International Civil Aviation Organization

Twelfth Meeting of the Air Traffic Management Sub-Group (ATM/SG/12) of APANPIRG

Bangkok, Thailand, 23 – 27 September 2024

Agenda Item 5: ATM System (Modernisation, Seamless ATM, CNS, ATFM)

TOWARDS HARMONISED REALISATION OF THE ICAO GLOBAL TRAJECTORY BASED OPERATIONS (TBO) CONCEPT IN THE ASIA AND PACIFIC REGIONS

(Presented by Indonesia, Japan, Republic of Korea, New Zealand, Singapore, Thailand, United States of America and International Air Transport Association (IATA))

SUMMARY

This paper presents an update on the APAC TBO Pathfinder Project which was initiated under the Asia Pacific Air Navigation Service Provider (ANSP) Committee (AAC) to determine the pathways to harmonise implementation planning towards operationalisation of the ICAO global TBO concept in the Asia and Pacific (APAC) regions. The project will build on ongoing efforts to accelerate development and deployment of the mature building blocks of TBO including System Wide Information Management (SWIM) and Flight and Flow Information for a Collaborative Environment Release 1 (FF-ICE/R1) in APAC, and to advance the development of future releases of FF-ICE and the Connected Aircraft concept by adopting a discovery approach through tabletop exercises, laboratory demonstrations and trials.

1. INTRODUCTION

1.1 The APAC TBO Pathfinder Project was initiated under the APAC ANSP Committee involving States / ANSPs, CANSO and IATA. The ANSPs of China, Indonesia, Japan, New Zealand, Philippines, Singapore, Thailand, United States of America, Viet Nam, along with Ministry of Land, Infrastructure and Transport of the Republic of Korea, CANSO and IATA, have agreed to work towards harmonising and accelerating implementation of the ICAO global TBO concept in the APAC region. 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 as well as feasible roadmaps to operationalise TBO in APAC within this 4-year project. This would allow the APAC ATM stakeholders to harmonise their planning and modernisation efforts to improve flight and overall air traffic management efficiency across the region.

1.2 The APAC TBO Pathfinder Project organised its first kick-off meeting from 3 – 5 April 2024, where participants shared about their TBO deployment plans with its enablers, including SWIM, FF-ICE and Connected Aircraft concept. Exchanges during the kick-off and numerous past virtual meetings and over email, culminated into an agreement on the goals, high-level deliverables and associated timelines. Three workgroups (WG) were formed to focus on specific goals and deliverables, as follows:

a) Goal 1 (to be driven by WG1)

Achieve a **common understanding of the ICAO global TBO concept, including its enablers and deployment timelines,** for project participants and for APAC ATM stakeholders.

b) Goal 2 (to be driven by WG2)

i) Using identified TBO scenarios based on APAC city-pairs, recognise and assess operational values. Table-top exercises, lab demonstrations, and live flight demonstrations will be executed based on a tiered level of participation;

ii) Implement **SWIM** for the first operational use case in the region; and

iii) Implement **initial FF-ICE/R1 services** for the selected set of city-pairs under ii(a) and in conjunction with the work planned for under ICAO APAC FF-ICE Ad-hoc Group.

c) Goal 3 (to be driven by WG3)

Explore, agree on, and document metrics and evaluation methodologies in support of **benefit assessment** of regional TBO scenarios, and achieve **consensus** to operationalise TBO and its enablers in APAC in alignment with regional needs and ICAO global plans.

2. DISCUSSION

2.1 The 3 workgroups have since progressed on their respective scope of work with the following updates:

WG 1 – Learning and Advocacy

2.2 WG1 identified effective communication to TBO stakeholders' leadership and executives as a key priority supporting modernisation and harmonisation of air navigation planning and implementation in the APAC region, as it is critical to secure necessary resource commitments. WG1 has developed a draft education framework to engage and inform technical, operational and executive leadership across ATM stakeholders about TBO concept and its importance to the region, comprising of the below topics:

