The Fourth Meeting of the Surveillance Study Group (SURSG/4) and the Third Meeting of Surveillance Sharing in SWIM Trial Implementation Group (S3TIG/3)

(Hong Kong China, 30-31 May 2024)

Agenda Item 2:   Review of the outcome of relevant meetings

A SUMMARY OF THE JOURNEY OF THE SURVEILLANCE STUDY GROUP (SURSG)

(Presented by the Secretariat)

SUMMARY

This paper presents relevant outcomes on the past meetings of the Surveillance Study Group (SURSG).

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1.   INTRODUCTION

1.1   The First Meeting of the Surveillance Study Group (SURSG/1) was held from **20 to 22 April 2021** via video teleconference. 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 the following link:
https://www.icao.int/APAC/Meetings/Pages/2021-SURSG-1.aspx

1.2   The Second Meeting of the Surveillance Study Group (SURSG/2) was held via Video Tele-Conference (VTC) from **15 to 17 March 2022**. The meeting was attended by **97** participants from **16** States/Administration and **2** International Organizations and **1** industry partner. The meeting report, working papers, information papers, and other resources can be accessed by following link:
https://www.icao.int/APAC/Meetings/Pages/2022-SURSG2.aspx

1.3   The Third Meeting of the Surveillance Study Group (SURSG/3) was held in Hong Kong, China, with the hybrid option (In-Person and Virtual Participation) *from* **22 to 24 March 2023**. The meeting was attended by **102** participants (25 In-Person and 77 Virtual) from **14** States/Administrations, **2** International Organizations, and **3** industry partners. The meeting report, working papers, information papers, and other resources can be accessed by following link:
https://www.icao.int/APAC/Meetings/Pages/2023-SURSG-3.aspx

1.4   The Fourth Meeting of the Surveillance Study Group (SURSG/4) is planned in Hong Kong, China, as an In-Person meeting *from* **30 to 31 May 2024** after the Joint event of SWIM over CRV Demonstrations and Surveillance data sharing over SWIM trial planned *from 28-29 May 2024* in

Hong Kong China. The Meeting report, working papers, information papers, and other resources can be accessed by following link:

https://www.icao.int/APAC/Meetings/Pages/2024-SURSG-4.aspx

1.5   The Fourth Meeting of the APAC SWIM Task Force (SWIM TF/4) was held from **3 to 6 November 2020** via video teleconference. The meeting was attended by 135 participants from 17 States/Administrations, 3 International Organizations, namely IATA, IFALPA, IFATCA and 5 Industry partners, namely Atlas Air, Cirium, Frequentis, PCCW Global and Snowflake. SWIM TF/4 meeting report, working papers, information papers, and other resources can be accessed by the following link:

https://www.icao.int/APAC/Meetings/Pages/2020-SWIM-TF4.aspx

1.6   The Fifth Meeting of the Surveillance Implementation Coordination Group (SURICG/5) of CNS SG was held from **22 - 24 September 2020** via video teleconference. The meeting was attended by 120 participants from 20 States/Administrations and 5 International Organizations, namely CANSO, EUROCAE, IATA, IFATCA, and ICCAIA, plus one service provider from Industry named PCCW Global. SURICG/5 meeting report, working papers, information papers, and other resources can be accessed by the following link:

https://www.icao.int/APAC/Meetings/Pages/2020-SURICG5-.aspx

1.7   The Seventh Meeting of the Surveillance Implementation Coordination Group (SURICG/7) was held *from 24 to 27 May 2022* via video teleconference. The meeting was attended by **117** participants from **21** States/Administrations, **4** International Organizations and **2** service providers from Industry. The meeting report, working papers, information papers and other resources can be accessed by the following link:

https://www.icao.int/APAC/Meetings/Pages/2022-SURICG-7.aspx

1.8   The Fifth Meeting of the APAC SWIM Task Force (SWIM TF/5) was held from **9 – 11 August 2021** via video teleconference. The meeting was attended by 173 participants from 21 States/Administrations, 4 International Organizations, and 1 service provider. SWIM TF/5 meeting report, working papers, information papers, and other resources can be accessed by the following link:

