International Civil Aviation Organization

The Fifth Meeting of System Wide Information Management Task Force (SWIM TF/5)

Video Tele-conference, 9 – 11 August 2021

Agenda Item 4: Review the report of SURSG/1

REVIEW REPORT OF THE FIRST MEETING OF THE SURVEILLANCE STUDY GROUP (SURSG/1)

(Presented by the Secretariat)

SUMMARY

This paper presents the discussions and relevant outcomes on the First Meeting of the Surveillance Study Group (SURSG/1).

1. INTRODUCTION

1.1 The First Meeting of the Surveillance Study Group (SURSG/1) was held from *20 to 22 April 2021* via Video Tele-Conference (VTC). The Meeting was attended by 118 participants from 15 States/Administrations, 4 International Organizations and 2 industry partners (CANSO, IATA, ICCAIA, IFATCA, Frequentis and PCCW Global). The meeting report, working papers, information papers, and other resources can be accessed by following link:

https://www.icao.int/APAC/Meetings/Pages/2021-SURSG-1.aspx.

1.2 This paper summarised relevant information and updates from the meeting.

2. DISCUSSION

2.1 The summary of discussion in the Meeting is given in following paragraphs.

Election of Chair

2.2 Mr. Vincent Wong, Acting Chief Electronics Engineer of the Air Traffic Engineering Services Division of the Hong Kong Civil Aviation Department (HKCAD), was elected as the chair of the Surveillance Study Group (SURSG).

Review of Terms of Reference (ToR) - Sec (WP/02)

2.3 The revised ToR by SURSG/1 is provided in **Appendix A** to the paper and to be presented to SURICG/6 for adoption

Update on SWIM Regional Coordination- IATA (IP/03)

2.4 IATA provided a summary on key SWIM activities in Asia & Pacific Region and updated the meeting on Information Management Panel (IMP) definition of SWIM Region. The potential

benefits for joining CRV/inter-regional networks, SWIM Demonstration on CRV postponed due to the COVID-19, results of relevant meetings including SWIM TF/4, MET/R WG/9, APA-CDM TF/5, ACSICG/7, SURICG/5 and a virtual seminar on SWIM in January 2021 by Electronic Navigation Research Institute (ENRI), Japan were reviewed in this Paper. The ICAO APAC Regional Office is uploading SWIM reference and education material to the SWIM-APAC site of the ICAO Secure Portal. IATA offers the meeting with a two-day IATA SWIM Training classroom course and has developed a two-hour online SWIM introductory course. ICAO secretariat informed the meeting about a two-day SWIM workshop that was held on ***6 -7 July 2021*.**

Surveillance Exchange Model Framework- Hong Kong, China (WP/04)

2.5 Hong Kong, China presented some key considerations leading to a proposal of ANSP's collaboration scheme in sharing and enriching surveillance coverage and ANSP's surveillance data sharing collaborative approach to expand surveillance coverage. Three Infrastructure models for Data Contribution and were proposed. The paper also proposed adoption of Unified Data Format, All Purpose Structured Eurocontrol Surveillance Information Exchange (ASTERIX), as common data format and described Infrastructure - Surveillance Central Data Processor (SCDP). A deployment for sharing surveillance data was described and illustrated. The paper further discussed the SWIM surveillance data sharing services over CRV. The chair encouraged members to consider examples and potential implementation approaches provided in the paper such as in section 4.4 for consideration by the Study Group. Additionally, the validity of section 4.5 that "surveillance data should be prioritized strictly over all other traffic in the data-sharing infrastructure" was commented in the meeting as it varies based on the usage. The meeting recognized the need to revise section 4.5 and proposed one task group of SURSG to look into performance requirements of surveillance data in the context of surveillance data sharing in SWIM.

Proposed Solutions for Sharing of Surveillance Data- Singapore (WP/06)

2.6 Singapore proposed solutions for States to share surveillance data and listed the pros and cons of the solutions. This paper was presented at SURICG/5 following the Conclusion CNS SG/23/10 (SURICG/4/1) - ADS-B and Flow Management, there is a need to share surveillance data to provide surveillance from "departure to destination". Three models, namely distributed solution, central database, and hybrid model, were introduced to the meeting. It was further informed that there might be some interested parties, who are not subscribers to CRV or without SWIM capabilities, but are keen to share their surveillance data with other States. Adjustment to the models will be required to accommodate these parties. One possible solution could be for these parties to connect directly to one or more of the centralized service data providers, if available.

