asia-Pacific Region. Analyses and capture SWIM security risks. Provide security guidelines and best practices to be incorporated in SWIM APAC Governance activities Proposed Guidance: FAA provide Technical interchange of SWIM IAM Phase 2 and SWIM IAM segment 3 planned investments that align with ICAO IATF requirements to include establishment of the FAA PKI Policy Management Authority to assist APAC development of SWIM Cyber Security Architecture Framework and PKI use governance.

Project Group	Old Task number	Old Task Description	New Task No	New Task Description	Objective and scope	Task Lead(s)	Planned Start	Planned completion	Dependencies	Guidance for SOW
Technical Architecture	1-6	Regional SWIM models	**4**	Development and maintenance of regional information exchange models	Support APANPIRG WG/TF regarding information exchange models and examine if any extension to the existing information exchange models, i.e. AIXM, FIXM, and IWXXM, and/or the new information exchange model(s) are required to support the Asia/Pacific regional operational requirements	Dr. Amornrat Jirattigalachote (Thailand) Mr. Wen Zhu (USA)	2016	~~2017~~ TBD (Regional Extension will need to be maintained/updated to accommodate (i) new operational use cases and (ii) the release of new version of information exchange model(s))	Global model definitions available	~~From the task 1-3 models may need extension /refinements - there is already a case for ATFM~~ ~~Interaction with "light" approach discussed by IMP, coordination with 1-7~~ ~~Relation with CCB - coordination with task 1-4~~ Regional Extension may need refinement - There is already a case for ATFM and ATFM/A-CDM integration; Interaction with "light" approach discussed by IMP - Coordiantion with Task 9 Relation with CCB - Coordination with Task 5
Governance	1-4	SWIM governance	**5**	Regional SWIM Governance Framework	I. Establish a robust and sustainable Governance model to ensure that a common set of policies, rules, and standards for identifying, designing, implementing, discovering, and operating SWIM-enabling components is consistently applied and enforced throughout the APAC. II. Develop or adopt standards, policies, and procedural guidelines to support the functional requirements for implementing all aspects of service-oriented development in the context of APAC SWIM. III. Facilitate visibility and control for insight into all APAC SWIM-enabled services by supporting developments of flexible mechanisms for service discovery, including, but not limited to, service registries.	Mr. Dongkie Park (ROK) Mr. Mark Kaplun (USA), Mr. Yukinobu Ryu (Japan) Mr. Xiaodong Lu (Japan), Ms. Honglei Gao (China)	2016	TBD (Note: SWIM Governance will be implemented throughout the SWIM lifecycle.)	I. Procedures for Air Navigation Services (PANS) Information Management (IM), Volume I System Wide Information Management II. Manual on System Wide Information Management (SWIM), Doc 10039, VOLUME I: SWIM Concept III. SWIM Discovery Service Implementation Specfication Service Description Conceptual Model (SDCM) IV. APAC SWIM Roadmap	I. Effective governance will result in more consistent decision-making and reduce risk and uncertainty. II. Identify new areas for policy development based on collected input and present them to the APAC SWIM TF. III. Further update the SDS solution to reflect user experience, lessons learned, and emerging technological solutions. IV. Facilitate ongoing engagement with SDS implementers through regular feedback and reviews. V. Concentrate on what really needs to be delivered to SWIM consumers. VI. Ensure that consumers' and providers' needs are met by developing a comprehensive SLA-management solution that can be adapted to multiple states' SWIM deployment scenarios.
	1-5	Design Regional SWIM Registry and architecture for phase 2								
	2-1-2 2-1-4	Implement SWIM registry and architecture Guidance and Requirements for Publishers and Consumers								
Information Services	2-1-2	Promote new needs and new services and maintain database of publishers (ID/access points/services/interface/format..) pending registry implementation	**6**	Information services	To develop and define the APAC version of the SWIM information service overview specifications and APAC version of data catalogue for information services based on operational needs in APAC.	Mr. Marco Kok (Hong Kong, China)	2017	2023	Dependent on new use cases and operational needs identiifed in APAC.	•Develop the APAC version of the required and optional information services for ANSP to prioritize the implementation of services •Develop the APAC version of data catalogue for information services •Identify any additional optional fields required for SWIM service overviews in APAC in addition to those as defined in PANS-IM
Validation & Demonstration	~~1/2/2001~~	~~Promote new needs and new services and maintain database of publishers (ID/access points/services/interface/format..) pending registry implementation~~	**7**	SWIM Demonstration	• Report on the SWIM in ASEAN demonstration, particularly the lessons learnt • Track and observe SWIM demonstrations and trials within the Asia/Pacific region and ensure that reports of those demonstrations and trails are presented to the SWIM Task Force • Provide, if requested, support for regional SWIM demonstrations	Mr. David Leow (Singapore) Dr. Amornrat Jirattigalachote (Thailand)	2017	2019		An "Excel" file? Include service descirptions etc Assume registry services can be available on CRV from 2019 onwards 70 FAA applications are available for use and should be referenced in the catalogue
	2-2-1	SWIM generalization					2021	TBD (Depening on the demonstration/trial to be conducted in APAC)	Demonstration/Trial to be conducted within APAC	
	2-1-3	Support validation and publication of SWIM based applications	**8**	SWIM services and application validation	• Construct a platform for SWIM service and application validation • Support the implementation of SWIM service and applications • Support the demonstration of SWIM based operations	Mr. Yukinobu Ryu (Japan) Mr. Xiaodong Lu (Japan) Ms. Honglei Gao (China) Mr. Dongkie Park (ROK)	2017 2020	2019 2023	• Manual on SWIM, SARPS, PANS and Guidance material from IMP, CP or ATMRPP • The status of SWIM TI implementation in APAC Region • Task 2 – Regional SWIM Infrastructure • Task 3 – Security Services • Task 5 – Governance • Task 6 – Information Services	Support the validation of FF-ICE/R1 service Develop validation requirements for Regional SWIM Infrastructure Support the validation of Regional SWIM Infrastructure with Security Services via the joint demonstration Support the validation of required SWIM services and applications for different operation levels
	1-7	Monitoring of panels work	**9**	Monitoring of panels work	Monitor developments by IMP and escalate issues/inputs as required	Mr. Yukinobu Ryu (Japan)	2016	2022	SWIM Manual and Technical Manual	Escalate issues to the panels Report back from panels 2 IMP meetings per year, monthly conferences A need for a Discussion paper at IMP (deliverable of the task) Focal point for common controlled vocabulary, in coordination with 1-4 Version management should be coordinated regarding backward compatibility and the content of models (FIXm, AIXM) Focal pint to trigger change requests to the models

