



ICAO

*International Civil Aviation Organization***THE THIRTIETH MEETING OF THE
COMMUNICATIONS / NAVIGATION AND
SURVEILLANCE SUB-GROUP (CNS SG/30) OF
APANPIRG***Bangkok, Thailand, 06 July – 10 July 2026***Agenda Item 7:** Information Management (IM)**7.1. Review Report of the Eleventh Meeting of System Wide Information
Management Task Force (SWIM TF/11)****REVIEW OF OUTCOMES OF SWIM TF/11**

(Presented by the Secretariat)

SUMMARY

The paper presents the outcomes of the Eleventh Meeting of the System Wide Information Management Task Force (SWIM TF/11) for meeting review.

1. INTRODUCTION

1.1 The Eleventh Meeting of the System Wide Information Management Task Force (SWIM TF/11) was held from **25 – 29 May 2026** in the ICAO APAC Regional Office, Bangkok, Thailand. The Meeting was attended by **100** participants from **16** Member States/Administrations and **3** International Organisations. The Meeting report, working papers, information papers, and other resources can be accessed by the following link:

<https://www.icao.int/APAC/meetingdocs?fid=60144#block-icao-page-title>

1.2 This paper summarises relevant information and updates from the SWIM TF/11 Meeting.

2. DISCUSSION

2.1 The summary of discussions in the SWIM TF/11 Meeting is given in the following paragraphs.

Election of Co-Chair

2.2 The ICAO Secretariat requested the SWIM TF/11 Meeting for the nomination of the second Co-Chair position. However, no nomination was received at the Meeting. As a result, the position remains vacant. It was suggested that the election be held again at the future SWIM TF Meeting.

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

2.3 The SWIM TF/11 Meeting acknowledged the need for interconnection among different regional IP networks to support global SWIM implementation and requested additional information on CRV updates as well as the establishment and upgrade plans of other regional networks, particularly with regard to ensuring interoperability and interconnection among these networks. ICAO Secretary provided detailed updated information as per the details shared in [WP/19 of ACSICG/13 Meeting](#).

2.4 The SWIM Task Force Co-Chair provided an update on the funding support available for the SWIM implementation support initiative under the Information Management (IM) Section at ICAO Headquarters. The ICAO Secretariat informed that, as part of this new initiative, a range of activities is being planned to facilitate the implementation of seamless information management, including SWIM, AIS/AIM, IP network interconnection, and related educational programmes. It was further noted that, subject to budget availability and necessary approvals, a workshop on the interconnection of CRV and REDDIG III is tentatively planned for the fourth quarter of 2026.

Summary of SWIM-Related Outcomes from Relevant APAC MET Meetings – Sec (WP/03)

2.5 This paper provided a consolidated update on SWIM-related outcomes from recent APAC MET Meetings (MET SG/29, MET/R WG/15, and MET/IE WG/24). It highlighted progress in MET-SWIM guidance, development of SWIM-based MET information services and use cases, and key implementation challenges affecting regional SWIM readiness. It also outlined implications of IWXXM implementation gaps for SWIM interoperability and service readiness to support SWIM TF/11 in refining APAC Common SWIM Information Services and enhancing cross-domain coordination.

2.6 The SWIM TF/11 Meeting discussed the use of SWIM-based MET use cases to support the refinement and alignment of MET-related SWIM information services, including service definitions and exchange models, and to promote consistent development and coordination across relevant domain groups. The Meeting also discussed the use of service interaction models (in particular publish/subscribe and request/reply) for MET information services within the SWIM environment.

2.7 In response to the request to consider the use of SWIM-based MET use cases to support the refinement and alignment of MET-related SWIM information services, including service definitions and exchange models, and to promote consistent development and coordination across relevant domain groups, it was recalled that the Information Management Panel (IMP), at its 4th Meeting, had reviewed the Information Service Definition (ISD) template, which could be used by all aviation-related information domains to ensure consistency in the development of information services.

2.8 It was informed that the work undertaken by the APAC region on the APAC Common SWIM Information Services was presented to the **IMP – Working Group Information/Services** at its 3rd Meeting in June 2025. It was further added that the fields included in the APAC Common SWIM Information Service list are aligned with, and constitute a subset of, the fields contained in the ISD template defined by the IMP.

2.9 It was added that the MET Panel (METP) is expected to undertake work on defining future MET information services. However, no work is currently planned within the METP to define MET information services for traditional MET products.

2.10 The SWIM TF/11 Meeting discussed in detail the need to define MET information services for traditional MET products, and the contributory bodies responsible for defining information services and maintaining the APAC Common SWIM Information Services list as a whole. The Meeting agreed that the approach similar to that adopted by the Panels should be applied. Specifically, the IMP

would be responsible for developing the ISD template, while the domain expert groups would be responsible for providing the detailed ISD content for services within their areas of expertise. Accordingly, for the APAC region, the MET/IE WG could consider providing details of MET information services and the FF-ICE Ad-hoc Group could consider providing details of FF-ICE related flight information services, while the consolidation and publication of the APAC Common SWIM Information Services would remain under the responsibility of the SWIM TF.

2.11 It was recalled that the request for the regular review and update of the APAC Common SWIM Information Services by the relevant expert groups had already been conveyed by SWIM TF to all relevant groups under CNS SG, ATM SG, and MET SG. Therefore, the Meeting agreed that there was no need to formulate an additional action item for this task.

2.12 The SWIM TF/11 Meeting discussed the need to ensure alignment among ISDs for similar information services developed by different regions, in addition to the ISDs for information services to be developed by the Panels. It was considered that the need for interregional coordination on this matter should be raised and addressed at the global level, particularly for the ISD of information services related to existing services or products, such as MET products. The Meeting agreed on a two-pronged approach to address this issue, i.e. (i) for APAC members of the IMP and APAC members of other related Panels (e.g. METP) to share this concern with the IMP and their respective Panels, **ACTION ITEM 11-1** and (ii) formulating the following draft Decision for CNS SG/30 considerations.

Draft Decision SWIM TF/11/01 Need for Alignment of Information Service Definitions across Regions	
What: To propose to the Information Management Panel (IMP) and relevant Panels to consider the need for alignment of Information Service Definitions for similar information services developed by different regions.	Expected impact: ☐ Political / Global ☒ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Considering that the Asia/Pacific regional SWIM will form part of the global SWIM, that ISD template was agreed at IMP/4, and that ISDs for similar information services have been developed by various regions, the consideration of IMP and relevant Panels to ensure alignment of ISDs and cross-regional interoperability of information services is required.	Follow-up: ☐ Required from States
When: 29-May-26	Status: Draft to be adopted by PIRG
Who: ☒ Sub groups ☐ APAC States ☒ ICAO APAC RO ☒ ICAO HQ ☒ Other: SWIM TF	

2.13 Considering that SWIM serves as a foundation for ANS modernisation, and noting the example discussed regarding the challenge in achieving alignment in the implementation of similar information services across regions, the Meeting further agreed to prepare a presentation for the APANPIRG/37 Meeting, apart from regular updates of SWIM TF through the CNS SG Meeting report. This presentation aims to highlight the challenges related to SWIM implementation and seek consideration for further actions to be taken by ICAO HQ and the relevant Panels. **ACTION ITEM 11-2**

2.14 Regarding the request to support alignment between MET and SWIM activities, taking into account ongoing regional coordination and related work, the Meeting discussed options such as

conducting joint Meetings of MET and SWIM experts, or holding SWIM TF and MET/IE WG Meetings in parallel with one designated joint Meeting day. It was recalled that SWIM TF Task Leads usually meet quarterly and also conduct quarterly joint Meetings with CRV OG experts. In such situations, conducting an additional quarterly Meeting with MET/IE WG experts would create a significant workload for SWIM TF experts. Regarding the option of holding MET/IE WG and SWIM TF Meetings in parallel, it was shared that many MET experts would miss the SWIM TF Meeting. Therefore, this option was not recommended.

2.15 It was decided that the SWIM TF Co-Chair and MET/IE WG Chair/Vice Chair will discuss together topics of common interest and plan for further Meetings as required. **ACTION ITEM 11-3**

Outcomes of SURICG/11 Meeting – Sec (WP/05)

2.16 The Eleventh Meeting of the Surveillance Implementation Coordination Group (SURICG/10) was held at the ICAO APAC Regional Office, Bangkok, Thailand, from 25 – 27 March 2026. In addition, the Fifth Meeting of the Surveillance Study Group (SURSG/5) was held from 23 – 24 March 2026 at the ICAO APAC Regional Office in Bangkok, Thailand.

2.17 It was noted that SURSG/SURICG had recommended the use of ASTERIX and JSON for surveillance information sharing over SWIM in the APAC region. In addition, it was suggested that the Surveillance Panel (SP) be informed of these regional developments through an information paper for their consideration and feedback. The Meeting was informed that the SURICG Co-Chairs and SWIM TF Chair are preparing a paper to share this information with the Aeronautical Surveillance Working Group under the SP at its 24th Meeting in September 2026. Further updates will be shared with the SWIM TF/12 Meeting. **ACTION ITEM 11-4**

2.18 The Meeting appreciated the SURSG for the successful completion of the tasks assigned to it and its contribution to SWIM development in the APAC region.

SWIM Implementation Pioneer Ad-hoc Group Progress Report – Singapore (WP/08)

2.19 Singapore presented the work done by the SWIM Implementation Pioneer ad-hoc Group (SIPG) since the last SWIM TF Meeting (SWIM TF/10) held from 20 to 23 May 2025. It was recalled that the SIPG Terms of Reference (ToR) were revised through [SWIM TF/10-Flimsy/01](#). Resulting from the SIPG WS/2 held following the SWIM TF/10 from 26 to 30 May, the SIPG laid out its work program in the form of 11 Tasks and assigned priorities to them, as well as agreed on the initial planned timeline as follows:

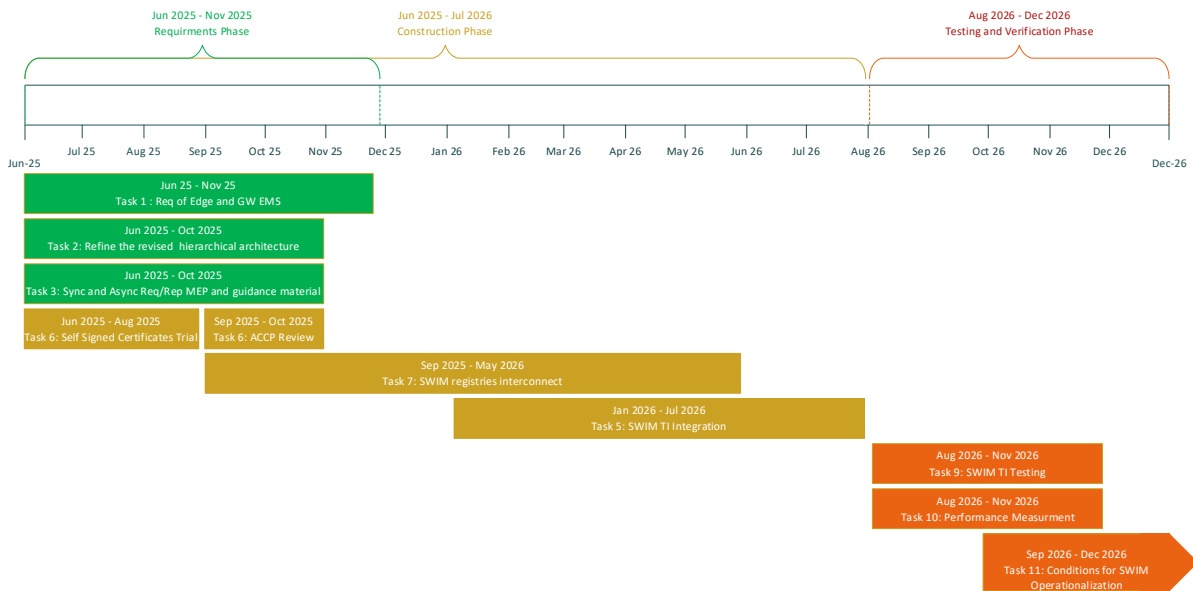


Figure 1- Initial SIPG Work Program Timeline

2.20 It was noted that SIPG conducted 10 online Meetings since SWIM TF/10 to make progress on the work plan as presented above. However, due to administrative hurdles and unexpected technical challenges faced by some of the task members, the timeline has been revised as follows:

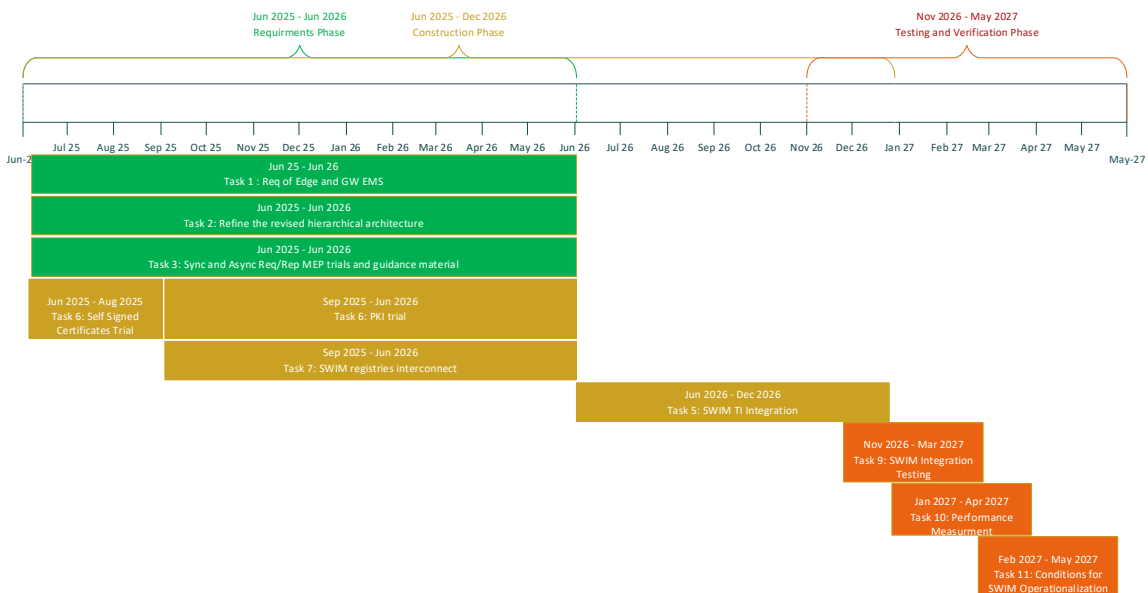


Figure 2: Revised SIPG Work Program Timeline

2.21 The Meeting was informed of the SIPG achievements under Task 2, Task 3, Task 6 and Task 7. It was noted that further details on the progress of the respective tasks were presented in the separate working papers. The Meeting was also informed that SIPG will continue to advance the work according to the revised work plan. Additionally, it was highlighted that the need for closer coordination with the ANS Information Security Task Force had been raised during the SIPG monthly discussions, especially regarding their deliverables and timelines, to ensure proper sequencing with the SWIM Task Force timeline.

2.22 The Meeting was informed that the 3rd working session will be conducted immediately after the SWIM TF/11 Meeting, from 1 to 5 June 2026. The SIPG will be developing a more detailed work programme for Tasks 5, 9, 10 and 11. The target is for SIPG to complete the work by Q1 2028 in order to be able to present the outcomes at the SWIM TF Meeting that year.

2.23 SWIM TF Co-Chair expressed her appreciation to SIPG for the tremendous amount of work being undertaken by the group.

2.24 In response to a question regarding the SIPG work plan for the period from Q2 2027, when the regional SWIM TI prototype is expected to become available, to Q1 2028, when SIPG expects to complete its work, it was clarified that testing of selected information services on the APAC SWIM TI prototype is anticipated during that period.

2.25 In response to a query regarding cybersecurity, the Meeting was informed that the focus will be placed on SWIM TI security rather than information security.

2.26 The Meeting emphasised the importance of participation by Telecom Malaysia, which is leading Task 6 of SIPG, in all key discussions, including in-person Meetings, to enhance the overall efficiency of SIPG. It was noted that the absence of key members from significant Meetings would lead to delays in the work assigned to the group, thereby affecting multiple States. The Meeting requested the support of the ICAO Secretariat to coordinate with the Civil Aviation Authority of Malaysia (CAAM) to encourage the active participation of Telecom Malaysia in both in-person and online SIPG Meetings. **ACTION ITEM 11-6**

2.27 In response to a request for suggestions regarding the involvement required by SIPG Task 6 in the work of ANSIA TF, it was suggested that SIPG Task 6 participate in all three work packages of ANSIA TF. To enhance the effectiveness of Task 6 activities, the Meeting requested the ICAO Secretariat to coordinate with CAAM to consider nominating a member to Work Package 2 of ANSIA TF. **ACTION ITEM 11-7**

2.28 In response to the need for more than one SWIM TF Meeting per year due to the ongoing critical phase of APAC SWIM implementation, the Meeting agreed that additional Meetings can be conducted, if necessary. However, given the current political situation impacting on the economy, it was suggested that the need and feasibility of holding multiple Meetings be evaluated in the future

*Asia/Pacific Regional Flight and Flow Information for a Collaborative Environment
(FF-ICE) Release 1 Implementation Plan – FF-ICE Ad Hoc Group (WP/09)*

2.29 Singapore and Thailand, on behalf of the ICAO APAC FF-ICE Ad-Hoc Group, presented the draft APAC Regional FF-ICE Release 1 Implementation Plan.

2.30 The Meeting was informed that the APAC FF-ICE/R1 Plan recommended implementation timeline for APAC as follows:

- a) 2030: commencement of technical tests and trials involving eAUs and cross-border eASP interactions;
- b) 2031: begin operational tests to identify and resolve any issues; and
- c) 2032: full operationalisation of three FF-ICE/R1 services (Filing Service, Flight Data Request Service and Notification Service).

