KEYNOTES

INTRODUCTION

The ICAO SWIM workshop 2016 was held in Bangkok, Thailand from 16 to 18 May 2016, gathering a total of 126 participants from:

- 22 States/Administrations of APAC Region (Australia, Bangladesh, Cambodia, China, Hong Kong China, Macao China, Fiji Islands, India, Indonesia, Japan, Lao PDR, Malaysia, Mongolia, Myanmar, New Zealand, Nepal, Philippines, Republic of Korea, Singapore, Thailand, USA and Viet Nam);
- 5 States of MID region (Egypt, Iran, Oman, Qatar, and Sudan);
- 4 International and Regional Organizations (Eurocontrol, ICCAIA, IATA, and SITA);
- 9 Aviation Industry companies (Avitech GmbH, Frequentis, FTS Technologies Inc., Harris Corporation, Leonardo, Mosaic ATM, NEC Corporation, NTT Data Corporation, and Thales);
- one research institute (Electronic Navigation Research Institute, Japan);
- one airline (Thai Airways International Public Co., Ltd.);
- 5 MET service providers (Egyptian Meteorological Authority, Hong Kong China Observatory, Korea Meteorological Administration, Meteo France and Thai Meteorological Department,); and
- two aviation academies (Advanced Air Traffic Systems Sdn Bhd, Malaysia and Embry Riddle Aeronautical University, USA).

In considering the GANP objective to implement SWIM as the global aviation intranet, as defined by ICAO Doc 10039, ICAO established a specific programme to coordinate the actions towards development of provisions and implementation of SWIM at a global level.

Furthermore, considering that the SWIM scope is clarified in the SWIM concept document, the ICAO SWIM workshop 2016 agreed on the following keynotes:

SWIM ROADMAP

1. Regional SWIM roadmaps should be developed in the APAC and MID Regions to support the Regional objectives/priorities as adopted by the respective PIRG.

2. The Regional SWIM roadmap should be defined taking into account, inter alia:

   - Deliverables by ICAO panels on SWIM;
   - Transition strategies that need to be developed to guarantee interoperability with legacy systems and SWIM specific systems, in order to not leave countries behind;
   - Opportunities of SWIM-related products and services offered by industry;
   - the current progress and issues of effective implementation in APAC and MID; and

- the operational requirements of air traffic management, including air traffic control and flight operations.

Note 1 – SWIM enablers are defined in the ICAO Regulatory and Operational Improvements (ROI) roadmap (exchange models such as FIXM, AIXM and extended flight plan in 2018 including GUFI, additional provisions for transition from AIS to AIM, amendments to Annex 10 and 11 for the use of SWIM, etc.)

3. The National programmes/plans should ensure that all stakeholders are considered and engaged as necessary from the beginning in the planning and implementation of SWIM.

4. Participants noted that SWIM adds significant value to other ASBU modules through reliable, secure, and efficient information exchange to make the best use of data from various sources.

GOVERNANCE

5. Governance is a crucial subject that needs to be defined ASAP since SWIM generalization will require sound governance principles. Specific attention should be paid to identify what has to be implemented at the global, regional and national levels, taking into account the reality of the regional and national implementation baselines and specific operational scenarios.

6. Data quality and verification process and Service Level Agreements (SLA) should be considered in the SWIM Governance. The approach to specify and meet reliability, maintainability and availability should be addressed.

7. Cybersecurity and protection should be considered in the SWIM Governance.

REGISTRY

8. The way to implement registry/provide registry services (whether global or regional, distributed or centralized) should be clarified by IMP and a target date set accordingly in the regional SWIM roadmaps.

ROADMAP MILESTONES AND IMPLEMENTATION

9. APAC:

   a. The workshop identified specific implementation targets (requiring the use of specific SWIM models) before 2022 and a generalization phase as intended by the GANP and draft seamless ATM plan from 2022. All should appear in the SWIM roadmap.

   - Target date in APAC for distributed multi-nodal ATFM information distribution capability utilizing FIXM version 3.0 (or later) should not be earlier than November 2019;

   - Target date in APAC for ATM systems to be supported by complete implementation of AIM Phase 3 using, at a minimum, AIXM version 5.1 should not be earlier than November 2019:

     Dependencies:
     o Annex 15 / Amendment on the requirements on the use of the improved NOTAM system for AIM (2018)

- o PANS-ATM (Doc 4444) / Procedures and guidance on the use of improved NOTAM system for ATM (2018)

- FIXM version 3.0 (or later), extended where necessary to accommodate additional regional requirements, is the agreed ATFM information exchange model for exchanging ATFM data between ATFM systems in the Asia/Pacific Region