Project Group	Old Task number	Old Task Description	New Task No	New Task Description	Objective and scope	Task Lead(s)	Planned Start	Planned completion	Dependencies	Guidance for SOW
Coordination and Promotion	1-3	Regional coordination within APAC and guidance and training to APANPIRG bodies	**10**	Regional coordination and SWIM-related information sharing	• Identify SWIM related activities (and their interdependencies) in planning or development within other WGs and TFs. • Liaise with relevant regional TF/WG to refine operational and communications requirements (ATFM SG, MET IE, AAITF, ACSICG, CRV OG, etc). • Provide guidance to APANPIRG WG/TF using SWIM. • Influence outcomes from other WGs and TFs that will support successful expansion of SWIM (eg: development of SWIM compatible CRV). • This involves confirming inclusion on agendas and appropriate discussions ensuing	Vacant	2016	2022	SWIM Manual and Technical Manual Guidance on IWXXM	Use APANPIRG organizational chart Revise on an annual basis Establish simple "MOU" between concerned APANPIRG bodies
		Guidance and training to APANPIRG WG/TF : - Provide guidance to APANPIRG WG/TF using SWIM					2017 2017 2017 2019 As needed	2022 2017 2018 2020	SWIM iKit (if confirmed by IMP)	From the task 1-3 APANPIRG WG/TF planning to use or using SWIM may need guidance (ad hoc basis) Guidance to States Mediation of legacy users Lessons learnt from ASEAN SWIM demonstration
	New	NA	**11**	SWIM implementation education and promotion (New task)	● Creation of an educational and promotional program needed to support SWIM implementation, operations, and facilitate cooperation among stakeholders within the region. ● Collaboration with other APAC SWIM TF task to ensure cohesiveness between the guidance materials and educational material deliverable from the APAC SWIM TF. ● Management, organization, and dissemination of all APAC SWIM educational material ● Creation of an APAC SWIM education and promotional catalog	Mr. Thomas Green (USA)	2022	TBD (See dependancies)	Completion of this task is reliant on the work completed in Task 1-10. As the task are completed and guidance is created, the catelog can be populated.	

Action ID	Task No	Reference	Who	What	Due date	Status
1-1		2.2.1 & 2.2.2	~~Jeri Groce (Chair)~~, Task 1, Secretariat	Introduce the mediation principle in the design of the SWIM transition	TBD	Open
1-2		1.1	All	Confirm their interest in ASEAN SWIM demonstration	30-Apr-2018	Completed
1-3		1.7 & 2.1.1	Yukinobu Ryu-san, (David Almeida)	Confirm terms used to designate the APAC SWIM "catalogue" are in compliance per controlled vocabulary	8-May-2018	Completed
1-4		Thomas Green	Le Thi Phuong, (David Almeida)	Contribute to Task 1-1 regarding the benchmarking of quality and verification process, Service Level Agreements (SLA)	TBD	Closed
1-5		New conversation	Jiseok Kang	Define the minimum set of information and basic function of APAC SWIM registry	30-Nov-2018	Completed
1-6	3;5	1.4	Mark Kaplun ~~and David Wills~~ Task 3 Lead (SWIM TF/6)	Embark requirements laid out in ICAO provisions and FAA best practices and other practices as available to define the SWIM security governance	4/30/2019 SWIM TF/11	Open
1-7	1	1.1	David Almeida and Edward Curtis	Introduce lessons learnt from ICCAIA in the benchmark	27-May-2018	Completed
1-8	8	2.1.3	Xiaodong Lu	Plan a large scale tabletop exercise and message exchange demonstration in the mid-term (2019 or 2020)	30-Nov-2018	Closed
1-9		Work Plan	Jeri Groce	Consolidate the SOW and update the work plan accordingly	22-May-2017	Completed
1-10		Work Plan	Frederic Lecat	Create a SWIM TF space under ICAO secure portal		Closed
1-11		1.2	Amo, Stuart Wilson, David Almeida	Define the purpose of scope of "Outreach to Aviation Partners" deliverable	5-Oct-2017	Completed
1-12	1	1.2 & 2.1.1	Amo, David Leow, Marco Kok	Align interdepedencies between Task 1.2 and 2.1.1.	30-Apr-2018	Completed
1-13		1.5	Jiseok Kang	Develop Working Paper for APAC SWIM registry approach	31-Dec-2018	Completed
1-14		1.1	Ryu-San, David Leow, and David Almeida	Need to create a WP for presentation to the IMP, letting them know which artifacts the APAC TF is dependent on, and by what date we need the artifacts by.	1-Nov-2017	Closed
1-15		Work Plan	Frederic Lecat	Send out ICAO Regional Martial out to team	1-Nov-2017	Closed
1-16	1	1.2	Marco Kok, and John Moore	Develop plan for development of a data catalog for Aeronautical, Flight, and Weather data	30-Nov-2018	Closed
1-17		1.1 & 1.4	Stuart Wilson, and Mark Kaplun	Need to coordinate development of SWIM Governance Framework for coordination between Task 1.1 and Task 1.4	30-Jan-2018	Closed

