International Civil Aviation Organization

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Navigation and Surveillance Sub-group (CNS SG/29)
of APANPIRG**

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Agenda Item 5: Information Management (IM)

APAC TBO PATHFINDER – FF-ICE/R1 LABORATORY DEMONSTRATION

(Presented by Singapore, Thailand, and USA)

SUMMARY

This paper presents an overview of the APAC TBO Pathfinder project, a regional initiative aimed at identifying the capabilities required for TBO in the APAC region. It highlights the key 2025 milestone in conducting the FF-ICE/R1 laboratory demonstration, while will showcase the operational benefits of FF-ICE/R1 and provide firsthand experience in developing the necessary technical capabilities.

1.   INTRODUCTION

1.1   The APAC TBO Pathfinder project was initiated in October 2023 as a 4-year project, under the APAC ANSP Committee (AAC) involving States / ANSPs and International Organisations. The ANSPs of China, Hong Kong China, Indonesia, Japan, New Zealand, Philippines, Singapore, Thailand, United States of America, Viet Nam, along with CANSO and IATA, agreed to work together on harmonised and expedited implementation of the ICAO global TBO concept in APAC. Through collaborative efforts to identify operational scenarios that are important and of high value for the region, the project will provide greater clarity on the expected benefits and for the project participants to put together an agreed-upon feasible roadmap to operationalize TBO in APAC. This would allow the APAC ATM stakeholders to synchronise their planning and modernisation efforts to improve overall flight and air traffic management efficiency across the region.

1.2   The APAC TBO Pathfinder project kick-off meeting was held in April 2024, where participants shared their TBO-related plans on SWIM, FF-ICE and the Connected Aircraft concept which are key TBO building blocks. Apart from the project participants, the ANSPs of Australia also participated as observers. Three workgroups (WGs) were formed within the project, with each focused on progressing specific goals and deliverables as follows.

WG 1	WG 2	WG 3
<u>Goal/Deliverable</u> Collate materials within a repository to facilitate **common understanding** of what ICAO Global TBO concept is for project participants and for APAC ATM stakeholders	<u>Goal/Deliverable</u> a) Recognize and document **operational values** arising from demonstrating identified regional TBO scenarios and city pairs b) **Utilize SWIM** for the 1st operational use case in the region c) **Utilize initial FF-ICE services** for the identified regional TBO scenarios and city pairs in (a)	<u>Goal/Deliverable</u> a) Determine **benefits** of regional TBO scenarios b) Jointly develop an **agreed-upon** TBO roadmap in line with regional needs and ICAO global developments, for project participants and APAC ATM stakeholders to pursue
<u>Leads</u> **Airways New Zealand and CAAS**	<u>Leads</u> **AEROTHAI, CAAS and FAA**	<u>Leads</u> **AirNav Indonesia, CAAC/ATMB, CAAS and FAA**
<u>Members</u> AirNav Indonesia, CAAP, VATM, CANSO, and IATA	<u>Members</u> AirNav Indonesia, Airways New Zealand, CAAC/ATMB, HKCAD, JCAB, VATM, and IATA	<u>Members</u> AEROTHAI and VATM

2.   DISCUSSION

2.1   To build the capabilities required for the operations of regional TBO scenarios and city pairs, WG2 utilizes a range of tools, including technical interchange meetings, technical trials, and planned laboratory demonstrations. In line with Recommendation 3.2/2 of the 14th Air Navigation Conference (AN-Conf/14) which calls for transition to FF-ICE services and cessation of ICAO 2012 flight plan by 2034, WG2 has identified its first key milestone as the execution of FF-ICE/R1 laboratory demonstration. This demonstration is intended to enhance understanding and provide firsthand experience in developing and testing the mandatory FF-ICE/R1 services, i.e. filing service and flight data request service, via SWIM through the conduct of selected operational scenarios. To ensure the meaningful participation, the demonstration is structured into two levels based on technological capabilities. The specific requirements for each level of participation are outlined below.

Participation Level	Requirements
Level 1: Participant with no FF-ICE/R1 services prototype	• Participate in demonstration planning, system interfacing, and system testing • Share lessons learnt from the demonstration • Provide update on organization's implementation progress • Active participation throughout the project
Level 2: Participant with FF-ICE/R1 services prototype	• Requirements as per Level 1 Participation Level • Provide at least two (2) FF-ICE/R1 mandatory services, i.e. filing service and flight data request service, using own prototype • Able to connect to SWIM

2.2   To prepare for the demonstration, a series of activities were conducted both online and onsite. The process began with a face-to-face technical interchange meeting in August 2024 to identify operational scenarios tailored to specific regional environment. These scenarios were subsequently reviewed and refined during an online technical discussion in October 2024. At the technical interchange meeting in January 2025, detailed requirements for technical capabilities were discussed, including SWIM technical infrastructure, SWIM information services, and information service definitions for some FF-ICE/R1 services. Following these discussions, online technical tests were conducted in April 2025, and a face-to-face technical trial, hosted by VATM in Hanoi, Viet Nam, was held from 6 to 8 May 2025.

2.3   The FF-ICE/R1 laboratory demonstration is scheduled to take place from 22 to 24 July 2025 in Hanoi, Viet Nam. It will showcase operational scenarios involving flights between the following city pairs:
- Guam → Bangkok,
- Tokyo → Bangkok,
- Bali → Bangkok, and
- Aukland → Singapore.

Technical capabilities to be demonstrated include:
- FF-ICE/R1 services, i.e. planning service, filing service, trial service, flight data request service, and notification service, using FIXM version 4.3 FF-ICE messages;
- Message integrity validation through security services, aligned with the ICAO Trust Framework;
- SWIM technical infrastructure and SWIM information services.

2.4   Lessons learnt from the demonstration will be shared with relevant APANPIRG contributory bodies such as SWIM Task Force, FF-ICE Ad-Hoc Group, to support their ongoing discussions and developments. To further build up capabilities towards TBO implementation, FF-ICE/R2 (post-departure trajectory negotiation and revision) activities, including technical interchange meetings, tabletop exercises, technical trials, and a laboratory demonstration, are planned for 2025 – 2026.

3.   ACTION BY THE MEETING

3.1   The meeting is invited to:

   a)   note the information contained in this paper; and

   b)   discuss any relevant matter as appropriate

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