International Civil Aviation Organization

Thirteenth Meeting of the Asia/Pacific Air Traffic Flow Management Steering Group (ATFM/SG/13)

Bangkok, Thailand, 03 – 07 April 2023

Agenda Item 4: Review of Current ATFM Operations and Problem Areas

PROGRESS UPDATES FROM ASIA-PACIFIC CROSS-BORDER MULTI-NODAL ATFM COLLABORATION (AMNAC)

(Presented by China, Hong Kong China, Singapore, Thailand, CANSO, and IATA)

SUMMARY

This paper presents the progress update of the *Asia-Pacific Cross-Border Multi-Nodal ATFM Collaboration (AMNAC)*, a collaborative effort by Air Navigation Service Providers (ANSPs) from States/Administrations in the Asia/Pacific region to implement cross-border ATFM. This paper discusses recent updates from the project, including network post-operations analysis, key outcomes from the recent AMNAC meeting, an update on the SWIM-based ATFM information exchange trial, and reminder to stakeholders to participate in the routine *APAC Bi-Weekly ATFM Web Conference* which serves as a regional CDM platform. This paper also seeks opinions and experience from States/Administration on conflicting ATFM measure resolution and quantitative analysis of ATFM benefits.

1. INTRODUCTION

1.1 The **Asia-Pacific Cross-Border Multi-Nodal ATFM Collaboration** (**AMNAC**) has been ongoing since 2015, laying down the foundation for cross-border ATFM in the region under the concept of *Distributed Multi-Nodal ATFM Network*. The concept, upon which the Asia/Pacific Regional Framework for Collaborative ATFM was founded, is based on a network of *ATFM Nodes* responsible for demand-capacity balancing within their area of responsibility while being connected to the network's information exchange infrastructure. The ATFM operations in each node will be based on regionally agreed principles and high-level operating procedures, with local adaptations as necessary.

1.2 The focus for this collaboration has been on building the infrastructure for information exchange and developing the common operating procedure for member ANSPs to use **Ground Delay Program (GDP)** to balance traffic demand against ATM capacity under distributed ATFM environment. To enable participation by ANSPs of varying readiness levels, AMNAC has adopted a tiered level participation model for the work as shown in **Table 1**.

Tiered Level	Capabilities
Level 3	▪ Able to generate, deliver, and receive CTOTs ▪ Able to comply with CTOTs from all Level-3 ATFM Nodes *Current members:* ▪ *Cambodia, China, Hong Kong China, Singapore, Thailand*

Tiered Level	Capabilities
Level 2	▪ Able to comply with CTOTs from all Level-3 ATFM Nodes *Current members:* ▪ *Indonesia, Malaysia, Myanmar, the Philippines, Viet Nam*
Level 1	▪ Observe and participate in the project's progress *Current members:* ▪ *Lao PDR*

Table 1 - Tiered Participation in AMNAC

1.3 AMNAC core member ANSPs (AMNAC Core Team) have been reporting project progress at various forums over the years through their States/Administrations, including the regular meeting of the Air Traffic Flow Management Steering Group (ATFM/SG). This working paper continues the progress report, focusing on the network post-operations analysis and outcomes from recent project meeting.

2. DISCUSSION

Network Post-Operation Analysis

2.1 As previously reported, the AMNAC Core Team had developed a network post-operations analysis portal to track the impact of and compliance to GDPs activated over time as part of the AMNAC initiative. The aim of the portal is to quantitatively identify problem areas to be addressed, which is important for the continuous enhancement of ATFM, and is not intended to "name and shame" members who did not achieve high level of performance.

2.2 The network post-operations analysis is a web-based portal updated based on data submitted by ATFM Units from Level-3 members every 3 months. The portal is maintained by Thailand and can be accessed at **https://bit.ly/amnac-poa**.

2.3 Based on the data up to December 2022, the following key observations can be made:

a) From 2019 onward, a majority (> 90%) of flights with assigned CTOTs departed from aerodromes under the jurisdiction of Level-2 and Level-3 ATFM nodes, signifying that CTOT compliance facilitation should be provided for most flights.

b) The COVID-19 pandemic resulted in significant traffic downturn and sharp reduction in the need for GDPs between 2020 and early 2022. However, an increasing number of GDPs have been activated in recent months in response to traffic congestion. This corresponds well with the rise of traffic demand as the pandemic wanes and travel restrictions are lifted. Additionally, "zero-delay" GDPs continued to be facilitated by Hong Kong China with participation from both AMNAC and East Asia ATM Coordination Group (EATMCG) members (Japan and Republic of Korea).

c) While flights' compliance to CTOTs – especially those issued by Thailand and Hong Kong China – were generally good (70% - 90%), there were still instances of low compliance such as during the Singapore-initiated GDP for Singapore Air Show 2022 (the average compliance rate was 47.6%).