Action ID	Task No	Reference	Who	What	Due date	Status
1-18		Work Plan	Mark Kaplun	Coordinate with Stephan Dubet who is developing the ICAO IMP SWIM Governance document		Closed
1-19		1.5	David Leow	Provide detailed Task 1.5 SOW to Stuart	10-Jan-2018	Completed
1-20		1.4	Mark Kaplun	Provide Goverernence and Registry lessons learned out to Task 1.5	30-Jan-2018	Completed
1-21		1.6	Frederic Lecat	Send ED-133 documentation to Amo and Amo to take this into consideration for requirements development for Task 1.6		Closed
1-22		1.8	Jeri Groce	Determine who will be the leader of Architecture Task (Task 1.8)		Closed
1-23		Work Plan	Stuart Wilson	Coordinate possible dates for next meeting and send out a poll.		Closed
1-24		Action Item 1-16	APAC Task Force Leadership	APAC Task Force Leadership to support Marco Kok, and John More on Action Item 1-16.	9-Apr-2018	Closed
1-25		1.8	Yunkinobu Ryu	Provide proposal on structure of Task 1.8 by the end of January.	30-Jan-2018	Closed
2-1		2.1.3	Yunkinobu Ryu, Xiaodong Lu, Gao Honglei, Jiseok Kang	Plan Regional message exchange demonstration	30-Nov-2018	Closed
2-3	1	1.1	David Almeida, Thomas Green	Establish contact with any SWIM-related working groups in other ICAO Regions	30-Apr-2019	Closed
2-4	1	1.1	David Almeida, Thomas Green	Make recommendations on the APAC Region applicability of items in SWIM TF/2 WP/4	30-Apr-2019	Closed
2-5	10	1.3	John Moore	Coordinate SWIM TF and MET IE/WG outcomes and activities This action is really about broader coordination of SWIM activities in APAC (not solely MET) and raising awareness of the work of the SWIM Task Force.	31-Dec-2019	Closed
2-6	10	1.3	John Moore More appropriate lead would be Amo or David Leow as the leads of the demonstration.	Coordinate minutes of SWIM in ASEAN Demonstration with SWIM TF	30-Nov-2018	Closed
2-7	5	1.4	David Willis, Mark Kaplun; Xiaodong Lu	Examine CRV OG to determine what structure may be used to form an APAC Regional SWIM Governance Review Board	Closed in SWIM TF/5	Closed
2-8	5	1.4	David Willis, Mark Kaplun	SWIM in ASEAN Demonstration participant Administrations to share any lessons learned or other insights relating to SWIM governance	30-Nov-2019	Closed
2-9		1.4	David Willis, Mark Kaplun	Develop a draft APAC Governance Framework		Closed
2-10		1.6	Amornrat Jirattigalochote	Coordinate SWIM in ASEAN Demonstration findings on A-CDM data attributes with APA-CDM/TF		Closed
2-11	2	1.8	Yunkinobu Ryu, Xiaodong Lu	Investigate the role of CRV in APAC SWIM and make recommendations on how APAC SWIM will interconnect with the CRV	30-Apr-2019	Closed
2-12		2.1.1	Marco Mang Hin Kok	Re-Draft SWIM survey, together with educational material to also inform survey participants on SWIM	30-Apr-2019	Closed
2-14	1	1.1	~~David Almeida,~~ Thomas Green (Thomas left),	Develop an APAC SWIM education implementation plan and high level education materials	SWIM TF/6 SWIM TF/7 SWIM TF/9 SWIM TF/10 SWIM TF/11	Open

Action ID	Task No	Reference	Who	What	Due date	Status
2-15			All	Commence drafting an APAC Regional SWIM Implementation guidance document		Closed
2-16		Action Item 2-8	John Moore	Confirm the dates of the ASEAN SWIM Demo with David Leow and Amo		Closed
2-17		Action Item 2-15	Shane Sumner	Discuss the due date for the APAC Regional SWIM Implementation Guidance document and report back to the group		Closed
2-18		Action Item 2-15	Secretariat and David Almeida	Create a skeleton structure of APAC Regional SWIM Implementation guidance document		Closed
2-19		Action Item 2-14	All	All states are encouraged to provide more SWIM education materials		Closed
2-20	5	1.4	Wen Zhu, Mark Kaplun, David Leow, and David Almeida	Discuss and draft a proposal to the chair and try to get clarification on deliverables 1.4		Closed
2-21	2	1.8	David Leow and Amornrat Jirattigalochote	Provide all ASEAN SWIM Demo lessons learned and each subtask can absorb the lessons applicable to that group.	30-Nov-2019	Closed
2-22	5	2.1.4	Xiaodong Lu	Send an email to **Jiseok Kang** and Shane Sumner to resolve the discussion if task 2.1.4 should be included in the SWIM Registry/Architecture task		Closed
2-23			Jay Zimmer	follow up with Shane Sumner to coordinate how APAC TF can interface with the CRV during Plenary 3. Need CRV points of contact to get on the agenda and brief out as well as attend this meeting		Closed
3-1			Task leads	The Task Leads will address the APAC SWIM Implementation Materials Table of Contents of the at the next quarterly Task Force Lead Teleconference and provide input of supplementary materials by SWIM TF/4	30-Apr-2020	Closed
3-2	2;3	1.3	Wen Zhu	Set up dedicated working group to covers other areas of cybersecurity	30-Apr-2020	Closed
3-3	4	1.6	Amornrat Jirattigalochote	The APAC SWIM FIXM Extension be forwarded to the FIXM Change Control Board (CCB) for validation and publication on the FIXM official website	30-Apr-2020	Closed
3-4	9	1.7	Task Force members	SWIMTF members to submit comments to Japanese IMP member,Yukinobu Ryu	20-May-2019	Closed
			Tasf Force members	SWIMTF to review Table of Contents for APAC SWIM Eductation programme (Appendix F to the SWIMTF/3 meeting report)	30-Jun-2019	Closed
4-1	1,10	Task 1&10	Secretariat	Enhance communication with ICAO EUR/NAT Office on SWIM PT activities	On-Going	Closed
4-2	7		Task Leads	Further exploit and deliberate the outcomes of SWIM in ASEAN Demonstration to benefit States/Administration	SWIM TF/6 SWIM TF/7	Closed
4-4			Task Leads of Task 2, Task 5 and Task 6	To join the sudy group proposed by SURICG to explore the initiative on surveillance data sharing over SWIM	SWIM TF/5	Closed
4-5			TF chair and Task Leads	Review the ToR and consolidate the action items in this list	SWIM TF/5	Completed
4-6			Amornrat Jirattigalochote, Secretariat	Plan another SWIM workshop	1st TL meeting in 2021	Closed
4-7			TF chair and Task Leads	Follow up the Task 3 and Task 11	1st TL meeting in 2021	Closed
4-8	9	Task 9	Yukinobu Ryu, Secretariat	List of SWIM relevant ICAO Panels and representatives from APAC	Need to provide list before removing from Action Items List provided	Closed
4-9	10	Task 10	John Moore, Secretariat	List of SWIM relevant meetings in APAC	SWIM TF/6	Closed
4-10	11	Task 11	Task Leads, Secretariat	Seek information on SWIM education and promotion for consolidation by Task 10.		Closed
4-11	11	Task 11	Task Leads, Secretariat	Share SWIM related material for future compilation of the APAC SWIM Implementation Materials	SWIM TF/6 SWIM TF/7	Closed

