REPORT OF

THE ICAO ASIA/PACIFIC SYSTEM WIDE INFORMATION MANAGEMENT (SWIM) SEMINAR 2025

Establishing SWIM – A Key Enabler for FF-ICE

Bangkok, Thailand
19 May 2025

The views expressed in this Report should be taken as those of Seminar and not of the Organization.

Approved by the Seminar
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1. Introduction

1.1 The ICAO Asia/Pacific System-Wide Information Management (SWIM) Seminar 2025 was held on 19 May 2025 at the ICAO Asia and Pacific Regional Office, Bangkok, Thailand. The theme of the Seminar was *Establishing SWIM – A Key Enabler for FF-ICE*. At the 14th Air Navigation Conference in 2024, Recommendation 3.2/2 was approved, outlining the transition to Flight and Flow – Information for a Collaborative Environment (FF-ICE) services and the cessation of the ICAO 2012 flight plan by 2034. SWIM plays a critical role as a key enabler for FF-ICE, and its implementation must occur prior to the start of FF-ICE deployment. With only nine years remaining until 2034, the timely implementation of SWIM is essential. This Seminar provided insights into the minimum SWIM capabilities necessary for FF-ICE implementation. It also served as a platform for the ICAO APAC SWIM TF to gather feedback from regional aviation stakeholders on how to effectively support them in meeting this goal within the limited timeframe.

2. Attendance

2.1 The Seminar was attended by **100** participants from **19** States/Administrations**, 3** International Organizations and **1** industry partner, including Australia, Bhutan, Cambodia, China, Hong Kong China, France, Japan, Lao PDR, Malaysia, Nepal, New Zealand, Pakistan, Philippines, the Republic of Korea, Singapore, Sri Lanka, Thailand, USA, Vietnam, CANSO, IATA, ICAO, and Frequentis. Variflight sponsored the lunch for the Seminar. The list of participants is provided in **Attachment 1.**

3. Opening of the Seminar

3.1 The Seminar was opened by Dr. Amornrat Jirattigalachote, Expert (Director Level), Corporate Strategy and Sustainability Office of Aeronautical Radio of Thailand Ltd. (AEROTHAI), Co-Chair of the SWIM Task Force (SWIM TF). Dr Amornrat Jirattigalachote warmly welcomed all participants and thanked Member States/Administrations as well as the International Organization for continuously supporting ICAO regional activities. She briefly explained the significant presentations planned for the Seminar and the benefits of knowledge sharing in enhancing the collaboration under the SWIM Task Force's leadership to overcome the challenges and progress the implementation of SWIM within the region.

3.2 Dr. Soniya Nibhani, Regional Officer ANS (CNS) Implementation, recalled all previous seminars and working sessions conducted from 2023 to support APAC States/Administrations meeting 2024 – 2030 APAC SWIM implementation timelines and encouraged delegates to participate in the discussion actively.

4. Officers and Secretariat

4.1 Dr Amornrat Jirattigalachote, Co-Chair of the SWIM Task Force, moderated the Seminar.

4.2 Dr. Soniya Nibhani, Regional Officer ANS (CNS) Implementation, acted as the Secretary of the Seminar with the support of Ms. Xu Jian, Associate Programme Officer (CNS) Implementation and Ms. Varapan Meefuengsart, the Programme Assistant from ICAO Asia and Pacific Regional Office.

5. Organization, working arrangement, language and documentation

5.1 The Seminar was organized for a full day. The working language was English, including all documentation and this report**.**

6. Summary of Presentations

6.1 A total of **seven** (7) presentations were delivered by various SWIM experts. The presentation materials can be accessed via the link.

The Summaries of all presentations are as follows:

SP01 – Setting the Scene

6.2 Dr. Amornrat Jirattigalachote, ICAO APAC SWIM Task Force Co-Chair, shared the background information on the motivation to conduct the Seminar and the specific topics to be explored. Notably, it was highlighted that the Seminar aimed to assist participants in understanding the minimum SWIM capabilities required to support the implementation of FF-ICE. Given the various developments made so far by SWIM TF, she shared how the Seminar will provide insights into how these developments will be implemented in relation to the realization of FF-ICE.