2.31 The Meeting reviewed the draft APAC FF-ICE/R1 Plan, particularly the implementation timeline. It was informed that the draft APAC FF-ICE/R1 Plan, including all feedback

from ATFM & A-CDM SG/16 and SWIM TF/11, will be submitted to CNS SG/30 (6-10 July 2026) and ATM SG/14 (3-7 August 2026) for approval. Subject to approval by both groups and the availability of Doc 9965 Manual on FF-ICE Vol. II – Implementation Guidance, the draft APAC FF-ICE/R1 Plan will be submitted to APANPIRG/37 (tentatively in November 2026) for endorsement.

2.32 Additionally, the Meeting was informed that the **dissolution of the FF-ICE Ad-Hoc group and the establishment of the APAC FF-ICE Implementation Task Force** will be proposed to ATM SG. The Implementation Task Force would, *inter alia*, address the transition from FPL2012 to FF-ICE, operations in a mixed-mode environment, and FF-ICE/R1 implementation issues in the APAC region.

2.33 The Meeting shared the concern about the proposed implementation timeline. It was discussed that, if the timeline proposed by the FF-ICE Ad-Hoc Group is based on the assumption that fully operational SWIM would be available by 2030, the proposed three-year period from the commencement of technical tests and trials to the full operationalisation of three FF-ICE/R1 services is highly challenging. It was suggested that the FF-ICE Ad-Hoc group consider testing the FF-ICE R/1 services over the SWIM TI prototype being developed by SIPG, which is expected to be ready by Q2 2027. **ACTION ITEM 11-8**

2.34 By doing so, it would allow ample time for services testing, while ensuring that the regional SWIM TI would be able to support the requirements of FF-ICE/R1. For further discussion on the possibility of conducting tests and trials on the regional SWIM TI prototype starting from Q2 2027, it was suggested that the FF-ICE Ad-Hoc group and SIPG first discuss the feasibility of such tests and trials. **ACTION ITEM 11-9**

2.35 In response to a question regarding the appropriate timeframe for the FF-ICE Ad-hoc Group to initiate coordination with SIPG for testing activities, it was suggested that coordination commence from March 2027, given that the regional SWIM TI prototype is expected to be ready by Q2 2027. **ACTION ITEM 11-10**

Update on MET-SWIM Documentation – Australia (WP/10)

2.36 This paper provided updates on guidance documents to support the implementation of meteorological aspects of SWIM. This included an updated MET-SWIM Roadmap, a new Guidelines for MET-SWIM Implementation and the deprecation of the MET-SWIM Plan.

2.37 The Meeting noted that the METP WG-MIE is preparing further updates to the MET-SWIM Guidelines and MET-SWIM Roadmap and welcomes suggestions for additional content or changes to the current editions. New editions of MET-SWIM Guidelines and IWXXM Guidelines are expected within the 2026 calendar year.

2.38 The Meeting was encouraged to review the MET-SWIM and IWXXM guidance documents and provide any suggested changes. It was agreed that feedback on both documents can be provided by SWIM TF experts at any time; however, to facilitate incorporation of proposed changes into the next editions, it was suggested that comments be submitted before **July 2026**. It was also suggested that States/Administrations review both documents and provide any proposed amendments to the ICAO Secretary before July 2026 as well. **ACTION ITEM 11-11**

Work Progress of SIPG Task 2: Refine the Revised Hierarchical Architecture – China (WP/24)

2.39 China presented the progress of SIPG Task 2: Refine the revised hierarchical architecture. The Meeting was informed that SIPG Task 2 is led by China, with participants including

Australia, Hong Kong China, India, Japan, Fiji, Singapore, Thailand, Malaysia, USA, Republic of Korea, New Zealand, and CANSO. It was informed that a hierarchical architecture scheme has been proposed, with participants currently conducting joint testing and verification based on consensus. It was also noted that SIPG Task 2 collaborates with Tasks 1 and 3 to establish a unified test environment to provide stable, interoperable architectural support for the implementation of APAC SWIM.

2.40 China shared that the SIPG Task 2 research currently focuses on routing mechanisms under different business scenarios, naming and configuration specifications of multiple queues and the specification of message priority, data model and other features through message metadata. It was further explained that the SIPG Task 2 test plan adopts a layered approach that progresses from simple to complex and supports continuous expansion in order to ensure effective support for the research work. The detailed task, technical solutions and test plan were shared with the Meeting.

2.41 The Meeting was informed that SWIM TI Interoperability Routing Mechanism integrates on-demand routing strategies, relying on message brokers and routing services to meet the Message Exchange Patterns (MEPs) and Quality of Service (QoS) requirements of SWIM information services. Proposals for Business Scenario Routing, Transmission Path Routing, and Granularity-Adapted Routing were shared with the Meeting.

2.42 For APAC SWIM Address Naming Pattern, scope and environment identification, routing-oriented address architecture, and information domain classification were explained.

2.43 It was noted that based on the APAC SWIM hierarchical architecture, SIPG Task 2 has formulated a seven-level test plan for heterogeneous EMSs interconnected over the CRV network. The test plan follows the principles of progressive correlation and full-scenario coverage:

- a) Level 1 and Level 2 focus on basic connectivity to verify inter-node reachability;
- b) The middle three levels (Level 3 - 5) focus on message transmission and routing to ensure reliable and accurate message delivery;
- c) The upper two levels (Level 6 and Level 7) focus on stability and adaptability to guarantee service availability under anomalies and adaptation to topology adjustments.

2.44 The Meeting noted that to date, some participants of SIPG Task 2 have constructed their physical SWIM TIs based on hierarchical architecture, enabling participants to conduct testing on the SWIM TI. Six participants have indicated their intention to deploy EMS nodes and join the testing activities. Five participants have successfully passed the Level 1 (Basic Network Connectivity) and Level 2 (Direct EMS Interconnection) tests, with all inter-node communication links verified as fully qualified, as shown in Figure 1.

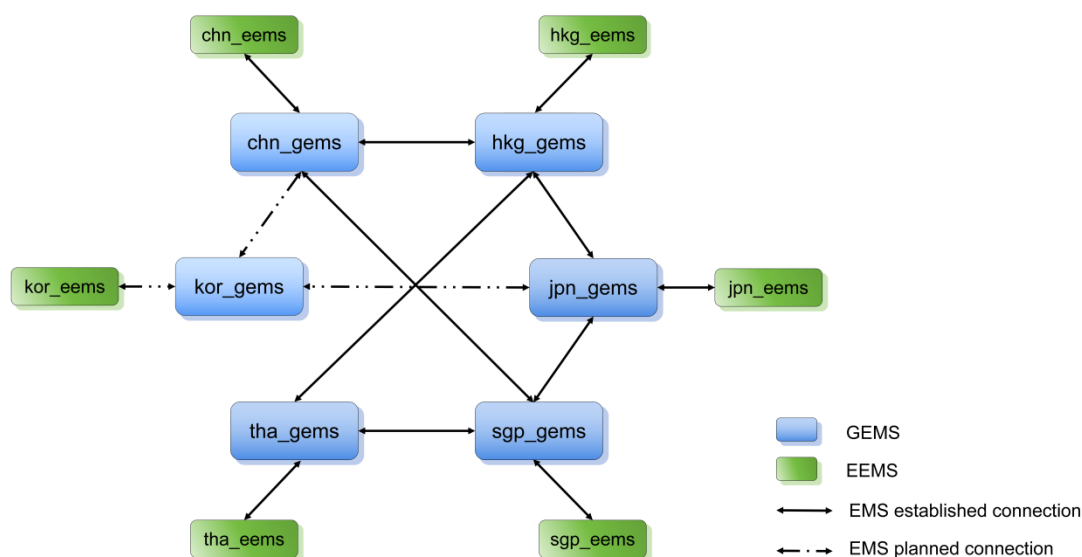


Figure 3: Participants' connection status

2.45 The Meeting noted that the Level 3 (Basic Message Transmission) testing is progressing as scheduled, laying a solid foundation for subsequent advanced testing phases, including multi-node routing and exception fault tolerance. Additionally, it was shared that verification is planned to be completed in 2026. As the testing activities move forward, test levels and EMS participants will be expanded as required by actual operational and testing needs.

2.46 The Meeting was presented with “APAC SWIM Hierarchical Architecture Test Plan”, provided in **Appendix A**, drafted by SIPG Task 2. The Meeting encouraged more States/Administrations to consider participating in the SIPG Task 2 activities and to provide feedback on the Test Plan.

2.47 In response to a query regarding performance testing, such as latency and failover tests, it was clarified that these tests will be conducted in coordination with SIPG Task 1. Regarding a question on the plan to conduct testing over the internet, it was shared that currently, there is only a plan to conduct tests using CRV.

2.48 It was queried whether SIPG Task 2 will conduct testing using other types of routing, e.g. topic-based routing, in addition to message-header based routing, and whether a comparison of message header-based routing and topic-based routing will be assessed. Task 2 Lead shared that other types of routing are being considered for future testing, including evaluation of the outcomes of tests using different routing methods under various scenarios. The Meeting was informed that the results of such testing will be shared in the future.

Outcomes of ATFM & A-CDM Steering Group 16 Meeting – ATFM & A-CDM SG Chair (WP/29)

2.49 This paper presented the discussions and relevant outcomes of the Sixteenth Meeting of Air Traffic Flow Management and Airport Collaborative Decision-Making Steering Group (ATFM & A-CDM SG/16), which was held in Bangkok, Thailand, from 6 to 10 April 2026. The Meeting report, working papers, information papers, and other resources can be accessed by the following link: APAC Meetings | International Civil Aviation Organisation.

2.50 It was noted under ATFM & A-CDM SG/16 - Agenda Item 6b: ATFM, A-CDM systems communication – ATFN/AMHS, FIXM, SWIM, two WPs were discussed:

2.51 Guidance Material to Assist APANPIRG Subsidiary Groups in Reviewing and Updating the List of APAC Common SWIM Information Services (WP-6b-01)

2.52 ATFM FIXM Message Data Attributes and Associated Message Templates Based on FIXM Version 4.3 as Asia/Pacific Regional Standard (WP-6b-02)

2.53 Guidance material provided in ATFM & A-CDM/SG/16 WP-6b-01 Appendix A illustrated the type and level of detail required, including business functionality of the information service, a brief description of the service, type of information to be exchanged, information exchange model/message type, message exchange pattern, and priority. A worked example was included for reference.

2.54 The ATFM & A-CDM SG/16 was informed that APANPIRG subsidiary groups were invited to assess whether existing entries combine multiple business functions and, if so, consider splitting them into more detailed and focused information services. Additionally, the ATFM & A-CDM SG/16 noted that a working draft of the Second Version had been developed, and APANPIRG subsidiary groups were requested to submit updates using “track changes” for consolidation at the SWIM TF/11 (26–29 May 2026).

2.55 The ATFM & A-CDM SG/16 noted the feedback from the APAC FF-ICE Ad-Hoc Group, which emphasised that domain-specific groups should focus on defining business rules and business process completion criteria, while the SWIM TF should determine MEP. The APAC FF-ICE Ad-Hoc Group also recommended inclusion of comprehensive operational scenarios as appendices to the Business Functionality for APAC Common SWIM Information Services document.

2.56 During the discussions at the ATFM & A-CDM SG/16, Singapore and Thailand presented a joint response that aligned with the recommendations of the APAC FF-ICE Ad hoc Group discussion. The response proposed updates to the APAC Common SWIM Information Services related to ATFM, focusing on improving clarity and usability. Key proposals included replacing the existing “Priority” column with two new columns - “Applicability” and “Desired Implementation Timeframe” – to better reflect operational relevance and implementation planning considerations. It was also noted by the ATFM & A-CDM SG/16 that the current MEP column had created ambiguity between business and technical aspects; therefore, it was proposed that MEP be addressed by the SWIM TF.

2.57 In addition, the ATFM & A-CDM SG/16 agreed with the recommendation by the APAC FF-ICE Ad-Hoc Group to enhance the “Brief description of the service” column by incorporating a reference to a dedicated appendix, to provide detailed use cases and required MEPs. Derived from the existing work of the Asia-Pacific Cross-Border Multi-Nodal ATFM Collaboration (AMNAC), five ATFM information exchange scenarios related to Flight-Specific ATFM Measure Service and ATFM/A-CDM Integration Service were developed. The finalised scenarios, provided in Appendix 4, were submitted to SWIM TF/11 for identification of the appropriate MEP. The Meeting reviewed the document and agreed that the proposed content is sufficient for SWIM TF to initiate the identification of MEP.

2.58 The Meeting discussed whether the receipt confirmation for ATFM messages identified in the five scenarios is required, as this would affect the selection of the MEP. It was clarified that, apart from ATFM units, airspace users, and airport operators, confirmation is not required. Furthermore, the Meeting discussed whether all possible MEPs for all types of users of ATFM-related SWIM information services should be included in the breakdown scenario tables. The Meeting agreed that only the MEP required to fulfil the operational requirements identified by the domain expert groups should be

included, in order to avoid confusion and to provide a minimum implementation requirement for information service implementers.

2.59 The Meeting was informed of the work on identification, mapping, and development of ATFM FIXM message data attributes and associated message templates based on FIXM version 4.3, to support cross border ATFM operations, A CDM, ATFM/A CDM integration, and traffic synchronisation in a SWIM environment in the APAC region.

2.60 The Meeting noted Conclusion APANPIRG/36/12 on the adoption of APAC Regional FIXM 4.3 Extension, which includes data attributes required to support regional operational requirements that are not included in the FIXM 4.3 Core. Based on this identification and mapping, the Technical Sub-Group (TSG) of AMNAC developed ATFM FIXM message templates (ATFM & A-CDM/SG/16 WP-6b-02 Appendix C). These templates defined the structure and rules for automated validation of ATFM related FIXM messages, covering CTOT/CTO allocation/cancellation and TTOT allocation. The templates also integrated the use of FIXM 4.3 Core and APAC Extension within the template schema to ensure harmonised and interoperable message construction for cross-border ATFM system to system exchanges via SWIM. It was noted that Appendix A of ATFM & A-CDM SG/16 – WP-6b-02 provides the list of data attributes for the five identified ATFM FIXM messages. Appendix B provides a mapping of data attributes to the FIXM version 4.3 Core and the APAC Extension. Appendix C provides the associated ATFM FIXM message templates to support harmonised and automated message validation.

2.61 It was added that, following the ATFM & A-CDM SG/16, additional feedback on the ATFM FIXM message templates was received, and the message template schema was updated accordingly. The validation of the updated message template scheme was successfully conducted by Singapore and Thailand in May 2026, as presented in SWIM TF/11 – WP/12.

2.62 The Meeting was shared that the associated ATFM FIXM message templates developed to support harmonised and automated message validation fall under the responsibility of the SWIM TF. Therefore, the ATFM FIXM message templates schema required review by the SWIM TF. Discussion on this matter was recorded under WP/12.

Hierarchical SWIM Architecture to Achieve Message Exchange Patterns in the APAC Region – Japan (WP/21)

2.63 The Meeting noted that in accordance with the decision of the SWIM TF, a hierarchical architecture has been adopted for the APAC SWIM implementation. Therefore, the approaches to achieving the different message exchange patterns defined in ICAO Doc 10203 Manual on SWIM Implementation based on this architecture need to be discussed and clarified. This working paper clarified the application requirements for these message exchange patterns and discussed technical approaches for achieving them through coordination among Edge and Gateway Enterprise Messaging Services (EMSs).

2.64 It was informed that to ensure the utilisation of various information services, the Manual on SWIM Implementation (ICAO Doc 10203) defines several Message Exchange Patterns (MEPs), including synchronous and asynchronous request/reply, publish/subscribe and one-way. These MEPs are expected to be supported by SWIM TI. However, the practical implementation of these patterns within the APAC SWIM hierarchical architecture requires further discussion and clarification. In particular, the coordination between Edge and Gateway EMSs introduces specific technical and operational considerations that need to be addressed to ensure interoperability and consistency across States.

2.65 Processes and constraints of Synchronous Request/Reply MEP, Asynchronous Request/Reply MEP, Publish/Subscribe MEP and one-way MEP were shared with the Meeting.

2.66 The Meeting noted that the practical validation and evaluation have been conducted through SIPG activities and agreed to provide this working paper to the relevant SIPG Tasks and SWIM TF Task group, particularly SIPG Tasks 1, 2, and 3, and SWIM TF Task 6, for further deliberation.

2.67 The Meeting discussed in detail all recommendations provided in this Working Paper and agreed that there remains a need for more detailed deliberation on each recommendation to ensure alignment with other work being conducted under SIPG, such as the development of Guidance Material on Request/Reply MEP. It was suggested that these recommendations be further discussed at the SIPG Meeting. **ACTION ITEM 11-13**

ATFM FIXM Message and Associated Message Templates based on FIXM Version 4.3 – ATFM SG (WP/12)

2.68 This paper presented the work on the development of ATFM FIXM message and associated message templates based on FIXM version 4.3 to support cross-border ATFM operations, A-CDM, ATFM/A-CDM integration, and traffic synchronisation in the SWIM environment in Asia/Pacific region. The Meeting noted that FIXM version 4.3 was formalised as the regionally agreed information exchange model for information exchange between operational ATFM systems. In support of cross-border ATFM operations and ATFM/A-CDM integration, successive regional FIXM extensions were developed collaboratively by the ATFM SG and the SWIM TF. In line with *Conclusion APANPIRG/35/4* and to ensure readiness of the implementation of ATFM FIXM information exchange, the Technical Sub-Group (TSG) of the Asia-Pacific Cross-Border Multi-Nodal ATFM Collaboration (AMNAC), in collaboration with members of the SWIM TF, identified the ATFM FIXM message data attributes, mapped them to the FIXM version 4.3 Core and Extension, and developed the associated message templates.

2.69 It was informed that this work was presented to the ATFM & A-CDM SG/16 through WP-6b-02 in April 2026. Consequently, the ATFM & A-CDM SG/16 agreed, through its *Draft Conclusion ATFM & A-CDM/SG/16-6*, to the adoption of the identified ATFM FIXM message data attributes, mapping, and the associated message templates, based on FIXM version 4.3, as regional standard templates effective Q1/2027.

