International Civil Aviation Organization

The Tenth Meeting of System Wide Information Management Task Force (SWIM TF/10)

Bangkok, Thailand, 20 – 23 May 2025

Agenda Item 3:   Outcomes of relevant meetings on SWIM-related matters

OUTCOMES OF SWIM TF Task Leads (TLs) MEETINGS AND JOINT CRV OG AD-HOC EXPERT GROUP AND SWIM TF TLS MEETINGS AFTER SWIM TF/9

(Presented by the Secretariat)

SUMMARY
The paper presents outcomes of SWIM TF TLs Meetings and Joint CRV OG Ad hoc Expert Group and SWIM TF TLs Meetings after SWIM TF/9 meeting held in 2024-2025.

1.   INTRODUCTION

1.1   The Ninth Meeting of the System Wide Information Management Task Force (SWIM TF/9) was held from *14 to 17 May 2024* in the ICAO Asia and Pacific Regional Office, Bangkok, Thailand. The Meeting was attended by **110** participants from **18** States/Administrations, **4** International Organizations and **2** industry partners. The meeting report, working papers, information papers, and other resources can be accessed by the following link:
         https://www.icao.int/APAC/Meetings/Pages/2024-SWIM-Seminar-and-SWIM-TF9.aspx

1.2   As an established effective practice in progressing various tasks of the SWIM TF, online Task Leads (TLs) coordination Meetings have been organized from time to time between Task Force Meetings to follow up on the progress of each task more effectively and better understand the regional information exchange requirements to be supported by APAC SWIM as well as the feasible and appropriate approach to establish SWIM over the regional network.

1.3   Additionally, the CRV OG Ad-hoc Group Meeting held on 2 June 2022 discussed the need for combined Meetings of CRV OG and SWIM TF to discuss the expectations of SWIM TF from the CRV network. Since then, the joint quarterly meetings have been organized since 2022.

1.4   This paper shared information about the outcomes of the SWIM TF TLs Meetings and Joint CRV OG Ad hoc Expert Group and SWIM TF TLs Meetings after SWIM TF/9.

2.   DISCUSSION

SWIM TF Task Leads coordination Meetings after SWIM TF/9

2.1   A total of **two** (2) SWIM TF Task Leads coordination Meeting was held after SWIM TF/9 to review the outstanding SWIM TF/7 and SWIM TF/8 action items, which included relevant

SWIM updates such as APAC SWIM implementation roadmap, SIPG and editorial ad-hoc group updates, joint events preparation, SWIM TI-related specifications, etc. The Minutes of the Meetings (MoM) of the two Meetings on **13 August 2024** and **07 January 2025** were shared with SWIM TF TLs. The reports are also provided in **Appendix A** and **Appendix B**.

Joint CRV OG Ad hoc Expert Group and SWIM TF TLs Meetings

2.2   A total of **four** (4) Joint Meetings of the CRV OG expert Ad-hoc group and SWIM TF TLs were conducted on **12 June 2024, 17-20 September 2024, 12 November 2024, and 13 March 2025**. Out of four meetings, the 17-20 September meeting was an in-person meeting, which was named the ***ICAO Workshop for the preparation of new CRV requirements and specifications for future System Wide Information Management (SWIM)/other aviation services***.

2.3   *The ICAO Workshop for the preparation of new CRV requirements and specifications for future SWIM/other aviation services* was held from 17-19 September 2024 in Guam, USA. The Workshop was attended by 20 participants from Nine (9) Member States/Administrations and two (2) international organizations, namely, Hong Kong China, Fiji, Japan, New Zealand, Singapore, Thailand, Tonga, USA, Vietnam, CANSO, and ICAO. The Workshop reviewed the outcomes of the Joint event of SWIM over CRV Demonstration and Surveillance data over the SWIM Trial to be held from 28 May to 29 May 2024 in Hong Kong China and adapted lessons learned into new CRV technical specifications. The Workshop also deliberated on the current AMHS and other dataflows, planned future dataflows for SWIM messages, and modified new CRV requirements. The Workshop allowed APAC States/Administrations to formulate enhanced CRV specifications to meet future SWIM needs based on their experience in utilizing CRV. Lastly, the Workshop acted as a platform for the SWIM and CRV experts to collaborate to draft improved and efficient new CRV specifications to accommodate future aviation requirements. The report and other resources of the Workshop can be accessed at this webpage: https://www.icao.int/APAC/Meetings/Pages/2024-New-CRV-and-Future-SWIM-WS.aspx

2.4   The MoM of joint Meetings conducted using Microsoft Teams is provided in **Appendix C**, **Appendix D, and Appendix E**.

3.   ACTION BY THE MEETING

3.1   The Meeting is invited to:

a) note the information contained in this paper; and

b) discuss any matters as appropriate.

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Minutes of the Meeting of SWIM TF TL Meeting: 13 August 2024 08:00 AM-10:00 AM BKK time

Meeting Date: 08/13/2024 08:00 AM
Location: Microsoft Teams Meeting
Participants:

1.	Dr. Amornrat Jirattigalachote	Thailand	Co-Chair, Task 1,4, 7 Lead
2.	Ms. Kristin Cropf	USA	Co-Chair
3.	Ms. Gao Honglei	China	Task 5 Lead
4.	Mr. Marco Kok	Hong Kong China	Task 6 Lead
5.	Mr. David Leow	Singapore	Task 1, 7 Lead
6.	Mr. Yukinobu Ryu	Japan	Task 2, 5, 8, 9 Lead
7.	Mr. Lu Xiaodong	Japan	Tasks 2, 5, and 8 Lead
8.	Mr. Jim Laymon	USA	Task 11 Lead
9.	Ms. Soniya Nibhani	ICAO	SWIM TF Secretary

<u>Notes:</u>

The Meeting was chaired by Dr. Amornrat Jirattigalachote, Strategic Planning Manager (Engineering), Policy and Strategy Management Bureau of AEROTHAI. Ms. Soniya Nibhani, Regional Officer ANS (CNS) Implementation, ICAO Asia and Pacific Regional Office, acted as the meeting secretary.