https://www.icao.int/APAC/Meetings/Pages/2021-SWIM-TF-5.aspx

1.9   The Twenty Fourth Meeting of the Communications, Navigation and Surveillance Sub-group (CNS SG/24) of APANPIRG was held from **30 November to 4 December 2020** via video teleconference. The meeting was attended by 176 participants from 26 States/Administrations and 5 International Organizations, namely CANSO, EUROCONTROL, IATA, IFATCA and IFATSEA, plus 26 participants from industry partners. CNS SG/24 meeting report, working papers, information papers, and other resources can be accessed by the following link:

https://www.icao.int/APAC/Meetings/Pages/2020-CNS-SG24.aspx

1.10   The Twenty Fifth Meeting of the Communications, Navigation and Surveillance Sub-group (CNS SG/25) of APANPIRG was held from **18 - 22 October 2021** via video teleconference. The meeting was attended by 215 participants from 23 States/Administrations and 4 International Organizations, namely CANSO, IATA, IFALPA, and IFATSEA, plus 28 participants from industry partners. CNS SG/25 meeting report, working papers, information papers, and other resources can be accessed by the following link:

https://www.icao.int/APAC/Meetings/Pages/2021-CNS-SG-25.aspx

1.11   This paper summarized relevant information and the progress of SURSG from its formation.

2.   DISCUSSION

2.1.   In a SWIM TF Task Leads meeting in 2019, the proposal to conduct SWIM over CRV demonstrations under the leadership of Hong King China was proposed, which was adopted by SWIM TF/5. The demonstration was delayed due to the COVID-19 pandemic.

2.2.   Surveillance data-sharing issues have been discussed from time to time in various regional meetings for years, particularly in the SEA/BOB ADS-B WG meetings and in SURICG meetings. The SEA/BOB ADS-B WG produced the draft data sharing agreement as a template to promote and implement surveillance data sharing at the sub-regional level to improve the efficiency and safety of air navigation services.

2.3.   Considering the proposed application of new surveillance technologies could be used to enhance the accuracy of estimated boundary and runway arrival time, to improve predictability and certainty of Air Traffic Operations in a seamless way, especially in South East Asia or Bay of Bengal sub-regions, the CNS SG/23 meeting adopted the following Conclusion:

Conclusion CNS SG/23/10 (SURICG/4/1) - ADS-B and Flow Management		
What: That, given the need to ensure greater awareness of aircraft progress before FIR and ATC sector boundaries to improve position estimates, States are encouraged to consider the application of new surveillance technologies and/or data sharing which can provide surveillance from "departure to destination".		Expected impact: ☐ Political / Global ☐Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To assist states considering how to improve arrival estimates and to counter the lack of DEP messages received in APAC ATC systems	Follow-up: ☐Required from States	
When: 6-Sep-19	Status: Adopted by Subgroup	
Who: ☒Sub groups ☒APAC States ☒ ICAO APAC RO ☐ICAO HQ ☐Other: XXXX		

2.3   In the SURICG/5 (2020) meeting, Hong Kong, China, and Singapore presented some key considerations leading to a proposal for a commercial-ANSP collaboration scheme to share and enrich surveillance coverage for the region to benefit the aviation community and accelerate the implementation of SWIM.

2.4   In the same SURICG/5 meeting, it was suggested to establish a Study Group under SURICG supported by subject matter experts in SWIM, CRV, ATFM, etc. and under the guidance of ICAO APAC to advise CNS SG on the best approach for regional surveillance data sharing. This proposal was also presented to SWIM TF/4 as WP/13 and resulted in action items 4-4.

2.5   The SURICG/5 (2020) meeting was invited to consider the Commercial-ANSP collaboration scheme and the various consideration factors leading to this potential scheme. It was requested to consider the potential developments in surveillance data, particularly ADS-B data, as SWIM services carried over CRV and support the establishment of the Study Group to recommend solutions on regional surveillance data sharing to provide surveillance from "departure to destination".