SP02 - JCAB's Journey to SWIM and FF-ICE

6.3 Mr. Yukinobu Ryu, Director for Flight Information Management Planning, Japan Civil Aviation Bureau, delivered a briefing on Japan's experiences with SWIM and FF-ICE experiences. He shared information on the development of CARATS (Collaborative Actions for Renovation of Air Traffic Systems), Japan's long-term vision for the future air traffic systems. This long-term vision aimed to address the increasing traffic congestion and demand as well as align with international trends. It was highlighted that, as part of this long-term vision, SWIM-related efforts have been conducted under the leadership of JCAB in close collaboration with R&D institutes and commercial vendors. Moreover, he outlined the SWIM journey in Japan, starting from participation in R&D activities to entering the implementation phase. He also informed about the launch of the SWIM Portal site, a platform where users can explore the current SWIM information services being provided. Additionally, he presented details about the SWIM Education and Enhancement (SWIMEE) team, comprising members from the aviation industry. This team aims to promote awareness, understanding, and usage of SWIM as well as explore its potential improvement. He also shared lessons learned to date and the planned next steps for Japan's SWIM implementation. Furthermore, he reiterated the AN-Conf/14 Recommendation on the cessation of the 2012 FPL and emphasized the relationship between SWIM, FF-ICE, and TBO. Lastly, he explained the high-level planned system integration to support mixed-mode FF-ICE/FPL2012 operations, along with Japan's participation in regional FF-ICE related forums. The Seminar noted that Japan is planning to upgrade its information services to implement the initial FF-ICE/R1 mandatory service (Filing service and Flight data request service) by 2028.

SP/03 – CAAS's Journey to SWIM and FF-ICE

6.4 Mr. Elvin Liow, Head (Open Platform for Air Navigation Services), Civil Aviation Authority of Singapore, provided examples of potential SWIM use cases, e.g., flow management, data analytics, etc., along with the necessary SWIM-related components to enable the use cases. He suggested adopting a "Start Small" approach, beginning with the identification of a single use case, using simulated data sources and networks to explore various SWIM technologies such as message broker, message protocol, and method for information service provisioning. He also emphasized the importance of participation in the SWIM TF and other regional trials to learn from and exchange insights with other stakeholders in the region. He further advised a gradual expansion of SWIM development by identifying additional use cases, data sets, and data sources. Moreover, it was shared that operationalizing SWIM would require considerations of additional aspects, e.g., cybersecurity, maintenance, and governance. He emphasized that SWIM implementation extends beyond the role of ANSPs and requires participation from other stakeholders across the aviation industry. He outlined CAAS's SWIM journey and plan for operational SWIM implementation. He reiterated the "Start Small" approach, which has also been adopted for their FF-ICE development and implementation. CAAS's experiences to date in FF-ICE activities and how these are related to SWIM activities were provided. Finally, he offered perspectives on the minimum SWIM capabilities required for FF-ICE, including connectivity with the internal flight planning system, connectivity with other organizations, and

considerations for cybersecurity and governance.

SP/04 – AEROTHAI's Journey to SWIM and FF-ICE

6.5 Mr. Arthit Tosukolvan, Air Traffic Engineering Manager, and Mr. Worapong Jirojkul, Executive Air Traffic Systems Engineer, AEROTHAI, presented AEROTHAI's journey in the development and implementation of SWIM and FF-ICE. They shared development timelines and key milestones achieved to date, along with plans for the implementation of operational SWIM and FF-ICE/R1 services. They also provided a draft of the high-level architecture of AEROTHAI's FF-ICE system, which is to be established over the SWIM Technical Infrastructure (SWIM TI). They explained the expected FF-ICE message flow within this architecture and the functions of various SWIM-related components in supporting FF-ICE operations. Furthermore, essential SWIM TI capabilities, both functional and non-functional, were highlighted, including messaging, security, TI management, and performance requirements. In terms of security, it was shared that authentication and authorization are considered minimum requirements. Lastly, they shared lessons learned thus far from both technical and general perspectives. They also encouraged participants to adopt a "Start Small" approach and emphasized the importance of participation in regional trials in enhancing understanding of SWIM.

SP/05 – SWIM Routing for FF-ICE Implementation and FF-ICE Mandatory Services on SWIM Demonstration – CANSO

6.6 Mr. Wayne Osse, Co-Chair of the CANSO Digital Transition Workgroup, shared global updates on SWIM and FF-ICE developments. He particularly outlined SWIM Global Routing and Information Service Definitions (ISDs) efforts to support globally harmonized FF-ICE/R1 services implementation over SWIM. He also shared the current challenges related to SWIM routing, especially for FF-ICE/R1 implementation, emphasizing the lack of implementation guidance or standards for information labels. To address this issue, the Seminar was informed that a dedicated group under the ICAO Air Traffic Management Requirements and Performance Panel (ATMRPP) has been established to develop a harmonized approach for SWIM routing among FF-ICE stakeholders. Moreover, he explained that the potential solution would involve establishing a standard SWIM routing label, utilizing message metadata (topics and properties) for information delivery without payload inspection, and implementing governance mechanisms for access control. The FF-ICE/R1 filing service demonstration was also conducted to showcase how eFPL, submission response, and filing status could be routed based on topics.

