



ICAO

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Thirty-Fifth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/35)

Bangkok, Thailand, 25 to 27 November 2024

Agenda Item 3: Performance Framework for Regional Air Navigation Planning and Implementation

3.2: ATM

COLLABORATIVE APPROACH FOR THE DEVELOPMENT OF A ROADMAP TO IMPLEMENT TRAJECTORY-BASED OPERATIONS (TBO) IN ASIA AND PACIFIC (APAC)

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

SUMMARY

This paper presents the ongoing work by members of the APAC TBO Pathfinder Project initiated under the APAC Air Navigation Service Provider (ANSP) Committee (AAC) to determine pathways and coordinated planning towards implementation of the ICAO's TBO concept in APAC. This include implementing essential building blocks such as System Wide Information Management (SWIM) and Flight and Flow Information for a Collaborative Environment Release 1 (FF-ICE/R1).

The primary output expected is a TBO implementation roadmap that takes into consideration varying levels of implementation readiness. It is expected that this implementation roadmap could be used for incorporation into the next edition of the ICAO APAC Seamless ANS Plan. It will provide States/Administrations in APAC with a pathway towards the deployment and implementation of TBO and meeting future performance requirements.

Strategic Objectives:

B: *Air Navigation Capacity and Efficiency* — Increase the capacity and improve the efficiency of the global aviation system

1. INTRODUCTION

1.1 The ICAO global concept for Trajectory-Based Operations (TBO) is a paradigm change for air traffic management (ATM) where flight trajectories are shared, maintained and used by all ATM stakeholders through all phases of flight. TBO is envisaged to improve the predictability of aircraft movement, flight efficiency, operator flexibility, and potentially enhance optimisation of available capacity. This paper updates the progress that has been made in APAC on the planning and implementation of TBO.

1.2 Under the APAC ANSP Committee (AAC), the APAC TBO Pathfinder Project commenced in October 2023 for an initial period of four years. The project involves ANSPs of China, Indonesia, Japan, New Zealand, Philippines, Republic of Korea, Singapore, Thailand, United States of America, Viet Nam, along with CANSO and IATA. Apart from the project members, the ANSPs of Australia and Hong Kong, China also participate as observers. Members of the project agreed to work on harmonised and expedited implementation of the ICAO global TBO concept in APAC. With operational scenarios that are collaboratively identified as important and of high value for the region, the project will provide greater clarity on the expected TBO benefits for all involved stakeholders. Consequently, these will help the project participants put together and agree on a roadmap to implement TBO in the region. Additionally, it would allow ATM stakeholders in APAC to synchronise their planning and modernisation efforts to improve overall flight and air traffic management efficiency across the region.

1.3 The project builds on ongoing efforts to expedite the implementation of the two essential TBO building blocks, SWIM and FF-ICE/R1, in APAC. These efforts are aligned with the outcomes from:

- AN-Conference/14 Recommendation 3.1/3: Enabling successful deployment of trajectory-based operations;
- AN-Conference/14 Recommendation 3.2/2: Transition to flight and flow information for a collaborative environment services and cessation of ICAO 2012 flight plan by 2034;
- Conclusion from APANPIRG/33/9: Asia-Pacific SWIM Implementation Timeframe and Inclusion of the Asia/Pacific SWIM Implementation in the Asia/Pacific Seamless ANS Plan; and
- Draft Conclusion from ATM/SG/12-3: Agree on the Adoption of FIXM Ver. 4.3.0 in Asia Pacific Region as the Standard Format.

2. DISCUSSION

2.1 To deliver its anticipated benefits, TBO needs to be developed and deployed in a synchronised manner. Due to varying levels of implementation readiness anticipated within APAC, an agreed roadmap to implement TBO in APAC is necessary.

2.2 As such, the APAC TBO Pathfinder Project formed three workgroups (WG), each focused on progressing specific goals and deliverables:

- WG1 – Learning and Advocacy
 - a) Collate materials within a repository to facilitate **common understanding** of ICAO Global TBO concept for project participants and stakeholders
- WG2 – TBO Trials and Capabilities Build-up
 - a) Recognise and document **operational values** arising from demonstrating identified regional TBO scenarios and city-pairs
 - b) **Utilise SWIM** for 1st operational use case in the region
 - c) **Utilise initial FF-ICE/R1 services** for the identified regional TBO scenarios and city pairs
- WG3 – Benefit Analysis and Realisation Roadmap
 - 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

2.3 It is envisaged that a major output of the APAC TBO Pathfinder Project would include a regional TBO implementation roadmap, taking into account the stages of developments, plans, and implementations of key building blocks such as SWIM, FF-ICE and Connected Aircraft etc. It is envisaged that the preliminary version of the roadmap will include SWIM and FF-ICE, and subsequent versions will include Connected Aircraft and other building blocks. Project participants will investigate and validate readiness and plans through joint research, table-top exercises, laboratory demonstrations, and/or live demonstrations. The implementation roadmap could be deliberated at APANPIRG for its consideration and further works by relevant contributory bodies, with the aim for it to be incorporated in the ICAO APAC Seamless ANS Plan.

2.4 As such, it would be timely to consider the need for the various APANPIRG contributory bodies, in coordination with AAC, to collaboratively develop an integrated implementation strategy on TBO, with the roadmap to implement TBO in APAC as a starting point.

3. ACTION BY THE MEETING

3.1 The Meeting is invited to:

- a) note the progress of the APAC TBO Pathfinder Project and the APAC ANSP Committee (AAC) including the envisaged output of an implementation roadmap for APAC TBO for eventual deliberation at APANPIRG; and
- b) encourage States and International Organisations to participate actively in the APAC TBO Pathfinder works.

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