Action ID	Task No	Reference	Who	What	Due date	Status
4-13	2	Task 2	Task 2 Group	Develop APAC SWIM TI Profile	SWIM TF/6 SWIM TF/7 SWIM TF/8 SWIM TF/10	Completed
5-1	Task 2, Task 5, 4,6 and Task 7	NA	Task Leads of Task 2, Task 5, Task 4 and Task 6, SURSG, **S3TIG**	Start study of surveillance data being carried via SWIM on CRV; Study to include exploration of updated exchange model	SWIM TF/6 SWIM TF/7 **SWIM TF/9** **SWIM TF/10**	Closed
5-2	Task 7	NA	Task 7 TLs, Secretariat	Conduct SWIM over CRV demo; Present lesson learned and findings to the group	SWIM TF/6 SWIM TF/7 SWIM TF/9 SWIM TF/10	Completed

Action ID	Task No	Reference	Who	What	Due date	Status	Comment	Additional Notes
4-3	3,5	Task 3&5	Task Governance and Task Security Management	Further cooperation on the security and trust in the context of SWIM service discovery		**Ongoing**	**SWIM TF/5**- As ongoing, need to remove from Action List and will manage by Secretariat	Wen and Jim to cordinate on this action (6/29)
4-12			Task Leads, Secretariat	Monitor GUFI issue and share reference materials in using GUFI	On-Going	**Ongoing**	Besides ICAO DOC 9965, EUROCAE ED-133 is good information. FAA will share its guidance to APAC.	Kristin to reach out to Diana Liang for materials on this subject

Asia and Pacific Ministerial Declaration on Civil Aviation (Delhi)

1) We, the Ministers from the Asia and Pacific States responsible for Civil Aviation, met in New Delhi, India, from 11-12 September 2024, on the occasion of the 2nd Asia Pacific Ministerial Conference on Civil Aviation and the 80th anniversary of the Convention on International Civil Aviation (Chicago Convention), organized by the International Civil Aviation Organization (ICAO), to reaffirm the obligations as the Contracting States to the Chicago Convention signed on 7 December 1944 to ensure the safety, security, efficiency and continuity of civil aviation;

2) Recalling that Ministers met at the 1st Asia Pacific Ministerial Conference on Civil Aviation in Beijing, China, from 31 January to 1 February 2018, and endorsed a landmark declaration (Beijing Declaration) underpinning the importance of air transportation for social and economic development and the shared commitments and vision of Asia and Pacific Ministers to build Regional momentum to realize the implementation of Aviation Safety priorities and targets and Asia/Pacific Seamless Air Traffic Management (ATM) Plan (now renamed as the Asia/Pacific Seamless Air Navigation Service (ANS) Plan) with the collaboration of States/Administrations and active participation of the aviation industry;

3) Acknowledging the extraordinary circumstances during COVID-19 pandemic which impeded States/Administrations from effectively implementing the Beijing Declaration commitments while noting updated safety and air navigation targets have emerged to better support States/Administrations in the Asia and Pacific Region;

4) Recognizing that the recovery of air transportation is progressing and that passenger and freight demand in the Asia and Pacific Region is forecast to regain higher growth rates requiring a concerted effort of States/Administrations and the aviation industry to meet the increasing demand while enabling a safe, secure, efficient and a more resilient aviation sector, and minimizing the adverse effects of international civil aviation on the global climate, which supports the realization of United Nations 2030 Agenda for Sustainable Development;

5) Identifying that key priorities exist in the Asia and Pacific Region requiring collaboration and that States/Administrations need to develop capabilities to improve safety, security and building of additional capacity to address emerging Regional and global challenges to sustain the Regional civil aviation growth forecast;

6) Noting that over half of the States/Administrations in the Asia and Pacific Region which have had an ICAO audit under the Universal Safety Oversight Audit Programme – Continuous Monitoring Approach (USOAP – CMA) have an effective implementation (EI) of the critical elements (CEs) of a State safety oversight system lower than the global average;

7) Noting that over half of the States/Administrations in the Asia and Pacific Region which have had an ICAO audit under the Universal Security Audit Programme (USAP) have an EI of the CEs of a State aviation security oversight system lower than the global average;

8) Acknowledging that the ICAO Assembly 41st Session endorsed the Global Aviation Safety Plan (GASP) 2023 – 2025 edition and the Seventh Edition of the Global Air Navigation Plan (GANP) as the global strategic directions for safety and air navigation respectively, and urged Member States to demonstrate the political will necessary to implement remedial actions to resolve safety concerns and air navigation deficiencies in a timely manner as well as integrate aviation in the national development plans;

9) Appreciating that HR development strategies combined with adequately funded and quality assured training and accompanying investment in training infrastructure is essential for developing and maintaining a qualified and competent workforce to manage all aviation activities and to meet ICAO's strategic objectives;

10) Realizing the benefits of working in partnership with ICAO and aviation stakeholders through interactive platforms for closer coordination to identify opportunities for innovation and the adoption and integration of new technologies, such as Advanced Air Mobility (AAM) to keep pace with global advancement in information technology, artificial intelligence, etc. and future evolving technologies and sciences;