2.6   An ad hoc group led by Hong Kong China prepared a draft Terms of Reference (ToR) for the proposed Study Group for further consideration by CNS SG/24 (2020). After deliberation, the meeting discussed the draft ToR through Flimsy/06 and deferred to the Study Group to fine-tune its ToR and decide its schedule and deliverables for updating to SURICG. It was agreed that SURICG would be held after SWIM TF so that the progress made by the Study Group would be shared with SWIM TF before reporting to SURICG. The SURICG/5 (2020) meeting proposed and CNS SG/24

(2020) meeting adopted the following Decision:

Decision CNS SG/24/16 (SURICG/5/1) - Establishment of Study Group under SURICG on Sharing of Surveillance Data in SWIM	
What: Noting the operational needs of this region to enhance surveillance data sharing and new technologies available, That, the Study Group under SURICG on Sharing of Surveillance Data in SWIM (SURSG) with ToR provided in Appendix P to the Report, comprising subject matter experts in relevant areas, including surveillance and SWIM, to be set up to study and recommend solutions on surveillance data sharing to provide surveillance from "departure to destination", be established.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To enhance surveillance coverage, enhance surveillance data availability by providing additional layers of surveillance services, and support the implementation of advanced Air Traffic Management (ATM) tools such as Air Traffic Flow Management (ATFM).	Follow-up: ☒Required from States
When: 4-Dec-20	Status: Adopted by Sub-group
Who: ☒Sub Groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: SURICG	

2.7.   In response to the CNS SG/24/16 decision, a study group was formed. The first meeting of Surveillance study group SURSG/01 was conducted from 20-22 April 2021 via Video Teleconferencing.

Progress in SURSG/1 (2021)

Proposed Solutions for Sharing of Surveillance Data

2.8   In the SURSG/1 meeting, Singapore proposed solutions for States to share surveillance data and listed the pros and cons of the solutions. It was discussed that there are three models, namely **distributed solution, central database, and hybrid model**, which can potentially be used to implement the data sharing. Detailed descriptions of the advantages and disadvantages of each model were provided. It was further reported that some interested parties might not be subscribers to CRV or without SWIM capabilities but are keen to share their surveillance data with other states. Adjustments 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 centralized service data providers, if available.

Proof-of-concept for surveillance data sharing on SWIM by Surveillance Study Group (SURSG)

2.9   In the SURSG/1 meeting, Hong Kong, China proposed a proof-of-concept (POC) for surveillance data sharing on SWIM to be conducted in Hong Kong China, for States' reference. The meeting noted that the hybrid model was successfully demonstrated during the SWIM in ASEAN Demonstration in November 2019 and is considered a suitable infrastructure for SWIM implementation in APAC. A high-level system block diagram of the POC was shared. SURICG/6 expressed support for the POC and the ongoing work of the SURSG.

Proposed Concept of Operations for Surveillance Data Sharing

2.10   In the SURSG/1 meeting, as the outcome of Sub-task 2.1 of the SURSG work plan,

one paper described the Concept of Operations (CONOPS) for sharing surveillance data among multiple parties using a platform such as SWIM. SURICG/6 (2021) discussed the proposed Concept of Operations (CONOPS) by Hong Kong China on behalf of SURSG for sharing of surveillance data among multiple parties using the platform such as SWIM along with the objective of the CONOPS to solicit suggestions/concerns from SURICG for consideration by SURSG in formulating the CONOPS.

ToR of Surveillance Study Group and Updates

2.11   The SURSG/1 meeting reviewed the ToR and made amendments on adding chair role and function, frequency of the meeting of SURSG, and the mode of the various task lead meetings for effective progress updates, decision making, work assignments as they arise, and the need to update the list of contributing States as necessary. Based on the recommendation of SURICG/6 proposed by SURSG/1, CNS SG/25 reviewed the revised ToR of SURSG and adopted the **Decision CNS SG/25/12 (SURICG/6/6)**: Revised ToR of Surveillance Study Group (SURSG). The ToR of SURSG has not been modified since then. The ToR is provided in **Appendix A** to this paper.