Adoption of agenda:

The Meeting adopted the attached provisional agenda.

Provisional Agenda SWIM_Leadership Me

Agenda Item 1: Welcome & Opening Remarks

- Dr. Amornrat Jirattigalachote and Ms. Kristin welcomed all delegates to the SWIM TF TL Meeting and shared opening remarks with delegates.

Agenda Item 2:   Outstanding SWIM TF/7, SWIM TF/8 and SWIM TF/9 Action Items Review
   o Review and Reproduction of SDS Implementation Specification Document for APAC Region
   o Finalisation of proposed APAC Common SWIM Information Services
   o Evaluation of FIXM v4.3's suitability to support ATFM, A-CDM, and integrated ATFM/A-CDM operations
   o Update of SOWs of Tasks
   o Update on APAC SWIM Implementation Guidance materials

(IGD)

- Dr. Amornrat shared updates on the SWIM-related discussions at the CNS SG/28 Meeting, especially the way forward regarding information security.
- The Meeting was updated that registry interoperability is being discussed at the IMP under the SWIM Service Registry Interoperability job card and the SDS implementation specifications will be further discussed with the job card team.
- For the need to develop FIXM v4.3 Extension to support APAC regional operational requirements, AEROTHAI is examining the core version of FIXM v4.3. Based on the preliminary result, it was found that FIXM v4.3 Core can be used to support the exchange of ATFM information. However, an Extension would still need to be developed to support information for A-CDM and integrated ATFM/A-CDM operations. Detailed analysis will be provided by AEROTHAI as soon as the thorough investigation is finished.
- Task Leads were encouraged to update SOW and share the updated version with the ICAO Secretariat and Co-Chairs.
- To finalise the proposed APAC Common SWIM Information Services, SWIM TF presented a working paper WP/23 to the 19th Meeting of the ICAO AIS/AIM Implementation Task Force (AAITF/19) in June 2024. However, due to the difference in understanding regarding SWIM information services between AIS and SWIM experts, the AAITF Ad hoc group has been formed to finalise the details of SWIM Common Aeronautical Information Services proposed by SWIM TF.
- Dr. Amornrat presented the Common SWIM Flight Information Services related to FF-ICE to the core team of the FF-ICE Ad-hoc group. The FF-ICE Ad-hoc group plans to conduct a workshop in Q1/2025, in which a review of FF-ICE related SWIM Information Services is planned.

Agenda Item 3: Update on SWIM Implementation Pioneer Ad-hoc Group

- The updates provided are mentioned in these slides.

SWIM
Implementation Pione

- The Meeting discussed about crucial tasks required in-depth discussions among the SIPG members, one of which is the AFTN/AMHS-SWIM transition. The Meeting was informed that an ad-hoc group was established under the ACSICG to work on this matter. Considering the need to timely develop the transition plan to expedite SWIM implementation within the region, the Meeting agreed on the need for SIPG to work in close coordination with this ACSICG ad-hoc group. ICAO Secretariat informed that the ACISCG/12 Meeting is from 24-28 March 2025.
- To efficiently progress the work of SIPG, including planning toward SWIM transition, it was concluded that there is a need to conduct a SIPG F2F working session in January 2025 at the ICAO APAC Office or Singapore. The ICAO Secretariat will share further information. **ACTION ITEM 1-1**

Agenda Item 4:   Update on the Regional Coordination Meeting
                o   SWIM TF/CRV OG Coordination Meeting

- SWIM service requirements collection for New-CRV
  Preparation for the Workshop (17-19 September 2024, Guam, USA)

- The Meeting discussed the agenda for the upcoming workshop in Guam, USA, and requested that members review and prepare input regarding CRV requirements as per the form provided by CRV OG experts for further discussion at the workshop.

- David is putting together working paper(s) based on the lessons learned from the joint event, which will be soon circulated with the SIPG members for review before submitting for discussion at the workshop.

Agenda Item 5: Updates on the assigned tasks by Task leads/contributors, including progress reports and issues

- **Task 1:** Regional Implementation Philosophy & Roadmap

  ✓ Task 1 update was provided under SIPG updates.

- **Task 2:** Regional SWIM Infrastructure

  ✓ Update was shared as follows:

- **Task 3:** Security Services

  ✓ The Meeting was informed that FAA has established a Policy Management Authority (PMA) for PKI and a certificate policy governing the issuance and management of certificates and Certificate Authority (CA) has been approved by the PMA. This certificate policy is consistent with the guidance being developed by the ICAO TFP. FAA will present an Information Paper regarding this matter at the SWIM TF/10.

- **Task 4**: Development and Maintenance of Regional Information Exchange Models

- ✓ The Meeting was informed that the FF-ICE Ad-hoc Group is preparing a working paper to be submitted to the ATM SG/14 in September 2024. In their working paper, the use of FIXM v4.3 for FF-ICE/R1 implementation within APAC will be proposed; this is aligned with the Draft Conclusion of ATFM SG/14 (ATFM/SG/14-1).

- **Task 5:** Task 5: Regional SWIM Governance Framework

    - ✓ On behalf of Mark Kaplan, Kristin requested Task leads to share feedback on the SDS Specifications version 2.0. The updated Task 5 SOW will be shared soon by Task Leads.

- **Task 6:** Information Services

    - ✓ The Meeting noted the update from Task 6, as shown in the following presentation.