11) Recognizing that only universal participation in the international air law treaties adopted under the auspices of ICAO would secure and enhance the benefits of unification of the international rules which they embody, with particular priority to be given to the Protocols of Amendment to the Convention on International Civil Aviation which have not yet entered into force;

12) The Second Asia Pacific Ministerial Conference, therefore, agrees to the Asia and Pacific Ministerial Declaration on Civil Aviation (Delhi) and the Ministers commit to the following:

1.0 Reaffirming Asia and Pacific Ministerial Declaration on Civil Aviation (Beijing)

1.1 Support and continue efforts towards the realization of the Beijing Declaration commitments, especially pursuing cooperative progress on commitments relating to aviation safety oversight capability, State Safety Programme (SSP) implementation, certification of aerodromes used for international operations, the timely implementation of the Asia/Pacific Seamless Air Navigation Service (ANS) Plan, and supporting the establishment of independent accident investigation authorities.

2.0 Effective Implementation of ICAO Global Plans

2.1 Undertake to support the effective implementation of the ICAO Global Aviation Safety Plan (GASP), Global Air Navigation Plan (GANP) and Global Aviation Security Plan (GASeP) and associated Regional plans, which include detailed guidance to assist States/Administrations in complying with ICAO's Standards and Recommended Practices (SARPs).

3.0 Aviation Safety

3.1 Continue efforts and cooperation to uphold aviation safety as a key priority, carrying out effective safety oversight and safety management activities, joining forces to share safety information and fostering a strong and positive safety culture.

3.2 Strive to achieve the current GASP, in particular, prioritize and commit resources to achieve the following goals:

a) Improve scores for the effective implementation (EI) of the critical elements (CEs) of the States/Administrations safety oversight system;

b) Work towards an effective SSP;

c) Endeavour not to have any Significant Safety Concerns (SSCs) under the USOAP Continuous Monitoring Approach (CMA) and to resolve any future SSCs within the time frame agreed with ICAO;

d) Collaborate with States/Administrations and the aviation industry through the Regional Aviation Safety Group (RASG) to organize capability-building events for the Region and implement Safety Enhancement Initiatives (SEIs) as stipulated in the Regional Aviation Safety Plan (RASP); and

e) Develop and publish a National Aviation Safety Plan (NASP).

4.0 Air Navigation Services

4.1 Commit to resources in modernization and innovation in Air Navigation Services, in tandem with developments in the airport and airline capacity, to support recovery and meet future demand for air travel and new entrants.

4.2 Commit to implement the ICAO Standards and Procedures for Air Navigation Services (PANS), and the Asia/Pacific Seamless ANS Plan (including prioritized GANP elements) and its subsidiary plans to enhance ANS capacity and harmonization in the Asia and Pacific Region focusing on as a matter of priority:

a. Phase I, II and III of the Asia/Pacific Regional Aeronautical Information Management (AIM);

b. Improved Airspace Safety and Capacity through the implementation of more efficient Air Traffic Control (ATC) separation minima;

c. Performance Based Navigation (PBN) implementation in accordance with ICAO Assembly Resolution A37-11 on Global PBN Goals;

d. Common Ground/Ground Telecommunication Infrastructure to support ANS applications;

e. Expediting the implementation of ICAO provisions related to System Wide Information Management (SWIM);

f. Enhanced civil/military cooperation;

g. Enhanced Surveillance capability for improved Safety and Efficiency;

h. Air Traffic Flow Management (ATFM) and Airport Collaborative Decision Making (A-CDM) implementation;

i. Air Traffic Management (ATM) contingency planning, in coordination with neighbouring States/Administrations;

j. Air navigation in national planning frameworks such as National Development Plans (NDPs) supported by National Air Navigation Plans (NANP); and

k. Enhancement of safety risk assessment capability.

4.3 Share best practices, resources and capability in the provision of ANS, including Aeronautical Search and Rescue (SAR), Meteorological Services for International Air Navigation (MET) and Air Traffic Flow Management (ATFM) through Regional cooperation and enhanced coordination.

4.4 Work collaboratively through ICAO and Regional collaborative platforms towards Seamless ANS, including Flight and Flow Information for a Collaborative Environment (FF-ICE) and Trajectory-Based Operations (TBO) to support future traffic growth and sustainability.

5.0 Aviation Security

5.1 Commit to continuing efforts and cooperation to uphold aviation security as a key priority, carry out effective aviation security oversight, enhance compliance with relevant ICAO aviation security and security-related Standards, joining forces to share security information as appropriate and foster a positive security culture.

5.2 Strive to achieve the aspirational goal of the GASeP as established, in particular, prioritize and commit resources to achieve the following objectives:

a) Improve score for the effective implementation (EI) of the critical elements (CEs) of the States/Administrations security oversight system;

b) Endeavour not to have any Significant Security Concerns (SSeCs) under the USAP Continuous Monitoring Approach (CMA) and to resolve any future SSeCs within the time frame agreed with ICAO;

c) Collaborate through Regional multilateral Forums such as; the Regional Aviation Security Coordination Forum (RASCF) to assist States/Administrations to achieve compliance with the relevant aviation security and security-related Standards.

6.0 Facilitation

6.1 Consistent with the facilitation-related Decisions of the ICAO 41st Assembly Session in October 2022 and the outcomes of ICAO's High-Level Conference on COVID-19 in 2021, strive to ensure coordination between civil aviation and various stakeholders, including the health authorities, to allow seamless implementation of ICAO Annex 9 — *Facilitation* and the ICAO's Facilitation Programme, including relevant health related provisions and the five key elements of the ICAO Traveller Identification Programme Strategy, and taking into account a multi-layered risk-based approach to establish national health and other facilitation measures.

7.0 Gender Equality

7.1 Demonstrate States/Administrations commitment to promote and encourage the aviation sector to take the necessary measures to strengthen gender equality by supporting policies, as well as the establishment, development and improvement of strategies and programmes to further women's careers within the aviation sector.