Considerations for Sharing of Surveillance Data- Singapore (WP/07)

2.7 Singapore presented the factors for States to take into considerations and elicit views from members towards a consensus on the approach for the sharing of surveillance data in the region. States would need to consider and decide on the use of the additional surveillance data obtained through this sharing. Some important factors such as sharing models, Performance Requirements for the Shared Surveillance Data, message format, data filtering, Commitment from Participating States, implementation approach, and other considerations were described. The meeting noted that in order to be consistent with SWIM architecture, performance requirements for surveillance data should be implemented in information service layer, while there is less control on transport layer. Therefore, for different service level there should be different information service requirements.

Distribution of Surveillance Data to PNG via CRV- ICCAIA & PNG (IP/04)

2.8 ICCAIA (Aireon) and Papua New Guinea jointly presented the status of Space based ADS-B data distribution using CRV. In 2020, the CRV Operations Group authorised Aireon to connect and contract with the CRV provider. Space based ADS-B data can now be delivered to other Aireon customers in Asia Pacific via CRV, potentially without need for any additional communication link or telecommunications costs. While there was concern for high latency of ADS-B data sharing using

VSAT link, the meeting was informed by Aireon that currently the latency for spaced based ADS-B system distribution using CRV is less than 1 second while there is no issue if it total latency is shorter than 2 seconds.

Surveillance Data Sharing Platform- PCCW Global (IP/05)

2.9 PCCW Global described the system architecture of PCCW SWIM service and its progresses to build its Surveillance data-sharing platform with EMS and Service Registry. The meeting was informed that PCCW Global is working with Frequentis Comsoft to host their SDDS-NG (Surveillance Data Distribution System – Next Generation) in PCCW SWIM for qualified States/Administrations/Stakeholders to publish or subscribe surveillance data by following the guidelines of the CRV OG & SWIM TF. Besides, PCCWG EMS can be part of the GEMS and will be inter-connected with other ANSPs and providers EMS. PCCW Global informed that PCCWG Surveillance data sharing platform has the ADS-B ASTERIX data processing functions.

Message queue system Supporting Low-Latency Surveillance Data Distribution- Hong Kong, China (IP/06)

2.10 Hong Kong, China presented an earlier test conducted by the Hong Kong Observatory (HKO) with positive results in the distribution of real-time ADS-B data to support prototyping of future meteorological applications for operation in the SWIM environment. They informed that in 2016, HKO had acquired and installed an ADS-B Ground Station to collect real-time ADS-B data. Initial tests indicated that the performance of sharing live ADS-B data with the test system is very promising. Hong Kong, China informed that although the intention of distributing real-time ADS-B data is for prototyping future meteorological applications, HKO has successfully demonstrated the feasibility of distributing data streams with low latency with existing technologies. The meeting appreciated the excellent sharing by Hong Kong Observatory, and noted the difference between this prototype platform and a real SWIM infrastructure based service while recognizing that the test setup and the messaging queuing configuration bore reasonable resemblance to the SWIM infrastructure and could serve as some reference or consideration by the Study Group.

Work plan of Surveillance Study Group- Hong Kong, China (WP/05)

2.11 Hong Kong, China presented a draft work plan for consideration by the SURSG, to achieve its objectives defined by Terms of Reference (ToR) for a harmonized sharing of surveillance data in SWIM in the APAC. According to the ToR, SURSG shall complete the four deliverables within its term of office. For each of the deliverables, a list of sub-tasks were identified for elaborating its required work content and facilitate the work sharing by Member States. The meeting discussed the need to include performance requirement of surveillance data in the work plan for SURSG. The meeting advised that Hong Kong, China to provide the mapping for each task with terms of reference of SURSG for detailed technical description of each task. The agreed work plan with focal point of voluntary Administrations/Organization is provided in **Appendix B** to the paper.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information in this paper; and

b) discuss any matters as appropriate.

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Revised TERMS OF REFERENCE

STUDY GROUP UNDER SURICG ON SHARING OF SURVEILLANCE DATA IN SWIM

Working Arrangement of the Study Group

Membership: The Study Group under SURICG on Sharing of Surveillance Data in SWIM ("Study Group", "SURSG**"** as acronym) shall be composed of subject matter experts from Member States involved in the provision of surveillance services and SWIM development as well representatives from Member States with an interest to contribute to the works of the SURSG. The SURSG may invite representatives of International Organizations recognized by the ICAO Council, Industry Partners or interested parties representing important civil aviation interests to participate in its work in consultative capacity.

Participants of SURSG/1 *(in alphabetical order)***:**

Australia, China, Hong Kong - China, India, Indonesia, Malaysia, Nepal, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Singapore, Thailand, United States, Viet Nam, CANSO, IATA, ICCAIA.

The SURSG shall have one elected Chair.