2.4 In the network POA portal, under "Filtered Compliance" tab, a chart is provided to show CTOT compliance rates by ANSPs over time. This can be useful to identify trends of CTOT compliance facilitation, therefore allowing problem areas to be addressed.

2.5 As air traffic begins to return with the expectation for GDPs to become more frequent, the necessity to support cross-border ATFM operations to optimize ATM capacity and enable efficient flow of traffic in the Asia/Pacific region becomes more critical. States/Administrations are encouraged to upkeep their ATM units' familiarity with the ATFM procedure and their readiness to support possible GDPs and other ATFM measures as the region rebounds from COVID-19 pandemic.

Key Outcomes from AMNAC/19

2.6 In January 2023, Thailand hosted the 19th Meeting of AMNAC (AMNAC/19) in Bangkok, with some participants attending virtually. The meeting was the first in-person gathering of AMNAC members since the start of the pandemic, and provided an opportunity to discuss several key topics including:

a) A refresher of AMNAC Common Operating Procedure (COP),

b) A review of ATFM strategic and operational points of contact, and the Standard Taxi-out Times (STT) used for CTOT calculation,

c) An exchange of ATFM implementation updates and operations/trials among AMNAC members, and

d) An update of the technical development for ATFM-on-SWIM by AMNAC Technical Subgroup.

2.7 One of the topics discussed was the resolution of conflicting ATFM measures, e.g., a flight being assigned several differing CTOTs from several ATFM units. The group agreed to the principle of facilitating such flight to comply with the most penalizing CTOT (i.e., CTOT with the highest ATFM delay) and ensuring it is exempted from other CTOTs through a Collaborative Decision Making (CDM) process. This is accepted as an interim procedure until an enhanced data and expanded information exchange infrastructure – possibly SWIM-based – and a more automated negotiation process become available.

2.8 The meeting also discussed the need for further quantitative exploration of fuel savings and emission reduction benefits from ATFM operations. The benefit analysis will serve as a motivation for ANSPs and airspace users to better comply with the ATFM measures. The group recognized the complexity of such quantitative analysis, however, as "what-if" modeling will likely be required to reasonably estimate the savings that would otherwise be lost had ATFM measure not been implemented. The AMNAC core team agreed to work together to develop and include an interim fuel-saving benefit analysis until the development of a more comprehensive analysis tool for use in future Post-Operations Analysis process.

2.9 Additionally, the meeting agreed to require AMNAC members planning to upgrade their participation level to a Level-3 to conduct GDP operational trials with the AMNAC Core Team and, if appropriate, other AMNAC members. The trials will allow other AMNAC members to familiarize with the upgrading member's system and interface, enabling a smooth transition and effective operational implementation.

2.10 As part of the AMNAC/19 meeting, a one-day workshop on the revised *Asia/Pacific Regional Framework for Collaborative ATFM v4.0* was organized with support from the ICAO Asia/Pacific Regional Office and Regional Sub-Office (ICAO APAC RO & RSO). The workshop was designed for ICAO APAC to brief AMNAC members on the revised Framework and for the members to ask questions, share opinions, and engage with ICAO APAC on the revised document. The workshop was well-received by members, and several points were discussed. Meeting participants were requested to bring any suggestions for further amendment of the Framework to the ATFM/SG/13 for discussion.

2.11 The AMNAC Core Team would like to take this opportunity to thank ICAO APAC RO & RSO once again for their support of the workshop.

Technical Updates

2.12 To enhance the effectiveness of AMNAC cross-border ATFM information exchange and communication, the AMNAC Core Team had established the Technical Subgroup to drive the development of SWIM-based communication infrastructure which would enable "ATFM-on-SWIM" operations in the region. The Technical Subgroup has been supporting the work of ICAO Asia/Pacific SWIM Task Force (SWIM TF) in this area, with the most notable recent accomplishment being the development of an extension to the Flight Information Exchange Model v4.2 (FIXM v4.2 Extension) that would support cross-border ATFM, A-CDM, ATFM/A-CDM integration as well as the future concept of traffic synchronization and FF-ICE/TBO.