8.0 Resourcing for Civil Aviation

8.1 Commit to providing Civil Aviation Authorities/Administrations in the Region with the necessary autonomy and powers, sustainable sources of funding and resources to carry out effective safety and security oversight and regulation of the aviation industry or alternatively, as may be appropriate, consider establishing and delegating responsibilities to an RSOO (Regional Safety Oversight Organization) that can effectively support regulatory oversight for aviation safety and security.

8.2 Urge Asia and Pacific States /Administrations, other ICAO Member States, international assistance and donor partners, as well as financial institutions to enhance cooperation and provide technical expertise, resources and funding support for technical assistance, capacity-building initiatives and the implementation of the above commitments/actions in the Asia and Pacific Region.

9.0 Aviation Environment Protection

9.1 Encourage Asia and Pacific States/Administrations to continue their efforts and work together to reduce emissions and other environmental impacts of aviation.

10.0 Ratification of International Air Law Treaties

10.1 Encourage Asia and Pacific States, which so far have not done so, to ratify the Amendments to the *Convention on International Civil Aviation*, in particular, the amendments to Articles 50 (a) and 56 adopted by the ICAO Assembly 39th Session in 2016, as soon as possible.

10.2 Encourage Asia and Pacific States to consider becoming parties to the international air law treaties that they have not yet ratified.

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LIST OF PARTICIPANTS

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15.	**REPUBLIC OF KOREA (7)**					

	STATE/NAME		TITLE/ORGANIZATION	E-MAIL	ATTENDANCE	
	48.	Ms. Hye-Young Lee	Public Official, Ministry of Land, Infrastructure and Transport of The Republic of Korea (MOLIT)	imhaze@korea.kr;	X	X
	49.	Mr. Byung-pyo Kim	Assistant Director, Ministry of Land, Infrastructure and Transportation of the Republic of Korea (MOLIT)	starticket91@korea.kr;	X	X
	50.	Mr. Kyuok Cho	Assistant Director, Ministry of Land, Infrastructure and Transport of the Republic of Korea, Incheon Air Traffic Control Regional Office	kyuok7237@korea.kr;	X	X
	51.	Ms. Sim Suin	Assistance Director, Korea Airports Corporation (KAC)		X	X
	52.	Mr. Sehwan Han	Senior Research Engineer, Korea Airports Corporation	hsh91@airport.co.kr;	X	X
	53.	Mr. Soo-Hyun Lee	Technological Research Department, KOREA AIRPORT CORPORATION	haha0982@airport.co.kr;	X	X
	54.	Mr. Jinwon Park	Aeronautical Communications, Incheon International Airport Corporation (IIAC)	jinwon_park@airport.kr;	X	X
16.		**SINGAPORE (7)**				
	55.	Mr. David Shin Hwah Leow	Head (Quality Assurance), Civil Aviation Authority of Singapore	david_leow@caas.gov.sg;	X	X
	56.	Mr. Wei Xiong Elvin Liow	Head (Open Platform for Air Navigation Services), Civil Aviation Authority of Singapore	elvin_liow@caas.gov.sg;	X	X

	STATE/NAME		TITLE/ORGANIZATION	E-MAIL	ATTENDANCE	
	57.	Ms. Yunxiu Yang	Senior Engineer, CAAS	yang_yunxiu@caas.gov.sg;	X	X
	58.	Ms. Mary Aquiline	Engineer, Civil Aviation Authority of Singapore (CAAS)	mary_aquiline@caas.gov.sg;	X	X
	59.	Mr. Mohamed Ruzaini Bin Mohamed Ismail	Senior Air Traffic Control Manager (Operations Technology), Civil Aviation Authority of Singapore	mohamed_ruzaini_ismail@caas.gov.sg;	X	X
	60.	Mr. Muhd Fahmie SALEH	Principal ATC Control Support Officer (OPS Technology Planning)		X	X
	61.	Mr. Jonathan Kua	Project Manager (NCS Pte. Ltd.)		X	X
17.	**SRI LANKA (5)**					
	62.	Mr. Dhanula Jayaratne	Civil Aviation Inspector AIS, Civil Aviation Authority of Sri Lanka	caiais1@caa.lk;	X	X
	63.	Mr. Asanga Bandara	Deputy Head of Electronics & Air Navigation Engineering, Airport and Aviation Services (Sri Lanka) Ltd.	asanga.eane@airport.lk;		X
	64.	Mr. B. A. Sampath Sisira Kumara	Manager Aeronautical Information Management, AASL Sri Lanka	sampath.aim@airport.lk;		X
	65.	Mr. Jude Peiris	Senior Manager - ATC, AASL Sri Lanka	judeatc.ans@airport.lk;		X
	66.	Mr. Antony Dinesh Chackrawarthy	Manager Aero.Com., Airport & Aviation Services (Sri Lanka) Ltd	dinesh.ans@airport.lk;		X
18.	**THAILAND (38)**					

	STATE/NAME		TITLE/ORGANIZATION	E-MAIL	ATTENDANCE	
	67.	Ms. Nattha Inluemsai	Senior Officer, The Civil Aviation Authority of Thailand (CAAT)	nattha.i@caat.or.th;	X	X
	68.	Mr. Chaiwat Saekhew	Officer, The Civil Aviation Authority of Thailand	chaiwat.s@caat.or.th;	X	X
	69.	Ms. Parichat Thongkleang	Head of Aeronautical Information Management System - AIM Acting AIM Manager, The Civil Aviation Authority of Thailand	parichat.t@caat.or.th;	X	X
	70.	Mr. Akkarin Insuwan	Head of Aeronautical Information Division, The Civil Aviation Authority of Thailand	akkarin.i@caat.or.th;	X	X
	71.	Mr. Piyanat Mentaisong	Aeronautical Information Management System Officer, The Civil Aviation Authority of Thailand	piyanat.m@caat.or.th;	X	X
	72.	Mr. Vittaya Plaeyao	Air Traffic Management Standards Division Senior Officer, The Civil Aviation Authority of Thailand	vittaya.p@caat.or.th;	X	X
	73.	Mr. Kananant Na Nakorn	Standards Development Officer, The Civil Aviation Authority of Thailand (CAAT)	kananant.n@caat.or.th;	X	X
	74.	Ms. Amornrat Jirattigalachote (CO-Chair)	Expert (Director Level), Aeronautical Radio of Thailand Ltd. (AEROTHAI)	amornrat.ji@aerothai.co.th;	X	X
	75.	Ms. Jittima Asawachaiporn	Aeronautical Information Manager, Aeronautical Radio of Thailand Ltd. (AEROTHAI)	jittima.as@aerothai.co.th;	X	X