The SURSG shall have Task Leads and Sub-Task Leads for tasks detailed in the "Deliverables to meet the Objectives", which currently features 4 main Tasks together with their sub-tasks. Members may volunteer to subscribe to the tasks and sub-tasks. Task Leads and Sub-Task Leads are to be selected through coordination and agreement among the respective task or sub-task subscribers.

Meetings: While the SURSG is established in ad hoc nature, it shall convene face-to-face/web meeting to achieve its TOR. Outcome of its meetings shall be reported to and sought endorsement from the SURICG. Progress of the SURSG shall also be shared with SWIM TF and CRV OG via their nominated representatives joining the SURSG.

Task Leads and Sub-Task Leads shall convene meetings as necessary and in formats as appropriate to discuss and work on their tasks to achieve the scheduled deliverables making reference to Deliverables Template, a temple of which is provided on the last page of this ToR.

Task Leads and Sub-Task Leads shall attend the SURSG meetings and in between SURSG meetings, ad-hoc or regular meetings to harmonize their work or resolve issues.

Schedule and delivery: Subject to the extent of prioritized applications considered by the SURSG, the schedule for delivery of the SURSG shall be decided by the SURSG, which shall update the SURICG accordingly.

The Objectives of Study Group are to:

1) Study, provide expert views and recommendations:
    a) to achieve harmonized sharing of surveillance data in SWIM in the Asia and Pacific Regions (APAC) according to Surveillance Strategy adopted by APANPIRG and in support of ICAO's GANP and ASBU initiatives; and

b) on the possible models of sharing surveillance data in SWIM in the SWIM environment, in consideration of the SWIM technical infrastructure, SWIM information service, CRV infrastructure and any applicable governance, and technical requirements.

2) Review, identify and provide expert views and recommendations to address major issues, raised to the SURSG by ICAO APAC, in the technical, operational or regulatory aspects of surveillance data sharing to facilitate the implementation of surveillance from “departure to destination” in APAC.

Deliverables to meet the Objectives:

1) To submit not fewer than 1 Progress Report per year to SURICG and SWIM TF, with the latest report submitted at least 2 months prior to convening of the SURICG meeting on the Study Group deliverables (listed in 2 to 4 below);

2) To study, identify and make recommendations on the **possible and practical** models for surveillance data sharing in SWIM in APAC with considerations of:

a) Concept of use/operation;
b) System design considerations of individual participant that shares surveillance data such as system robustness, data security and integrity, data latency, fallback arrangements and system recovery;
c) General requirements from perspective of collaborative sharing of surveillance data such as centralized/decentralized surveillance data processing, data repository, service registry, service resilience and service recovery;
d) Required commitments of data sharing participants such as commitment of resources and costs;
e) Implementation roadmap and time frames with consideration of
    (i) An incremental approach/a comprehensive approach at the outset;
    (ii) Type(s) of surveillance data to be shared; and
    (iii) Information exchange model for surveillance data in SWIM;
f) SWIM technical infrastructure, SWIM information service, CRV infrastructure;
g) Other currently available or emerging technologies; and
h) ICAO Global Air Navigation Plan (GANP) and Aviation System Block Upgrades (ASBU) as well as APAC Seamless ANS Plan.

3) To prepare, based on its works in 2) above, a report on the possible implementation of surveillance data sharing in SWIM in APAC inclusive of the following:

a) Recommendations for:
    (i) An incremental approach/a comprehensive approach at the outset in surveillance data sharing;
    (ii) Type(s) of surveillance data to be shared; and
    (iii) Exchange model of surveillance data in SWIM.
b) Pros and cons and cost effectiveness for the possible models that have been considered and a recommendation on the best approach or parallel approaches;
c) Concept(s) of Operations of the recommended approach(es);
d) Required commitments of participating Member States who share their surveillance data;
e) Required commitments of Member States who access the shared surveillance data; and
f) Draft multi-lateral agreement on surveillance data sharing and data consumption.

4) To develop guidance materials to assist Members States participating in the sharing of surveillance data and Member States accessing the shared surveillance data.