Progress in SURSG/2 (2022)

Surveillance Study Group: Progress Report, Recommendations in Study Report on surveillance sharing, and moving forward

2.12   Hong Kong China listed major recommendations in the Study Report and proposed a way forward with the recommendations for members' discussion and decisions. Hong Kong China shared the list of tasks, volunteer task leads, and members, along with the latest status. With members' support, inputs, and efforts from task leads, all tasks in the Feasibility Study Stage have been completed, culminating in the Concept of Operations paper (Task 2-1) and Study Report (Tasks 2.2-2.6).

2.13   The Study Report on Surveillance Sharing was prepared following the framework in the task list. A list of the high-level recommendations extracted from the Study Report from General, Technical, and Administrative aspects was provided in Table 2, "High Recommendations from Study Report" in the paper. Based on the recommendations, a "Moving Forward" column was introduced in Table 2 with suggestions that would lead surveillance sharing past the recommendation stage towards the implementation stage. **The study report was agreed upon during the meeting and uploaded to the ICAO APAC e-docs webpage**.

2.14   While reviewing the proposed recommendation, Singapore shared its concern about the expectations from the specification related to System Reliability for Tier 1 and System Availability for Tier 2, which Australia seconded. SURSG/2 was informed that the specifications were adopted from the thirteenth edition of the ADS-B Implementation and Operations Guidance Document (AIGD v13.0). The requirements may be modified in the future based on the trial outcomes. This was further discussed in the SURICG/7 event.

2.15   In SURICG/7 (2022), Hong Kong China clarified the reasons for the difference between the adopted values of service level of shared data for Tiers 1 and 2 in the SURSG outcome and those specified in the AIGD and suggested a need to align the SURSG outcome as described in **Table 1 – High-Level Recommendations from Study Report** with the definitions of Appendix 6 of AIGD. After deliberation, Hong Kong China agreed to take action to discuss with the Chair of SURSG to align the SURSG outcome with AIGD, thus ensuring no misunderstanding and that the specified performance requirements are suitable for the targeted services.

2.16   In response to the abovementioned action item, the Study Report was further updated to align with the definitions of Appendix 6 of AIGD. The revised study report was uploaded on the ICAO APAC e-document webpage.

2.17   SURSG/2 deliberated the necessity for establishing the Surveillance Sharing in SWIM

Trial Implementation Group (S3TIG) to oversee a trial proposed by the recommendation. China, Hong Kong China, IATA, Singapore, and Thailand seconded the proposal, with PCCWG also indicating its interest in participating in the trial. SURICG/7 (2022) discussed the proposal for establishing S3TIG and suggested that forming S3TIG as an ad-hoc group within SURSG would be more effective than a contributory body under SURSG.

Surveillance Data Sharing Proof of Concept

2.18   SURSG/2 discussed the Surveillance Data Sharing Proof of Concept (POC) conducted by HKCAD, PCCWG and Frequentis ComSoft. PCCWG shared the outcomes of a POC conducted on 4 March 2022 to demonstrate sharing ADS-B data in a simulated SWIM over CRV environment and the benefits of a Surveillance Central Data Processor (SCDP). PCCWG shared a video to introduce the POC exercise, which was presented in SURICG/7

Progress in SURSG/3 (2023)

Business Models for Joining the S3TIG Trial – PCCWG (WP/12)

2.19   PCCWG presented proposals on how ANSPs can participate in the upcoming S3TIG Trial, including the CRV connectivity requirements, surveillance data sharing demonstration, and scenario-based demonstration. The SURSG/3 Meeting noted that it would benefit the aviation community if more ATM stakeholders participated in the SWIM Data Exchange. The meeting was invited to share the number of Member States that will participate in the trial and discuss the scope of the trial for the commercial and technical arrangement.

2.20   The SURSG/3 Meeting shared the need to explore other options for joining the Trial/Demo by States/Administrations with no CRV connectivity. Additionally, further deliberations were required about the cost implications for states having CRV connectivity but no spare bandwidth to share for the Trial/Demo. It was agreed that S3TIG would incorporate this discussion into the agenda item while preparing the Survey questionnaire.