2.70 The Meeting noted that additional feedback was received after ATFM & A-CDM SG/16, and the templates were subsequently updated. Singapore and Thailand successfully validated the updated message templates in May 2026. It was highlighted that with the updated message template schema, the identified ATFM message data attributes and their mapping to the FIXM version 4.3 Core and the APAC Extension, as agreed by ATFM & A-CDM SG/16, remain unchanged.

2.71 With the abovementioned, the following draft conclusion was proposed, which was endorsed by the SWIM TF/11 Meeting for APANPIRG/37 adoption through CNS SG/30 endorsement.

Draft Conclusion SWIM TF/11/02 – Adoption of ATFM FIXM Message Data Attributes and Associated Message Templates Based on FIXM Version 4.3 as Asia/Pacific Regional Standard	
What: The ATFM FIXM version 4.3 message templates be: a) adopt the ATFM FIXM message data attributes and associated message templates, based on FIXM Version 4.3, as Asia/Pacific regional standard templates effective Q1/2027 to support cross-border ATFM information exchange via SWIM	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental

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 synchronisation.		☒ Ops/Technical
Why: To support harmonised and automated message validation for cross-border ATFM system-to-system data exchanges, in alignment with Conclusion APANPIRG/35/4 and Draft Conclusion ATFM & A-CDM/SG/16-6.	Follow-up: ☐ Required from States	
When: 29-May-26	Status:	Draft to be adopted by PIRG
Who: ☒ Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☒ Other: ATM/SG		

2.72 In response to a query regarding whether the ATFM FIXM message template schema is required to be published on the official FIXM website (www.fixm.aero), it was clarified that such publication may not be necessary, as the ATFM FIXM message template scheme is intended for regional use within APAC. It was further noted that publication on the ICAO Asia/Pacific Regional Office website should sufficiently serve the purpose.

APAC SWIM Implementation Framework – Japan (WP/20)

2.73 This paper re-examined key outstanding issues related to the APAC SWIM implementation framework within the scope of the SWIM TF and sought further guidance from the Meeting to facilitate the finalisation of associated agreements and technical specifications. It was noted that there is a need to establish a common understanding of what constitutes APAC SWIM and to accelerate the development of consensus-based documentation and technical specifications, SWIM implementation framework, including the roles, responsibilities and accountabilities of stakeholders, governance structure, standards and specifications, policies and processes were clarified and proposed in the Meeting.

2.74 The Meeting was informed about the concern that several elements of the implementation framework for SWIM remain insufficiently defined, particularly in terms of governance structure, role allocation, and policy alignment at the regional level, which may impact the consistency and interoperability of SWIM implementation across the APAC region.

2.75 Roles, responsibilities and accountabilities of different SWIM stakeholders were shared. Given that APAC SWIM is a federated system involving multiple States and stakeholders, a governance structure is essential to ensure coordination, consistency, and transparency, and the following structure was proposed:

- **Regional SWIM Board (working title)**

The highest decision-making body responsible for regional policy direction, approval of standards, and resolution of cross-border coordination issues.

- **Technical Steering Group (working title)**

Responsible for the development, maintenance, and harmonisation of technical specifications. This function may evolve from the current SWIM Task Force.

- **Operations Committee (working title)**

Responsible for operational coordination, including service deployment, monitoring, and usage management.

2.76 It was noted that, while the draft APAC SWIM implementation framework identifies a governance structure comprising a Regional SWIM Board, a Technical Steering Group, and an Operations Committee, further clarification may be beneficial with regard to the institutional positioning and decision-making arrangements of such governance bodies at the regional level.

2.77 The Meeting was also informed that, taking into account the federated and multi-State nature of APAC SWIM, as well as different possible approaches to regional coordination, the following two governance options were identified for further consideration. It was added that these options are not mutually exclusive and may evolve over time depending on regional consensus and implementation maturity.

<u>Option 1:</u> Governance Based on ICAO APAC Institutional Framework	<u>Option 2:</u> State-Led Governance Independent of ICAO Structures
1. Under this option, APAC SWIM governance would be established by leveraging existing ICAO APAC institutional arrangements, in particular within the framework of APANPIRG. 2. A dedicated APAC SWIM Board could be established as a subordinate body under APANPIRG, with participation from States of the Asia/Pacific Region and support from the ICAO APAC Office. This Board would serve as the highest regional decision-making body for APAC SWIM, providing strategic direction, endorsing governance arrangements, and approving key policies and specifications related to SWIM implementation. 3. The existing SWIM Task Force could evolve into, or form the basis of, a Technical Steering Group, operating under the oversight of the APAC SWIM Board. This group would be responsible for the development, maintenance, and harmonization of technical specifications, including APAC-specific extensions to ICAO information exchange models, as well as supporting implementation activities across the region. 4. An Operations Committee could be established to support coordination of operational deployment, service monitoring, and operational issue resolution among participating stakeholders, reporting to the APAC SWIM Board as appropriate.	1. Under this option, APAC SWIM governance would be established through a multilateral, State-led arrangement outside the formal ICAO institutional structure, while remaining aligned with ICAO standards and guidance. 2. A APAC SWIM Board could be established based on a governance agreement or memorandum of understanding among participating States. The Council would be composed of officially designated State representatives and would be responsible for approving regional SWIM policies, technical specifications, and participation arrangements. 3. A supporting Technical Steering Group would be responsible for developing and maintaining technical and architectural specifications, informed by practical implementation experience, trials, and demonstrations. While ICAO information exchange models and guidance would be used as the baseline, this group could manage regional adaptations and implementation-driven refinements in a flexible manner. 4. An Operations Committee could be established to address practical aspects of federated operations, including service availability coordination, trust frameworks, security arrangements, and information-sharing practices among participating stakeholders.

5. This option would ensure strong alignment with ICAO global provisions, including PANS-Information Management (Doc 10199), and would benefit from established ICAO governance processes and regional recognition, while recognising that decision-making processes may be subject to existing ICAO procedural timelines.	5. Under this model, the ICAO APAC Office could participate as an observer or advisor, facilitating information exchange with ICAO activities and supporting consistency with global SWIM developments. This option may offer increased flexibility and implementation agility, while requiring careful consideration of how outcomes are coordinated with ICAO regional and global processes.
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2.78 It was noted that both governance options provide viable pathways for establishing effective regional SWIM governance in the APAC region. The choice of approach, or a phased combination of both, may be informed by regional consensus, implementation priorities, and the desired balance between institutional alignment and operational flexibility.

2.79 The Meeting noted that SWIM TF has developed, or is developing, a range of standards and specifications. Key deliverables include:

- APAC SWIM Service Overview Extensions (draft)
- SWIM Discovery Service (SDS) Implementation Specification (v1.0.0)
- SWIM Metadata Exchange Service (SMXS)
- FIXM v4.3 APAC Extension
- APAC SWIM Technical Infrastructure Profiles (TI Profiles) v1.0
- APAC SWIM Implementation Guidance (IGD)

2.80 Additional specifications, including those related to information security, are expected to be developed. The Meeting recommended that the APAC SWIM implementation framework be formalised by consolidating governance arrangements, roles, standards, and procedures into a single agreed framework document, subject to endorsement by relevant stakeholders.

2.81 The Meeting agreed that Option 1 is the preferred approach, as it ensures harmonisation of SWIM implementation in line with ICAO provisions, supports SWIM interoperability, and promotes adherence to United Nations policies and ethical principles. The Meeting requested Japan to continue exploring further details of Option 1 together with the SWIM TF Task 5 group and to share the outcomes with SWIM TF at a future Meeting. **ACTION ITEM 11-14**

2.82 The Meeting discussed that, in the future, the SWIM TF may evolve into a new Subgroup, as the SWIM concept extends beyond CNS. The ICAO Secretary shared that each section within the ICAO APAC Regional Office is responsible for one Subgroup, and that the establishment of additional Subgroups would require additional resources, which are not currently available. The Meeting was recalled that SWIM TF has been retained under the CNS Subgroup as its current work is highly technical in nature. For the time being and in the near future, the SWIM TF will continue to ensure appropriate coordination with other relevant domain expert groups. Once the regional SWIM technical foundation has been established, should the SWIM TF consider it appropriate, it may request APANPIRG to establish a new Subgroup or consider other alternatives, such as reassignment to another existing Subgroup.

Establishment of a SWIM Test Environment for APAC SWIM – Japan (WP/22)

2.83 Japan presented potential options for the establishment of an evaluation environment within APAC SWIM, including an analysis of their respective advantages and disadvantages, in order to support decision-making by States concerning regional implementation.

2.84 It was recalled that the APAC SWIM infrastructure is envisaged to comprise Gateway Enterprise Messaging Services (GEMS) provided by several States, as well as Edge EMS (EEMS) implemented by individual APAC States. SWIM operations depend on user systems (applications), such as those operated by airlines, which consume information services primarily provided by national ANSPs via the platform. In this context, it is essential that both service providers and service consumers undertake appropriate validation and evaluation activities.

2.85 Relevant requirements and guidance from ICAO Doc 10199 PANS-IM, a part of the Information Service Overview requirements and existing practices, such as a case study of FAA, Eurocontrol, and JCAB, were shared with the Meeting.

2.86 A proposal to build a Testing Environment for APAC SWIM, along with its advantages and disadvantages, was shared.

Option 1: Continuation of the SIPG Test Environment (CRV-based)	Option 2: Internet-Based SWIM Sandbox Environment
Advantages - Closely replicates the operational (live) environment Disadvantages - Participation may be limited due to resource constraints - Connectivity challenges may arise for certain States - Bandwidth testing requires CRV provisioning, incurring additional costs - No established framework for connectivity via the Internet Risks None	Advantages - Facilitates simpler, faster, and more cost-effective connectivity - Supports accelerated implementation, testing, and capacity-building - Enables flexible bandwidth testing - May function as an interim Edge EMS - Particularly suitable for MET information services Disadvantages - Does not fully replicate the operational CRV environment - Potential concerns regarding data sensitivity Risks - May require policy adjustments in certain States - Potential implications in terms of operational costs

2.87 The Meeting noted that Option 1, the regional SWIM testing environment over CRV, is aligned with the current SIPG test setting. Maintaining this approach during the initial phase of APAC SWIM implementation may therefore be advantageous. However, as APAC SWIM evolves with operational SWIM traffic carried over CRV and the demand for service validation increases, constraints on CRV capacity may arise. On the other hand, a regional SWIM testing environment over the Internet may accommodate a wider group of information consumers and support testing of bandwidth-intensive information services (e.g. MET) in a regional environment. Accordingly, it was recognised that there may be a future need to transition from the regional SWIM testing environment from CRV to the

Internet. The Meeting therefore requested Japan to further explore feasible approaches for transitioning the testing environment from CRV-based connectivity to Internet-based connectivity **ACTION ITEM 11-16** It was further suggested that the study considers the associated technical work and costs required for such transition and the long-term maintenance of the environment. In this regard, the CRV network model, which is based on cost-sharing among APAC member States, may serve as a useful reference.

IMP Updates – Japan (IP/04)

2.88 Japan provided an overview of the fourth Meeting of the Information Management Panel (IMP/4), held at ICAO Headquarters in Montréal from 20 to 24 April 2026. Proposed amendments to the *Procedures for Air Navigation Services — Information Management (PANS-IM, Doc 10199)* and the *Manual on SWIM Implementation (Doc 10203)* were discussed with a view to enhancing SWIM interoperability. In addition, an action plan to improve global interoperability was developed, and the Panel's work programme (Job Card) was reviewed in the IMP/4 Meeting.

2.89 The Meeting was informed that progress related to the ATM Information Reference Model (AIRM), including the planned release of version 1.3.0 in 2026 (current approved version: 1.2.0), was reported to the IMP/4. It was added that submission of AIRM 1.3.0 to the IMP for approval is planned for autumn 2026.

2.90 The Meeting noted that the Services Working Group introduced the Global SWIM Registry Interoperability Concept, which proposed a method to improve interoperability among SWIM registries. It was also reported that no major revisions to existing SWIM guidance are currently envisaged. In addition, updates were provided on the SWIM Discovery Service (SDS) Specification under development within the APAC SWIM TF. IMP/4 also shared that APAC and the FAA plan to conduct operational scenario development and testing in 2026. Future work at the IMP level will continue in coordination between the Services and Architecture Working Groups.

2.91 It was noted that several working and information papers were submitted addressing topics related to the Global SWIM environment. Given the complexity of issues related to the Global SWIM environment, including the need to consider operational aspects across multiple domains and coexistence with existing systems such as AFTN/AMHS, the IMP agreed to request the Air Navigation Commission (ANC) to establish a dedicated task force involving relevant panels, recognising that the work would require border coordination across multiple domains and stakeholders.

Update on MET Information Exchange Via AMQP in Europe – Australia (WP/13)

2.92 Australia provided an update on the implementation of AMQP brokers in Europe for meteorological information exchange, which describes the current state of the standardisation of AMQP headers and message structure as defined by the European MET3SG and key lessons learned during implementation. Australia highlighted the need for detailed, globally agreed technical specifications for AMQP message and application properties, and the practical differences encountered between different AMQP implementations. Aggregation data being performed across the Northern Europe Aviation Meteorology Consortium (NAMCON) states was also highlighted.

2.93 The Meeting was requested to consider adopting the same approach and guidance for meteorological information exchange aspects of APAC SWIM, as well as to consider if there is a need to align the metadata used across different information domains.

2.94 Singapore informed the Meeting that it has been working with its MET service provider on migrating certain weather services towards AMQP adoption. Singapore further queried, with respect to non-IWXXM products (e.g., other data models, imagery, etc.), whether there are any ongoing initiatives within the METP to support their migration to SWIM-compliant frameworks, for example, via HTTP,

in order to align them with the AMQP environment alongside IWXXM-based message exchanges. Another query was raised regarding whether there is a requirement to standardise the topic address delimiters for MET services.

2.95 Australia informed the Meeting that discussions are ongoing under the updating work of the MET-SWIM Roadmap and Guidelines for MET-SWIM Implementation regarding different data types and the associated exchange mechanisms. It was noted that many MET services are likely to adopt AMQP as a notification service, carrying IWXXM messages together with associated payloads, similar to the approach implemented in Europe. Australia also provided an example of standardised notifications between Volcanic Ash Advisory Centres (VAACs), which may include IWXXM data and polygon information representing ash extents. User systems could then utilise request/reply services to retrieve higher-volume gridded data, concentration levels, or imagery products as needed.

2.96 Regarding the requirement to standardise topic address delimiters for MET services, METP is currently looking to adopt the European approach. The Meeting was invited to share recommendations, if any. Japan suggested considering the implementation of metadata for the AMQP-based PUB/SUB.

2.97 With respect to the request to consider adopting the same approach and guidance for meteorological information exchange aspects within APAC SWIM, it was agreed that this can be further assessed and considered by SIPG Task 2, as the group is currently working on routing mechanisms for the APAC region. It was acknowledged that the SIPG Task 2 work is mainly based on the message property-based routing; however, the topic-based routing can be discussed within Task 2. **ACTION ITEM 11-17**

2.98 Regarding the request to consider whether there is a need to align metadata used across different information domains, it was shared that it would depend on the type of metadata involved. As the naming convention and structure are currently under discussion within SIPG Task 2, it was suggested that this request also be considered under that work. **ACTION ITEM 11-18** Australia requested that, should SIPG develop any recommendations arising from both requests, these be shared with the MET/IE WG / MET SG Secretary. **ACTION ITEM 11-19**

Progress Update on SWIM Implementation in Japan (IP/06)

2.99 Japan presented a progress update on the implementation of SWIM in Japan. It outlined Japan's strategic approach, the development of SWIM technical infrastructure, and the commencement of operational information services in March 2026. It also highlighted Japan's alignment with ICAO Global Air Navigation Plan (GANP) and the APAC SWIM Implementation Roadmap, as well as future steps toward full SWIM-enabled operations.

2.100 The Meeting was informed that Japan's SWIM implementation has been guided by a phased and operationally focused approach. Rather than a single system replacement, Japan has pursued the gradual integration of SWIM concepts into existing ATM environments, ensuring continuity of operations while enabling future scalability. It was added that the key principles of Japan's SWIM roadmap include:

- Coexistence with legacy systems during transition,
- Early operational use of various types of digital information
- Provision of standardised information services via a centralised SWIM platform

2.101 It was added that Japan has established a national SWIM technical infrastructure as a digital information platform for aviation-related data. The infrastructure enables centralised collection, management, and dissemination of aeronautical, meteorological, and operational information through standardised interfaces. Key characteristics of Japan's SWIM Technical Infrastructure include:

- Internet-based access with appropriate security controls,
- Service-oriented architecture supporting multiple information services,
- Capability to provide information in internationally standardised digital formats

2.102 It was noted that the launched SWIM services are provided through a SWIM portal, allowing authenticated and authorised users to access information via web-based interfaces and system-to-system connections. Japan emphasised early operational benefits through practical information services such as Digital Aeronautical Information Services, Integrated Airport and Airspace Information Services, and Flight Plan and ATS Information Services. It was noted that these services are designed to coexist with existing AMHS/AFTN-based processes while offering a pathway toward future ICAO concepts such as FF-ICE. It was added that Japan's SWIM implementation is fully aligned with the ICAO APAC SWIM Implementation Roadmap, including the dual operation strategy where legacy systems and SWIM services coexist during the transition period.

2.103 Japan shared its plans to further expand SWIM capabilities and its willingness to continue to refine governance, cybersecurity, and service management frameworks to ensure sustainable SWIM operations.

2.104 In response to a question on difficulties faced in coordinating with different stakeholders, Japan informed the Meeting that most users currently use browser-based services, while efforts are ongoing to promote the use of Web API and PUB/SUB services.

2.105 In response to a question about the SWIM governance framework implemented in Japan, it was informed that a SWIM steering committee consisting of multiple aviation stakeholders has been established. It was further added that SWIM usage and enhancement are promoted through the SWIM Education and Enhancement Committee (SWIMEE). To accelerate SWIM implementation and encourage wider SWIM adoption, Japan emphasised the importance of providing SWIM education to users.

