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)

PROGRESS UPDATE OF THE ICAO ASIA PACIFIC FLIGHT AND FLOW INFORMATION FOR A COLLABORATIVE ENVIRONMENT (FF-ICE) AD HOC GROUP

(Presented by Singapore on behalf of Hong Kong China, Japan, New Zealand, Singapore, Thailand, and United States)

SUMMARY

This paper presents the outcomes of the ICAO Asia Pacific (APAC) Flight and Flow Information for a Collaborative Environment (FF-ICE) Ad hoc Group workshop with tabletop exercise conducted from 18 to 21 June 2024.

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 Asia Pacific (APAC) Flight and Flow Information for a Collaborative Environment (FF-ICE) Ad hoc Group held its inaugural workshop with tabletop exercise (TTX) at the ICAO APAC Regional Office in Bangkok, Thailand from 18 to 21 June 2024. The workshop was attended by 45 participants from 10 States/Administrations and International Organisation[1], as well as FlightKeys[2], a commercial flight planning service provider. The workshop materials can be accessed at https://www.icao.int/APAC/Meetings/Pages/2024-FF-ICE-and-WS-with-TTX.aspx.

1.2 The FF-ICE concept was developed to address the limitations and constraints of the current flight planning mechanism, commonly known as FPL2012 to support the information need for Trajectory Based Operation (TBO) environment. FF-ICE is a collaborative-decision making mechanism that enables dynamic flight information exchange and trajectory management among ATM stakeholders to achieve efficient coordination, better situational awareness and optimum ATM system outcome. ICAO has defined two releases of FF-ICE, with the first release (FF-ICE/R1) focusing on the pre-departure phase of flight and the second release (FF-ICE/R2) focusing on the post-departure phase.

[1] The workshop participants included Australia, Cambodia, Hong Kong China, Japan, Philippines, Singapore, Thailand, United States, Viet Nam, IATA and FLIGHTKEYS.

[2] FlightKeys provides flight planning services to airlines on the generation of optimized flight routes and filing of flight plans with ANSPs.

1.3 In October 2023, ATM/SG/11, agreed on **Decision ATM/SG/11-4** to establish an FF-ICE Ad hoc Group to progress the works related to FF-ICE/R1 in the Asia Pacific region. The ICAO APAC FF-ICE Ad hoc Group was tasked to:

a) Study the successful development of FF-ICE in other regions and States, and draw useful lessons; and raise the understanding of FF-ICE by sharing use case scenarios and business cases;

b) Develop the Asia Pacific regional FF-ICE operational requirements and related operational processes and procedures;

c) Provide guidance on capabilities required for mixed mode environment where both FF-ICE capable and non-FF-ICE capable airspace users and ATM service providers operate;

d) Develop a FF-ICE implementation strategy for the Asia Pacific region including timeframes and roadmap;

e) Coordinate and collaborate with APAC SWIM TF, review the development of FIXM revisions and if needed, propose FIXM extension amendments for regional adoption;

f) Recommend more ASBU elements for inclusion into the Asia Pacific Seamless ANS Plan, as they mature;

g) Submit inputs and recommendation to the ICAO ATM Requirements and Performance Panel (ATMRPP) when deemed necessary; and

h) Undertake any other tasks related to FF-ICE implementation that may arise in the future.

2. DISCUSSION

2.1 The workshop, through a series of presentations, discussions and a TTX, had taken the first step to achieving the deliverables of the ICAO APAC FF-ICE Ad hoc Group.

2.2 The workshop was set out to achieve the following key objectives:

a) **Raising the region's understanding of FF-ICE/R1.** There was comprehensive sharing on the global FF-ICE developments and training provided on the six FF-ICE/R1 services and required enablers. These sessions raised the participants' understanding of FF-ICE/R1 and the associated benefits and was well received by the participants. ANSPs and industry stakeholders also had the chance to share on their own FF-ICE/R1 experience for the collective learning of the group.

b) **Discover the regional FF-ICE/R1 operational requirements.** A tabletop exercise was conducted to simulate possible operational scenarios in both full FF-ICE/R1 and mixed mode environments. This provided participants the opportunity to witness FF-ICE/R1 use cases and think about the operational requirements for implementation of FF-ICE/R1 in their own context.

c) **Discuss the regional FF-ICE/R1 implementation strategy and timeline.** Discussions were initiated on transitioning from current FPL2012 to FF-ICE/R1 services and the considerations in a mixed mode environment. Some of the ANSPs also shared on their FF-ICE/R1 implementation plans and timelines. This was a first step to developing the region's FF-ICE/R1 implementation approach.

FF-ICE Overview

2.3 The workshop noted the ongoing work at the ICAO ATMRPP[3] to identify the FF-ICE services that will provide a more dynamic and integrated approach to managing air traffic. The workshop also noted the plans to sunset FPL2012 and was informed of the ICAO working paper that would be tabled for the ICAO Fourteenth Air Navigation Conference (AN-Conf/14) in August 2024 on the cessation of FPL2012 by 2034.

FF-ICE's role in TBO and Air Traffic Flow Management (ATFM)

2.4 The workshop noted the concerns on incorporating ATFM information into the FF-ICE response messages due to the dynamic nature of ATFM information and the challenge of elaborating detailed restrictions in a computer-readable format for trajectory determination. The workshop also noted the need for harmonized principles to resolve conflicting Calculated Take-Off Times (CTOTs) issued by multiple ANSPs.