2.13 An ATFM information exchange trial via SWIM technical infrastructure over the region's Common aeRonautical VPN (CRV) is expected to commence in the second quarter of 2023 (Q2/2023). The trial will focus on CTOT distribution, revision, and cancellation use cases. This trial will also illustrate how existing ATFM related information that are sent via Aeronautical Fixed Telecommunication Network (AFTN) using Slot Allocation Message (SAM), Slot Revision Message (SRM) and Slot Cancellation Message (SLC) can be converted into FIXM format (based on FIXM v4.1 with APAC Extension) and exchanged via SWIM. In the trial, the Globally Unique Flight Identifier (GUFI) will also be included for exchange. **Figure 1** (below) shows a high-level graphical illustration of the trial setup:

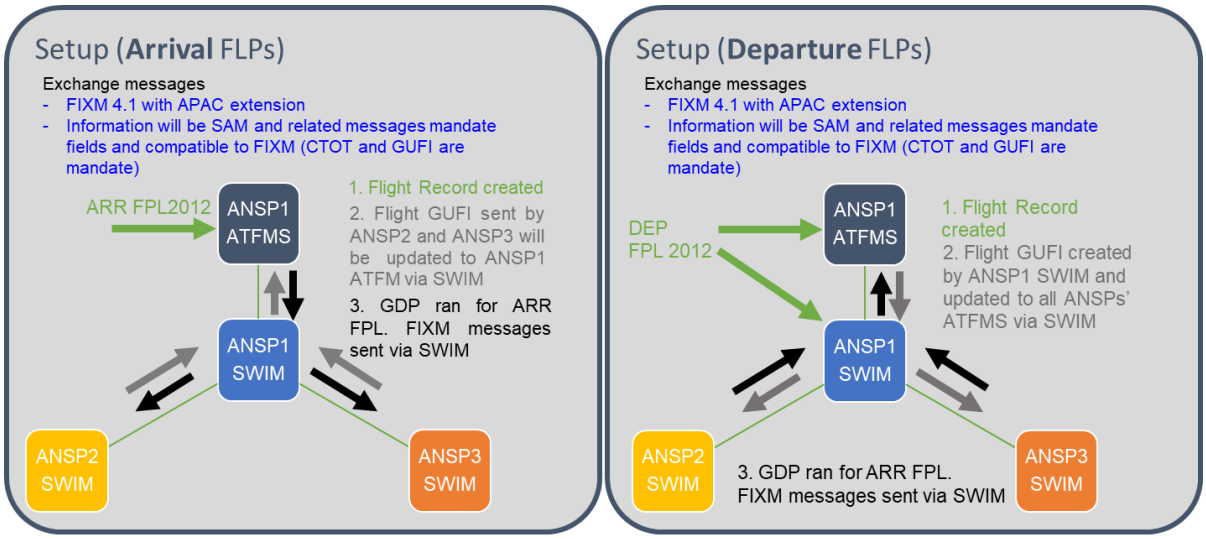

Figure 1: ATFM-on-SWIM over CRV Trial Setup

Reminder: APAC Bi-Weekly ATFM Web Conference

2.14 The AMNAC Core Team also wishes to remind States/Administrations of the routine **APAC Bi-Weekly ATFM Web Conference** being held **every 2 weeks on Thursdays at 0800 UTC**. The web conference is hosted on a rotational basis by Hong Kong China, Singapore, and Thailand, and has been a primary platform at which key regional updates such as ATM capacity limitations and possible ATFM measures are discussed. Updates on current traffic demand in comparison to pre COVID-19 traffic movements are also provided by participating States/Administrations to increase awareness of the recovery of regional air traffic post-pandemic. Information shared during the web conferences are consolidated into the network **ATM/ATFM Status Update** document, an updated version of which is currently hosted on the regional **COVID-19 information sharing webpage**.

2.15 States/Administrations are invited to continue participating in the routine APAC Bi-Weekly ATFM Web Conference, as it is a platform at which timely information can be exchanged across the network. This routine regional CDM platform will be of paramount importance as traffic demand returns to the region.

3. ACTION BY THE MEETING

3.1 The meeting is invited to

a) note the information contained in this paper;

b) continue to ensure local procedures to facilitate compliance with CTOT are established and practiced;

c) discuss the principle of resolving conflicting ATFM measures based on the most penalizing ATFM delay, and share opinions on the methods to carry out conflict resolution in a distributed environment effectively;

d) share knowledge and experience, if any, of quantitively analyzing fuel-saving and emission-reduction benefits from ATFM with the AMNAC Core Team;

e) note the requirement to conduct GDP trials prior to participating in AMNAC as a Level-3 member ANSP;

f) continue or begin participating in the routine APAC Bi-Weekly ATFM Web Conference on Thursdays every 2 weeks at 0800 UTC; and

g) discuss any relevant matters as appropriate.

…….