SWIM Discovery Service (SDS) Update: Schema release, testing, and global adoption for Registry Interconnection – United States (WP/15)

2.106 The paper discussed updates to the SWIM Discovery Service (SDS) development, a standardised approach to support registry interoperability and federated information service discovery across independently managed SWIM registry environments. It was informed that recent SDS developments (post APAC SWIM TF/10) include alignment with the latest PANS-IM data model and standardisation of protocols for registry metadata exchange and preparation for demonstration, testing, and implementation.

2.107 The Meeting was informed that originally developed as a collaboration between the FAA and Korea Airports Corporation (KAC), SDS has been further matured and adopted in the APAC region and the FAA, both regionally and as members of the IMP, through collaborative initiatives. The recent schema release and updated service description artefacts now enable ICAO States implementing SWIM registries with harmonised metadata exchange and service discovery across individual registries.

2.108 The paper highlighted how SDS aligns with the regional frameworks and ICAO IMP objectives under the SWIM Registry Interoperability Job Card, and upcoming initiatives to develop operational scenarios, test cases, and an implementation plan for registry interconnection and adoption at both regional and global ICAO levels. The Meeting noted the importance of SDS implementation to achieve the global SWIM registry interoperability concept and enable SDS as a candidate global technical solution.

2.109 It was stated that regional test cases and test plans should be developed for SDS testing and continued maturity, implementation plans and schedules should also be socialised for SDS

development and service roll-out. Additionally, it was noted that cross-regional SDS demonstrations should be conducted for global adoption. States/Administrations were encouraged to continue socialisation and adoption efforts among both SWIM TF and IMP stakeholders to support the implementation of the SDS concept and associated data exchange mechanisms across SWIM registries for global interoperability.

2.110 Regarding the proposal to develop regional test cases and test plans for SDS testing and continued maturity, it was noted that this task is already within the scope of SIPG activities.

2.111 Regarding the proposal to conduct cross-regional SDS demonstrations for global adoption, it was recalled that SDS demonstrations have previously been conducted between Europe and the United States, as well as within the APAC region. It was added that SWIM TF, through members common to both SWIM TF and IMP, continues to share updates on SDS developments at IMP Meetings. To continue demonstrations with other regions, it was highlighted that there is currently no information about the availability of SWIM registry in regions other than those mentioned above. Therefore, further SDS demonstrations cannot be planned at this time.

2.112 Regarding the proposal to **conduct SDS demonstrations over CRV** in addition to the Internet, it was agreed that, as most APAC States currently plan to implement SWIM registries over the Internet, demonstrations over CRV may be reconsidered in the future.

2.113 The Meeting discussed the need for a baseline standardised version of SDS for the APAC region. It was recalled that all APAC States/Administrations intending to implement SWIM registries would need to implement SDS in accordance with the agreements reached at SWIM TF/3 and SWIM TF/8. In this context, the Meeting agreed that it would be prudent to adopt SDS v2.0 as the baseline SDS version for the APAC region. Following detailed deliberation, the Meeting drafted the following draft Conclusion for APANPIRG/37 adoption through CNS SG/30.

Draft Conclusion SWIM TF/11/03 Adoption of SWIM Discovery Service Baseline Standardised Version for APAC Region – SDS v2.0			
What: To adopt the SWIM Discovery Service version 2.0 (SDS v2.0) as a regional baseline standard for Asia/Pacific SWIM implementation.		Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical	
Why: Considering that the target completion of the Asia/Pacific regional SWIM implementation is 2030, and that many APAC States/Administrations intend to implement SWIM registries, the provision of a baseline SDS version is essential to support harmonised SWIM implementation within the APAC region. SDS v2.0 has been studied and tested by the SWIM TF and that it is aligned with Doc 10199 PANS IM, to support its adoption as the regional baseline standard for SDS.		Follow-up: ☐ Required from States	
When:	29-May-26	Status:	Draft to be adopted by PIRG
Who:	☒ Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☒ Other: CNS SG		

2.114 To ensure accessibility to the SDS Implementation Specification, Version 2.0, the Meeting requested the United States to upload the latest edition of the document to the SWIM Service Discovery website (discovery.swim.aero). **ACTION ITEM 11-20**

2.115 The Meeting discussed the need for a minor update to SDS v2.0 to include additional information service overview fields, i.e. “Information service definition reference” and “Use limitation”, which were recently agreed at IMP/4. The United States agreed to undertake the task of updating SDS v2.0 accordingly. **ACTION ITEM 11-21**

Development of Updated Version of Business Functionality of APAC Common SWIM Information Service and Associated Guidance Material – Task 6 Leads (WP/16)

2.116. The Meeting recalled that Decision 36/11 from APANPIRG/36 in November 2025, adopted the [First Version of the Business Functionality for APAC Common SWIM Information Services](#). At SWIM TF/10 in May 2025, it was noted that the level of detail differed across different information domains (e.g. aeronautical information, flight information, surveillance data, meteorological information, etc.), potentially caused by different levels of understanding as to what detail was needed by SWIM TF to facilitate the development of SWIM information services within the APAC region. Two actions were raised at SWIM TF/10 to improve the utility and information in the listing of APAC Common SWIM Information Services.

2.117. The paper proposed the initial draft, second working version of the Business Functionality of APAC Common SWIM Information Services, taking into account inputs from the relevant APANPIRG Subsidiary Groups, including FF-ICE Ad-Hoc Group, SURSG, SURICG, ATFM & A-CDM/SG, MET/IE WG and AAITF and also incorporated additional suggested improvements that were identified through the consultation with those Subsidiary Groups.

2.118. The suggested improvements to the Business Functionality for Common APAC SWIM Information Services were proposed as follows:

- a) Replace “Priority” with two independent columns (not yet incorporated into the table):
 - i. “Applicability” (“region-wide” in order to achieve the anticipated benefits, vs. “as needed” to meet local needs); and
 - ii. “Desired implementation timeframe” (Immediate (before 2030), Medium-term (2030-2035), Long-term (beyond 2035)).
- b) Inclusion of a “maturity” attribute only in the working version of the table (i.e. not in the published version) to highlight the state of development of the associated Information Service (e.g. mature, under development, ideation). This will provide easy insight to all relevant stakeholders, for example, when deciding which Information Services to include when recommending the publishing of subsequent versions of the Business Functionality of APAC Common SWIM Information Services at the ICAO APAC e-doc website, i.e. only “mature” and “under development” Information Services would be published.
- c) Identification of the relevant Subsidiary Group responsible for the associated entry(ies) in the document, by relevant Information Service domains (e.g. Flight Information Services, Aeronautical Information Services). Note that this has resulted in creating a new separate Information Service domain grouping, “Flow Information Services”, which had been grouped with the Flight Information Services in the published First Version.

2.119. The specific suggestions from Subsidiary Groups regarding the usability, clarity, and structure of the information in the list of APAC Common SWIM Information Services were shared at the Meeting.

2.120. It was noted that, at the [Fourth Asia/Pacific FF-ICE Ad-Hoc Group Meeting](#) and Workshop, held from 16 to 18 March 2026, the Ad-hoc Group reviewed the Business Functionality of APAC Common SWIM Information Services, Version 1.0, and agreed on the following recommendations for consideration by the SWIM TF.

- a) Recognising the limited technical expertise within domain-specific groups such as the FF-ICE Ad-Hoc Group, it was agreed that the group should **focus on defining business rules and business process completion criteria** for information services. The determination of appropriate Message Exchange Patterns (MEPs) for each business process should be undertaken by SWIM TF, which possesses the relevant technical expertise.
- b) To support the determination of MEPs, it was agreed that **comprehensive operational scenarios**, including operational requirements and business process completion criteria, are essential. Accordingly, such scenarios, where required, should be provided as an appendix to the Business Functionality of APAC Common SWIM Information Services document. A reference to the appendix should also be included in the ‘Brief description of the service’ column. Figure 1 illustrates an example of how these comprehensive scenarios may be incorporated:

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 Service in Initial 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. Appendix A: Filing Scenario	Flight plan for registration, update or cancellation	FIXM	Appendix A	1

SWIM TF to fill in

Appendix A: Filing Scenario

	Message	Details	Timeout	Comments	Message Exchange Pattern
1	eAU send eFPL (FFP) to eASP	Mandatory	N/A	-	
2	eASP returns Submission Response (SR) #1 to eAU	Mandatory (after eFPL received)	1 minute	eASPs validate message format and basic rules. SR ACK: Validation passed SR REJ: Validation failed SR MAN: Manual Processing needed	
3	eASP returns Submission Response (SR) #2 to eAU	Conditional (only if SR#1 = MAN)	Variable (manual processing time)	Any subsequent SR is provided after manual intervention of eFPL (after SR MAN)	
4	eASP returns Filing Status (FS) #1 to eAU	Mandatory (if final SR = ACK)	1 minute after SR “ACK”	eASPs evaluate flight plan against operational constraints and ATM configuration	
5	eASP returns Filing Status (FS) #2 to eAU	Conditional (if FS #1 = PENDING, or due to re-evaluation)	Variable (2 nd evaluation)	eASP sends updated FS when flight is ready to be evaluated (for PENDING) or when operational changes affect flight status	

Figure 4: An example of how the comprehensive scenarios may be incorporated in the Business Functionality of APAC Common SWIM Information Services.

2.121. The SURSG/5 and SURICG/11 Meetings deliberated at length on the initial set of APAC Common SWIM Surveillance Information Services and provided input and comments. The SURSG/5 and SURICG/11 Meetings recommended that *Guidance Materials for the sharing of*

surveillance data in SWIM should be added as a reference document for APAC Common SWIM Surveillance Information Services to support service implementers. This has been incorporated into the draft second working version of the document.

2.122. At [the ATFM & A-CDM/SG/16](#) Meeting, Singapore and Thailand presented a joint response (SP/14) that aligned with the outcomes of the FF-ICE Ad-Hoc Group discussion. The response proposed updates to the APAC Common SWIM Information Services related to ATFM, focusing on improving clarity and usability. It was also noted that the current “Message Exchange Pattern (MEP)” column had created ambiguity between business and technical aspects; therefore, it was proposed that MEP determination be separated and addressed by the SWIM TF. In addition, Singapore and Thailand recommended enhancing the table by incorporating a clearer “Brief description of the service” through referenced filing scenarios example developed by the FF-ICE Ad-Hoc Group. The proposed next steps included finalising these scenarios and submitting them to the SWIM TF within agreed timelines in 2026 to support the identification of MEP. The finalised scenarios are attached in **Appendix 7** and submitted to SWIM TF/11 to undertake the identification of MEP.

2.123. The ATFM & A-CDM SG/16 Meeting noted that [Appendix B of the working paper](#) identified four ATFM-related SWIM Information Services; however, **only two services—namely the Flight-Specific ATFM Measure Service and the ATFM/A-CDM Integration Service**—had been included in the first published edition. The ATFM & A-CDM SG/16 encouraged further review of the remaining two services, i.e. the ADP Distribution Service and the Flow-Specific ATFM Measure Service, considering any progress since the SWIM TF/10 discussions, and invited feedback on their potential inclusion in the next revision.

2.124. It was clarified that the proposed ATFM messages in the five ATFM information exchange scenarios were associated with two APAC Common SWIM Information Services, with the first message exchanged under the ATFM/A-CDM Integration Service and the remaining four messages under the Flight-Specific ATFM Measure Service; additional administrative clarity might be provided through supporting appendices. The Meeting noted that, while a reference document for the ADP Distribution Service was made available following the elevation of the Asia-Pacific ADP exchange procedure, the digital data format for ADP remained under development and the exchange model was yet to be defined. The Flow-Specific ATFM Measure Service was similarly recognised as less mature, given the absence of a harmonised, region-wide operational application and potential network impacts. It was agreed that further operational and technical development was required before detailed SWIM messaging could be specified, and that relative maturity or priority could be reflected in the information services table, with coordinated input from the ATFM & A-CDM/SG to be provided to the SWIM/TF Meeting in May 2026.

2.125. The ATFM & A-CDM/SG/16 Meeting proposed no changes in the provided list of [ATFM-related information services](#). In addition, the message types proposed to the information services table will be mapped to relevant information services for SWIM TF reference to identify the Message Exchange Pattern.

2.126. The MET/IE WG/24 Meeting noted the information presented in WP/27 and reviewed the guidance material provided by SWIM TF. During the discussion, the Meeting suggested that **the SWIM TF may wish to consider addressing possible options for push “pub-sub” services and on-demand “request/reply” services as part of future refinement of the document**. The MET/IE WG/24 Meeting reviewed the list of APAC Common SWIM Information Services related to MET and agreed that no amendments or modifications were needed at this Meeting.

2.127. The ICAO Aeronautical Information Services – Aeronautical Information Management Implementation Task Force ([AAITF/21](#)) Meeting does not propose any new amendments

to the APAC Common SWIM Aeronautical Information Services already published in version 1 of the document in 2025.

2.128. In response to a suggestion to develop, at the global level rather than the regional level, a list of Common SWIM Information Services, in addition to those being defined by the technical panels, it was informed that, due to differences in current SWIM implementation maturity across regions, the IMP has different priorities. However, considering the APAC SWIM implementation timelines of 2024-2030, it was essential for the SWIM TF to define a prioritised list of Common SWIM Information Services to support APAC States/Administrations in identifying required information services that should be implemented on SWIM as a priority within the APAC region. It was further added that, as several key IMP members and other relevant panels are also part of the SWIM TF, efforts are being made to ensure that APAC Common SWIM Information services remain aligned with the global format and other relevant global recommendations.

2.129. The Meeting reviewed the draft Second Version of the APAC Common SWIM Information Services document and agreed that SWIM TF is best placed to determine the most appropriate Message Exchange Pattern for each defined Information Service proposed in the table of Business Functionalities for APAC Common SWIM Information Services.

2.130. It was agreed that the revised version template will incorporate all suggestions provided by different expert groups. In addition, all services containing some fields marked with “TBD” or “?” and not incorporated into the first version will be included in version 2.0 to avoid confusion within expert groups regarding the exclusion of information services for which the groups had previously provided inputs. It was added that new columns for which information is currently unavailable will be left blank, with all possible options available for further selection by relevant expert groups. These measures were intended to ensure that the APAC Common SWIM Information Services v2.0 document will be used by the relevant expert groups for regular review during their upcoming Meetings.

2.131. It was suggested to upload “Guidance Material for Business Functionality of APAC Common SWIM Information Services”, to the ICAO APAC e-Document webpage as a supporting document to the second version of APAC Common SWIM Information Services, to support other domain expert groups in updating the second version of APAC Common SWIM Information Services.
ACTION ITEM 11-22

2.132. To align with the Second Version of the document, Task 6 was requested to update the Guidance Material to cover the new columns and the methodology to define complex services through detailed scenario breakdowns. **ACTION ITEM 11-23**

2.133. The Meeting agreed to publish the document as the second version and present the revised document for consideration by CNS SG/30 through the following Draft Decision and subsequent adoption by APANPIRG/37. Following APANPIRG/37’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.

Draft Decision SWIM TF/11/04 - Adoption of APAC Common SWIM Information Services, v2.0		
What:	The second version of APAC Common SWIM Information Services, provided in Appendix B , be adopted for immediate use by APAC States/Administrations. The set of APAC Common SWIM Information Services, and the associated performance of SWIM Technical Infrastructure underpinning these services, is not specified to support the provision of aircraft separation.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical

Why: To assist APAC States/Administrations in planning and implementing their SWIM information services.		Follow-up: ☐ Required from States
When: 29-May-26	Status: Draft to be adopted by PIRG	
Who: ☒ Sub groups ☐ APAC States ☐ ICAO APAC RO ☐ ICAO HQ ☐ Other: MET SG, ATM SG, AOP SG		

2.134. The Meeting discussed at length the definition and categorisation of “Maturity”. Regarding the definition of “Maturity”, two concepts were deliberated, i.e. (i) the maturity of details of table elements for a specific information service included in the APAC Common SWIM Information Services list, and (ii) the maturity level representing readiness of the information service itself for implementation. Regarding the categorisation of “Maturity”, one proposal was to adopt the Maturity Levels applied to ASBU elements under the ASBU framework in the Global Air Navigation Plan. After detailed deliberation, it was agreed that further discussion under Task 6 is required to develop the definition and categories of “Maturity”. **ACTION ITEM 11-24**

Feedback on Business Functionality Requirements for APAC Common SWIM Information Services – Flight Information Services – FF-ICE Ad Hoc Group (WP/17)

2.135. This paper presented feedback from the ICAO APAC FF-ICE Ad-Hoc Group on the approach for defining business functionality requirements for APAC Common SWIM Information Services. The FF-ICE Ad-Hoc Group proposed breaking down FF-ICE services into detailed operational scenarios with business completion criteria, in order to enable the SWIM TF in determining appropriate Message Exchange Patterns (MEPs) at the scenario step level rather than at the service level. This approach aimed to provide clearer business requirements to enable the SWIM TF to identify more accurate technical specifications.

2.136. The Meeting was presented with the process to define complex services by domain expert groups as follows:

- a. **Service-Level Definition** – Domain expert groups continue to provide broad-level information service definitions by populating the existing service definition table in the "Business Functionality for APAC Common SWIM Information Services" document, as per current practice.
- b. **Scenario Identification** – Domain expert groups identify which services are complex that require scenario-level analysis, and then identify all operational scenarios associated with each of those services.
- c. **Scenario-Level Analysis** – Domain expert groups expand on the ‘Brief Description of Service’ column by conducting detailed analysis for each identified scenario and documenting it in appendices, including:
 - i. **Business completion criteria**: Define when actors can consider their business operation complete and proceed with subsequent operations for that specific scenario
 - ii. **Detailed workflow analysis** – Define each message exchange step using the Scenario Steps Table

2.137. The Meeting discussed and agreed with the proposed enhanced methodology for analysing complex information services through detailed scenario breakdowns, including the specification of business completion criteria and the Scenario Steps Table. It was agreed that the proposed methodology can be applied to the analysis of any complex service. However, it was clarified that not all information services included in the *Business Functionality of APAC Common SWIM*

Information Services would necessarily require the level of detail developed following this methodology. The contributory bodies responsible for updating relevant information services, at their discretion, may consider adopting this methodology. It was suggested to incorporate this information in the “**Guidance Material for Business Functionality of APAC Common SWIM Information Services**”. **ACTION ITEM 11-25**

2.138. Based on the business requirements and completion criteria defined by domain expert groups, it was proposed that the SWIM TF take the responsibility to determine the appropriate MEPs for each step in the Scenario Steps Table. A summary of the fields in the Scenario Step Table and the respective responsible bodies is as follows.