    SWIM_TF_Task6_info
    rmation_service_2024

    - ✓ The ICAO Secretariat was requested to coordinate with AAITF to share a modified version for common SWIM information services regarding aeronautical information before the SWIM TF/10. **ACTION ITEM 1-2** Marco will share the latest version of the common SWIM information service after the review of the MET SG/28 Meeting with the ICAO Secretariat. **ACTION ITEM 1-3**

- **Task 7:** SWIM Demonstration

    - ✓ No updates.

- **Task 8:** SWIM Services and Application Validation

    - ✓ Xiaodong shared the following updates:

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Task 8 Status

- **Progress:**
  - The SWIM TI services and information services have been evaluated at the SWIM over CRV Demo.
    - The messaging service between different SWIM TIs
    - The surveillance information sharing
    - The related information services for FF-ICE/R1 operations
  - The evaluation of FIXMv4.3 has been conducted.
    - The capability to implement FF-ICE/R1

- **Issues:**
  - The specifications for regional common information services should be considered.

- **Task 9**: Monitoring of Panels' Work

  ✓ The IMP/3 Meeting is planned for 30 September to 4 October in Montreal. The update from IMP/3 will be shared at the next SWIM TF TL meeting.

- **Task 10:** Regional Coordination and SWIM Related Information Sharing

  ✓ The SWIM-related tasks are being coordinated with various the contributory bodies under APANPRIG such as AAITF, FF-ICE Ad-hoc Group, ATFM SG.

- **Task 11:** SWIM Implementation Education and Promotion

  ✓ Task 11 lead has been transferred. No replacement yet.

Agenda Item 6: Next Meeting date and any other business

  ✓ The Meeting agreed to have the next SWIM TF TL meeting during the week of 6 January 2025, before the in-person SIPG meeting. ICAO Secretariat was requested to share the poll to schedule the next meeting. **ACTION ITEM 1-4**

Minutes of the Meeting of SWIM TF TL Meeting: 07 January 2025 08:00 AM-10:00 AM BKK time

Meeting Date: 01/07/2025 08:00 AM
Location: Microsoft Teams Meeting
Participants:

1.	Dr. Amornrat Jirattigalachote	Thailand	Co-Chair, Task 1,4, 7 Lead
2.	Ms. Kristin Cropf	USA	Co-Chair
3.	Mr. Jeremy Bienkowski	Australia	Task 6 Lead
4.	Ms. Gao Honglei	China	Tasks 5 and 8 Lead
5.	Mr. Marco Kok	Hong Kong China	Task 6 Lead
6.	Mr Henry Chan	Hong Kong China	Tasks 2 Lead
7.	Mr Vincent Wong	Hong Kong China	
8.	Mr. David Leow	Singapore	Task 1, 7 Lead
9.	Mr. Yukinobu Ryu	Japan	Task 2, 5, 8, 9 Lead
10.	Mr. Lu Xiaodong	Japan	Tasks 2, 5, and 8 Lead
11.	Mr. Jim Laymon	USA	Task 3 Lead
12.	Mr. Saugat Prasai	USA	
13.	Mr Justin Prasai	USA	
14.	Mr. Cassandra Leid	USA	
15.	Mr. Wen Zhu	USA	Task 4 lead
16.	Mr. Mark Kaplun	USA	Task 5 Lead
17.	Mr. John Moore	IATA	Task 10 Lead
18.	Ms. Soniya Nibhani	ICAO	SWIM TF Secretary
19.	Ms Xu Jian	ICAO	Associate Programme Officer, ANS (CNS) Implementation

Notes:

The meeting was chaired by Dr. Amornrat Jirattigalachote, Strategic Planning Manager (Engineering), Policy and Strategy Management Bureau of AEROTHAI. Ms. Soniya Nibhani, Regional Officer ANS (CNS) Implementation, ICAO Asia and Pacific Regional Office, acted as the meeting secretary.

Adoption of agenda:

The meeting adopted the attached provisional agenda.

Provisional Agenda
SWIM_Leadership Me

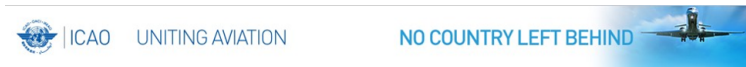**Agenda Item 1**: Welcome & Opening Remarks

- Dr. Amornrat Jirattigalachote and Ms. Kristin welcomed all delegates to the SWIM TF TL Meeting and shared opening remarks with delegates.

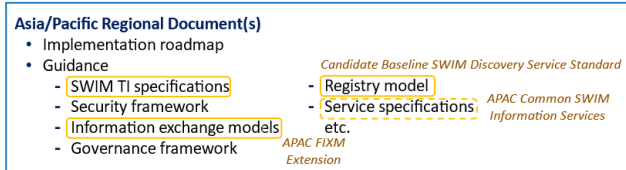**Agenda Item 2:**   Outstanding SWIM TF/7, SWIM TF/8 and SWIM TF/9 Action Items Review
   o Review and Reproduction of the SDS Implementation Specification Document for the APAC Region
   o Finalization of proposed APAC Common SWIM Information Services
   o Evaluation of FIXM v4.3's suitability to support ATFM, A-CDM, and integrated ATFM/A-CDM operations
   o Update of SOWs of Tasks
   o Update on APAC SWIM Implementation Guidance materials (IGD)