- Initial steps in the migration to digital exchange of MET (IWXXM) to support SWIM environment:

  a) **Nov 2013** − Amendment 76 to Annex 3 **enabled** exchange of OPMET information in digital form;

  b) **Nov 2016** − Amendment 77 to Annex 3 will **recommend** exchange of OPMET information in digital form; and

  c) **Nov 2018** − Amendment 78 to Annex 3 is envisaged* to **standardize** exchange of OPMET information in digital form

  Notes 2 – ICAO METP is responsible for inclusion of MET information in the SWIM environment, including further development of MET services/systems taking into consideration integration in SWIM, and further development of the SWIM concept relating to MET.

  Note 3 – The METP/WG-MIE is developing proposed standards* for exchange of OPMET information in digital form to be included in draft Amendment 78 to Annex 3 (for review/approval by METP in Oct 2016; expected applicability Nov 2018), plus a MET-SWIM implementation plan and Guidelines for the Implementation of OPMET Data Exchange using IWXXM.

b. Extended AMHS will be used to exchange IWXXM data internationally through the AFS, therefore regional implementation of Annex 3 provisions for exchange of OPMET in digital form is contingent on the regional implementation of Extended AMHS. For this, a profile selecting what needs to be implemented from ICAO Doc 9880 needs to be defined.

c. As part of the implementation process, it was recommended that a safety case should identify operational hazards and mitigate risks to an acceptable level.

10. MID:

As agreed in the MID Air Navigation Strategy.

TRANSITION

11. In considering chapter 4 of SWIM manual the transition schemes for States/ANSP should ensure performant connectivity and interoperability between legacy AFTN/AMHS and SWIM implementations.

12. If such gateways are used, they would handle address conversion between SWIM and AMHS/AFTN Environment to and from X.400 protocol used by AMHS.

13. Backward compatibility between successive model versions and legacy formats should be ensured for a transition period to be defined.

MONITORING OF GLOBAL DEVELOPMENTS

14. Upcoming SWIM related amendments to ICAO Annexes including 3, 11, 4, 15 and 10 should be monitored and contributed by the States. Amendments are expected to be available at different horizons: 2019, 2020 and 2022 according to the ASBUs framework.

ARCHITECTURE AND MESSAGE MEDIATION AND COMMON IP NETWORK INFRASTRUCTURE

15. Compatibility among different exchange models should be guaranteed for SWIM systems interoperability.

16. Standards development is a critical activity and standards developing organizations who can promptly address the needs of SWIM should be identified.

17. Messaging infrastructure: The necessity to adopt standards for messaging (extended AMHS and web services) and expose the SWIM message exchange patterns from MTA should be clarified by IMP to ensure a smooth transition as guided by Chapter 4 of ICAO Doc 10039.

18. Interoperability of industry solutions for messaging should be promoted and tested.

19. Possibility to carry AIDC over IP (in the same way that in Europe FMTP allows carrying OLDI over IP): should be considered by Communications Panel.

20. SWIM requires the implementation of Interregional, regional and national IP connectivity with agreed performance. In APAC and MID, CRV IP based network has been agreed on to provide this function from 2017.

21. Once a common IP network is available, all A-CDM/ATFM/AIM/MET data should be migrated.

CHALLENGES

22. Following challenges regarding ASBU B0 and SWIM enablers were noted:

- QMS, AIXM (and consequently eAIP) and eTOD are main challenging elements in B0-DATM; and
- IP Network is a challenging SWIM enabler

23. Main reasons for the non-implementation were noted as follows:

- Financial issues; and
- Lack of awareness, and competent human resources (needs for training)

24. Guidance materials and iKITs (implementation KITs) could help States with the implementation.

UPCOMING EVENTS RELATED TO SWIM

25. A number of SWIM related events were announced:

- Keep "*spreading the SWIM word*" among the MET community: EUMETNET workshop 22-23 may 2016;
- SWIM Global Demo event (8-9 June 2016 – Roma): global interoperability demonstrated;
- ICAO APAC/EUR/MID Interregional Seminar on the *"Service improvement through integration of digital AIM, MET and ATM Information"* in 2017; and
- ICAO global symposium scheduled in September 2017.

26. The workshop agreed to refine the scope of a regional work programme based on draft ACSICG work programme by end of June 2016. The informal group will identify the objectives, and dependencies (deliverables of IMP, other). The group is composed of: Australia, China, Japan, New Zealand, Singapore (to be confirmed), Thailand (to be confirmed), ICAO HQ, ICCAIA, ICAO MID and ICAO APAC.