Fields	Description	Responsibility
Step	Sequential identifier for each message exchange within the scenario	Domain Expert Group
Message	Specific message type, e.g. FF-ICE message type, with sender and recipient identification (e.g., "eAU sends Filed Flight Plan to eASP", "eASP returns Submission Response to eAU")	Domain Expert Group
Message Requirements	Message requirement classification and prerequisite conditions that must be satisfied prior to message transmission • Mandatory - Message must be sent/received in all instances of the scenario without exception • Conditional - Message must be sent/received when specific triggering conditions are met, but is not required when those conditions do not occur	Domain Expert Group
Business Timeout	Maximum acceptable time duration for message response from an operational perspective. The message originator is expected to contact the recipient if no response is received within the timeout period.	Domain Expert Group
Comments	Additional operational context, processing requirements, or business rule specifications that inform technical implementation	Domain Expert Group
Message Exchange Pattern	A template or pattern that defines the sequence and structure of messages exchanged between interacting components to accomplish a single complete information exchange. The Message Exchange Pattern helps the information service provider understand how the information service should behave, and the information service consumer understand how to interact with the information service.	SWIM TF

Table 1: Scenario Step Table Fields

2.139. The Meeting was requested to review the proposed definition of the “Message Exchange Pattern” field in Table 2, for which the SWIM TF is responsible for determining. The definition of Message Exchange Pattern was deliberated at length. It was agreed that the Message Exchange Pattern definition in ICAO Doc 10203 Manual on the SWIM Implementation can be used instead of creating a new definition. With this agreement, the revised definition of Message Exchange Pattern was amended as follows:

***Message exchange pattern.** A template that describes relationships of multiple messages exchanged between interacting components to accomplish a single complete information exchange*

2.140. This new definition was incorporated into the revised Appendix A to APAC Common SWIM Information Service v2.0.

2.141. It was agreed that SWIM TF will undertake the determination of appropriate MEPs for each scenario step based on the business requirements defined by domain expert groups and consider applying this approach to other complex SWIM Information Services that contain multiple operational scenarios with varying business requirements.

2.142. Task 6 was assigned to identify the appropriate MEP for FF-ICE related Flight Information Services in Appendix A to APAC Common SWIM Information Service v2.0, with the support of China, Japan, the Republic of Korea, Singapore and Thailand, which are involved in the FF-ICE Ad-Hoc group. **ACTION ITEM 11-26**

API Management and Gateway Introduction, Framework, and Best Practices for Harmonised SWIM Request/Reply Messaging – United States (WP/18)

2.143 The Meeting noted that the FAA and APAC region are considering Application Programming Interface Management and Gateway solutions to implement web services with Request-Reply message exchange patterns for SWIM data exchange. It was informed that Application Programming Interfaces (API) enable software systems to securely communicate and share data across government agencies and international partners. API gateways serve as a centralised entry point, managing routing, security, and system performance. API management provides governance through monitoring, access control, and lifecycle oversight. Together, they support the development of scalable, secure, and reliable digital services. Organisations benefit from faster system integration; users gain greater control and consistency with improved user experience.

2.144 The Meeting was informed that FAA is modernising its SWIM messaging infrastructure with API Gateways for synchronous messaging and event-brokers for asynchronous messaging. FAA provided an overview of the latest FAA-APAC developments on API Gateways for SWIM messaging, benefits of an API Management and Gateway solution, and best practices to develop a framework for API governance and harmonised cross-regional SWIM data exchange. Operational use cases and examples of SDS implementation leveraging API Gateway were noted by the Meeting.

2.145 The Meeting was requested to include API Governance Framework and guidance materials development in the Governance Working Group and offered to collaborate in SIPG and related APAC Task Force regarding API Gateway strategy discussions and demonstrations.

2.146 The Meeting shared concerns about schema validation requirements as part of the API Gateway governance, as in some States/Administrations' SWIM implementations, information service providers and the information service consumers are responsible for conducting schema validation, while the API Gateway is considered part of SWIM TI. However, in the FAA framework, schema validation is treated as a security requirement for all data entering the system. Due to these differing considerations, it may be difficult to reach an agreement on the proposed API governance framework, as different States/Administrations may impose varying national security regulations and measures.

2.147 Regarding the request to include the development of an API Governance Framework and related guidance materials under the Governance Working Group, it was noted that additional detailed discussions on the features and functionalities of API Gateway are still required. It was

therefore recommended to first establish and agree on the **minimum required features and functionalities of the API Gateway** before considering its adoption at the APAC regional level. Once these foundational elements are defined, development of the API Governance Framework can be revisited at a later stage. Considering that the current stage of work is to focus on agreeing upon the minimum features and functionalities of the API Gateway, it was agreed to assign this activity SIPG Task 3, rather than Task 5 under the SWIM TF. **ACTION ITEM 11-27** As the work of SIPG Task 2 is closely related to the API Gateway concept, it was further suggested that SIPG Task 3 work closely with Task 2, as the minimum features and functionality to be agreed upon may affect the implementation topology, namely a centralised or distributed API Gateway. **ACTION ITEM 11-28**

2.148 In response to concerns regarding the incorporation of this new activity under the limited SIPG timelines, the SWIM TF Co-Chair informed the Meeting that the finalisation of various MEP mechanisms and guidance materials related to the Request and Reply MEP should be given the highest priority for SIPG. If the proposed API Gateway study cannot be completed before Q2 2027, it can instead be considered under a future SIPG task. **ACTION ITEM 11-29**

Progress on Development of R-R MEP Guidance Material – SIPG (WP/27)

2.149 This paper presented the progress on development and main contents of R/R MEP Guidance Material drafted by SIPG Task 3 and outlined implementation approaches for the APAC SWIM TI prototype. The Meeting noted that this guidance material is not the final version but rather serves as the initial baseline for implementing R/R MEP within the APAC region. It was recalled that, since SWIM TF/10, extensive discussions have been held at the SIPG level regarding the implementation of R/R MEP in the APAC region. While consensus has been reached on certain topics, such as the adoption of HTTP for synchronous R/R MEP, others, including the choice between full mesh and hierarchical architectures, remain subject to ongoing debate. These unresolved issues will be further discussed under SIPG Task 3. It was added that under the SIPG, R/R MEP will be implemented, tested and validated in the APAC SWIM TI prototype based on the current version of guidance material and, through a continuous feedback loop, any deficiencies or areas for improvement identified during the prototyping phase will be iteratively reflected in the guidance material to improve its maturity.

2.150 The Meeting discussed the significance of this document. It was noted that this document serves as guidance material providing a regional baseline for the major MEPs to be used in the future. It was recommended that all States/Administrations review the document and provide their feedback to SIPG Task 3 for further improvement. **ACTION ITEM 11-30**

2.151 MET/IE WG Chair informed that the proposed description of synchronous and asynchronous R/R MEP for FF-ICE scenarios may not align with many MET scenarios. It was agreed that the MET/IE WG will provide feedback to ensure the guidance document covers most use cases in the region. **ACTION ITEM 11-31**

Progress on Development of REST API URI Structuring and Naming Guidance Material – SIPG (WP/28)

2.152. ROK, on behalf of the SWIM Pioneering Group (SIPG), provided the progress on development of REST API URI Structuring & Naming Guidance Material, a subsequent deliverable of the R/R MEP Guidance Material within the SIPG Task 3.

2.153. The Meeting noted that the R/R MEP Guidance Material provides a high-level approach to implement the R/R MEP in the APAC region, and as of April 2026, at the SIPG level, there is a tentative consensus on how to implement synchronous R/R MEP. The consensus focuses on four key technical pillars:

- Protocol: HyperText Transfer Protocol(HTTP)/HTTP(Secure)S v1.1

- Architecture: Representational State Transfer (REST) as an architectural style
- Implementation: Application Programming Interface (API) Gateways (GW) (or Proxies)
- Routing: Path-based Routing (PBR)

2.154. It was informed that if future implementation proceeds based on these technical pillars, service instances using RESTful API are expected to be exposed through API GWs deployed at regional and local levels, common conventions and standardised URI structures ought to be defined and applied across the region.

2.155. The Meeting was informed that the REST API URI Structuring & Naming Guidance Material outlines how to design and apply RESTful API URI structuring and naming conventions for implementing synchronous R/R MEP in the APAC region, which includes the definition of REST and RESTful APIs, the rationale for URI structuring and naming conventions, path element definitions, and data flow diagrams illustrating how requests are routed when the conventions defined in this guidance material are applied. The paper summarised the key concept of REST API URI structuring and naming for regional SWIM. The main contents of the REST API URI Structuring & Naming Guidance Material were shared in the Meeting, and the guidance material is provided in **Appendix 11**.

2.156. The Meeting noted that the URI naming related recommendations provided by [WP/21 of SWIM TF/11](#) and the discrepancies between those recommendations and the considerations presented in this document. SIPG Task 3 was requested to further study recommendations contained in WP/21 and amend the guidance material, if deemed necessary. **ACTION ITEM 11-32**

Comments on Technical Memorandum of Cooperation (TMC) Document for ATM Information Exchange through SWIM – New Zealand (WP/25)

2.157 This paper presented New Zealand's comments on the draft Technical Memorandum of Cooperation (TMC) document for ATM Information Exchange through SWIM, following Actions 10-11 and 10-12 from SWIM TF/10.

2.158 As part of the collaboration outlined in Action 10-12, Australia advised Malaysia and New Zealand that they understood the original intent of the SWIM TMC, based on the SWIM TF/8 working paper, to: 1) To have States formally "establish SWIM", 2) To clarify boundaries of responsibility (in terms of SWIM TI), and 3) Establish operational capability. New Zealand agreed with this core of this understanding and with the intent expressed, with the following additional views/proposals:

- a) Creation of a unilateral agreement issued at the ICAO APAC-level rather than bilateral or multilateral agreements. In this, New Zealand agrees with Australia's feedback from their SWIM TF/10 Information Paper, section 2.3.2, which suggested a non-binding head agreement at the regional level. New Zealand agrees that a memorandum of cooperation is needed (as outlined in section 2.3 of the SWIM TF/8 Working Paper) but bilateral agreements between contracting states would result in too many agreements to be workable, while multilateral agreements could be hard to reach consensus on.
- b) Creation of a suite of documents that includes but is broader than the TMC to allow the appropriate level of detail to be developed at the right time and by the relevant parties. In this, New Zealand largely endorses Australia's feedback from their SWIM TF/10 Information Paper, section 2.3.3, which suggested a subordinate set of documents to the head agreement to address any specific, detailed procedural and administrative matters.

- c) Revision of the approach to the TMC (or equivalent artefact) within this suite of implementation and operational documents, such that it becomes a document that describes intent and practical arrangements rather than technical implementation. This allows it to be agreed between interconnecting parties without constraining technical implementation or requiring the documentation of successful transition to operations. This revised TMC should address Thailand's feedback from SWIM TF/8 Final Report, section 2.2, that it would be premature to adopt the draft TMC given the status of SWIM implementation within the region. New Zealand agrees with this feedback and notes that, with the changes proposed, New Zealand expects that an earlier agreement of a revised TMC would be possible and beneficial. The revised TMC would also still be aligned with the intent behind the TMC, to ensure participants within APAC are aligned on SWIM, as outlined by Malaysia in their working paper to SWIM TF/8 (section 2.3, which noted that the first Meeting of SIPG identified the need for a TMC.

2.159 New Zealand's proposal for this suite of documents is to adapt the CRV suite of documents to SWIM, based on learnings from CRV, as outlined in the table below:

SWIM Artefact	Purpose (SWIM)	Approvers (SWIM)	Developed by:
ICAO letter, from APAC statement at the regional level	Outlines the cooperative intent and outcome of SWIM	Signatories not required – issued by ICAO to APAC members	Drafted by the Task Force, endorsed by the Chair and the majority on behalf of the Task Force, issued by ICAO for APAC members, and added to the Implementation Guidance
Technical Memorandum of Cooperation (TMC) aligned to the ICAO Letter	Establishes high-level technical/procedural arrangements and obligations between APAC participants	Potentially design/system owners or operational management within the participant organisation	Drafted by the Task Force, template added to the Implementation Guidance
Implementation Manual	Sits next to the TMC – outlines the detailed technical and other requirements to establish a messaging system and connections	Design authorities and/or their representatives (e.g., SIPG members)	Drafted by SIPG, evolved by the Task Force, and added to the Implementation Guidance
Operations Manual	Sits next to the TMC - outlines the operational details for SWIM, i.e., who is who, who has what connections, etc.	Design / operational authorities and/or their representatives (e.g., SIPG members)	Drafted by SIPG, evolved by the Task Force, and added to the Implementation Guidance

Table 2: Suite of documents for SWIM

2.160 New Zealand proposed a revised TMC that reflects the above structure, as well as the following approach and addresses feedback to date in the following way:

- a) The scope should be for the long-term relationship between APAC members, and not just for the Pioneer Group/trial and initial implementation of SWIM. The revised TMC incorporates implementation and operations.
- b) By focusing on Message Systems, it allows non-ANSP / non-Country Message System participants to be included as well as ANSPs.
- c) The proposed revised TMC removes the ANSP/country aspect but suggests a common type of agreement among integrating Message Systems without imposing agreements on Information Service Providers (ISPs) and Information Service Consumers (ISCs), which are able to be devolved to Edge Message System providers independently. The country aspect would be tackled by the head agreement (i.e., ICAO APAC letter) level instead, which addresses Australia's feedback.
- d) Agreements for connection of ISPs and ISCs to Edge Message Systems (assuming Gateway Message Systems do not connect directly to ISPs and ISCs, only through Edge Message Systems) would be down to the terms and conditions established by each Edge Message Systems' provider for connection to their services. These are, therefore, not considered part of the SWIM TMC.
- e) There is a need for participants to cooperate on SWIM for operational, and non-operational (i.e., testing/development systems), systems. However, a participant may decide to vary from a specific SWIM specification (especially for non-operational systems). In this instance, the assumption is that the participant would establish their own agreement with all other affected participants for its non-operational systems, outside of the SWIM TMC.
- f) The Need for SWIM Operations Group was reflected in the 'Governance' section of the revised TMC, New Zealand agrees in principle with Australia's feedback from their SWIM TF/10 Information Paper that they would support a dedicated group (such as SWIM OG), however New Zealand sees the Task Force performing this function until such time as such a body exists and the Task Force relinquishes its role to that group.
- g) New Zealand proposes that Australia's feedback from their SWIM TF/10 Information Paper, which was related to wording in the draft TMC, could be covered in the subordinate agreements instead of the TMC.
- h) The revised TMC has been reviewed by Airways' Legal team, who agree that it includes relevant required feedback from the previous working paper, noting one change to earlier feedback, specifically reversing the original 'settlement of dispute' feedback back to the original, simpler text. This is due to the proposal that there should be a head of agreement ICAO APAC-wide and the resulting non-technical / specific nature of the revised TMC lessens the concerns about disputes.

2.161 The Meeting expressed its appreciation to New Zealand for providing a comprehensive paper and a revised TMC document. The Meeting agreed to adopt a revised multilayer approach; however, it was noted that the roles and details of each SWIM Artefact require further review and discussion. It was suggested that WP/20 from SWIM TF/11 and the proposals contained in this paper be considered jointly within Task 5 of the SWIM TF. **ACTION ITEM 11-33** Australia, Malaysia, and New Zealand were invited to participate in Task 5 to support further discussions on TMC. Australia and

New Zealand confirmed their willingness to join Task 5. The ICAO Secretariat will coordinate with Malaysia on this matter. **ACTION ITEM 11-34**

Updates from Editorial Ad-hoc Group - Editorial Ad-Hoc Group (SP/03)

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

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

2.163 The Meeting was informed that major challenges in drafting the first version of IGD are stability and maturity of the content required for the drafting process. It was noted that, prior to SWIM TF/11, only details of the APAC SWIM TI specifications and FIXM version 4.3, including the regional Extension, were considered sufficiently mature for inclusion in the IGD. It was further noted that the updated version of the APAC Common SWIM Information Services list, which will form part of the Service Specifications chapter of the IGD, would be reviewed during SWIM TF/11, while agreement on a specific SDS version, the regional baseline would also be discussed at the SWIM TF/11.

2.164 A request was received to compile all key documents related to the APAC SWIM implementation that have been developed or are being developed under the SWIM TF. SWIM TF Co-Chair agreed to prepare a document titled “ **Existing References for ICAO APAC SWIM Documents** ”, which will be uploaded on the ICAO APAC e-documents webpage to provide consolidated reference information for APAC States/Administrations in support of their SWIM implementation activities. **ACTION ITEM 11-35**

APAC SWIM Implementation Progress Indicators - SWIM TF Co-Chair (SP/04)

2.165 The Meeting recalled that, under the ANS commitments in the Delhi Declaration, there is a commitment related to SWIM: *Expediting the implementation of ICAO provisions related to SWIM*. It was informed that the ICAO Secretariat provides progress updates on all Delhi Declaration Commitments in every Subgroup, APANPIRG, DGCA Conference, and Ministerial Conference Meetings. However, difficulties were encountered in measuring SWIM implementation progress within the APAC region due to the absence of established indicators.

2.166 The Meeting was informed that, in response to Action Item 10-31, the ICAO Secretariat informed the **DGCA/60 Conference** that indicators to measure SWIM implementation progress in the APAC region were under development, and the latest status of APAC States/Administrations' readiness for SWIM implementation will be shared with the **DGCA/61 Conference**. At the same time, Action Item 10-32 was assigned to the ICAO Secretariat and the SWIM TF Co-Chair to draft indicators for finalisation at the SWIM TF/11 Meeting.

