



*International Civil Aviation Organization*

**The Fifth Meeting of ICAO Asia/Pacific Air Traffic Flow Management Steering Group (ATFM/SG/5)**

Bangkok, Thailand, 30 March – 3 April 2015

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**Agenda Item 5: Development of Regional ATFM Framework**

**PROGRESS OF THE AIR TRAFFIC FLOW MANAGEMENT (ATFM) OPERATIONAL TRIAL**

(Presented by Australia, China, Hong Kong China, Indonesia, Malaysia, Singapore, Thailand, Viet Nam, CANSO, IATA and IFATCA)

**SUMMARY**

This paper continues with the update on the collaborative efforts among Australia, China, Hong Kong China, Indonesia, Malaysia, Singapore, Thailand and Viet Nam to conduct an Air Traffic Flow Management (ATFM) Operational Trial using the concept of the Distributed Multi-Nodal ATFM Network.

This collaborative project aims to enhance operational efficiency and optimize capacity through increased predictability and Demand-Capacity balancing which enables stakeholders to better manage operations. This initiative tries to pave the way for a regional harmonized Cross-Border ATFM solution for Asia-Pacific.

**1. INTRODUCTION**

1.1 Through the previous two meetings of the ATFM Steering Group (ATFM/SG/3 and ATFM/SG/4), States acknowledged the rapid and sustained increase in air traffic demand within the Asia Pacific region. Meanwhile some of the current measures to regulate air traffic flow by independently imposing minimum border-crossing interval / Miles in Trail / Minutes in Trail requirements to ANSP upstream may not be effective to smoothen the flow of traffic and achieve demand-capacity balance at constrained resources. In addition this may introduce unnecessary delays to flights which could have otherwise been avoided through a robust cross-border air traffic flow framework. It was recognized that an effective cross-border ATFM solution would be necessary to address the air traffic flow needs of the region.

1.2 The concept of the Distributed Multi-Nodal ATFM Network, conceived through the collaborative research project by Singapore and Airbus ProSky with operational inputs from Malaysia, Hong Kong, China and Thailand among other relevant stakeholders, was presented and endorsed at ATFM/SG/3 as a formulated Decision:

***ATFM/SG Decision 3/1: Distributed Multi-Nodal Networked ATFM Concept***

*That, the distributed multi-nodal networked ATFM concept be considered as a viable foundation to be incorporated into the regional ATFM framework for the development and implementation of ATFM for the Asia/Pacific Region, taking into account the guidance of ICAO Doc 9971.*

1.3 Further, at ATFM/SG/4, IATA presented the outcomes of a study into regional flow management and resulting recommendations; leading to the following Decision being adopted:

***ATFM/SG Decision 4/1: Asia-Pacific Regional ATFM Concept of Operations and Timeline***

*That, the Asia-Pacific Air Traffic Flow Management Steering Group:*

- *Adopts the Multi-Nodal ATFM Concept of Operations as the foundation for the Regional Concept of Operations/Implementation Strategy for regional cross-border ATFM implementation; and,*
- *Confirms 8 November 2018 as the target date for regional cross-border ATFM implementation, for inclusion in the performance objectives of the Regional Framework for Collaborative ATFM, in alignment with ASBU and the APAC Seamless ATM Plan);*

1.4 Following the concept development, several States have embarked on a collaborative ATFM Operational Trial based on the Distributed Multi-Nodal ATFM Network concept with support from ICAO, IATA, ACI, CANSO, EU-AATIP and IFATCA. The Operational Trial is planned to commence in June 2015. A phased approach will be adopted to initially address demand capacity balancing at airports and subsequently in the airspace as appropriate. This approach allows for timely commencement of the Operational Trial and room for further expansion as the trial progresses into subsequent phases.

## **2. DISCUSSION**

2.1 Thus far the Distributed Multi-Nodal ATFM Operational Trial Project has progressed over the year through four Project Meetings and two Airlines Focus Group Meetings. Progress update from the first two Project Meetings and the first Airlines Focus Group Meeting was presented at the previous ATFM Steering Group meeting (ATFM/SG/4 - WP/05). **Attachment A** and **Attachment B** to this paper outlines the participation requirement for ANSPs and Airspace Users following the Tiered Participation Level approach discussed there (ATFM/SG/4 - WP/05, para. 2.13). This working paper continues to provide further updates from the most recent meetings.

### Multi-Nodal / 3 Project Meeting

2.2 Following the first two Project Meetings and an Airlines Focus Group Meeting (progress reported through ATFM/SG/4 - WP/05), the third ATFM Operational Trial Project Meeting (Multi-Nodal / 3) was held in conjunction with the Airlines Focus Group Meeting on 28 – 29 January 2015 in Yogyakarta, Indonesia. A one-day seminar on Collaborative ATFM/CDM Implementation was conducted prior to the meeting. This allowed the opportunity to provide necessary ATFM foundations for new members. Following the seminar, discussion took place on the preparatory details for trial commencement. Several key topics were discussed including the ATFM workflow, ATFM Operational Trial arrangement and stakeholder communications.