A Joint Event for Surveillance Data Sharing in SWIM Trial and SWIM over CRV Demonstration - Hong Kong, China (WP/07)

2.21   Hong Kong China proposed combining the surveillance data sharing in the SWIM Trial under S3TIG ("the Trial") and the SWIM Demonstration over CRV under SWIM TF as a joint event for States' consideration. It was informed that the proposal on combining the two events would save effort in preparing similar network and system infrastructure for the trial, demonstrate data exchange of different throughput, examine such bandwidth requirements on CRV, and enhance user experience with more types of SWIM services showcased. The SURSG/3 Meeting endorsed that *the Trial* and *SWIM over CRV Demonstration* should be conducted as a Joint Event. However, it was discussed that the proposal needs to be agreed upon by the SWIM TF Meeting. The Seventh Meeting of System Wide Information Management Task Force (SWIM TF/7) held from 9 to 12 May 2023 in ICAO Asia and Pacific Regional Office, Bangkok, Thailand, agreed to conduct both events as a Joint Event.

Trial of Surveillance Data Sharing Using SWIM - Hong Kong, China (WP/08)

2.22   The paper presented the proposal on the items to be demonstrated in the trial of the surveillance data sharing using SWIM under S3TIG for States' consideration. The trial was proposed to be conducted as a demonstration event followed by an evaluation period of about three months, subject to discussion in S3TIG.

2.23   The SURSG/3 Meeting noted that with live surveillance data sharing being realized among participating States in the trial, the practicality and technology in surveillance data sharing using SWIM could be shown to the audience. In addition, a scenario-based demonstration was proposed to

visualize the benefits brought to ATFM operation during the event. Prepared scripts and data, including surveillance data, flight information, MET information, and flow management information, will be exchanged in real-time to simulate the data flow of a complete life cycle of an ATFM operation, which cannot be easily captured in a live situation. Other SWIM capabilities proposed to be demonstrated in the event were also shared.

Survey for Expression of Interest (EOI) in participating in Demo/Trial of S3TIG – Sec (SP/01)

2.24   The SURSG/3 Meeting deliberated the proposed questions for Expression of Interest (EOI) in participating in the Joint Event of S3TIG and reviewed the S3TIG Joint Event Tentative Timelines. The SURSG/3 Meeting agreed that the proposed questions need modifications along with the addition of more information to support States/Administrations in responding to the survey.

2.25   The meeting agreed that the Surveillance Sharing in SWIM Trial Implementation Group (S3TIG) would amend the questionnaire and prepare supporting documents containing useful information, such as definitions of various terms used in the questionnaire to clear potential doubts of Member States/Administrations responding to the survey and any other necessary modifications. The questionnaire will be a composite survey with 2 separate sets of questions respective to the Trial and SWIM over CRV Demonstration (Demo). The S3TIG will share the part of the questionnaire mainly related to the Demo and the endorsement of the proposal for the Joint Event by SURSG/3 in a joint working paper or a paper by the lead of S3TIG to SWIM TF/7 planned for 9-12 May 2023 in Bangkok, Thailand for SWIM TF/7's agreement.

2.26   The SURSG/3 Meeting also agreed that the survey would be shared with States/Administrations only and not involve any other parties. Additionally, the survey will be shared, after the endorsement of the SWIM TF/7, with Member States/Administrations by the ICAO Secretariat. The S3TIG will draft a formal package/agreement to participate in the Joint Event by Member States/Administrations to be shared with interested States/Administrations after the survey outcomes are processed, analyzed, and interested Members to participate in the Demo/Trial are identified.