2.167 Following the Action Item 10-32 of SWIM TF/10, three SWIM implementation progress stages – “In Preparation/Planning”, “Under Development/Implementation”, and “In Operation” – were agreed upon during SWIM TF Task Leads held Meetings held in August 2025, November 2025, and February 2026. For each stage, further refinements were presented to the Meeting, taking into account feedback received from Japan and Singapore.

2.168 The proposed SWIM indicators were reviewed by the Meeting. The finalised indicators are provided in **Appendix C**.

2.169 The Meeting noted that, for the scoring, a status of “Not implemented” will be assigned a score of 0, “Partially implemented” will be assigned a score of 0.5, and “Fully Implemented” will be assigned a score of 1. It was further agreed that the score of each stage will be represented by the average score of the relevant criteria.

2.170 It was also agreed that all key criteria of each stage will be assessed using the same methodology and weighed equally. It was also agreed that the consolidated SWIM implementation progress survey results will be processed and presented, including details of the implementation levels for each stage. **ACTION ITEM 11-36**

2.171 For the way forward, it was agreed that all SWIM TF/11 participants will provide feedback to the finalised ICAO APAC SWIM Indicators **before 12 June 2026** for any proposed changes; however, major changes will not be considered. **ACTION ITEM 11-37**

2.172 Furthermore, it was agreed that the ICAO Secretariat will develop an online platform for reporting of SWIM implementation progress in accordance with the finalised indicators. Access to the platform will be shared through a State letter and by email **on 3 July 2026** for States/Administrations’ reporting. **ACTION ITEM 11-38** It was added that all States/Administrations are required to respond to the SWIM implementation progress reporting request, **ACTION ITEM 11-39**, as this information and detailed analysis of results will be presented to **the DGCA/61 conference**, as requested by the **DGCA/60 Meeting**. **ACTION ITEM 11-40**

2.173 It was also added that **only one response** from each State/Administration will be accepted. Therefore, States/Administrations were advised to conduct broader consultation, primarily with AIS providers, ANSPs, MET service providers, and airport operators, when reporting their SWIM implementation status. States/Administrations are expected to submit their response through the online reporting platform **by 14 August 2026**, so that results can be processed and presented to the DGCA/61 Conference, planned for the first week of September 2026. **ACTION ITEM 11-41**

SWIM TF Tasks restructuring- SWIM TF Co-Chair (SP/05)

2.174 The Meeting was informed of the current SWIM TF task structure, and leads are 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), 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), Yosuke MORO (Japan) Xiaodong Lu (Japan), Honglei Gao (China)

Groups	Task No.	Subject/Task	Task Leads
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	Yosuke MORO (Japan)
	10	Regional coordination and SWIM-related information sharing	John Moore (IATA)
	11	SWIM implementation education and promotion (New task)	Vacant

Table 3- The Existing Task Structure leads

2.175 It was noted that, during the SWIM TF Task Leads Meetings conducted after the SWIM TF/10 Meeting, there were discussions on the need for restructuring of tasks under SWIM TF. The proposal presented by the SWIM TF Co-Chair included the removal of **Task 3 – Security Service**, as the ANSIA TF is currently working on the ANS information security aspects. It was clarified that the SWIM TF will continue collaborating and coordinating with the ANSIA TF to ensure SWIM security requirements are incorporated into their relevant deliverables. The second proposal was to remove **Task 7 – SWIM Demonstration**, as the APAC region is currently in the SWIM implementation phase rather than the validation stage. The third proposal was to rename **Task 8 – SWIM Services and Application Validation** to **Task X – SWIM Services Validation**, as SWIM applications are beyond the scope of SWIM as defined in Doc 10039 Manual on the SWIM Concept. Lastly, it was suggested to merge three tasks: **Task 9 – Monitoring of Panels' Work**, **Task 10 – Regional Coordination and SWIM-related Information Sharing**, and **Task 11 – SWIM Implementation Education and Promotion** into a single task entitled “Coordination and Promotion”, considering that regional coordination is currently conducted through the well-established coordination process between the ICAO Secretariat of SWIM TF and relevant expert groups.

2.176 The Meeting discussed the proposed restructuring of tasks and their respective leads. After detailed deliberations, the agreed task structure and corresponding task leads are 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), Yosuke MORO (Japan) Henry Chan (Hong Kong, China)
Technical Architecture	3	Development and maintenance of regional information exchange models	Amornrat Jirattigalachote (Thailand) Vacant

Groups	Task No.	Subject/Task	Task Leads
Governance	4	Regional SWIM Governance Framework	Young Jin Ha (ROK) Mark Kaplan (USA) (retired) Justin Prasai (U.S) Yosuke MORO (Japan) Xiaodong Lu (Japan), Honglei Gao (China)
Information Services	5	Information services	Marco Kok (Hong Kong, China) vacant
Validation & Demonstration	6	SWIM services and application validation	Yosuke MORO (Japan) Xiaodong Lu (Japan), Honglei Gao (China), Young Jin Ha (ROK)
Coordination and Promotion	7	Coordination and Promotion	Yosuke MORO (Japan) Elvin Liow (Singapore)

Table 4- New Task Structure and leads

SWIM harmonization

2.177 The Meeting discussed the need for a harmonised level of implementation among all significant APAC States/Administrations in order to realise the full benefits of SWIM across the region. The Meeting expressed concern regarding the absence of India from SWIM TF meetings in recent years, which has resulted in an incomplete understanding of the SWIM implementation status in the State. It was recalled that, in the past, India had been highly active in sharing progress on SWIM implementation, as well as participating in regional trials and demonstrations.

2.178 The Meeting requested the ICAO APAC Office to kindly encourage India to re-engage in SWIM TF meetings and to share its implementation status, with a view to ensuring the benefits of harmonised and timely SWIM implementation across the APAC region. **ACTION ITEM 11-46**

Date and Venue for the Next Meeting

2.179 The SWIM TF/12 is tentatively planned to be held from **7 to 11 June 2027**.

3. ACTION BY THE MEETING

3.1 The Meeting is invited to:

- a) note the information contained in this paper;
- b) review and adopt the draft Conclusion mentioned in sections 2.71 and 2.113;
- c) review and adopt the draft Decisions mentioned in sections 2.12 and 2.133; and
- d) discuss any relevant matter as appropriate

APAC SWIM Hierarchical Architecture Test Plan

1. Test Objectives

This test for the CRV network environment verifies the connectivity between APAC SWIM EMS nodes (EEMS/GEMS) and adjacent nodes, along with the compliance, reliability and routing correctness of their message transmission. It is required to ensure successful full-process message delivery under the two core message interaction modes: asynchronous request-response and publish-subscribe. All test results shall comply with the APAC SWIM TI specifications, AMQP 1.0 protocol and relevant message format requirements.

2. Test Premises and Environment Preparation

The CRV network is activated; IP connectivity is available between adjacent EMS nodes involved in the test, meeting the cross-border connectivity configuration requirements.

All EMS nodes (EEMS/GEMS) are deployed; the AMQP 1.0 broker is running normally; the username, password and URI configurations comply with specifications; and the user's read/write access permissions for AMQP addresses are correctly configured.

EMS node information has been entered into the routing table, supporting static/dynamic routing; the binding relationship configuration between EEMSs and their corresponding superior GEMS is completed.

Test data is prepared, covering data formats such as FIXM, AIXM, IWXXM and ASTERIX that conform to the APAC_CATEGORY enumeration.

3. Multi-level Test Design

Level 1: Basic Network Connectivity Test for Adjacent EMS Nodes (Verify "Network Link Reachability Between Adjacent Nodes")

Test Content

Only verify the IP connectivity and port reachability of adjacent EMS nodes in the CRV network, and ensure no network-layer blockage between adjacent nodes (tests for non-adjacent nodes across regions are not involved).

Test Steps

1. Confirm adjacent node combinations: all EEMS bound superior GEMS connections and GEMS-to-GEMS connections (classified based on the actual deployed adjacent relationships).

2. For each group of adjacent nodes, execute the ping command from the initiating node and ping continuously for 100 times (e.g., EEMS → superior GEMS, GEMS → adjacent GEMS).
3. On the EEMS nodes, execute the telnet command to test the AMQP port of the connected GEMS and verify the establishment of TCP connections; similarly, on the GEMS nodes, test the AMQP port of adjacent EEMS/GEMS.
4. Use the route-trace tool to track the link of each group of adjacent nodes, confirm no routing interruption, and ensure the smoothness of the direct link between adjacent nodes.

Expected Results

The ping test success rate of all adjacent nodes is 100%, with average latency ≤ 50 ms and no packet loss.

Telnet connection to the AMQP port between adjacent nodes is successful, returning an AMQP protocol handshake response.

Adjacent nodes are directly connected, with no loops or interrupted nodes.

Test Focus

Focus on the effectiveness of network paths between adjacent nodes, laying a foundation for subsequent EMS layer connections and message transmission.

Level 2: Direct connectivity test between EMS (Verify "EMS layer reachability")

Test Content

Verify the effectiveness of AMQP connections between adjacent EEMS and GEMS, as well as between GEMS and GEMS, to ensure normal communication at the EMS layer.

Test Steps

1. Configure the superior GEMS for a specific EEMS and enter the AMQP URI (IP: Port) of the corresponding GEMS.
2. Initiate an AMQP connection request from this EEMS to connect to the superior GEMS and record the connection status.
3. Repeat Steps 1-2 to complete the following connection tests: connections between all EEMS and their corresponding superior GEMS, as well as between adjacent GEMS.
4. After the connection is established, maintain it for 30 minutes and monitor connection stability (no disconnection or reconnection).

Expected Results

The success rate of AMQP connection establishment between all adjacent EMS nodes is 100%, with no abnormal disconnection during the connection maintenance period.

There are no errors such as authentication failure or protocol incompatibility in the AMQP connection logs.

Test Focus

Verify the configuration effectiveness of the binding relationship between EEMS and their superior GEMS, as well as the direct connectivity between GEMS.

Level 3: Single Transmission Mode Message Sending Test (Verify "Basic Message Transmission")

Test Content

Verify the message sending compliance and success rate between adjacent nodes under the two transmission modes (Point to Point and Broadcast) respectively.

(1) Point to Point Mode Test

Test Steps

This test case addresses scenarios that require an explicit recipient ID, such as the submission of a filed flight plan.

1. SWIM message sender delivers SWIM message with an explicit recipient ID in the message metadata to connected EEMS;
2. EEMS delivers SWIM message with the destination EEMS to connected GEMS;
3. GEMS routes messages to the appropriate next-hop GEMS node;
4. The next-hop GEMS routes SWIM message to the destination EEMS;
5. The destination EEMS routes the message to the SWIM message receiver according to the recipient ID contained in the message metadata.

Expected Results

The message sending success rate reaches 99.9%.

Message format verification passed: addresses comply with lowercase requirements, message metadata are complete, and application attributes conform to APAC enumeration specifications.

(2) Broadcast Mode (Pub/Sub) Test

Test Steps

This test case address recipient-free scenarios such as meteorological information publication.

1. SWIM message sender publishes SWIM message with the recipient-free in the metadata;
2. EEMS publishes SWIM message to connected GEMS;
3. The GEMS publishes SWIM messages, and adjacent GEMSs subscribe to the Topic address to receive the messages;
4. The EEMS subscribes to the Topic address of the superior GEMS to receive SWIM messages and replicate messages to EEMS's own topic;
5. SWIM message receivers subscribe to the Topic address of the EEMS and consume SWIM messages.

Expected Results

The message reception success rate of all subscribers reaches 99.9%; the message content received by each node is consistent without loss or tampering.

Message format verification passed: addresses comply with lowercase requirements, message metadata are complete, and application attributes conform to APAC enumeration specifications.

Level 4: Mixed Multi-transmission Mode Test (Verify "Mode Compatibility")

Test Content

Run Point to Point and Broadcast (Pub/Sub) mode messages simultaneously to verify that there are no conflicts between the two modes and no confusion in message routing.

Test Steps

1. Execute all test steps of the Point to Point mode test specified in Level 3.
2. Execute all test steps of the Broadcast (Pub/Sub) mode test specified in Level 3 simultaneously.
3. Monitor the message sending, receiving, routing and system logs of both transmission modes in real time.

Expected Results

The message sending success rate is $\geq 99.9\%$ in concurrent scenarios, with no message loss or misdelivery.

There are no conflicts between the address formats and routing logic of the two modes' messages, and no routing exception alarms in logs.

Level 5: Multi-node Collaborative Message Routing Test (Verify "Cross-node Routing")

Test Content

Simulate the real hierarchical architecture to verify multi-GEMS hop routing and end-to-end message transmission of EEMS - GEMS - GEMS - GEMS - EEMS (across non-adjacent nodes).

Test Steps

1. Ensure that messages traverse multiple GEMS nodes between the sender and the recipient.
2. Perform Level 4 testing.

Expected Results

The message sending success rate is $\geq 99.9\%$ in concurrent scenarios, with no message loss or misdelivery.

There are no conflicts between the address formats and routing logic of the two modes' messages, and no routing exception alarms in logs.

Level 6: Exception Scenario Fault Tolerance Test (Verify “Stability and Fault Tolerance”)

Test Content

Simulate scenarios such as network interruption, node failure and message abnormality to verify the fault tolerance capability of EMS message transmission.

Test Cases

Exception Scenario	Test Steps	Expected Results
Adjacent node network temporary interruption (10s)	During multi-node routing test, interrupt the CRV connection between transit GEMS and target GEMS (adjacent relationship) for 10 seconds and then restore it.	After network recovery, messages are automatically re-transmitted without loss (success rate: 100%)
Message Timeout	When sending Point to Point messages, set TTL = 1000ms and deliberately block the receiver port	Timed out messages are automatically discarded without duplicate delivery; timeout alarms are recorded in logs
Duplicate Messages	Manually send 2 messages with the same MESSAGE_ID	The receiver performs deduplication and retains only 1 valid message
Non-Compliant Message Format	Send broadcast messages missing the APAC_CATEGORY field	The receiver rejects the messages, returns a format error response, and clearly marks the missing field in logs

Level 7: Topology Structure and Message Routing Adjustment Test (Verify "Adaptability to Topology/Routing Changes")

Test Content

In the CRV network environment, verify the normalcy of adjacent node connectivity, message transmission reliability and routing correctness after EMS node topology adjustments (node addition/decommissioning, adjacent node relationship modification) and message routing strategy adjustments (static routing update, dynamic routing switch, backup routing change). Ensure no connectivity interruption, message loss or routing disorder occur after topology and routing changes, so as to support the system's adaptability to topology iteration requirements in actual deployment.

Test Steps

1. EMS node topology adjustment: Add, decommission EMS nodes and modify adjacent node relation, and verify adjacent node connectivity.
2. Routing info update: modify routing dynamically or statically.

Expected Results

Node adjacent connectivity is normal and routing is correct. No interruption, message loss or routing disorder occurs.

4. Test Entry and Exit Criteria

(1) Test Entry Criteria

The CRV network has completed adjacent node deployment with correct node IP/port configurations, meeting bandwidth and latency requirements.

The AMQP broker of EMS nodes starts normally; routing tables and binding relationships between EEMS and GEMS have been configured completely.

Test data (message templates, node association information) is ready and complies with APAC SWIM specifications.

(2) Test Exit Criteria

The pass rate of all Levels' test cases is $\geq 99.9\%$, with no critical defects (e.g., connectivity failure, message loss, routing errors).

The compliance verification rate of message format reaches 100% (no violations in addresses, message headers, and application attributes).

The routing latency of cross-region multi-node meets expectations, with no performance bottlenecks in concurrent message processing.

CNS SG/30
Appendix A to WP/18

In exception scenarios, EMS nodes have fault tolerance capability without system avalanche, data tampering or similar issues.

Business Functionality of APAC Common SWIM Information Services
(Reviewed by FF-ICE/4, SURSG/5, SURICG/11, ATFM & A-CDM/SG/16, MET/IE WG/24, AAITF/21)

Second Version (May 2026)

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.– “Applicability”: expected to be implemented “region-wide” in order to achieve the anticipated benefits, vs. “as needed” to meet the needs for a subset of the region

– “Desired implementation timeframe”: Immediate (before 2030), Medium-term (2030-2035), Long-term (beyond 2035)

– “Maturity”: “All elements defined” vs. “All elements not defined” (to be further refined)

(“Applicability”, “Desired Implementation Timeframe” and “Maturity” are yet to be reviewed by the Subsidiary Groups)

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	Applicability	Desired implementation timeframe	Maturity
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.	Availability or activation/deactivation or temporarily change of airspace, restricted area, danger area, search and rescue regions	AIXM	Pub/Sub or Req Reply			
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	AIXM	Pub/Sub or Req Reply			

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	Applicability	Desired implementation timeframe	Maturity
		area, danger area, search and rescue regions (Remarks – Other data published in the AIP may be included)					
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, nav aids, instrument landing systems, Aerodrome location, communication facilities (frequencies)	AIXM	Pub/Sub or Req Reply			
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			
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			
ATIS distribution service	Provides continuous and automated broadcast of recorded aeronautical information in airport and terminal areas.	Current weather conditions, runway in use, available approaches, and other data relevant to arriving and departing aircraft, specific ATC procedures, and any airport construction activity that could affect taxi planning	TBD	Pub/Sub			
Search and rescue service	Allows Rescue Coordination Centres (RCCs) to exchange information with neighbouring RCCs and ATS units for coordination during SAR operations.	Search and rescue regions, Registered aircraft operator details and contacts, ICAO Autonomous Distress Tracking (ADT) data, Location of Aircraft in	TBD	Pub/Sub			

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	Applicability	Desired implementation timeframe	Maturity
		Distress Repository (LADR) data, ICAO OPS CTRL database contact information, SAR Unit (SRU) location and capability data					
APAC Common SWIM Flight Information Services							
GUFİ service	GUFİ (Globally Unique Flight Identifier) generation and provision	GUFİ	FIXM	Req/Reply			
FF-ICE filing service	Provides a means to submit, update or cancel flight plans through a SWIM-based interface using FIXM. Appendix A: Filing Service Scenarios	Flight plan for registration, update or cancellation	FIXM	Appendix A			
FF-ICE publication service	Provides harmonised sharing of flight plan information in a global standard supporting common situation awareness.	Flight information for publication	FIXM	Pub/Sub			
FF-ICE trial service	Allows operators to test the effect of a potential change in a flight plan prior to committing to the change. Appendix A: Trial Service Scenarios	Proposed changes in a flight plan	FIXM	Appendix A			
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. Appendix A: Flight Data Request Service Scenarios	Current status of a flight plan, a copy of flight plan or supplementary plan	FIXM	Appendix A			

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	Applicability	Desired implementation timeframe	Maturity
FF-ICE notification service	Provides notification of a change in flight state, such as Departure (DEP) and Arrival (ARR) Air Traffic Service (ATS) messages. Appendix A: Notification Service Scenarios	ARR, DEP messages	FIXM	Appendix A			
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. Appendix A: Planning Service Scenarios	Preliminary flight plan for early ATFM planning	FIXM	Appendix A			
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.	Refer to ADP template	FLXM ² ?	Pub/Sub			
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	CTOT, CTO, CLDT, and fields currently included in APAC AFTN/AMHS-Based ICD for ATFM ³	FIXM	Appendix B			

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

² FLXM: Flow Information Exchange Model

³ Based on the conclusion from ATFM/SG/15, an amendment to this ICD will be proposed in which a more structured use of REGUL and REGCAUSE fields will be introduced. This proposal is expected to be tabled at the upcoming CNS/SG meeting.