	STATE/NAME		TITLE/ORGANIZATION	E-MAIL	ATTENDANCE	
	76.	Ms. Narissara Na Rangsri	Aeronautical Information Manager, AEROTHAI, Aeronautical Radio of Thailand Ltd.	comm.future@gmail.com;	X	X
	77.	Mr. Thanathorn Dechasawatwong	Air Traffic Engineering Manager, AEROTHAI	tanatornd@gmail.com;	X	X
	78.	Mr. Wirot Potilar	Air Traffic Engineering Manager, AEROTHAI, Aeronautical Radio of Thailand Ltd.	wirot.po@aerothai.co.th;	X	X
	79.	Mr. Arthit Tosukolvan	Engineer, AEROTHAI, Aeronautical Radio of Thailand Ltd.	arthit.to@aerothai.co.th;	X	X
	80.	Mr. Jatuporn Noottapong	Air Traffic Engineering Manager, AEROTHAI, Aeronautical Radio of Thailand Ltd.	jatuporn.no@aerothai.co.th;	X	X
	81.	Mr. Worapong Jirojkul	Executive Air Traffic Systems Engineer, AEROTHAI, Aeronautical Radio of Thailand Ltd.	worapong.ji@aerothai.co.th;	X	X
	82.	Ms. Anocha Srisa-ard	Executive Aeronautical Information Officer, AEROTHAI, Aeronautical Radio of Thailand Ltd.	anotarn@gmail.com;	X	X
	83.	Ms. Jirawadee Sopitnonthagul	Transport Technical Officer, Department of Airports, Thailand	jirawadee.s@airports.go.th;		X
	84.	Mr. Ammarin Chaipatnontikon	Transport Technical Officer, Department of Airports, Thailand	ammarin.c@airports.go.th;		X

	STATE/NAME		TITLE/ORGANIZATION	E-MAIL	ATTENDANCE	
	85.	Ms. Saowakhon Tetiya	Aerodrome Safety Specialist, Airport Services Standards Division, Aviation Services Standards Department		X	X
	86.	Ms. Suvachira Teeraphathananon	Senior Engineer, Airport of Thailand PLC.	suvachira.t@airportthai.co.th;	X	X
	87.	Mr. Tanapon Intaruk	Airport Operation System Engineer, Airport of Thailand PLC.	tanapon.intaruk@gmail.com;	X	X
	88.	Ms. Rassamee Damrongkietwattana	Director of Aeronautical Weather Monitoring Sub-division, Thai Meteorological Department	rassmee@hotmail.com;	X	X
	89.	Ms. Paweena Panikodom	Meteorologist, Thai Meteorological Department	pavna55@hotmail.com;	X	X
	90.	Mr. Worapong Noothong	Meteorologist, Thai Meteorological Department	pui-74@hotmail.com;	X	X
	91.	Mr. Pongkhun Maneesri	Meteorologist, Thai Meteorological Department	pongkhun@gmail.com;	X	X
	92.	Mr. Wanchalearm Petsuwan	Computer Technical Officer, Telecommunications Division, Meteorological Department		X	X
	93.	Ms. Natthaporn Lertsamranpinit	Computer Technical Officer, Thai Meteorological Department	natthaporn.le@gmail.com;	X	X
	94.	Ms. Anut Thueaksuban	Specialist-Aeronautical Information Management, Bangkok Airways Public Company Limited	anut@bangkokair.com;	X	X

	STATE/NAME		TITLE/ORGANIZATION	E-MAIL	ATTENDANCE	
	95.	Ms. Suchavalee Yimchalam	Manager - Airside Operations, Bangkok Airways Public Company Limited	suchavalee@bangkokair.com;	X	X
	96.	Mr. Sheerwei Ho	System Analyst, Corporate Information Technology, Bangkok Airways Public Company Limited		X	X
	97.	Ms. Chanakan Suksawade	System Analyst, Bangkok Airways	chanakan.suk@bangkokair.com;		X
	98.	Mr. Naroupon Chandrakulsiri	Manager of international flight safety department, Thai Airways International Public Company Limited	Naroupon.c@thaiairways.com;	X	X
	99.	Mr. Piyawut Tantimekabut	ATM Expert (Director Level) Aeronautical Radio of Thailand Ltd (AEROTHAI)	piyawut.ta@aerothai.co.th;		X
	100.	Ms. Pakarin Hiranyalap	Senior Aerodrome Safety Officer, AOT			X
19.	**UNITED STATES OF AMERICA (1)**					
	101.	Mr. Shayne Campbell	Senior International Air Traffic Representative Asia Pacific, United States Federal Aviation Administration (FAA)	shayne.a.campbell@faa.gov;	X	X
20.	**VIETNAM (4)**					
	102.	Mr. Nguyen Hong Hiep	Manager, CNS Department, VATM	nguyenhonghiepbk@vatm.vn ;	X	X
	103.	Ms. Le Thi Phuong	Deputy Director, VNAIC, VATM	lephuongais@vatm.vn;	X	X