a) Introduction of TBO concept

b) Benefit of TBO

c) Requirement for TBO implementation

d) Aviation stakeholder discussion

e) Airline's perspective

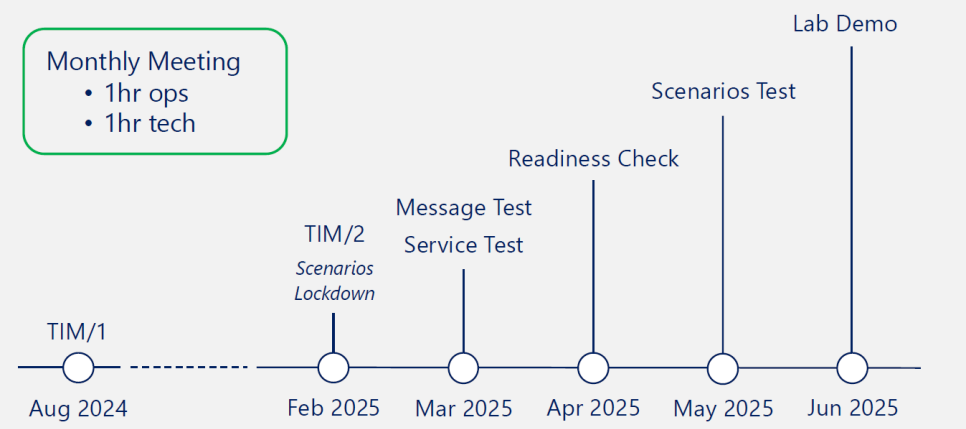
f) Summary of past trials and lessons learnt

2.3 A repository will also be established to support easy access to information and continuous learning by APAC ATM stakeholders with a target launch in February 2025.

WG 2 – TBO trials and Capabilities Built-up

2.4 WG2 conducted a technical interchange meeting (TIM), from 5 – 8 Aug, focusing on identifying the operational values for APAC region, in preparation of the conduct of the FF-ICE/R1 lab demonstration in June 2025. At the TIM, participants collaboratively worked on operational scenarios e.g. Guam → Bangkok, Tokyo → Bangkok, Bali → Bangkok, Auckland → Singapore and Bali → Singapore. The WG 2 participants also discussed on the tiered level participation for the FF-ICE/R1 lab demonstration. While a tiered participation will be available to allow greater participation, participants are encouraged to actively participate by readying their technical capabilities within the 4-year project.

2.5 The WG 2 participants also discussed on the SWIM connectivity and shared examples on the implementation of some FF-ICE/R1 services. The planned timeline for the upcoming WG 2 activities is as follows, which included a monthly check-in:



2.6 To avoid duplication in the deployment of mature enablers, WG2 has been coordinating and leveraging on the ongoing initiatives conducted by the ICAO APAC SWIM Task Force (SWIM TF) and ICAO APAC FF-ICE Ad-hoc Group.

WG 3 – Benefit Analysis and Realisation Roadmap

2.7 WG3 conducted a virtual meeting on 2nd July to discuss on the possible approach to select metrics for the purpose of evaluating benefits for TBO use cases. The group agreed that the GANP KPIs would be a good reference and will discuss customisation of metrics that is needed to isolate the benefits of TBO. The group also recognised the need to understand current operations in order to identify areas which would benefit from TBO.

2.8 As such, the group agreed that the first step would be to conduct an analysis of historical trajectories and delay data to identify operational inefficiencies in the current environment. The group also agreed to explore data sharing so that end-to-end trajectories for selected city pairs could be analysed. This initial analysis will be performed on a small sample from recent months (e.g., 1 week from 2024) for analysts to get familiar with data and methodology, and to identify and resolve critical data gaps.

2.9 In support of the work of WG2, WG3 will document and elaborate on the operational values of interest to the APAC region which was identified during the TIM.

Conclusion

2.10 Within APAC, it is expected that there would be different levels of readiness and the ability to manage air traffic within a mixed-mode environment would be essential. While this is so, States and

Regions should focus on expediting the planning and implementation of mature TBO technical enablers whilst ICAO continue in their work to focus on regional and global implementation harmonisation.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the progress of TBO development and harmonisation efforts in APAC;

b) encourage States and ANSPs to commit resources to participate in the APAC TBO Pathfinder project which would lead to harmonisation of TBO in APAC;

c) consider inclusion of the TBO realisation roadmap into the next update of the APAC Seamless ANS Plan; and

d) discuss any relevant matters as appropriate.

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