SP/06 – Transition from FPL2012 to FF-ICE: Advancing Towards SWIM-Enabled Operations – IATA

6.7 Mr. John Moore, Assistant Director – Flight and Technical Operations, IATA Asia-Pacific, outlined the limitations of the FPL2012 flight planning system, especially the inability of the current FPL2012 format to accommodate all necessary information required for more efficient trajectory planning and demand/capacity balancing. He highlighted the need for a transition to FF-ICE to address these shortcomings. He explained the benefits to airlines of accessing and processing aeronautical information in the Aeronautical Information Exchange Model (AIXM) and MET information in the ICAO Meteorological Information Exchange Model (IWXXM) formats through SWIM information services. He also provided an example of how the increased information shared through the FF-ICE flight plan would enhance ANSP's trajectory calculation. He briefly described the overview of the Flight Information Exchange Model (FIXM), the standard format used for the FF-ICE flight plan, and emphasized its ability to accommodate a wider range of flight-related data, particularly aircraft performance and flight profile information. He further noted that the airline flight planning system would need to interpret constraints/restrictions in AIXM and IWXXM in order to generate flight plans in FIXM. He stressed that the full benefits of FF-ICE benefits can only be realized within a SWIM-enabled environment. Additionally, he presented the benefits of FF-ICE from the airline perspective, the baseline SWIM capabilities to support FF-ICE operations, the challenges associated with transition, and expectations and desired outcomes from the airline industry's viewpoint.

SP/07- Integrating SWIM into a Global TBO/FF-ICE Service Architecture: Challenges and Vendor Perspectives – Frequentis

6.8 Mr. Ulrich Kaage, ATM Solution Consultant, Frequentis, shared an overview of SWIM as described in ICAO Doc 10039, along with a timeline of TBO/FF-ICE activities for a flight based on ICAO Doc 9965 Vol II. He described how communication networks and messaging are anticipated in a mixed-mode environment in which SWIM and legacy communication systems will coexist. He explained key challenges in integrating SWIM with TBO/FF-ICE, including the relationship between information types and corresponding SWIM information services complexity and the associated cost in standardizing information and SWIM information services at global, regional, and national levels. Lastly, he provided information on mitigation strategies from the perspective of Frequentis, e.g., the importance of strong international cooperation to harmonize regional implementations, the need for ANSPs and industry collaboration during the standardization phase to reduce system costs, the adoption of local system adapters instead of national or regional gateways in mixed-mode environments, the review of current service definitions and information exchange models (e.g., digital NOTAM and AIP data sets) to support ICAO compliant improvements.

7. Key Outcomes of the Seminar

7.1 The suggestions, recommendations, and dialogues on various aspects, which were shared in the Seminar, are as follows:

- As per the survey conducted in the second FF-ICE Ad-hoc Group meeting and workshop, the regional sunset of FPL2012 is considered to be 2032, giving only 7 years left for APAC States/Administrations to implement FF-ICE/R1 services.
- Formation of a multidisciplinary team comprising representatives from across the aviation industry, e.g., airspace users, airport operators, ANSPs, ATM industries, academia and research institutes, other related governmental bodies, etc., is recommended to ensure effective communication and coordination for SWIM implementation.
- States/Administrations are currently exploring various mechanisms to support airspace users in submitting, translating, delivering, and forwarding FF-ICE flight plans. However, these diverse approaches may lead to a complex and fragmented operational environment. Establishing a mandate for SWIM and FF-ICE implementation could promote harmonized regional implementation. Nevertheless, such mandates may introduce unintended challenges. Careful consideration and close coordination among stakeholders, especially between airspace users and ANSPs, are essential to achieving a balanced and practical implementation.
- It was noted that, for some APAC States/Administrations, the current policy is to provide SWIM information through both the Internet and CRV.
- Airspace users expect that ANSPs will use the information shared through the FF-ICE process in their airspace management and ATFM planning to ensure that airspace and airport resources are utilized efficiently.
- Airlines expect that when an airline transitions to FF-ICE, any ANSP not yet capable of processing FF-ICE flight plans will internally handle the internal translation from the FF-ICE flight plan to FPL2012. This approach would relieve airspace users from the burden of maintaining both the FF-ICE flight plan and FPL2012 flight planning systems.
- It was discussed that the benefits of the richer information provided in the FF-ICE flight plan will be limited if ANSPs do not adapt their ATM automation systems to utilize this additional information. Relying solely on translating FF-ICE flight plans into FPL2012 to input into the ATM automation system may diminish the potential advantages of FF-ICE.
- It was shared that the provision of a centralized SWIM technical infrastructure service is being discussed among some key airlines and IATA to support airlines in fulfilling the FF-ICE requirements.