2.27   The tentative timelines to conduct the Trial and/or Demo were as follows:

Task	Responsible Parties	Tentative Timelines/Deadlines
Finalization of Survey Questionnaire	SURSG/3 and S3TIG Participants, Led by HK China, Thailand, and Singapore	28 April 2023
Sharing Survey with APAC Member States	ICAO Secretariat	19 May 2023 (4 weeks will be provided to States to respond)
Submission of response and States and possible extension of survey	All Interested APAC States	23 June 2023
Compilation of Response to Survey	ICAO Secretariat SURSG/S3TIG Chairs/Leads	30 June 2023

Sharing formal package with agreed Parties to participate in Demo and/or Trial	Agreed Parties and Host State (Hong Kong China)	July 2023 (1 Month will be provided to States to respond)
Working-level preparatory Meetings (online/in-person)	Lead and Deputy Lead, agreed Parties	Mid-August 2023 – October 2023
Trial/Demo	Agreed Parties and Host State (Hong Kong China)	November 2023 (Worst case scenario: Q1 2024)
Report on Demo	Lead and Deputy Lead	SURSG/4

2.28   The abovementioned discussions were performed in the SWIM TF/7 held from 9 to 12 May 2023. The SWIM TF/7 Meeting noted that pseudo-CRV would be used as the network infrastructure for the Demo/Trial, and the ATFM scenario, based on the ASEAN Demonstration, will be refined and enriched to be used in the Demo, which is considered a suitable use case to demonstrate the operational benefits brought by SWIM. The SWIM TF/7 Meeting also noted that S3TIG is surveying to gauge States' interest in participating in the joint event.

2.29   The SWIM TF/7 Meeting reviewed and modified the questionnaire and agreed that the ICAO Secretariat would share the survey questionnaire with APAC Member States by 19 May 2023, as agreed upon at the SURSG/3 Meeting. Once received, Member States were requested to expedite the response to the survey due to tight timelines to conduct the Trial/Demo by Q4 of 2023 or Q1 of 2024.

2.30   The survey questionnaire was circulated through ICAO APAC State Letter Ref.: T 8/13.1: AP071/23 (CNS) with Subject – *Survey on a Joint Event of SWIM over CRV Demonstration ("the Demo") and Surveillance Data Sharing in SWIM Trial ("the Trial")* on 16 May 2023, which expected Member States/Administrations to submit the completed survey preferably not later than 12 June 2023.

2.31   Of a total of 16 questionnaire returns, 8 States (Australia, Hong Kong China, India, Japan, Malaysia, Republic of Korea, Singapore and Thailand) agreed to participate as surveillance data contributors and/or consumers, while 7 States (China, Fiji, Indonesia, Laos PDR, New Zealand, Pakistan and Philippines) shared their intention as observers.

Data Format for Surveillance Data Sharing – Hong Kong, China (WP/06)

2.32   Hong Kong China presented the proposal on the data format to be exchanged in the trial of the surveillance data sharing using SWIM under S3TIG for States' consideration. As a recommendation from the Study Report delivered under SURSG, the trial to be conducted under S3TIG would adopt the ADS-B CAT 21 Version 2.1 data format to support ATFM operation. The paper compared the pros and cons of using FIXM, JSON, and original ASTERIX data and suggested that using the original ASTERIX data format as the payload for SWIM data exchange would be a preferred option. Based on the ASEAN Demonstration, the AMQP headers were proposed to carry the surveillance data payload.

State of SWIM implementation in Singapore and readiness to share ADS-B data – Singapore (WP/09)

2.33   Singapore presented the progress of SWIM implementation in Singapore and its impact on the sharing of surveillance information, specifically ADS-B data from the Singapore ADS-B sensor. Singapore shared its plan for upgrading the SWIM infrastructure, which includes a provision for the connection to the CRV through which data can be shared. After completing the SWIM upgrading works,

Singapore shared its intention to publish the ADS-B data from the Singapore ADS-B sensor for consumption by approved parties as an ASTERIX-based JSON formatted message similar to the current ADS-B service in the Singapore SWIM is provisioned.

2.34   Considering that the format for ADS-B data sharing has not yet been decided upon, Singapore proposed that the meeting direct the S3TIG group to deliberate on this matter and consider the appropriate message format to facilitate ADS-B data exchange.

2.35   The SURSG/3 Meeting discussed the pros and cons of different data formats proposed in the WP/06 and concurred that ASTERIX and JSON both may be considered potential data formats for conducting the trial and SWIM over CRV demonstration. Another proposal was to add a question related to the preferred data format, with ASTERIX and JSON data format as potential answers, in the Survey questionnaire to be prepared by S3TIG to better understand the readiness of interested demo/Trial parties. S3TIG discussed the requirements of the proposed question to add to the survey questionnaire and further deliberated on this topic of interest and priority and proposed data format(s) for the Trial and Demo.