2.3 The meeting discussed the ATFM Workflow for the ATFM Operational Trial. It was agreed that the process should, for the initial phase, be simple to understand and implement. To ensure conformance to industry standards, CTOT distribution to relevant stakeholders will take place no less than 2 hours before EOBT. This is in line with the discussion during the previous project meeting (Multi-Nodal / 2). It was also agreed that the communication of CTOT and/or other ATFM-related information will follow standard industry practice. This includes the use of ATFM messages selectively adapted from EUROCONTROL’s template (ADEXP Standard supplemented by EUROCONTROL ATFM User Manual) for cross-border suitability. Further details surrounding workflow and operational information dissemination would continue to be developed.

2.4 To further refine the structure of the ATFM Operational Trial so as to yield the most informative outcomes, the meeting acknowledged the need to develop operational scenarios to be tested. These operational scenarios would provide comprehensive insight on capacity-impacting situations and how ATFM measures could be efficiently handled to achieve demand/capacity balance. To create the appropriate scenarios for the ATFM Operational Trial, each participating ANSP would assess traffic characteristics at their participating major airports and potential coverage of flights given different time horizons in which ATFM measures are effective; building the specific time horizons into ATFM Operational Trial Scenario including (1) Demand-Capacity balance impact situation, (2) Impacting time and (3) Impact estimation and ATFM measure required. A sample preliminary ATFM Operational Trial Scenario is included in **Attachment C**.

2.5 It has been recognized that the percentage of flights included in an ATFM measure directly impact equitability in delay absorption. Thus, to ensure equitability and confidence in the ATFM initiative, participating Airspace Users (“Member” airlines) will follow the requirements as per Annex B and will receive advanced CTOT notification for pre-flight planning, whereas Non-Participating Airspace Users (“Non-Member” airlines) will be subjected to conventional tactical flow measures such as MDI or MIT / MINIT on shorter notice, possibly with insufficient pre-planning time. This distinctively emphasizes the advantage of active participation by Airspace Users to obtain advanced CTOT restrictions for enhanced operational planning which could potentially optimize flight operations. Exemption from ATFM measures will be in accordance to special flights such as Humanitarian, Emergency, Medical Evacuation and Head-of-State flights as referenced to ICAO Doc 9971.

2.6 The meeting had further discussion on the phased approach (1.4) to the ATFM Operational Trial with greater emphasis on the first phase. To ensure a structured execution of the trial, a multi-staged approach will be adopted. Essentially starting with three stages as follows:

- a) Stage 1: Testing of communication linkage, monitoring of traffic demand prediction effectiveness, testing of CDM process between stakeholders, and an exercise to simulate CTOT workflow.
- b) Stage 2: Implementation of CTOT in real operations, albeit under predefined / preselected time period and scenario as well as real capacity-impacting situations.
- c) Stage 3: Introduction of slot swapping mechanism

Further detail of this plan will continue to be developed, ensuring smooth commencement of the ATFM Operational Trial.

2.7 To support the trial, Airservices Australia agreed to develop Business Rule for the ATFM Operational Trial, while maintaining the assumption that ATFM User Manual would be developed for each participating ANSPs based on the common Business Rule.

2.8 The importance of having a clear picture of participation capabilities among member stakeholders was also reiterated, and the Participation Level model previously discussed in para 2.1 was reviewed. The meeting tasked each participating ANSP to assess capabilities and select their appropriate Participation Level for the commencement of the ATFM Operational Trial, with a view that this selection can be changed as their capabilities are developed progressively in the future. It should also be noted that, within a single ANSP, there could be varying levels of participation at different aerodrome control units / ATC towers based on readiness and necessity.

2.9 The meeting recognized the importance of awareness on the part of all stakeholders for this initiative. For stakeholder communications, the meeting agreed to consider the use of AIP Supplement and/or AIC for general information along with weekly NOTAMs to specify time period during which ATFM Measure will be applied. To aid in building further mutual understanding among all stakeholders involved, an “awareness package” may also be developed prior to the trial commencement.

Multi-Nodal / 4 Project Meeting

2.10 Further to the previous meetings and teleconferences among core Point of Contacts (POCs), the fourth ATFM Operational Trial Project Meeting was held on 26 - 27 March 2015 in Bangkok, Thailand. The meeting continued to tackle several outstanding points of discussion and action items in preparation for the trial commencement. Progress update from this meeting will be added as **Attachment D** to this paper following the briefing at ATFM/SG/5.

ATFM Operational Trial Effort Continuation

2.11 The ATFM Operational Trial preparations will continue to progress with series of monthly meetings between members and teleconferences between core POCs. This will allow the group to continually refine the process and prepare capabilities to ensure smooth commencement of the trial. Progress of the work will continue to be shared at all relevant forums to provide updates to the larger aviation community in the region.