- The meeting noted that for Action Item 8-8, *Request IMP members within APAC to consider presenting SDS to IMP WG/I-S and WG/G for further deliberation*, a paper, **SWIM Discovery Service Development in APAC** was presented to IMP/WG-I/S/2 from 27 February - 1 March 2024 and IMP/WG-G/11 from 18 – 21 March 2024. The next step is to present details on the registry model analysis to the SWIM Service Registry Interoperability job card team under IMP WG-I/S. The teleconference for IMP WG-I/S is planned for Jan 2025, during which IMP members will present the information.
- The meeting noted that *Draft Decision CNS SG/28/02 (Decision SWIM TF/08/01)- Information Management Panel consider the adoption of SWIM Discovery Service as a Global Standard for Globally Interoperable Service Discovery* was adopted by APAIPIRG/35 as **Decision APANPIRG/35/6**.
- Recalling Action Item 9-3, *evaluate FIXM v4.3's suitability to support ATFM, A-CDM, and integrated ATFM/A-CDM operations*, the meeting was informed about ongoing actions. It was added that APANPIRG/35 adopted the FIXM 4.3 version as a standard format to support FF-ICE R/1 and cross-border ATFM operations From Q3 to 2026 in the APAC region by **Conclusion APANPIRG/35/4**.
- Dr Amo informed that after close coordination with Thailand operational experts, Thailand finished the evaluation of suitability and found that most of the data fields of the extension of FIXM version 4.1 and 4.2 will still stand except for the track messages. Thailand is developing the schema and expects to finish the development within this month. By February 2025, the XSD file will be shared with the interested testing parties of the TBO pathfinder project, and the test will be conducted in March 2025.
- Task Leads were encouraged to update SOW and share the updated version with the ICAO Secretariat and Co-Chairs before the SWIM TF/10 Meeting in May 2025.
- The Task 5 lead requested a meeting with SWIM TF co-chairs and other Task leads to discuss updates on Task 5 SOW. Dr Amo will schedule the meeting. **ACTION ITEM 2-1**
- The meeting discussed IGD materials on these topics:

Draft Work Plan for IGD

- The meeting recalled two Decisions adopted by CNS SG/28:

Decision CNS SG/28/03 (*Decision SWIM TF/08/02*)	-	Candidate Baseline SWIM Discovery Service Standard for APAC
Decision CNS SG/28/04 (*Decision SWIM TF/09/01***)**	-	APAC SWIM Technical Infrastructure Profiles v1.0

- The meeting noted that version 2 of SDS specifications is available, and no version information was mentioned in the adopted conclusion.

Agenda Item 3: Update on SWIM Implementation Pioneer Ad-hoc Group

- The meeting noted the 1st Working Session of SIPG- In Person (14-17 January 2025) in Bangkok, Thailand. The SIPG lead shared information about agenda items and presentations that will be discussed in the working session.

Agenda Item 4: Update on the Regional Coordination Meeting
  - SWIM TF/CRV OG Coordination Meeting

- Dr Amo shared key outcomes of the SWIM TF/CRV OG Coordination Meeting held on 12 November 2024.
- It was noted that the CRV OG Co-Chair offered to review the required functionalities for a sandbox to gauge the possibility of providing support in developing one.
- Additional updates provided:
- Meshed Network – PCCWG has agreed to support the initial eight states planning on implementing an EMS via a meshed network using GRE tunnels. CRV OG needs to confirm the states and dates.
- Jitter – PCCWG agreed to a 100ms jitter SLA.
- Pseudo CRV – PCCWG agreed to retain Pseudo CRV until 31 March 2025. CRV OG Co-chair (Asia) has requested that this be maintained as is. They are happy to, but someone must pay for the costs. We discuss the opportunity to reduce the costs by lowering the SLA, i.e., 8/5 instead of 24/7, and other measures as well. They are going to provide pricing for discussion at OG13.
- SWIM Development environment. CRV OG Co-chair (Asia) discussed the concept with the Manager of Air Traffic Service Development (Software) and the CIO, and both agreed with the concept. CRV OG Co-chair (Asia) needs the requirements to investigate their ability to support this further. Dr Amo will share the list of requirements by the end of Jan 2025. **ACTION ITEM 2-2**
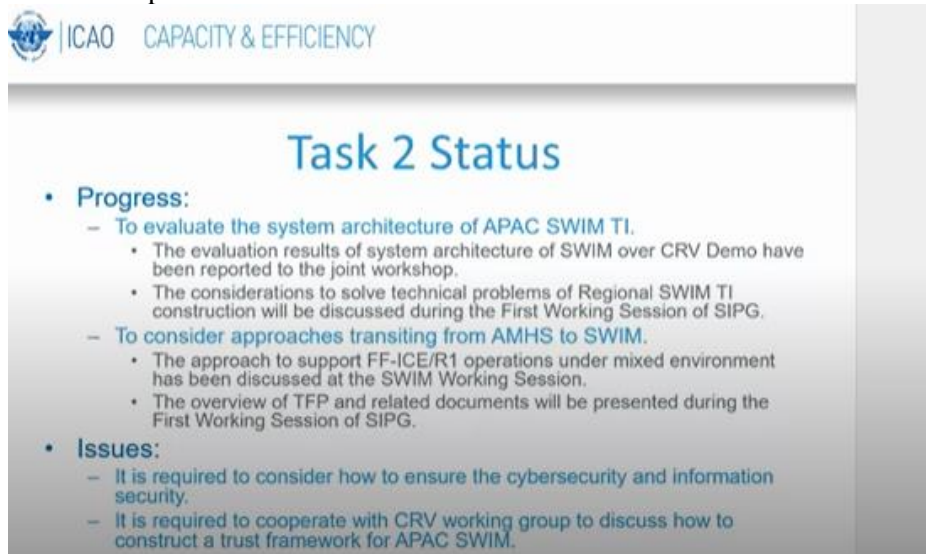
Agenda Item 5: SWIM Seminar & SWIM TF/10 Preparation

- o SWIM Seminar Title
- o SWIM TF/10+SIPG 2nd Working Session?
- o Election of Co-Chair
- o WPs/IPs
- o Expected Conclusions/Decisions