> *Benefits of Surveillance Data Sharing for MET Information Services in SWIM - Hong Kong, China (IP/02)*

2.36   Hong Kong Observatory (HKO), under Hong Kong China, presented how future MET information services could be enhanced using the surveillance data shared in SWIM. The meeting noted that MET information to be exchanged in SWIM includes ICAO Meteorological Information Exchange Model (IWXXM) messages, gridded products, and imagery. In particular, the four dimensions (4D) MET information service can also provide users with on-demand access to polygons or images of high-impact weather phenomena derived from the gridded products, which is useful to aviation users for assessing the potential impact of weather on their flight trajectory over time. Furthermore, the benefits of surveillance data for MET information services to ANSP and airlines were elaborated.

2.37   SURSG Chair requested to explore the possibility of including the elements and proposed applications in the IP/02 paper for demonstration in the proposed Joint Event, which was agreeable to HKO and the Meeting.

> *Lessons Learned in Sharing Surveillance Data using SWIM Information Service - Republic of Korea (WP/10)*

2.38   The paper presented ROK's lessons learned in the exchange of surveillance data through a SWIM information service, specifically through the utilization of the Advanced Message Queuing Protocol (AMQP) based messaging services. With the introduction of characteristics of surveillance data, the SURSG/3 Meeting noted ROK had implemented SWIM information services for surveillance data and is currently working on the SWIM testbed. Additionally, the considerations for future implementation and lessons learned were shared with the meeting. In response to a question, ROK clarified that it provides both ASTERIX and JSON data formats to the Stakeholders based on Stakeholder's needs.

> *Review of Work Plan for Surveillance Study Group (SURSG) - Hong Kong China (WP/11)*

2.39   The SURSG/3 meeting reviewed and shared recommendations on the Surveillance Study Group Work Plan, given the progress and development following SURSG/2 held in March 2022. Considering the planned Joint Event for Surveillance Data Sharing in the SWIM Trial and SWIM Over CRV Demonstration (Demo) and the progress of the current Work Plan, the meeting reviewed the changes proposed to Items 3-2, 4, 4-1 & 4.2 of the Work Plan. SURSG Chair requested the meeting to provide support and participate in the trial.

2.40   Following the proposed and agreed changes in WP/11 of SURSG/3, it was discussed and agreed that the description of Task 4 (on Guidance Material) would be elaborated to include the incorporation of a section of technical and operational considerations as reference for the preparation of a multilateral agreement for states/parties intending to share surveillance data and the elaborated text is to be discussed at the next SURSG meeting.

2.41   The approved and modified SURSG work plan by the SURSG/3 Meeting is as follows:

Group	Task	Description	Start	End	Task Owner(s)
Recommendation Stage	3	Report on the possible implementation of surveillance data sharing in SWIM	SURSG/2	SURICG/7	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	Hong Kong China, IATA, Singapore, Thailand, Viet Nam
	~~3-2~~	~~Preparation of draft multilateral agreement on surveillance data sharing and data consumption~~ [absorbed into Task 4]	~~SURSG/2~~	~~SURICG/7~~ ~~(to be reviewed at SURSG/3)~~	~~TBD~~
	4	Guidance materials for the sharing and access of surveillance data	~~SURICG/7~~ (after Demo)	~~SURICG/9~~ SURICG/10	TBD
	4-1	Preparation of the framework and 1st draft of guidance material	~~SURICG/7~~ ~~SURICG/8~~ (after Demo)	~~SURSG/3~~ SURSG/4 or SURSG/5[1]	TBD
	4-2	Further development of the working draft of guidance material for endorsement by SURICG and CNS SG	~~SURSG/3~~ (after Demo)	~~SURICG/9~~ SURICG/10	TBD

Updates from SURICG/9

2.42   The Ninth Meeting of the Surveillance Implementation Coordination Group (SURICG/9) was held at the ICAO APAC Regional Office, Bangkok, Thailand, from 7 – 10 May 2024. The meeting was attended by 68 participants from 22 Member States/Administrations namely Australia, Cambodia, China, Hong Kong China, Macao China, Fiji, India, Indonesia, Japan, Lao People's Democratic Republic, Malaysia, Maldives, Nepal, New Zealand, Philippines, Pakistan, Republic of Korea, Singapore, Sri Lanka, Thailand, USA, and Viet Nam, 4 International Organizations namely IATA, EUROCAE, EUROCONTROL and ICAO, and 1 industry partner Indra.