2.12 With the Distributed Multi-Nodal ATFM Network concept adopted as the foundation of Regional ATFM Concept of Operations, the ATFM Operational Trial aims to set the stage for harmonized regional cross-border ATFM operations in Asia-Pacific and is a crucial step toward the implementation of Asia-Pacific Seamless ATM Plan.

**3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) urge States to accord priority to this ATFM Operational Trial in developing a regional cross-border ATFM solution; and
- c) discuss any relevant matters as appropriate.

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**ATTACHMENT A – Tiered Participation Level for ANSPs**

*Note:* Outside ATFM Ops Trial ANSPs may already have been asked to support ATFM Operations through Minimum Departure Intervals between flights or providing longitudinal separation between flights such as Miles-in-Trial or Minutes-in-Trial

**Level 1 – Observe Trial (includes Level 0)**

- Participate in CDM/ATFM Meetings
- Participate in Operational Trial Planning process

**Level 2 – Facilitate CTOT for Departures (includes Level 0 and 1)**

- Receive CTOT for departure to other Demand-Capacity imbalance airports
- Facilitate airline operator CTOT compliance for departing flights

**Level 3 – Demand-Capacity Balancing Capability (includes Level 0,1 and 2)**

- Evaluate Traffic Demand
- Evaluate and update Airport Acceptance Rate (AAR)
- Distribute CTOT to airline operators and ANSPs

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**ATTACHMENT B – Tiered Participation Level for Aircraft Operators**

**Level 1 – Participate in the Observe Trial**

- Receive CTOT for departure to other Demand-Capacity imbalance airports
- Manage flight operations and coordinate with ATCs and Airport Operators to achieve CTOT compliance for departures
- Participate in the ATFM / CDM Operational Trial Project and Focus Group meetings
- Participate in the Operational Trial planning process

**Level 2 – Slot Swapping and CTOT User Inputs (includes Level 1)**

- Optimize flight operations through slot swapping and CDM process
- Provide CTOT User to ATFM portal (advanced Operational Trial – later phase)
- Evaluate and update on outcomes of ATFM measures
- Refine CDM process for optimized flight operations

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**ATTACHMENT C – Draft ATFM Operational Trial Scenario**

*1) Demand-Capacity Balance Impact Situation*

Typhoon is passing at 150 NM south of Hong Kong from East to West, strong crosswind affecting Hong Kong International Airport (VHHH)

*2) Impacting Time*

- a. Impacting Time: 1100-1500UTC
- b. Applicable Event Forecast: 0300UTC

*3) Impact Estimation and ATFM Measure Required*

- a. AAR reduced from 29 movements/hour to 24 movements/hour during the event
- b. Ground Delay Program using CTOT required for arriving flights due to excessive demand anticipated from Flight Plan received

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**ATTACHMENT D** - Updates from the 4<sup>th</sup> Distributed Multi-Nodal ATFM Operational Trial Meeting  
(Multi-Nodal/4)

- Stakeholder participation in the ATFM Operational Trial evolved from independent ANSPs, Airlines, Airport Operators into ATFM Nodes which provide more coherent linkage among individual ANSPs, Airlines and Airport Operators
- ATFM Node Participation Level confirmed
  - o *Level-3 ATFM Nodes*: Generate, deliver and comply to CTOT
    - China, Hong Kong China, Singapore, Thailand
  - o *Level-2 ATFM Node*: Receive and comply to CTOT
    - Malaysia
  - o *Level-1 ATFM Node*: Observers
    - Australia\*, Cambodia, Indonesia, Viet Nam
  - o Note\*: Australia ATFM Node is Level-3 capable, providing consultative and contributory role for the purpose of the ATFM Operational Trial, leading development of Harmonized Business Rule
  - o Airline participate as part of each respective ATFM nodes with readiness for advanced CTOT management
  - o Airport Operators participate as part of each respective ATFM nodes, benefiting from enhanced situational awareness to optimize aircraft stands occupancy
- ATFM Operational Trial has become more defined with provisional timing and scope of each stage, as follows:

<b>Phase 1: Distributed ATFM for Airport Arrival Constraints (Jun 2015 – Jun 2016)</b>		
<b>Stage 1: CTOT Communications</b> (Jun – Sep 2015) Ensure proper CTOT communication flow among ATFM Nodes and stakeholders	<b>Stage 2: CTOT Adherence</b> (Oct 2015 – Jan 2016) Initial ATFM operations under scripted scenarios with provisions of addressing ad-hoc demand-capacity imbalance	<b>Stage 3: Advanced CTOT Management</b> (Feb – Jun 2016) More complex ATFM operations including CTOT revisions, cancellation and improvements
<b>Phase 2: More Advanced Distributed ATFM</b>		
- Consider airspace constraints		

- Efforts are being focused on Phase 1, Stage 1 ATFM Operational Trial which includes
  - o Harmonized Business Rules
  - o More detailed ATFM Communication Network Map including ATFM Message Format & Communications Framework`
  - o Stakeholder Educational Package
  - o ATFM Nodes to ensure readiness for ATFM Operational Trial participation
- Next Meeting: 29-30 Apr 2015 – Singapore