*International Civil Aviation Organization*

**First Meeting of the Surveillance Study Group (SURSG/1)**

(Video Teleconference, 20– 22 April 2021)

**Agenda Item 3**: Review of outcome of relevant meetings

# UPDATE ON SWIM REGIONAL COORDINATION

(Presented by IATA on behalf of ICAO APAC SWIM Task Force)

**SUMMARY**

This paper provides a brief on key SWIM activities being undertaken in Asia & Pacific Region including topics discussed in the SWIM Task Force/4 meeting in November 2020.

## 1. INTRODUCTION

1.1 The actions of the APAC SWIM Task Force include identifying and communicating all SWIM related activities (and their interdependencies) in planning or development within other Working Groups (WGs) and Task Forces (TFs). It is to liaise with relevant regional TF/WGs to refine operational and communications requirements, provide guidance to those WG/TFs developing and using SWIM, and influence outcomes from other WGs and TFs that will support successful expansion of SWIM. This involves confirming inclusion on agendas and appropriate discussions ensuing.

1.2 Whilst Task 10 specifically states "Coordinate SWIM TF and MET IE/WG outcomes and activities", the action is primarily about broader coordination of SWIM activities in APAC (not solely MET) and raising awareness of the work of the SWIM Task Force.

1.3 This summary endeavours to report on all activities related to SWIM in APAC but acknowledges there may be some missing. This is not intentional, and any additional input and updates are welcomed.

1.4 Given meeting delays caused by the COVID-19 pandemic, some of the updates from 2020 may have been surpassed by further work in 2021. It is also unrealistic to include all details within this update so the audience is invited to visit the Meeting Report for SWIM TF/4 at https://www.icao.int/APAC/Meetings/2020%20SWIM%20TF4/Final%20Report.pdf to access content for broader discussions on SWIM research and development activities in the region.

## 2. DISCUSSION

APAC Regional SWIM Implementation

2.1 The Information Management Panel (IMP) updated the agreed definition of SWIM Region to: *A geographical area in which a group of States and/or ATM stakeholders has agreed upon common regional governance in support of system wide information management implementation*.

Note: A SWIM region can be an ICAO region or any other community of interest agreeing on common governance.

Common aeRonautical Virtual Private Network (CRV):

2.2 Seventh Meeting of the Common aeRonautical Virtual Private Network Operations Group (CRV OG/7) was held 20 - 22 January 2020.

2.3 MPLS/IP Based Inter-Regional Connection – The meeting agreed to a proposal to develop a high-level concept on the interconnection of the CRV with other regional network such as REDDIG/MEVA/PENS. Several States that connect to the CRV are also required to connect to other regional networks. There are potential benefits with implementing interconnections between regional networks such as harmonization and efficiency in the connection for services like SWIM and reducing costs for States that connect to other regional networks.

2.4 The meeting heard a proposal for a SWIM Demonstration on CRV hosted by Hong Kong China in March 2020 to demonstrate the operational benefits of using CRV to carry SWIM data, and the corresponding services envisaged as necessary or complementary to support implementation of SWIM in APAC region. Through an operational scenario using real exchange of SWIM data the demonstration was to be conducted over a dedicated mini-CRV provided by PCCWG while not impacting normal operations for the routine traffic being exchanged.

2.5 Due to the COVID-19 crisis the demonstration was not able to progress. Hong Kong China will notify interested parties of a new date once available.

2.6 SWIM TF/4 discussed how to overcome the limitations of CRV and avoid the unsupportable point-to-point connections between all stakeholders, the cooperation between CRV and SWIM service providers is required. As result of discussion, the CRV-based architecture is required for regional SWIM implementation during the transition period and the CRV-based Interoperable SWIM Architecture with the following recommendations is considered as an appropriate approach in the APAC Region:

- To assure the quality of communication for different applications, it is recommended to divide the AMHS (or legacy) communication and SWIM communication into different logical communication layers on CRV.

- To avoid the unsupportable point-to-point connections between all stakeholders, it is required CRV and SWIM service providers to establish common agreements and creating a collaborative environment at the regional level.

- To achieve the interoperability during the transition period, the SWIM-enabled system is required to receive/send AMHS message types from/to CRV-based legacy systems.

2.7 CRV OG/8 is scheduled for 17-19 May 2021.

Air Traffic Flow Management (ATFM):

2.8 The APAC FIXM 4.1 Extension, initiated by ATFM/SG, developed by the APAC SWIM Task Force (TF), and reviewed and approved by the FIXM Change Control Board (CCB) and APANPIRG/30 is published on the FIXM website at https://fixm.aero and on the ICAO APAC Regional Office eDocuments web-page for immediate use by APAC administrations, where capability to do so exists (https://www.icao.int/APAC/Pages/eDocs.aspx).