FF-ICE/R1 Services Deep Dive

Globally Unique Flight Identifier (GUFI) and Filing Service Concerns

2.5 The workshop noted the need to further discuss on the mode of flight plan (FPL) dissemination in a mixed mode environment and the way of handling unaccepted eFPL[4] in the flight planning system. The workshop also noted the need for regional standardization in flight planning process to mitigate airspace users' challenges of flight planning across multiple States with varying FPL requirements.

Planning Service Concerns

2.6 The workshop noted the concerns about the impact of dynamic ATFM constraints on planning service, and the value of the planning service as compared to the trial service. Further regional discussions would be needed on the possibility of incentivizing airspace users to file preliminary flight plans (PFP).

Notification Service Concerns

2.7 The workshop noted the queries raised on the party responsible for sending departure and arrival messages in the FF-ICE environment. The workshop also identified the need for a regional database of aASP[5]/eASP[6] to ensure that messages in the correct formats were directed to the correct recipients. The workshop recognized the need to differentiate between FF-ICE notification messages and current ATS message notifications, and ensuring their reliable transmission to different parties.

FIXM Usage & Concerns

2.8 The workshop noted that the latest FIXM version 4.3.0 was to be used in the US and Europe for their FF-ICE/R1 implementation. The workshop also noted concerns regarding multiple regional FIXM extensions and the potential challenges faced by airspace user when filing to different regions.

[3] Air Traffic Management Requirements and Performance Panel.
[4] eFPL refers to filed flight plan exchanged using FF-ICE services.
[5] An aASP is an ATM Service Provider that is not capable of providing the mandatory FF-ICE services.
[6] An eASP is an ATM Service Provider that is capable of providing the mandatory FF-ICE services.

Tabletop Exercise

2.9 The workshop noted the questions regarding the FF-ICE/R1 message formats and fields, messages exchange workflow, and handling of various operational scenarios. The group would further discuss these templates and processes for regional harmonization.

Next Steps for FF-ICE/R1 Implementation

2.10 The workshop noted the invitation to participate in the Technical Interchange Meeting (TIM) of the APAC TBO Pathfinder Workgroup 2 in August 2024. The TIM was completed with discussions regarding the operational scenarios and values, and technical requirements in preparation and support of conducting a FF-ICE/R1 demonstration by the first half of 2025.

Observations from the Workshop

2.11 The survey at the start of the workshop revealed that 67% of the participants had first heard about FF-ICE only after 2020. By the end of the workshop, majority of the participants had found the workshop and TTX most beneficial in reinforcing their understanding of the FF-ICE concept and the FF-ICE/R1 services workflow, and hence expressed increased confidence in implementing FF-ICE/R1 services after gaining this improved understanding.

2.12 During the ANSPs sharing segment, Japan, Singapore, Thailand, the United States, and Viet Nam shared their plans for FF-ICE/R1 implementation, which were all in a phased approach with initial services starting around 2025-2030. The rest of the States were in various stages of planning and seeking guidance for their implementation of the FF-ICE/R1 services.

2.13 The discussions on the operational requirements were valuable in eliciting various questions and considerations in different operational scenarios. These considerations would need to be factored in as the group progresses further in the implementation planning.

Conclusion

2.14 The workshop was successful in providing participants with a better understanding of FF-ICE/R1 concept and services, and opportunities for rich discussions on specific regional FF-ICE/R1 operational requirements. There were also initial discussions on the regional implementation strategy and sharing of initial implementation timelines by the various ANSPs.

2.15 Building on this workshop, the ICAO APAC FF-ICE Ad hoc Group has proposed a second workshop, tentatively in Q1 2025 to dive deeper into the regional operational requirements and procedures and discuss the documentation framework for the APAC FF-ICE/R1 implementation plan. The involvement of both operational and technical personnels in the second workshop would be crucial to provide States with a better understanding of the FF-ICE implementation requirements from an operational and systems perspective.

2.16 The ICAO APAC FF-ICE Ad hoc Group would work with the ICAO Secretariat on the provision of further information on the conduct of the second workshop nearer the date and integrating the APAC FF-ICE/R1 implementation plan to the APAC Seamless ANS Plan.

2.17 FF-ICE/R1 is a main building block of Trajectory Based Operations (TBO). The second workshop to discuss the APAC FF-ICE/R1 implementation plan including timelines and roadmap will be a key activity supporting future development, including planning towards TBO, of the APAC Seamless ANS Plan.

2.18 To ensure initial regional harmonization as APAC states plan for their FF-ICE/R1 implementation, the ICAO APAC FF-ICE Ad hoc Group recommends for the regional adoption of FIXM version 4.3.0 as the standard format in 2026 for the implementation of FF-ICE/R1 services.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information in this paper;

b) encourage States to participate in the 2025 ICAO APAC FF-ICE Ad hoc Group workshop to develop the FF-ICE/R1 implementation plan;

c) discuss and agree to the Draft Conclusion ATM/SG 12-X; and

d) discuss any relevant matters as appropriate.

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<table>
<tr><td colspan="3">Draft Conclusion ATM/SG/12-X: Regional adoption of FIXM 4.3.0 as the standard format in 2026 for the implementation of FF-ICE/R1 services</td></tr>
<tr><td colspan="2">What: That,
noting the need for harmonized implementation of FF-ICE/R1 services, State and Sub-Regional, to adopt FIXM 4.3.0 as the standard format exchange, from 2026 onwards.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To ensure regional harmonisation of FF-ICE/R1 services</td><td colspan="2">Follow-up: ☒Required from States</td></tr>
<tr><td>When: 27-Sep-24</td><td colspan="2">Status: Draft to be adopted by Subgroup</td></tr>
<tr><td colspan="3">Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other: XXXX</td></tr>
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