- The meeting discussed the title of the Seminar to be conducted in 2025. The list of themes of past seminars was provided as follows:
  1. The 2022 Theme was: Asia/Pacific SWIM: Where are We Now?
  2. The 2023 Theme was: Working Session on System Wide Information Management (SWIM) Business Requirements Brainstorming- November 2023 session.
  3. The 2024 Theme was: Building Asia/Pacific Regional SWIM: The Journey to Version One.
  4. The 2024 Theme in Nov 2024 session: The SWIM Working Session: From Business Requirements to Practical Solutions
- All members were requested to share ideas for the Seminar with the ICAO Secretariat or SWIM TF Co-chairs.
- The meeting discussed the need to conduct a second working session of SIPG with SWIM TF/10 meeting (19 to 23 May 2025) to save the cost of travel for SIPG members. The invitation letter for both meetings will be shared by mid-February 2025. **ACTION ITEM 2-3**
- The meeting discussed other essential discussions to be conducted in the SWIM TF/10 Meeting.

Agenda Item 6: Updates on the assigned tasks by Task leads/contributors, including progress reports and issues

- **Task 1:** Regional Implementation Philosophy & Roadmap

  ✓ Task 1 update was provided under SIPG updates.

- **Task 2:** Regional SWIM Infrastructure

  ✓ The update was shared as follows:

- The meeting noted that Doc 10204 has been published**.**

- **Task 3:** Security Services

  ✓ No updates.

- **Task 4**: Development and Maintenance of Regional Information Exchange Models

  ✓ Already updated under agenda item 2.

- **Task 5:** Task 5: Regional SWIM Governance Framework

  ✓ Already updated under agenda item 2.

- **Task 6:** Information Services

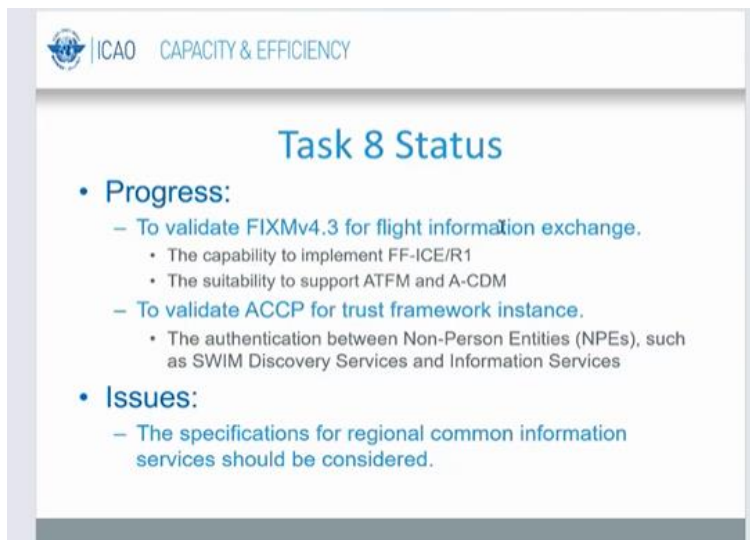 ✓ The meeting noted the update from Task 6, as shown in the following presentation.

  SWIM_TF_Task6_info
  rmation_service.pptx

- **Task 7:** SWIM Demonstration

  ✓ The meeting noted that another lab demonstration that uses SWIM services will be conducted under APAC PBO Pathfinder in June/July 2025.

- **Task 8:** SWIM Services and Application Validation

  ✓ Xiaodong shared the following updates:

- **Task 9**: Monitoring of Panels' Work

✓ The meeting noted key updates about the IMP Meeting conducted in November 2024.

- **Task 10:** Regional Coordination and SWIM-Related Information Sharing

  ✓ The task lead will share details in the SWIM TF/10 Meeting.

- **Task 11:** SWIM Implementation Education and Promotion

  ✓ Task 11 lead position is open for nomination. The meeting was requested to nominate candidates if possible.

Agenda Item 7: Next Meeting date and any other business

  ✓ The meeting agreed to have the next SWIM TF TL meeting during the week of 4 August 2025 week. The ICAO Secretariat was requested to share the poll to schedule the next meeting. **ACTION ITEM 2-4**

MOM of Joint Meeting of CRV OG Ad-hoc Expert and SWIM TF Task Leads
12 June 2024, Video Tele-Conference (VTC)

Minutes of the Joint Meeting of CRV OG Experts and SWIM TF TLs: 12 June 2024 08:00 AM-10:00 AM BKK Time

Meeting Date: 06/12/2024 08:00 AM
Location: Microsoft Teams Meeting

Attendance:

Ms. Amornrat Jirattigalachote	amornrat.ji@aerothai.co.th
Ms. Brenda Buwu	Brenda.Buwu@AirservicesAustralia.com
Ms. Cropf, Kristin M (FAA)	kristin.m.cropf@faa.gov
Mr. Will Turner	Will.CTR.Turner@faa.gov
Mr. David Leow	David_LEOW@caas.gov.sg
Ms. Huang Zheng	huangzheng@catc.net.cn
Mr. Gene	gwhkwok@cad.gov.hk
Mr. Henry Chan	hhlchan@cad.gov.hk
Mr. Hoang Tran	Hoang.Tran@faa.gov
岩澤 康志	iwasawa-y28j@mlit.go.jp
Mr. Joe Knecht (FAA)	Joe.Knecht@faa.gov
Mr. Kelepi Dainaki	KelepiD@fijiairports.com.fj
Mr. LU Xiaodong	luxd@mpat.go.jp
Mr. Shayne Campbell	Shayne.A.Campbell@faa.gov
Mr Laymon, Jim (FAA)	jim.laymon@faa.gov
Mr. Thomas Green	thomas.green@lstechllc.com
Mr. Will Turner	Will.CTR.Turner@faa.gov
Mr. Fullerton, John W-CTR	John.W-CTR.Fullerton@faa.gov
Ms. Soniya Nibhani	snibhani@icao.int

Notes:

Dr. Amornrat Jirattigalachote, SWIM TF Co-Chair, moderated the meeting.