Business functionality of the information service	Brief description of the service	Type of information to be exchanged	Information exchange model / Message type	Message exchange pattern	Applicability	Desired implementation timeframe	Maturity
	airborne flight, whose control mechanism is a Calculated Time Over (CTO). Recipients of this information should take actions to comply with the ATFM measure contained herein. Appendix B: ATFM Operational Scenarios						
Flow-Specific ATFM Measure Service	Supports notification of information related to “flow-specific” ATFM measures, i.e. measures whose control mechanisms apply to a “group of flights” on a particular traffic flow. An example is the Minutes-in-Trail (MINIT) requirement applied on an eastbound traffic using A1 from VT*, VV* to RK*. Recipients of this information should take actions to comply with the ATFM measure contained herein.⁴	Spacing parameters for MINIT, MIT; Departure intervals for MDI; Alternate routes for Re-Routing; Flight level allocation for Level Capping	TBD	Pub/Sub			
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. Appendix B: ATFM Operational Scenarios	ATFM measure information: CTOT A-CDM departure planning information: TOBT, TTOT, TSAT	FIXM	Appendix B			
APAC Common SWIM Meteorological Information Services							

⁴ Common operating procedure for this group of ATFM measures (e.g., MINIT, MIT, MDI, Re-Route, Level Capping) has not been developed for the APAC region yet, and should be developed before finalizing the information service to support the operations.

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	Applicability	Desired implementation timeframe	Maturity
FOR AERODROME							
METAR/SPE CI service	Provides of IWXXM-formatted METAR/SPECI product specified in ICAO Annex 3.	Provision of the existing Annex 3 product via an information service	IWXXM	Pub/Sub Req/Reply			
TAF service	Provides of IWXXM-formatted TAF product specified in ICAO Annex 3.		IWXXM	Pub/Sub Req/Reply			
Aerodrome Meteorological 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) in Nov 2030 tentatively (Note: Level of standardisation needs to be considered, as different aerodrome information services may be required for different use cases.)	IWXXM	Pub/Sub or Req/Reply			
Aerodrome Meteorological Forecast Information Service	Provides information of the expected meteorological conditions, including probability, at an airport during a specified period. Advanced meteorological SWIM (MET-SWIM) service being developed by MET Panel.		IWXXM	Pub/Sub or Req/Reply			
FOR ENROUTE							
SIGMET service	Provides 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			
AIRMET service	Provides 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			
Tropical Cyclone Advisory service	Provides IWXXM-formatted Tropical Cyclone Advisory product specified in ICAO Annex 3. (Designated provider: States with Tropical Cyclone Advisory Centre)		IWXXM	Pub/Sub Req/Reply			

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	Applicability	Desired implementation timeframe	Maturity
Volcanic Ash Advisory service	Provides IWXXM-formatted Volcanic Ash Advisory product specified in ICAO Annex 3. (Designated provider: States with Volcanic Ash Advisory Centre)		IWXXM	Pub/Sub Req/Reply			
Space Weather Advisory service	Provides IWXXM-formatted Space Weather Advisory product specified in ICAO Annex 3. (Designated provider: States with Space Weather Advisory Centre)		IWXXM	Pub/Sub Req/Reply			
Volcano Observatory Notice for Aviation (VONA) service	Provides of IWXXM-formatted VONA specified in ICAO Annex 3. Provision of VONA is a recommended practice in Annex 3 (Amd 82). (Designated provider: States with a designated State Volcano Observatory)		IWXXM	Pub/Sub Req/Reply			
Quantitative volcanic ash 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 Volcanic Ash Advisory Centre (VAAC))	QVA gridded forecasts including probabilities, and IWXXM QVA objects. A recommended practice for significant ash clouds in Annex 3 (Amd 82) 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 Req/Reply			
WAFc (World Area Forecast Centres) gridded 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 Req/Reply			

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	Applicability	Desired implementation timeframe	Maturity
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, turbulence, icing, etc.	IWXXM	Pub/Sub or Req/Reply			
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)	Special aircraft observations of weather phenomena as specified in Annex 3, including turbulence, icing, mountain wave, thunderstorms, duststorm, sandstorm, volcanic cloud, volcanic activity / eruption	TBD	Pub/Sub or Req/Reply			
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.	Upper air winds and temperatures derived from Mode S DAPS	TBD	Pub/Sub or Req/Reply			
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			
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			
APAC Common SWIM Surveillance Information Services							
Surveillance data only sharing service	Provides surveillance data of aircraft. (Reference: Guidance Material for the Sharing of Surveillance Data in SWIM)	latitude, longitude, flight level, ground speed (optional), magnetic heading (optional), target	ASTERIX Cat 21 (payload in JSON or RAW format)	Pub/Sub			

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	Applicability	Desired implementation timeframe	Maturity
		identification, target address, mode 3/A code (optional), date, time of message reception for position, quality indicators, SAC, SIC					
Surveillance data with flight plan information sharing service	Provides surveillance data of aircraft with flight plan information. (Reference: Guidance Material for the Sharing of Surveillance Data in SWIM)	globally unique flight identifier, aircraft identification, departure aerodrome, destination aerodrome, aircraft type (optional), wake turbulence category (optional), latitude, longitude, flight level, ground speed (optional), magnetic heading (optional), target identification, target address, mode 3/A code (optional), date, time of message reception for position, quality indicators, SAC, SIC	ASTERIX Cat 21+FPL (payload in JSON format) Or ASTERIX Cat 21+FPL (FPL contained in message header and Cat 21 payload in RAW format)	Pub/Sub			

APPENDICES

Purpose

These appendices provide detailed operational scenarios for SWIM Information Services that require further description than can be achieved in the main Business Functionality for APAC Common SWIM Information Services table. The additional detail may be associated with varying requirements and business completion criteria, or where the behaviour of the service may depend on the operational scenario, therefore requiring a more granular analysis.

Scenario Steps Table

Operational scenarios detailed in the appendices should follow the format of a Scenario Steps table. The table below specifies and elaborates the fields in the Scenarios Steps table, as well as indicates who is responsible for completing each field.

Fields	Description	Responsibility
Step	Sequential identifier for each message exchange within the scenario	Domain Expert Group
Message	Specific message type, e.g. FF-ICE message type, with sender and recipient identification (e.g., "eAU sends Filed Flight Plan to eASP", "eASP returns Submission Response to eAU")	Domain Expert Group
Message Requirements	Message requirement classification and prerequisite conditions that must be satisfied prior to message transmission • Mandatory - Message must be sent/received in all instances of the scenario without exception • Conditional - Message must be sent/received when specific triggering conditions are met, but is not required when those conditions do not occur	Domain Expert Group
Business Timeout	Maximum acceptable time duration for message response from an operational perspective. The message originator is expected to contact the recipient if no response is received within the timeout period.	Domain Expert Group
Comments	Additional operational context, processing requirements, or business rule specifications that inform technical implementation	Domain Expert Group
Message Exchange Pattern	A template that describes relationships of multiple messages exchanged between interacting components to accomplish a single complete information exchange.	SWIM TF

APPENDIX A

Purpose

This appendix provides detailed operational scenarios for FF-ICE Flight Information Services, with the corresponding recommended MEP by the SWIM Task Force. Each FF-ICE service could contain multiple operational scenarios that have varying requirements and business completion criteria. Hence, technical specifications cannot be defined at the FF-ICE service level. They require more granular scenario-based analysis.

Scope and Application

Five of the six FF-ICE/R1 services are covered. Publication Service is not included as it requires a straightforward Pub/Sub MEP. For each of the 5 FF-ICE/R1 services, the possible operational scenarios were identified. Within each operational scenario, the business completion criteria and a table containing the scenario steps, message exchanges, actors involved, message requirements and business timeouts were detailed. With this information, the SWIM TF recommended the corresponding MEP.

Role Delineation

- Domain Expert Groups: The FF-ICE Ad-Hoc Group defined the operational scenarios and business completion criteria based on operational requirements
- SWIM Task Force: Determined appropriate technical specifications and Message Exchange Patterns based on the clearly defined business requirements provided

Business Completion Criteria Definition

- **Business Completion Criteria** — The point at which the relevant actor can consider their operational procedure for the specific flight to be complete and proceed with subsequent flight operations for that specific flight. This is defined by specific message receipts by the relevant actor.
 - *Format: [Actor] receives/sends [Message Type] [with specific status/condition when applicable]*

FILING SERVICE SCENARIOS

Scenario 1: Submission of Filed Flight Plan (eFPL) by eAU

Business Completion Criteria:

- eAU receives Filing Status with ACCEPTABLE or NOT ACCEPTABLE status indication; or
- eAU receives Submission Response with REJ status indication

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
1	eAU sends Filed Flight Plan (eFPL) to eASP	Mandatory	N/A	Initial flight plan submission	
2	eASP returns Submission Response (SR) to eAU	Mandatory (following reception) eFPL	1 minute following eFPL submission	Message format validation and basic rule compliance check ACK: Flight plan received and stored on file REJ: Flight plan rejected and not stored on file MAN: Manual intervention required	
3	eASP returns subsequent Submission Response(s) to eAU	Conditional (only when previous SR = MAN)	Variable (dependent on manual processing duration)	Additional Submission Responses will be sent after manual processing. Response can be • MAN (manual processing ongoing); • ACK (manual processing resolved and proceed to Filing Status); or • REJ (manual processing failed)	
4	eASP returns Filing Status (FS) to eAU	Conditional (when SR = ACK)	1 minute following SR "ACK"	Operational evaluation against ATM configuration and applicable restrictions/constraints	

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
				ACCEPTABLE: Complies with requirements NOT ACCEPTABLE: Does not comply with requirements PENDING: Not yet evaluated	
5	eASP returns Filing Status(es) to eAU	Conditional (when previous FS = PENDING or triggered by re-evaluation process)	Variable	Additional Filing Status messages sent when: 1) Initial status was PENDING and eASP subsequently completed flight plan evaluation, or 2) Re-evaluation of eFPL detects changes in ATM restrictions/constraints affecting flight plan acceptability	

Scenario 2: Submission of Flight Plan Update (FPU) by eAU

Business Completion Criteria:

- eAU receives Filing Status with ACCEPTABLE or NOT ACCEPTABLE status indication; or
- eAU receives Submission Response with REJ status indication

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
1	eAU sends Flight Plan Update (FPU)	Mandatory	N/A	Modification to existing flight plan data via update message	
2	eASP returns Submission Response (SR) to eAU	Mandatory (following reception) FPU	1 minute following FPU submission	Message format validation and basic rule compliance check ACK: Update processed successfully, flight plan modified	

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
				REJ: Update failed, flight plan unchanged MAN: Manual intervention required	
3	eASP returns subsequent Submission Response(s) to eAU	Conditional (only when previous SR = MAN)	Variable (dependent on manual processing duration)	Additional Submission Responses will be sent after manual processing. Response can be • MAN (manual processing ongoing): • ACK (manual processing resolved and proceed to Filing Status); or • REJ (manual processing failed)	
4	eASP returns Filing Status (FS) to eAU	Conditional (when SR = ACK)	1 minute following SR "ACK"	Operational evaluation against ATM configuration and applicable restrictions/constraints ACCEPTABLE: Complies with requirements NOT ACCEPTABLE: Does not comply with requirements PENDING: Not yet evaluated	
5	eASP returns Filing Status(es) to eAU	Conditional (when previous FS = PENDING or triggered by re-evaluation process)	Variable	Additional Filing Status messages sent when: 1) Initial status was PENDING and eASP subsequently completed flight plan evaluation, or 2) Re-evaluation of FPU detects changes in ATM restrictions/constraints affecting flight plan acceptability	

Scenario 3: Submission of Flight Cancellation (FC) by eAU

Business Completion Criteria:

- eAU receives Submission Response with ACK or REJ status indication

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
1	eAU sends Flight Cancellation (FC) to eASP	Mandatory	N/A	Termination of flight plan and associated GUFU operational use	
2	eASP returns Submission Response (SR) to eAU	Mandatory (following Flight Cancellation message reception)	1 minute following FC submission	Message format validation and basic rule compliance check ACK: Cancellation processed successfully, flight plan cancelled REJ: Cancellation failed, flight plan remains active MAN: Manual intervention required, flight plan remains active	
3	eASP returns subsequent Submission Response(s) to eAU	Conditional (only when previous SR = MAN)	Variable (dependent on manual processing duration)	Additional Submission Responses will be sent after manual processing. Response can be • MAN (manual processing ongoing); • ACK (manual processing resolved, cancellation successful); - or • REJ (manual processing and cancellation failed)	

PLANNING SERVICE SCENARIOS

Scenario 1: Submission of Preliminary Flight Plan (PFP) by eAU

Business Completion Criteria:

- eAU receives Planning Status with CONCUR, NEGOTIATE, OR NON-CONCUR status indication; or
- eAU receives Submission Response with REJ status indication

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
1	eAU sends Preliminary Flight Plan (PFP) to eASP	Mandatory	N/A	Initial preliminary flight plan submission for collaborative decision making	
2	eASP returns Submission Response (SR) to eAU	Mandatory (following reception) PFP	1 minute following PFP submission	Message format validation and basic rule compliance check ACK: Preliminary Flight plan received and stored on file REJ: Preliminary Flight plan rejected and not stored on file MAN: Manual intervention required	
3	eASP returns subsequent Submission Response(s) to eAU	Conditional (only when previous SR = MAN)	Variable (dependent on manual processing duration)	Additional Submission Responses will be sent after manual processing. Response can be • MAN (manual processing ongoing); • ACK (manual processing resolved and proceed to Planning Status); or • REJ (manual processing failed)	
4	eASP returns Planning Status (PS) to eAU	Conditional (when SR = ACK)	1 minute following SR "ACK" if re-	Planning evaluation against ATM configuration and applicable restrictions/constraints.	

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
			evaluation process is provided	CONCUR: Complies with requirements NEGOTIATE: Would be accepted if filed, but eASP proposes modifications/constraints or identifies differences from desired route/trajectory NON-CONCUR: Does not comply with requirements	
5	eASP returns Planning Status(es) to eAU	Conditional (when re-evaluation process detects changes)	Variable	Additional Planning Status messages sent when re-evaluation detects changes in ATM restrictions/constraints affecting preliminary flight plan acceptability	

Scenario 2: Submission of Flight Plan Update (FPU) by eAU

Business Completion Criteria:

- eAU receives Planning Status with CONCUR, NEGOTIATE, OR NON-CONCUR status indication; or
- eAU receives Submission Response with REJ status indication

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
1	eAU sends Flight Plan Update (FPU) for PFP to eASP	Mandatory	N/A	Modification to existing preliminary flight plan data via update message	
2	eASP returns Submission Response (SR) to eAU	Mandatory (following reception) FPU	1 minute following FPU submission	Message format validation and basic rule compliance check ACK: Update processed successfully, preliminary flight plan modified	

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
				REJ: Update failed, preliminary flight plan unchanged MAN: Manual intervention required	
3	eASP returns subsequent Submission Response(s) to eAU	Conditional (only when previous SR = MAN)	Variable (dependent on manual processing duration)	Additional Submission Responses will be sent after manual processing. Response can be • MAN (manual processing ongoing); • ACK (manual processing resolved and proceed to Planning Status); or • REJ (manual processing failed)	
4	eASP returns Planning Status (PS) to eAU	Conditional (when SR = ACK)	1 minute following SR "ACK"	Planning evaluation against ATM configuration and applicable restrictions/constraints. CONCUR: Complies with requirements NEGOTIATE: Would be accepted if filed, but eASP proposes modifications/constraints or identifies differences from desired route/trajectory NON-CONCUR: Does not comply with requirements	
5	eASP returns Planning Status(es) to eAU	Conditional (when re-evaluation process detects changes)	Variable	Additional Planning Status messages sent when re-evaluation detects changes in ATM restrictions/constraints affecting preliminary flight plan acceptability	

Scenario 3: Submission of Flight Cancellation (FC) by eAU

Business Completion Criteria:

- eAU receives Submission Response with ACK or REJ status indication

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
1	eAU sends Flight Cancellation (FC) to eASP	Mandatory	N/A	Termination of preliminary flight plan and associated GUF I operational use	
2	eASP returns Submission Response (SR) to eAU	Mandatory (following Flight Cancellation message reception)	1 minute following FC submission	Message format validation and basic rule compliance check ACK: Cancellation processed successfully, preliminary flight plan cancelled REJ: Cancellation failed, preliminary flight plan remains active MAN: Manual intervention required, preliminary flight plan remains active	
3	eASP returns subsequent Submission Response(s) to eAU	Conditional (only when previous SR = MAN)	Variable (dependent on manual processing duration)	Additional Submission Responses will be sent after manual processing. Response can be • MAN (manual processing ongoing); • ACK (manual processing resolved, cancellation successful); or • REJ (manual processing and cancellation failed)	