7.2 Regarding the minimum SWIM capabilities necessary for FF-ICE implementation, the following recommendations were made:

For Airspace User (AU):

- Airlines' system capabilities to consume, process, utilize, and share information in AIXM, IWXXM, and FIXM formats. These XML schemas permit the exchange of richer data.
- Connection to the SWIM network, registry, etc., for receiving and sharing information, as well as for discovering necessary SWIM services – including connected aircraft.
- AIS databases are to be baselined in AIXM format.
- Integration with ANSPs and EUROCONTROL Network Manager services to consume AIXM feature data as published in the Route Availability Document (RAD) and Airspace Usage Plan (AUP). This information provides definitions of Free Route Airspace (FRA) airspace and any associated constraints.
- Capability to consume dynamic route segments and airspace constraint data harmonized with NOTAM constraints. The availability of digital versions of NOTAM information will help make this process seamless.

For ATM Service Provider (ASP)

- Connectivity to internal flight data/flight plan management system to receive and publish flight plans and related messages.
- Connectivity with other organizations through CRV and the Internet.
- Cybersecurity mechanism.
- Governance framework, especially data sharing policy.
- Minimum functional and non-functional SWIM TI capabilities, including messaging, security (at a minimum, authentication and authorization), TI management, and performance requirements.

8. Closing of the Seminar

8.1. Dr. Amornrat Jirattigalachote expressed her gratitude to all participants for their active engagement and contribution, especially for sharing their ideas and questions. At the wrap-up session, she summarised the key messages from each presentation. Lastly, she extended sincere appreciation to all speakers for their participation and for sharing their insights with APAC Member States/Administrations. Additionally, she expressed gratitude to all event participants and sponsors for their support.

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LIST OF PARTICIPANTS

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	STATE/NAME		TITLE/ORGANIZATION	E-MAIL	ATTENDANCE	
	85.	Ms. Saowakhon Tetiya	Aerodrome Safety Specialist, Airport Services Standards Division, Aviation Services Standards Department		X	X
	86.	Ms. Suvachira Teeraphathananon	Senior Engineer, Airport of Thailand PLC.	suvachira.t@airportthai.co.th;	X	X
	87.	Mr. Tanapon Intaruk	Airport Operation System Engineer, Airport of Thailand PLC.	tanapon.intaruk@gmail.com;	X	X
	88.	Ms. Rassamee Damrongkietwattana	Director of Aeronautical Weather Monitoring Sub-division, Thai Meteorological Department	rassmee@hotmail.com;	X	X
	89.	Ms. Paweena Panikodom	Meteorologist, Thai Meteorological Department	pavna55@hotmail.com;	X	X
	90.	Mr. Worapong Noothong	Meteorologist, Thai Meteorological Department	pui-74@hotmail.com;	X	X
	91.	Mr. Pongkhun Maneesri	Meteorologist, Thai Meteorological Department	pongkhun@gmail.com;	X	X
	92.	Mr. Wanchalearm Petsuwan	Computer Technical Officer, Telecommunications Division, Meteorological Department		X	X
	93.	Ms. Natthaporn Lertsamranpinit	Computer Technical Officer, Thai Meteorological Department	natthaporn.le@gmail.com;	X	X
	94.	Ms. Anut Thueaksuban	Specialist-Aeronautical Information Management, Bangkok Airways Public Company Limited	anut@bangkokair.com;	X	X