Agenda Item 1: **Welcome & Opening Remarks**

1. Mr Vaughan Hickford, CRV OG Co-Chair (Asia), Mr Kelepi Dainaki, CRV OG Co-Chair (Pacific), Dr Amornrat Jirattigalachote, SWIM TF Co-Chair, and Ms Kristin Cropf, SWIM TF Co-Chair, welcomed all delegates and shared opening remarks.

Agenda Item 2: CRV OG and SWIM TF Working Together

MOM of Joint Meeting of CRV OG Ad-hoc Expert and SWIM TF Task Leads
12 June 2024, Video Tele-Conference (VTC)
- Outcomes of SWIM over CRV Demonstration
- SWIM TF/9 key outcomes for CRV OG
- Workshop on "CRV requirements for SWIM Services"

1. Dr Amo shared key outcomes of the SWIM over the CRV demonstration. She informed that S3TIG demonstrated different scenarios including ATFM scenarios for regional ATFM improvement using SWIM Technical Infrastructure and SWIM information services and FF-ICE R1 on Pseudo CRV. It was informed that the demonstration went very well and no issues were observed with the performance of Pseudo CRV.
2. The meeting noted that Singapore and Hong Kong China are compiling lessons learned from the joint event. Hong Kong China informed that they are collecting surveillance data shared by all the data contributors on the pseudo-CRV. They can let CRV OG know the bandwidth used for surveillance data, which is the most bandwidth consumable data.
3. Vaughan informed that Pseudo CRV attributes are the same as CRV package D of operational CRV being used by States.
4. The meeting noted that in the joint event, Hong Kong China subscribed to 20 Mbps while other participating States subscribed to 2 Mbps.
5. It was noted that CRV circuits do not have any bandwidth restrictions. However, the last mile connection can impose some limits on enhancing the bandwidth of CRV circuits as the last mile connection is provided by a third-party service provider of respective States/Administrations on a contractual basis to PCCWG.
6. Dr Amo shared key outcomes of the SWIM TF/9 meeting. Xiaodong shared relevant content of the draft APAC SWIM TI profile for CRV OG experts' reference and feedback.
7. The meeting noted other key outcomes, including the request for guidance by SWIM TF/9 from CNS SG28 for the group responsible for information security provisions in the APAC region.
8. **CRV data requirements for the SWIM workshop** will be organized from **17-19 September 2024** in **Guam, USA**. To prepare for the workshop, Vaughan suggested SWIM TF TLs provide additional technical specifications shared through a form by CRV OG experts.
9. It was informed that the shared form was discussed among the Task Force task leads. The SWIM TF discussed the consideration of the bandwidth and the latency, but the determination of Jitter was difficult. Vaughan informed that Jitter is equivalent to frame delay in digital messages.
10. It was discussed that frame delay will depend on the safety criticality of the message, which is still under discussion. Therefore, providing information about this parameter may be difficult.
11. Vaughan informed about a free tool which can be used to estimate these paraments. Vaughan will share further guidance on the tool. **ACTION ITEM 6-1**

Agenda Item 3: Regional SWIM Establishment
- **SWIM Implementation Pioneer Working Group**

12. Dr Amo shared updates on SIPG work. It was informed that SIPG will continue to work for another year. Pseudo CRV may be discontinued soon, so SIPG is exploring other options to continue the current test.

13. The meeting noted that three options are being considered: 1. Pseudo CRV extension by PCCWG, 2. use of residual bandwidth of operational CRV, or 3. move current SWIM TI on the internet. If the use of residual bandwidth of the operational CRV option is selected, SWIM TF TLs will need the help and support of CRV OG experts. The third option required a massive amount of work from SIPG members. Some SIPG members cannot move to the internet due to State security

MOM of Joint Meeting of CRV OG Ad-hoc Expert and SWIM TF Task Leads
12 June 2024, Video Tele-Conference (VTC)

requirements. Further discussion would be done in a monthly meeting on 27 June 2024. Vaughn will provide some ideas for utilizing the residual bandwidth option. **ACTION ITEM 6-2**

Agenda Item 4: CRV Governance

14. Vaughan provided updates on ongoing discussion in CRV OG Ad-hoc Governance Group.

Agenda Item 5: Next Meeting Date and Any Other Business

15. The meeting agreed to have the next meeting after on any day from **11-12 November 2024.** ICAO Secretariat will share a doodle for finalizing the dates. **ACTION ITEM 6-3**

MOM of Joint Meeting of CRV OG Ad-hoc Expert and SWIM TF Task Leads
12 November 2024, Video Tele-Conference (VTC)

Minutes of the Joint Meeting of CRV OG Experts and SWIM TF TLs: 12 November 2024 08:00 AM-10:00 AM BKK Time

Meeting Date: 11/12/2024 08:00 AM
Location: Microsoft Teams Meeting

Attendance:

1.	Ms. Amornrat Jirattigalachote	amornrat.ji@aerothai.co.th
2.	Mr. Vaughan Hickford	vaughan.hickford@airways.co.nz
3.	Ms. Brenda Buwu	Brenda.Buwu@AirservicesAustralia.com
4.	Mr Augustine Lau	augustine_lau@caas.gov.sg
5.	Mr. Will Turner	Will.CTR.Turner@faa.gov
6.	Mr. David Leow	David_LEOW@caas.gov.sg
7.	Ms. Huang Zheng	huangzheng@catc.net.cn
8.	Mr. Gene	gwhkwok@cad.gov.hk
9.	Mr. Hoang Tran	Hoang.Tran@faa.gov
10.	加藤 賢一	katou-k24s@mlit.go.jp
11.	Mr. Joe Knecht (FAA)	Joe.Knecht@faa.gov
12.	Mr. Marco Kok	KelepiD@fijiairports.com.fj
13.	Mr. LU Xiaodong	luxd@mpat.go.jp
14.	Mr. Yukinobu Ryu	Shayne.A.Campbell@faa.gov
15.	Ms. Soniya Nibhani	snibhani@icao.int

Notes:

Dr. Amornrat Jirattigalachote, SWIM TF Co-Chair, moderated the Meeting.