NOTIFICATION SERVICE SCENARIOS

Scenario 1: Dissemination of Flight Departure (FD) Notification by Departure eASP

Business Completion Criteria:

- Departure eASPs receives Submission Response with ACK or REJ status indication

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
1	Departure eASP sends Flight Departure (FD) to relevant eASP(s)	Mandatory	N/A	Notification of actual departure event (equivalent to DEP message)	
2	Receiving eASP returns Submission Response (SR) to departure eASP	Mandatory (following departure message reception)	1 minute following dissemination of FD	Message format validation and basic rule compliance check ACK: Departure notification successful REJ: Departure notification failed MAN: Manual intervention required	
3	Receiving eASP returns subsequent Submission Response(s) to departure eASP	Conditional (only when previous SR = MAN)	Variable (dependent on manual processing duration)	Additional Submission Responses will be sent after manual processing. Response can be - MAN (manual processing ongoing); - ACK (departure notification successful); or - REJ (departure notification failed)	

Scenario 2: Dissemination of Flight Arrival (FA) Notification by Arrival eASP

Business Completion Criteria:

- Arrival eASPs receives Submission Response with ACK or REJ status indication

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
1	Arrival eASP sends Flight Arrival (FA) to relevant eASP(s)	Mandatory	N/A	Notification of actual arrival event (equivalent to ARR message)	
2	Receiving eASP returns Submission Response (SR) to arrival eASP	Mandatory (following arrival message reception)	1 minute following dissemination of FA	Message format validation and basic rule compliance check ACK: Arrival notification successful REJ: Arrival notification failed MAN: Manual intervention required	
3	Receiving eASP returns subsequent Submission Response(s) to arrival eASP	Conditional (only when previous SR = MAN)	Variable (dependent on manual processing duration)	Additional Submission Responses will be sent after manual processing. Response can be - MAN (manual processing ongoing); - ACK (arrival notification successful); or - REJ (arrival notification failed)	

TRIAL SERVICE SCENARIOS

Scenario 1: Submission of Trial Request (TRQ) by eAU

Business Completion Criteria:

- eAU receives Trial Response with CONCUR, NEGOTIATE, or NON-CONCUR; or
- eAU receives Submission Response with REJ status indication

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
1	eAU sends Trial Request(s) (TRQ) to eASP	Mandatory	N/A	Multiple independent requests can be sent simultaneously without waiting for responses. These "what-if" requests allow evaluation of flight plan alternatives without creating new flight plans or modifying existing flight plans. eASPs may limit number/frequency of requests.	
2	eASP returns Submission Response (SR) to eAU	Mandatory (following each trial request reception)	1 minute following TRQ submission	Message format validation and basic rule compliance check ACK: Trial request processed and will be evaluated REJ: Trial request rejected MAN: Manual intervention required	
3	eASP returns subsequent Submission Response(s) to eAU	Conditional (only when previous SR = MAN)	Variable (dependent on manual processing duration)	Additional Submission Responses will be sent after manual intervention. Response can be	

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
				• MAN (manual processing ongoing); • ACK (manual processing resolved and proceed to Trial Response); or • REJ (manual processing failed)	
4	eASP returns Trial Response (TRP) to eAU	Conditional (when SR = ACK)	1 minute following SR "ACK"	Evaluation against ATM configuration and applicable restrictions/constraints. . CONCUR: Complies with requirements NEGOTIATE: Would be accepted if submitted as eFPL or PFPs, but eASP proposes modifications/constraints or identifies differences from desired route/trajectory NON-CONCUR: Does not comply with requirements	

FLIGHT DATA REQUEST SERVICE SCENARIOS

Scenario 1: Submission of Flight Data Request (FDRQ) by eAU/eASP

Business Completion Criteria:

- Requestor (eAU/eASP) receives Flight Data Response; or
- Requestor (eAU/eASP) receives Submission Response with REJ status indication

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
1	eAU or eASP sends Flight Data Request (FDRQ) to eASP or eAU	Mandatory	N/A	Request for flight plan data, supplementary data, or flight status. Additional flight information may be provided, subjected to eAUs/eASPs implementation	
2	Receiving party returns Submission Response (SR) to message originator	Mandatory (following each flight data request reception)	1 minute from submission of FDRQ	Message format validation and basic rule compliance check ACK: Flight data request processed and flight information will be provided REJ: Flight data request rejected (invalid format, unauthorized access, or data not found etc.) MAN: Manual intervention required	
3	Receiving party returns subsequent Submission Response(s)	Conditional (only when previous SR = MAN)	Variable (dependent on manual processing duration)	Additional Submission Responses will be sent after manual intervention. Response can be • MAN (manual processing ongoing); • ACK (manual processing resolved and proceed to Flight Data Response); or	

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
				REJ (manual processing failed)	
4	Receiving party returns Flight Data Response (FDRP)	Conditional (when SR = ACK)	1 minute following SR "ACK"	Requested flight information provided. No response expected from recipient of Flight Data Response	

APPENDIX B

ATFM Operational Scenarios for APAC Common SWIM Information Services

1. Background

- 1.1. As the aviation community moves away from legacy point-to-point teletype messaging, System-Wide Information Management (SWIM) serves as the primary enabler for the digital exchange of aeronautical, flight, and meteorological information.
- 1.2. The exchange of tactical ATFM requirements, specifically **Calculated Take-Off Time (CTOT)**, and **Calculated Time Over (CTO)**, and one of the key A-CDM data elements supporting demand prediction, the **Target Take-Off Time (TTOT)**, is currently managed through a mix of legacy message formats and systems and emerging digital services. To ensure global interoperability and seamless transition to FF-ICE operating environment, these exchanges must be mapped to clear operational use cases within ICAO guidance materials and regionally operating procedures.
- 1.3. The exchange of CTO, CTOT, and TTOT is critical for the following operational reasons:
- 1.4. Enabling Flexible Trajectory-Based Demand-Capacity Balancing (CTO): The exchange of CTO allows an ANSP to balance demand and capacity within their area of responsibility by metering traffic through a specific waypoint in their airspace or at the boundary of their Flight Information Region (FIR) rather than imposing ATFM control mechanism at the departure airport which may be outside their FIRs. This approach aligns with the spirit of FF-ICE, in which FF-ICE capable ATM service provider (eASP) provides ATM restriction/constraint impacting trajectory within their area to the FF-ICE capable airspace user (eAU), and the eAU is responsible for managing their trajectory to comply with the requirements. This approach provides greater flexibility for the AUs to determine how best to meet the DCB requirement while still honouring their business objectives.
- 1.5. Balancing Demand and Capacity through an ATFM Measure Imposed at Departure Aerodrome (CTOT): While the move toward CTO is foreseeable in the future FF-ICE environment, there will be cases where a conventional Ground Delay Program (GDP) with the assignment of CTOT will still be used, e.g., in the case of domestic ATFM operations or in specific areas of cross-border ATFM operations with special arrangements among the ANSPs involved. In a GDP, CTOT is the primary constraint time issued to regulate departures of flights destined for congested or constrained airspace or arrival aerodrome. The sharing of CTOT with ANSP managing the

departure aerodrome ensures that the departure aerodrome holds the aircraft on the ground to smooth out traffic peaks before they enter the airborne network or going to the arrival aerodrome.

- 1.6. Enhancing Predictability via Airport Collaboration (TTOT): TTOT is derived from Airport-Collaborative Decision Making (A-CDM) processes and provides a more accurate picture of when an aircraft is expected to be ready for departure compared to the filed flight plan. Integrating A-CDM derived times such as TTOT into ATFM assists in enhancing ATFM's demand prediction, resulting in a more accurate, dynamic, and effective demand-capacity balancing initiatives.
- 1.7. The transition from legacy messages (such as Slot Allocation Messages - SAM) transmitted via AFTN/AMHS to modern Flight Information Exchange Model (FIXM) messages is driven by the need for global interoperability, data richness, and the implementation of SWIM.
- 1.8. There is a need to shift from existing SAM and related messages to ATFM FIXM messages due to the following reasons below:
 - 1.8.1. Limitations of legacy AFTN/AMHS formats: Legacy teletype-based formats are rigid and often lack the flexibility to carry complex trajectory data required for modern ATFM.
 - 1.8.2. Support for FF-ICE and global standardization (which FIXM will be used for exchanging flight-related information): Shifting ATFM and A-CDM information exchange to FIXM-based message formats ensures that APAC ATFM and A-CDM operations are aligned with global ICAO standards and are ready to support the operations in FF-ICE environment, as well as facilitating "global interoperability.
 - 1.8.3. Handling of region-specific requirements via extensions: Shifting to FIXM allows the region to define specific data elements (such as those found in the APAC Regional FIXM Extension) in a structured, machine-readable format (XML/GML) that legacy teletype-based messages cannot easily support.

2. Operational Scenarios

- 2.1. The three parameters cited represent different phases within a flight trajectory:

- 2.1.1. TTOT (Target Take-Off Time): Generated by A-CDM system, representing the expected time a flight is expected to depart from the departure aerodrome considering factors including the airspace user's TOBT (Target Off-Block Time) and departure sequencing requirements.
- 2.1.2. CTOT (Calculated Take-Off Time): Generated by the ATFM system to manage traffic into constrained or congested airspace or arrival aerodrome by controlling the departure (take-off) time of the flight from the departure aerodrome.
- 2.1.3. CTO (Calculated Time Over): Generated by the ATFM system to manage traffic into constrained or congested airspace by controlling the time the flight is expected to cross a specific waypoint in an airspace.
- 2.2. Operational Use Cases for ATFM FIXM messages to be exchanged using Flight-Specific ATFM Measure Service and ATFM/A-CDM Integration Service (ref. Business Functionality of APAC Common SWIM Information Services, version 1.0) are elaborated below:
 - 2.2.1. Cross-Border A-CDM data exchange: Using SWIM to provide timely cross-border TTOT updates from A-CDM airports to airport operators or ANSP. This enables more accurate demand prediction, allowing for more optimised CTOT/CTO allocation and more appropriate delay assignment, reducing unnecessary buffering and ground delay.
 - 2.2.2. Cross-Border Metering between Adjacent ANSPs: Sharing a CTO, especially between two adjacent Air Navigation Service Providers (ANSPs) enables traffic metering through early speed adjustments in the cruise phase, rather than ad-hoc holding by the downstream ANSP which are more costly, less environmentally friendly, and introduces additional workload on ATCOs.
 - 2.2.3. Expanding the scope of ATFM measure: Conventional ATFM measure such as a GDP targets management of pre-departure flights. With the inclusion of CTO issuance, the scope of ATFM measure could be expanded to include airborne flights. AUs could contribute to overall traffic management through trajectory adjustments during cruise phase to meet with the required CTO. This could reduce ground delays as ATFM delays are spread across a wider flight profile range.

2.2.4. Dynamic Collaborative-Decision Making Process: Enabling ANSPs and AUs to view ATFM information in real-time and perform timely negotiations as information are exchanged.

3. ATFM FIXM Messages Identified

3.1. In order to achieve the above ops scenarios, five different messages were identified, namely (1) FIXM TTOT Allocation, (2) FIXM CTOT Allocation, (3) FIXM CTOT Cancellation, (4) FIXM CTO Allocation and (5) FIXM CTO Cancellation.

3.2. The FIXM TTOT, CTOT and CTO Allocation messages allow the system to exchange TTOT, CTOT or CTO values (respectively) when made available as well as providing the revision to them. Note that the revision to TTOT, CTOT, and CTO can be distributed using the “Allocation” messages by replacing the existing time values. Recipient systems should be able to differentiate between an initial allocation and a revision.

3.3. The FIXM CTOT and CTO Cancellation messages allow the system to remove the CTOT or CTO values usually sent after an ATFM program is cancelled.

Step	Message	Details	Business Timeout	Comments	Message Exchange Pattern
1	FIXM TTOT Allocation	Mandatory (when TTOT is available)	N/A	For all departure flights with TTOT, ANSPs will publish.	
2	FIXM CTOT Allocation	Mandatory (after ATFM program ran)	N/A	After a GDP is run or revised, dependent on individual configuration condition set on when to be sent out, this message has to be published.	
3	FIXM CTOT Cancellation	Mandatory (after ATFM program is canceled)	N/A	After GDP is canceled, or the assigned CTOT no longer applies to the flight, this message has to be published.	
4	FIXM CTO Allocation	Mandatory (after ATFM program ran)	N/A	After the ATFM measure is run or revised, dependent on individual configuration condition	

				set on when to be sent out, this message has to be published.	
5	FIXM CTO Cancellation	Mandatory (after ATFM program is canceled)	N/A	After the ATFM measure is canceled, or the assigned CTO no longer applies to the flight, this message has to be published.	

4. Mapping of ATFM FIXM Messages to APAC Common SWIM Information Service

4.1. Business functionality of the information service: **Flight-Specific ATFM Measure Service**

4.1.1. Scenario: Dissemination of CTOT Allocation by Initiating ATFMU to Facilitating ATFMU, AU, and other relevant stakeholders

4.1.1.1. Business Completion Criteria: Initiating ATFMU disseminates FIXM CTOT Allocation Message to Facilitating ATFMU, AU, and other relevant stakeholders. No business confirmation needed.

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
1	Initiating ATFMU sends FIXM CTOT Allocation to Facilitating ATFMUs, AUs, and other relevant stakeholders	Mandatory (after ATFM program ran)	N/A	After a GDP is run or revised, dependent on individual configuration condition set on when to be sent out, this message has to be published.	

4.1.2. Scenario: Dissemination of CTOT Cancellation by Initiating ATFMU to Facilitating ATFMU, AU, and other relevant stakeholders

- 4.1.2.1. Business Completion Criteria: Initiating ATFMU disseminates FIXM CTOT Cancellation Message to Facilitating ATFMU, AU, and other relevant stakeholders. No business confirmation needed.

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
1	Initiating ATFMU sends FIXM CTOT Cancellation to Facilitating ATFMUs, AUs, and other relevant stakeholders	Mandatory (after ATFM program is cancelled)	N/A	After GDP is cancelled, or the assigned CTOT no longer applies to the flight, this message has to be published.	

- 4.1.3. Scenario: **Dissemination of CTO Allocation** by Initiating ATFMU to Facilitating ATFMU and AU

- 4.1.3.1. Business Completion Criteria: Initiating ATFMU disseminates FIXM CTO Allocation Message to Facilitating ATFMU and AU. No business confirmation needed.

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
1	Initiating ATFMU sends FIXM CTO Allocation to Facilitating ATFMU and AU	Mandatory (after ATFM measure ran)	N/A	After ATFM measure is run or revised, dependent on individual configuration condition set on when to be sent out, this message has to be published.	

- 4.1.4. Scenario: Dissemination of CTO Cancellation by Initiating ATFMU to Facilitating ATFMU and Facilitating ATFMU and AU

- 4.1.4.1. Business Completion Criteria: Initiating ATFMU disseminates FIXM CTO Cancellation Message to Facilitating ATFMU and AU. No business confirmation needed.

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
1	Initiating ATFMU sends FIXM CTO Cancellation to Facilitating ATFMU and AU	Mandatory (after ATFM measure cancelled)	N/A	After ATFM measure is cancelled, or the assigned CTO no longer applies to the flight, this message has to be published.	

4.2. Business functionality of the information service: **ATFM/A-CDM Integration Service**

- 4.2.1. Scenario: Dissemination of TTOT Allocation by departure eASP/ATFMU

- 4.2.1.1. Business Completion Criteria: Departure eASP/ATFMU disseminates FIXM TTOT Allocation to relevant eASPs/ATFMU. No business confirmation needed.

Step	Message	Message Requirements	Business Timeout	Comments	Message Exchange Pattern
1	Departure eASP/ATFMU sends FIXM TTOT Allocation to relevant eASPs/ATFMUs	Mandatory (when TTOT is available)	N/A	For all departure flights with TTOT, ANSPs will publish.	

ICAO APAC SWIM INDICATORS

1. SWIM Implementation Status- In preparation/planning

Criteria 1: Readiness of the implementation plan

Final Score: (Total Score/6) x 100%

- 1) Use case development: Identify and develop use case(s)
Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)
- 2) Stakeholder mapping: Identify information providers and consumers
Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)
- 3) Gap analysis: Determine required data transformation/preparation to standardised information exchange models
Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)
- 4) Service identification: Decide on and prioritise information services to be implemented
Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)
- 5) TI design: Decide on SWIM TI architecture
Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)
- 6) Governance framework design: Draft SWIM governance and policy framework
Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)

2. SWIM Implementation Status- Under development/implementation

Criteria 1- Engineering buildup and testing

Final Score: (Total Score/6) x 100%

- 1) Data preparation: Transforming/preparing data into standardised information exchange models
Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)
- 2) Information services buildup:
 - a. Developing and implementing information services
Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)
 - b. Ensuring service discoverability through the service registry
Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)
- 3) TI buildup: Developing and implementing SWIM TI

Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)

4) Testing & validation

Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)

5) Governance establishment

Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)

3. SWIM Implementation Status- In operation

Criteria 1- Establishment of SWIM TI + Trial information service(s)

Final Score: (Total Score/9) x 100%

1) Data delivery: Information delivery in standardised information exchange models through trial information services

Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)

2) Service discovery: Information services discoverable

Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)

3) Governance execution (**Governance Score:** (Total Score/7) x 100%)

i. Executing mechanism to ensure Service Level Agreement(s) tracking

Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)

ii. Executing mechanism to monitor performance through Quality of Service (QoS) metrics

Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)

iii. Executing mechanism to ensure Information service lifecycle management

Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)

iv. Executing framework to ensure SLA and QoS of SWIM TI

Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)

v. Executing mechanism/framework for access control and management

Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)

vi. Executing framework/guideline for information service onboarding/offboarding

Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)

vii. Executing procedures to resolve disputes between the information service provider and the consumer

Options: Not implemented (0), Partial implementation (0.5), Full implementation (1)