	STATE/NAME		TITLE/ORGANIZATION	E-MAIL	ATTENDANCE	
	104.	Mr. Nguyen Vu Thuan	D/Manager, ATS Division, NORATS, VATM	vuthuanatc@gmail.com;	X	X
	105.	Mr. Duong Thanh Nam	D/Manager, Technical - Safety - Quality Division, ATTECH, VATM	namdt@attech.com.vn;	X	X
21.		**CANSO (1)**				
	106.	Mr. Wayne Osse	Chief Architect, Global Aviation and Transportation, Solace	wayne.osse@solace.com;	X	X
22.		**IATA (1)**				
	107.	Mr. John Moore*	Assistant Director, IATA APAC	moorej@iata.org;	X	
23.		**FREQUENTIS (3)**				
	108.	Ms. Diane Tan	Regional Sales Manager	diane.tan@frequentis.com;	X	X
	109.	Mr. Ulrich Kaage	ATM Solution Consultant	ulrich.kaage@frequentis.com;	X	X
	110.	Mr. Leo Adhemar Tan	System Engineer	leo.tan@frequentis.com;	X	
24.		**ICAO (4)**				
	111.	Ms. Soniya Nibhani	Regional Officer ANS Implementation (CNS), Asia and Pacific Office International Civil Aviation Organization	snibhani@icao.int;	X	X
	112.	Mr. Hiroyuki Takata	Regional Officer, Air Traffic Management ICAO Asia and Pacific Regional Office	htakata@icao.int;		X

	STATE/NAME		TITLE/ORGANIZATION	E-MAIL	ATTENDANCE	
	113.	Ms. Jian Xu	Associate Programme Officer, Air Navigation Systems (CNS) Implementation, International Civil Aviation Organization Asia and Pacific Office	jixu@icao.int;	X	X
	114.	Ms. Varapan Meefuengsart	Programme Assistant, CNS/MET Asia and Pacific Office International Civil Aviation Organization	vmeefuengsart@icao.int;	X	X

* Online attendance

LIST OF WORKING/INFORMATION PAPERS

WP/IP/SP Number	Agenda	Subject	Presented by
		WORKING PAPERS	
WP/01	1	Provisional Agenda	Secretariat
WP/02	3	Review of relevant meetings	Secretariat
WP/03	3	Outcomes of ACSICG/12	Secretariat
WP/04	3	Outcomes of SURICG/10	Secretariat
WP/05	3	Outcomes of the Joint Event of SWIM over CRV demonstration and surveillance data over SWIM Trial	Hong Kong China
WP/06	3	Outcomes of SWIM TF Task Leads meetings and Joint Meeting of SWIM TF Task Leads and CRV OG Experts in 2024-25	Secretariat
WP/07	3	SWIM Implementation Pioneer Ad-hoc Group Progress Report	Singapore
WP/08	3	SIPG Action WS-1-9: Options for internet connection in the Asia-Pacific SWIM	SIPG
WP/09	3	SIPG Action WS-1-12: Conclusions of the Asia-Pacific SWIM Transition Discussions	SIPG
WP/10	4	Need for additional specificity in defining APAC Common SWIM surveillance information Services	Australia
WP/11	4	Business functionality of APAC Common SWIM Information Services	Hong Kong China
WP/12	4	Outcomes of the APAC Common SWIM Aeronautical Information Services Ad Hoc Group	APAC Common SWIM Aeronautical Information Services Ad Hoc Group
WP/13	5 (b)	Aggregation Function for MET Information Services	Australia
WP/14	5 (b)	Enhancing Reliable Message Delivery in Hierarchical Architecture for APAC SWIM Implementation	Japan
WP/15	5 (b)	Requirements for Implementing Aviation Information Security Framework in the APAC Region	Japan
WP/16	5 (b)	Using a Self-Signed Certificate for Secure SWIM Communication Exchange	Malaysia
WP/17	5 (b)	SIPG ACTION WS-1-4、WS-1-5- Improvement of the	China and Hong Kong

WP/IP/SP Number	Agenda	Subject	Presented by
		hierarchical architecture for regional SWIM implementation and requirements for gateway EMS	China
WP/18	5 (b)	Approach to a Global API Gateway for Web Services	ROK
WP/19	5(e)	Proposed addition of information service reference for APAC Common SWIM Information Services	Australia
WP/20	5(f)	Expected Capabilities of CRV for APAC SWIM Implementation	Japan
WP/21	5(d)	Comparison of SWIM Discovery Service (SDS) Implementation Specification Between V1.0 and V2.0	ROK
WP/22	6	Comparison of PANS Information Management (DOC 10199) Requirements and APAC SWIM	Japan
WP/23	7	Review of SWIM TF ToR, SOW, Work Plan, and Outstanding Action Items	Secretariat
WP/24	8	IWXXM: Latest developments and future plans	Hong Kong China
WP/25	9	Outcomes of the Second Asia Pacific Ministerial Conference on Civil Aviation	Secretariat
WP/26	9	CNS-related ASBU in Asia/Pacific Seamless ANS Plan	Secretariat
WP/27	5 (e)	Methods for implementing FF-ICE Services using Request/Reply Message Exchange Pattern	ROK
WP/28	5 (f)	Strategies to SWIM operationalization in the aspect of validation	ROK
WP/29	5 (b)	Requirements Specification Template for GEMS and Global SWIM Service	ROK
WP/30	5 (c)	Updates on the Asia/Pacific FIXM v4.3 Extension	Thailand
WP/31	5 (b)	Recommended Technical Performance Requirements for EMS	Thailand
WP/32	5 (c)	Outcomes of the ATFM/SG/15 Meeting on Related Matters	ATFM SG Chair
		INFORMATION PAPERS	
IP/01	1	Meeting Bulletin	Secretariat
IP/02	5 (g)	Updates from IMP	Japan
IP/03	8	Progress update on SWIM Implementation in Malaysia	Malaysia
IP/04	4	Comments on TMC Document for ATM Information	Australia

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		Exchange through SWIM	
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SP/02	5	Self Signed Certificate for SWIM EMS Connectivity	Malaysia
		FLIMSY	
Flimsy/01	4	Review of SIPG TOR	Singapore
Flimsy/02	4	Improvements to the Business Functionality of APAC Common Swim Information Services	Australia
Flimsy/03	5	Pre-Requisites to Trust Framework Instance Participation	Singapore
Flimsy/04	4, 5	APAC Common Swim Information Services and the Provision of Aircraft Separation	Australia

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