Agenda Item 1: **Welcome & Opening Remarks**

1. Mr Vaughan Hickford, CRV OG Co-Chair (Asia) and Dr Amornrat Jirattigalachote, SWIM TF Co-Chair, welcomed all delegates and shared opening remarks.

Agenda Item 2: CRV OG and SWIM TF Working Together

- Outcomes of Workshop on "CRV requirements for SWIM Services"- 17-20 September 2024
- Outcomes of SWIM Working Session- 6-8 November 2024

MOM of Joint Meeting of CRV OG Ad-hoc Expert and SWIM TF Task Leads
12 November 2024, Video Tele-Conference (VTC)

1. Dr Amo shared key outcomes of the *Workshop on CRV requirements for SWIM Services*. All action items of the workshop were reviewed, and updates on action items for which CRV OG was responsible were shared by CRV OG Co-Chair (Asia). The Meeting noted that action item 1-5 of the workshop is closed, while other action items are in progress.

2. It was discussed that the COM chart shows the interconnection of various ANSPs in the APAC region. However, it does not reflect which type of network it is using. It was recalled that the ATN Infrastructure table on the CRV portal contains CRV interconnection information. ICAO Secretariat shared that the AMC COM chart has information about New PENS. The ICAO Secretariat will coordinate with AMC to check if CRV network information can be added to the AMC portal. **ACTION ITEM 7-1** In addition, it was suggested to download svg file of the COM chart from the AMC portal and try to generate an editable COM chart. Singapore will support generating editable COM charts. **ACTION ITEM 7-2**

3. Dr Amo summarized key outcomes and lessons learned from the SWIM working session.

4. CRV experts shared information about how CRV experts provided CRV implementation support to implement CRV during the initial phases of the project.

5. The Meeting discussed that each SWIM-capable State has its own SWIM Testbed.

6. SWIM TF is interested in developing or purchasing a SWIM Sandbox tool for APAC States/Administration, which can be used to test SWIM in a lab environment. It will help States understand the benefits of SWIM. However, the funding and process required for tool acquisition required further discussion.

7. CRV OG Co-chair (Asia) said they have done virtualization work in their corporate operational and secure monitoring spaces. They can host the sandbox if detailed requirements can be shared. Dr Amo will send a list of the functionalities expected from the SWIM sandbox. **ACTION ITEM 7-3**

Agenda Item 3: Regional SWIM Establishment
   SWIM Implementation Pioneer Working Group

12. It was noted that the in-person SIPG Meeting is planned from 14-17 January 2025 at the ICAO APAC Office, Bangkok, Thailand. Prioritization of SWIM messages over CRV is one key agenda for discussion.

13. It was noted that the SIPG meeting is a technical interchange meeting, and only planned working papers will be used to moderate discussion. Therefore, no working paper submission is asked for by the states.

Agenda Item 4: CRV Governance

14. It was informed that the next Meeting of CRV OG Ad-hoc Governance Group will be scheduled in February 2025.

Agenda Item 5: Next Meeting Date and Any Other Business

15. The Meeting agreed to have the next Meeting on any day from **10-14 March 2025.** ICAO Secretariat will share a doodle for finalizing the dates. **ACTION ITEM 7-4**

MOM of Joint Meeting of CRV OG Ad-hoc Expert and SWIM TF Task Leads
13 March 2025, Video Tele-Conference (VTC)

Minutes of the Joint Meeting of CRV OG Experts and SWIM TF TLs: 13 March 2025 08:00 AM-10:00 AM BKK Time

Meeting Date: 03/13/2025 08:00 AM
Location: Microsoft Teams Meeting

Attendance:

1. Ms. Amornrat Jirattigalachote — amornrat.ji@aerothai.co.th
2. Mr. Vaughan Hickford — vaughan.hickford@airways.co.nz
3. Mr. Kelepi Dainaki — KelepiD@fijiairports.com.fj
4. Ms. Brenda Buwu — Brenda.Buwu@AirservicesAustralia.com
5. Mr Augustine Lau — augustine_lau@caas.gov.sg
6. Benoit Reder — benoit.reder@aviation-civile.gouv.fr
7. Didier Yvetot — didier.yvetot@aviation-civile.gouv.fr
8. Mr. David Leow — David_LEOW@caas.gov.sg
9. Ms. Huang Zheng — huangzheng@catc.net.cn
10. Ms. Gao Honglei — gaohonglei@atmb.net.cn
11. Mr. Gene — gwhkwok@cad.gov.hk
12. Mr. Henry Chan — hhlchan@cad.gov.hk
13. Mr. Wallace Ng
14. Mr. Marco Kok — mhkok@hko.gov.hk
15. Mr. LU Xiaodong — luxd@mpat.go.jp
16. Mr. Yukinobu Ryu — ryuu-y2ea@mlit.go.jp
17. Mr Ajay Kumar — ajaykumarcom@AAI.AERO
18. Mr Shayne Campbell — Shayne.A.Campbell@faa.gov
19. Ms. Soniya Nibhani — snibhani@icao.int
20. Jian Xu — jixu@icao.int

Notes:

Mr. Vaughan Hickford, CRV OG Co-Chair (Asia), moderated the Meeting.