2.9 Currently, the development of conceptual model, logical model and physical model of FIXM extension has been completed, and the documentation of FIXM ATMB ATFM Extension version 0.1 is in progress. The validation and demonstration of developed FIXM Extension will be carried out at a later date, in one Regional Air Traffic Management Bureau as experimental unit.

SWIM Discovery Service (SDS):

2.10 The concept of a SWIM Discovery Service (SDS) was introduced at SWIM TF/4. The ability to search for and locate (discover) services offered by a growing number of independently developed and autonomously managed SWIM domains is highly important and is a precursor for achieving global information exchange.

2.11 The US FAA and Korea Airports Corporation (KAC) are collaborating in an effort to define and test an approach for enabling federated service discovery across geographical and organizational boundaries. In this approach, a "discovery service" is a core SWIM service that allows a user to search for and obtain service metadata from multiple sources in one consolidated result. Discovery services do not need a centralized discovery mechanism since they are self-advertising and also advertise each other.

2.12 To formalize the approach, the FAA has produced an SDS Implementation Specification v.1.0.0 (https://discovery.swim.aero/sds/1.0.0/) that establishes guidelines and techniques for developing a discovery service capable of interacting with other SDS-compliant discovery services.

Security and Trust in the Context of SWIM Discovery Service

2.13 The work of SDS identified the need to address issues of security and trust that might occur when multiple independently operated discovery services exchange information.

2.14 An example scenario (an end user wanting to "find all operational flight services") that required intercommunication among three different discovery services illustrated the issues. The parties are investigating using a federated identity management solution approach to secure the communication.

2.15 The meeting also heard an overview of the latest relevant security technologies and discussed the proposed APAC Mutual Trust Infrastructure being developed as part of the Security Management sub-task of the SWIM TF and its relationship to issues of trust between discovery services.

SWIM Service Category Taxonomy

2.16 A SWIM Service Category Taxonomy was described and offered as a standard approach for classifying SWIM Services. It is designed for the purpose of organizing SWIM services into classes or categories to make the services easier to find or manage.

2.17 It is described as a 3-level hierarchy with a top level "SWIM Service" classified into two categories, "Information Service" (services that provide information products) and "Core Service" (services that provide support capabilities). Each category would have sub-categories; e.g., "Weather Service" would be a sub-category of Information Service, and "Security Service" would be a subcategory of Core Service.

2.18 The virtue of this taxonomy is that it can be extended horizontally by adding more categories to any level of the hierarchy, or vertically by further dividing a particular category into more specialized subcategories; in this way it is able to meet future business needs.

2.19 Rendering the taxonomy into machine language (see https://semantics.aero/servicecategory) would also allow it to support applications for service discovery or governance processing.

FF-ICE/R1 Service Validation and Implementation

2.20 Japan, China and Republic of Korea have jointly conducted a demonstration to validate the implementation of FF-ICE services and the process of related messages for FF-ICE/R1 operation through two scenarios by considering the FF-ICE/R1 capable ASPs and AUs (eASP and eAU).

2.21 The demonstration showed that the SWIM-based FF-ICE operation is capable of providing related information in greater detail and allow the eAU and the eASP to share their expectations in an unambiguous manner via the exchange of trajectory information.

Meteorology:

2.22 MET/R WG/9 (May 2020) agreed to establish a new deliverable as follow-up to Decision MET SG/23/7 – *Development of APAC User Requirements for SWIM-based MET Information Services Supporting ATFM*.

2.23 The meeting reviewed a proposal on the development of APAC use-cases and user-requirements for SWIM-based MET information services supporting air traffic flow management (ATFM). This was follow-up from initiation of the work at earlier meetings.

2.24 The proposal included a list of proposed terms of reference for the work, as well as examples of use-cases and data catalogues and a draft table of contents of user-requirements for SWIM-based MET information services supporting ATFM.

2.25 That meeting established an ad-hoc group to work with other relevant bodies of APANPIRG (particularly the ATFM WG) to continue the work focused on SWIM-based MET information services specifically addressing the needs of ATFM in the APAC Region.

2.26 Next MET Requirements (MET/R) WG meeting and MET/ATM Webinar is scheduled for late May 2021.

2.27 MET Information Exchange (MET/IE) WG/19 and MET Services (MET/S) WG/ were held in the week 22-26 March.

2.28 Multiple States provided updates on varying extents of testing and using IWXXM for the sharing of MET data.

2.29 The meeting recognized that, in order for an online register of APAC IWXXM exchange status to be an effective tool for facilitating States' implementation of IWXXM exchange, the register should contain up to date information provided by all APAC States.

2.30 To aid education on the topic, a list of Frequently Asked Questions (FAQs) on IWXXM is being developed for MET Sub-Group to approve later this year.

Airport Collaborative Decision Making (A-CDM):

2.31 The Sixth Meeting of the Asia/Pacific Airport-Collaborative Decision-Making Task Force (APA-CDM TF/5) was held15-17 June 2020.