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[1] Subject to timing of Demo.

2.43   The SURICG/9 meeting was informed that after the SWIM TF/7 Meeting, which was held from 8-11 May 2023, the S3TIG and SWIM Implementation Pioneer Ad-Hoc Group (SIPG) met monthly to prepare for the joint event. As an outcome of the collaborative and hard work of S3TIG and SIPG, the joint event of SWIM over CRV Demonstration (the Demo) and Surveillance data over SWIM Trial (the trial), is being organized from **28 May to 29 May 2024,** along with the Fourth Meeting of the Surveillance Study Group (SURSG/4) from **30 May to 31 May 2024** in Hong Kong China.

2.44   The Joint Event objective is to demonstrate the practicability and benefits to States/Administrations of carrying SWIM data over CRV and hosting potential SWIM services over the CRV network to encourage Asia-Pacific States/Administrations to implement SWIM within Asia-Pacific SWIM Implementation timelines (2024-2030) adopted by Asia/Pacific Air Navigation Planning and Implementation Regional Work Group (APANPIRG) by Conclusion APANPIRG/33/9.

2.45   The Joint Event results from the consolidated efforts of Surveillance Sharing in the SWIM Trial Implementation Group (S3TIG) and SWIM TF to showcase the benefits brought by SWIM through operational scenario demonstration, trial of surveillance data sharing and presentation of potential SWIM services over CRV. A dedicated and segregated Pseudo CRV network instead of the operational one is utilized for the Joint Event to avoid potential impact on the operational CRV. The Joint Event is made possible with the support of 8 key contributor States, including Australia, Hong Kong China, India, Japan, Malaysia, the Republic of Korea, Singapore, and Thailand as data contributors and/or consumers, and 9 observer States including China, Fiji, Indonesia, Laos PDR, New Zealand, Pakistan, Philippines, Sri Lanka and Vietnam. The first day of the Joint Event (28 May 2024) is dedicated to system setup preparation and rehearsal by active participants, whereas the formal demonstration will take place the next day (29 May 2024).

2.46   The SURSG/4 Meeting, being organized from 30-31 May 2024 after the Joint Event, objective is to provide expert views and recommendations to achieve harmonized sharing of surveillance data in SWIM in the Asia and Pacific (APAC) Region along with the potential models of sharing of surveillance data in SWIM according to the Surveillance Strategy adopted by APANPIRG and in support of ICAO's GANP and ASBU initiatives.

2.47   The State letter sharing information about both meetings, agenda items, and other required information is shared with APAC States/Administrations by State letter Ref: T 8/ 2.9, 2.10 & 2.11 – AP043/24 (CNS) on 08 March 2024.

2.48   The SURICG/9 Meeting noted that as per the current plan, as most deliverables except one Guidance material for the sharing and access of surveillance data allocated to SURSG are completed and most objectives are achieved, the SURSG/4 Meeting will propose the dissolution of the SURSG if the joint event is successful and after the completion of the remaining deliverable and presentation at future SURICG meetings. If SURSG/4 concludes the dissolution of SURSG, the Decision will seek the endorsement of SURICG and then CNS SG accordingly. The SURICG/9 Meeting noted that SURSG/4 outcomes will be presented to SURICG/10 next year.

3.   ACTION BY THE MEETING

3.1   The Meeting is invited to:

      a)   note the information in this paper;

      b)   note the achievements of SURSG; and

      c)   discuss any matters as appropriate.

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Appendix A

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.

1.   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.

2.   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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