Agenda Item 1: **Welcome & Opening Remarks**

1. Mr. Vaughan Hickford, CRV OG Co-Chair (Asia) and Dr. Amornrat Jirattigalachote, SWIM TF Co-Chair, welcomed all delegates and shared opening remarks.

MOM of Joint Meeting of CRV OG Ad-hoc Expert and SWIM TF Task Leads
13 March 2025, Video Tele-Conference (VTC)

Agenda Item 2: CRV OG and SWIM TF Working Together

- Outcomes of CRV OG/13
  - ✓ CRV II Contract updates
  - ✓ Pseudo-CRV cost
  - ✓ SWIM Architecture over CRV
  - ✓ Other discussion
- SWIM Sandbox
- Strategy for PKI Implementation Outcomes of Workshop on "CRV requirements for SWIM Services"- 17-20 September 2024
- Outcomes of SWIM Working Session- 6-8 November 2024

1. Vaughan shared key outcomes of the *CRV OG/13,* along with the latest status of the CRV contract management process. The timelines of the CRV II RFI process were shared with the Meeting.
2. The updates about the cost of Pseudo CRV discussion with PCCWG in CRV OG/13 were shared. SWIM experts noted two costs with and without SLA, and that cost is higher in terms of CRV OG/13. Various options discussed in CRV OG/13 to retain Pseudo CRV were shared with SWIM experts. PCCW Global shared their willingness to **extend Pseudo CRV till June 2025** to facilitate CRV OG to conduct discussions with SWIM TF.
3. SWIM TF noted that Japan shared a request with PCCW Global to prepare a document explaining the configuration of Pseudo CRV to make States understand this network along with the procedure to request connection to this network. It was agreed that this document would be beneficial for States. PCCW Global will draft the document and share it in the next CRV OG Ad-hoc Group meeting on 12 June 2025.
4. David shared that there is a need to maintain the pseudo-CRV because SIPG has some states that have categorically stated that testing over the Internet is going to be difficult for them. Discussion on how a contract will be made with PCCWG for Pseudo CRV was discussed.
5. Vaughan informed that there is a need to discuss with PCCWG what the contract looks like because, at the moment, each State/Administration has signed up for a five-year contract and then a five-year contract. But now, as we get closer to the contract date, the maximum we can sign for is three years.
6. CRV OG experts requested SWIM TF to do an offline discussion and share expected timelines for the setup and future plans with SWIM TF for Pseudo CRV in **the first week of April 2025**. **ACTION ITEM 8-1**
7. SWIM TF experts asked if individual negotiation or collective negotiation would be possible if required with PCCWG. CRV experts suggested collective negotiation, including information on how many states will need this service and for how much time. SWIM TF experts will share information for further negotiations by CRV OG. **ACTION ITEM 8-2**
8. Singapore informed that if Pseudo CRV can be implemented on the Cloud, then **AWS is preferred**.
9. Vaughan informed that the CRV service provider would not provide internet connectivity.
10. David informed that Option 3 was asking the CRV to provide the Internet connection to SWIM, and if that's not possible, then SIPG will have to explore **Options 1 and 2**.
11. Vaughan asked how the EMS for SWIM is going to physically connect to the CRV. Singapore informed that as per Singapore's architecture Singapore has two EMS: one for connecting to the CRV and one for Internet. Basically, these are two independent but talking EMS, so they talk to each other, but they're not connected, and they route traffic between each other. Singapore is thinking of setting up the queues properly. The messages that come from the CRV that is bound

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for a destination on the Internet can then be routed between the two EMS out to the Internet and vice versa.

12. On the question of whether EMS, which is CRV-connected, is connecting to the CRV router directly, Singapore informed that there is Security architecture in place. To route the two, there's a third EMS, which is an internal EMS. So, the traffic comes in from the CRV through a security architecture into our intranet EMS, which is then routed back. Essentially, the Internet EMS is separated from the CRV EMS by two sets of security infrastructure, with a third EMS in between.

13. Vaughan suggested doing routing at the network to route the traffic rather than EMS. Singapore informed that SIPG is not doing IP-based routing but message routing, which is in layer 7.

14. On the question of SWIM about security architecture for CRV, Vaughan informed that in CRV, each state or user is responsible for the security architecture. CRV OG has not set a minimum of requirements, but it is as per Singapore's description in New Zealand, and some other states have something very similar as well. In addition, CRV OG is not looking to add any more security requirements to the network architecture.

15. SIPG informed that they need to discuss in SIPG some security requirements in CRV in case they choose Option 2.

16. Vaughan suggested using CIS hardening guidelines, which will be shared by Vaughan. **ACTION ITEM 8-3**

17. The Meeting suggested preparing a joint paper for the proposal to form a PKI infrastructure implementation contributory body in CNS SG/29, along with some other recommendations, rationale, and suggestions. **ACTION ITEM 8-4**

18. For hosting the sandbox, detailed requirements will be shared by Dr Amo, who will send a list of the functionalities expected from the SWIM sandbox. **ACTION ITEM 8-5**

Agenda Item 3: Regional SWIM Establishment
SWIM Implementation Pioneer Working Group

12. It was noted that the in-person SIPG Meeting is planned for 26-30 May 2025 at the ICAO APAC Office in Bangkok, Thailand.

13. The following document provided updates on SIPG work:

Outcomes from SIPG
1st Working Session.p

Agenda Item 4: CRV Governance

14. The outcomes of the CRV OG Ad-hoc Governance Group held during CRV OG/13 were shared.

Agenda Item 5: Next Meeting Date and Any Other Business

15. The Meeting agreed to have the next Meeting **on 18-22 August 2025** as an in-person meeting in New Zealand. If there are any issues in finalizing the agreement in New Zealand within a specific time, it will be organized in Bangkok, Thailand.