2.32 CANSO provided a preview of its draft ATFM/A-CDM Integration Guide aimed to be published in mid-2020 and which identifies SWIM as one of the items considered to be the minimum for effective integration of A-CDM and ATFM.

2.33 The meeting noted that the information exchanges between ATFM and A-CDM should be scalable to allow a phased expansion of functionality on both systems. On interoperability, it was recommended using SWIM concept with the most current FIXM / FIXM Extension.

2.34 The group has an ongoing action to identify any other data attributes which are necessary to support the A-CDM and ATFM integrated operations (from A-CDM perspective), in addition to the ones

already included in the current version of the FIXM v4.1 Extension in collaboration with experts from ATFM/SG and SWIM TF. A-CDM experts were strongly encouraged to attend ATFM/SG and/or SWIM/TF.

2.35 Next APA-CDM Task Force meeting is scheduled for late April 2021.

Aeronautical Communications Services (ACS)

2.36 The Seventh Meeting of Aeronautical Communications Services (ACS) Implementation Co-ordination Group of APANPIRG (ACSICG/7) took place 21-23 July 2020.

2.37 Several States updated on readiness of AMHS and/or CRV to support SWIM exchanges, particularly the sharing of IWXXM messages.

2.38 Next ACSICG meeting is scheduled for 21-23 June 2021.

Collaboration in Sharing of Surveillance Data in SWIM

2.39 This meeting will primarily cover the items in this section.

2.40 The Fifth Meeting of the Surveillance Implementation Coordination Group (SURICG/5) was held 22 - 24 September 2020.

2.41 Following the Conclusion CNS SG/23/10 (SURICG/4/1) - *ADS-B and Flow Management*, it was agreed there is a need to share surveillance data to provide surveillance from "departure to destination". Singapore proposed solutions for sharing of surveillance data using SWIM/CRV and PCCW Global, the selected CRV service provider through ICAO TCB process, presented their capability to provide a hosted platform over SWIM/CRV for sharing of surveillance data.

2.42 Singapore proposed a multidisciplinary study group be established, to be led by SURICG, including experts from surveillance, SWIM and ATFM and it was intended that they inform this meeting of further details.

2.43 General availability to all ANSPs, contributing or not, to the shared surveillance data is recommended to realize benefits such as more rapid expansion of CRV community and the launch of SWIM services.

2.44 With the concern of sensitivity of surveillance data, the ownership and accountability of correctness on surveillance data, contributing ANSPs need to consider what surveillance data to be shared and associated commitment to high availability, system redundancy and coverage of surveillance data to be shared.

2.45 SWIM TF/4 agreed to a study group to further explore an initiative for a Surveillance Central Data Processor (SCDP), a possible Commercial-ANSP collaboration, and to study the data sharing model at EUROCONTROL'S Network Manager as a possible reference model for surveillance data sharing in APAC.

ENRI Forum on SWIM

2.46 The Electronic Navigation Research Institute (ENRI) in Japan hosted a virtual seminar on SWIM in January 2021.

2.47 Presentations included:

- SWIM in Japan – Towards the next stage of CARATS (JCAB)
- FAA SWIM activities: Implementation of Future Research (US FAA)

- SWIM – An Airline Perspective (IATA)
- A Regional Picture on SWIM Related Activities (ICAO RO)
- SWIM Research & Development in ENRI (ENRI)

SWIM Education and Training:

2.48 Due to COVID-19, the Second Meeting of ICAO Information Management Panel (IMP/2) has been suspended to Q2 in 2021, therefore, the development of the draft SWIM Manual Vol.II will be delayed until after that. Also, the delivery of SWIM related SARPs may be delayed a few years.

2.49 APAC SWIM Implementation Materials and APAC SWIM Education Programme were also delayed from their original schedule due to loss of resources in ICAO APAC Office and impact of COVID-19. The reasonable target date for completion of regional documents now would be after the availability of the global implementation manual as the gaps for the regional needs could be identified.

2.50 ICAO APAC is progressively loading SWIM reference and education material to the SWIM-APAC site of the ICAO Secure Portal. To gain access please follow these steps:

- Access the portal website: https://portallogin.icao.int/
- Subscribe to the group APAC-SWIM.
- Following the guidance, input your profile information.
- Wait for approval.
- You will receive an email to notify you once processed.

2.51 SWIM awareness / educational videos are available from both ICAO at https://youtu.be/wXI9ep98Z8E and IATA at https://youtu.be/QplD6sP--gg

2.52 IATA also offers a two-day IATA SWIM Training classroom course and during COVID-19 has also developed a two-hour online SWIM introductory course, both of which participates can register for at https://www.iata.org/en/training/.

## 3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper; and

b) discuss any relevant matter as appropriate.

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