Template of Deliverables

		Efforts thus far
1	Study, provide expert views and recommendations: a) to achieve harmonized sharing of surveillance data in SWIM in the Asia and Pacific Regions (APAC) according to Surveillance Strategy adopted by APANPIRG and in support of ICAO's GANP and ASBU initiatives; and b) on the possible models of sharing surveillance data in SWIM environment, in consideration of the SWIM technical infrastructure, SWIM information service, CRV infrastructure, and any applicable governance, and technical requirement.	
2	Review, identify and provide expert views and recommendations to address major issues, raised to the SURSG by ICAO APAC, in the technical, operational or regulatory aspects of surveillance data sharing to facilitate the Mode S DAPs implementation in APAC.	
Deliverables to meet the Objectives:		**Efforts thus far**
1	To submit not fewer than 1 Progress Report per year to SURICG and SWIM TF , with the latest report submitted at least 2 months prior to convening of the SURICG meeting on the SURSG deliverables (listed in 2 to 4 below)	
2	To study, identify and make recommendations on the possible and practical models for surveillance data in SWIM in APAC with considerations of : a) Concept of use/operation; b) System design considerations of individual participant that shares surveillance data such as system robustness, data security and integrity, fallback arrangements and system recovery; c) General requirements from perspective of collaborative sharing of surveillance data such as centralized/decentralized surveillance data processing, data repository, service registry, service resilience and service recovery; d) Required commitments of data sharing participants such as commitment of resources and costs; e) Implementation roadmap and time frames with consideration of: (i) An incremental approach/a comprehensive approach at the outset; (ii) Type(s) of surveillance data to be shared; and (iii) Information exchange model for surveillance data in SWIM. f) SWIM technical infrastructure, SWIM information service, and CRV infrastructure; g) Other currently available or emerging technologies; and	

	h) ICAO Global Air Navigation Plan (GANP) and Aviation System Block Upgrades (ASBU).	
3	To prepare, based on its works in 2) above, a report on the possible implementation of surveillance data sharing in SWIM in APAC inclusive of the following: a) Recommendations for: (i) An incremental approach/a comprehensive approach at the outset in surveillance data sharing; (ii) Type(s) of surveillance data to be shared; and (iii) Information Exchange model for surveillance data in SWIM. b) Pros and cons and cost effectiveness for the possible models that have been considered and a recommendation on the best approach or parallel approaches; c) Concept(s) of Operations of the recommended approach(es); d) Required commitments of participating Member States who share their surveillance data; e) Required commitments of Member States who access the shared surveillance data; and f) Draft multi-lateral agreement on surveillance data sharing and data consumption.	
4	To develop guidance materials to assist Members States participating in the sharing of surveillance data and Member States accessing the shared surveillance data.	

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Work Plan of Surveillance Study Group

Group	Task	Description	Start	End	Task Lead(s) (TL)/ Contributors
Feasibility Study Stage	**1**	**Preparation of Progress Report on the SURSG deliverables**	-	Before every SURSG Meeting	Hong Kong China (**TL**)
	2	**Study, identification and recommendation of possible and practical models for surveillance data sharing in SWIM**	SURSG/1	SURSG/2	Hong Kong China (**TL**)
	2-1	Preparation of Concept of Use/Operation	SURSG/1	SURSG/2	Singapore/**TL**, Hong Kong China, Thailand, Viet Nam
	2-2	Study, identify and recommend on Implementation Model including the consideration of system design and collaboration model on sharing of surveillance data.	SURSG/1	SURSG/2	Hong Kong China, Republic of Korea, Singapore, Thailand, Viet Nam.
	2-3	Study, identify and recommend on an Infrastructure Model based on SWIM and CRV infrastructure	SURSG/1	SURSG/2	China, Hong Kong China, Singapore, Thailand, Viet Nam, PCCW Global as advisor
	2-4	Study, identify and recommend on a Business Model including commitments by data sharing participants as well as incurred resource and cost	SURSG/1	SURSG/2	China, Hong Kong China, Singapore, Thailand, Viet Nam
	2-5	Study, identification and recommendation of Participation Model in consideration of commitments by data consumers and multi-lateral agreement on surveillance data sharing	SURSG/1	SURSG/2	Hong Kong China, Singapore, Thailand, China, Viet Nam, IATA
	2-6	Preparation of implementation roadmap and time frames with consideration of approach, types of surveillance data and information exchange model	SURSG/1	SURSG/2	China, Hong Kong China, Singapore, Thailand, Viet Nam.
	2-7	Preparation of draft multi-lateral agreement on surveillance data sharing and data consumption	SURSG/2	SURICG/7	Hong Kong China, IATA, Singapore, Thailand, Viet Nam

Recommendation Stage	**3**	**Report on the possible implementation of surveillance data sharing in SWIM**	SURSG/2	SURICG/7	To be decided (TBD)
	3-1	Consolidation of all the outcomes of Task 2 into a report according to the contents defined in TOR for submission to SURICG	SURSG/2	SURICG/7	TBD
	4	**Guidance materials for the sharing and access of surveillance data**	SURICG/7	SURICG/9	TBD
	4-1	Preparation of the framework and 1st draft of guidance material	SURICG/7	SURSG/3	TBD
	4-2	Further development of the working draft of guidance material for endorsement by SURICG and CNS SG	SURSG/3	SURICG/9	TBD

Focal points from Administrations/Organizations/Industry Partners

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