	STATE/NAME		TITLE/ORGANIZATION	E-MAIL	ATTENDANCE	
	95.	Ms. Suchavalee Yimchalam	Manager - Airside Operations, Bangkok Airways Public Company Limited	suchavalee@bangkokair.com;	X	X
	96.	Mr. Sheerwei Ho	System Analyst, Corporate Information Technology, Bangkok Airways Public Company Limited		X	X
	97.	Ms. Chanakan Suksawade	System Analyst, Bangkok Airways	chanakan.suk@bangkokair.com;		X
	98.	Mr. Naroupon Chandrakulsiri	Manager of international flight safety department, Thai Airways International Public Company Limited	Naroupon.c@thaiairways.com;	X	X
	99.	Mr. Piyawut Tantimekabut	ATM Expert (Director Level) Aeronautical Radio of Thailand Ltd (AEROTHAI)	piyawut.ta@aerothai.co.th;		X
	100.	Ms. Pakarin Hiranyalap	Senior Aerodrome Safety Officer, AOT			X
19.	**UNITED STATES OF AMERICA (1)**					
	101.	Mr. Shayne Campbell	Senior International Air Traffic Representative Asia Pacific, United States Federal Aviation Administration (FAA)	shayne.a.campbell@faa.gov;	X	X
20.	**VIETNAM (4)**					
	102.	Mr. Nguyen Hong Hiep	Manager, CNS Department, VATM	nguyenhonghiepbk@vatm.vn ;	X	X
	103.	Ms. Le Thi Phuong	Deputy Director, VNAIC, VATM	lephuongais@vatm.vn;	X	X

	STATE/NAME		TITLE/ORGANIZATION	E-MAIL	ATTENDANCE	
	104.	Mr. Nguyen Vu Thuan	D/Manager, ATS Division, NORATS, VATM	vuthuanatc@gmail.com;	X	X
	105.	Mr. Duong Thanh Nam	D/Manager, Technical - Safety - Quality Division, ATTECH, VATM	namdt@attech.com.vn;	X	X
21.		**CANSO (1)**				
	106.	Mr. Wayne Osse	Chief Architect, Global Aviation and Transportation, Solace	wayne.osse@solace.com;	X	X
22.		**IATA (1)**				
	107.	Mr. John Moore*	Assistant Director, IATA APAC	moorej@iata.org;	X	
23.		**FREQUENTIS (3)**				
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	109.	Mr. Ulrich Kaage	ATM Solution Consultant	ulrich.kaage@frequentis.com;	X	X
	110.	Mr. Leo Adhemar Tan	System Engineer	leo.tan@frequentis.com;	X	
24.		**ICAO (4)**				
	111.	Ms. Soniya Nibhani	Regional Officer ANS Implementation (CNS), Asia and Pacific Office International Civil Aviation Organization	snibhani@icao.int;	X	X
	112.	Mr. Hiroyuki Takata	Regional Officer, Air Traffic Management ICAO Asia and Pacific Regional Office	htakata@icao.int;		X

	STATE/NAME		TITLE/ORGANIZATION	E-MAIL	ATTENDANCE	
	113.	Ms. Jian Xu	Associate Programme Officer, Air Navigation Systems (CNS) Implementation, International Civil Aviation Organization Asia and Pacific Office	jixu@icao.int;	X	X
	114.	Ms. Varapan Meefuengsart	Programme Assistant, CNS/MET Asia and Pacific Office International Civil Aviation Organization	vmeefuengsart@icao.int;	X	X

* Online attendance

LIST OF PRESENTATIONS

Presentation Ref No.	Subject	Speakers
SP/01	SP01- Setting the Scene	Ms. Amornrat Jirattigalachote, ICAO Asia/Pacific SWIM Task Force Co-Chair, Strategic Planning Manager (Engineering), AEROTHAI
SP/02	JCAB's Journey to SWIM and FF-ICE	Mr. Yukinobu Ryu, Director for Flight Information Management Planning, Japan Civil Aviation Bureau
SP/03	CAAS's Journey to SWIM and FF-ICE	Mr. Elvin Leow, Head (Open Platform for Air Navigation Services), Civil Aviation Authority of Singapore
SP/04	AEROTHAI's Journey to SWIM and FF-ICE	Mr. Arthit Tosukolvan, Air Traffic Engineering Manager, AEROTHAI Worapong Jirojkul, Executive Air Traffic Systems Engineer, AEROTHAI
SP/05	SWIM Routing for FF-ICE Implementation and FF-ICE Mandatory Services on SWIM Demonstration	Mr. Wayne Osse, Co-Chair of CANSO Digital Transition Workgroup
SP/06	Transition from FPL2012 to FF-ICE: Advancing Towards SWIM-Enabled Operations	Mr. John Moore, Assistant Director – Flight and Technical Operations, IATA Asia-Pacific
SP/07	Integrating SWIM into a global TBO/FF-ICE service architecture: Challenges and vendor perspectives	Mr. Ulrich Kaage, ATM solution consultant, Frequentis

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