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**ASSEMBLY — 39TH SESSION**

**TECHNICAL COMMISSION**

**Agenda Item 36: Aviation safety and air navigation implementation support**

**ASIA/PACIFIC DISTRIBUTED MULTI-NODAL CROSS-BORDER AIR TRAFFIC FLOW  
MANAGEMENT (ATFM) COOPERATION**

(Presented by the People's Republic of China)

**EXECUTIVE SUMMARY**

This document is intended to report on the progress in the distributed multi-nodal cross-border ATFM cooperation and the implementation plan for the next stage. Meanwhile, it invites other countries outside the Asia Pacific region to take part in the cross-border ATFM cooperation and the verification and development of the “distributed multi-nodal” ATFM concept, and further facilitates the wider promotion and application of the “distributed multi-nodal” cross-border ATFM concept worldwide.

<i>Strategic Objectives:</i>	This paper relates to the Safety and Air Navigation Capacity and Efficiency Strategic Objectives.
<i>Financial implications:</i>	
<i>References:</i>	

<sup>1</sup> English and Chinese versions provided by the People's Republic of China.

## 1. INTRODUCTION

1.1 It's generally agreed by the ICAO and countries in Asia Pacific that ATFM is a major driver of smooth and efficient flight operations in this region. Though air navigation service providers (ANSPs) in the Asia Pacific region are committed to addressing the long-term problems faced by air traffic management (ATM) through increasing airspace capacity, ATFM is now a necessary and effective means to strike a balance between the fast growing flight frequencies and the limited airspace capacity.

1.2 The trial operation of the Asia/Pacific Distributed Multi-Nodal Cross-Border ATFM has effectively organized the ATM entities, airlines and airports from 10 countries for international ATFM cooperation. This program aims to meet the expected objective for regularized cross-border ATFM operations in Asia Pacific on the basis of the trial operation of the "distributed cross-nodal" ATFM concept verified and polished by various stakeholders.

1.3 The Asia/Pacific Cross-Border ATFM Cooperation was launched on June 29, 2015, and now has held 9 international meetings. Through a highly inclusive flexible multi-levelled participation mechanism, it enables the cooperation among countries and regions with differing ATFM capabilities and foundations in Asia Pacific, and contributes to the development of cross-border ATFM in this region.

## 2. DISCUSSION

2.1 China ATM authority made the suggestion for ATFM information sharing and interaction in Asia Pacific for the first time at the Fourth Meeting of the Asia/Pacific Air Traffic Flow Management Steering Group (ATFM/SG/4) and recommended that ICAO set up an ATFM Information Requirements Small Working Group for future cross-border ATFM development. ICAO approved the establishment of the ICAO ATFM Information Requirements Small Working Group (ATFM/IR/SWG) led by China ATM authority at the Assembly and included it into relevant documents. In the meantime, a Cross-Border ATFM Technical Group (ATFM/TECH GROUP) was created during the trial operation of the Asia/Pacific Cross-Border ATFM to support and facilitate the work of ATFM/IR/SWG and report to it. With the unremitting efforts of ICAO, China ATM authority and countries in Asia Pacific, a good start was made in the region with double wings of the ATFM/IR/SWG at the technical level and ATFM trial operation at the operational level jointly advancing the Asia/Pacific Cross-Border ATFM.

2.2 Players in the Asia/Pacific Cross-Border ATFM trial operation are divided into several levels, and the current trial operation is jointly conducted by LEVEL3 players (China, Hong Kong of China, Singapore and Thailand). The trial operation is conducted in several stages. In June to September, 2015, the stage-I trial of information connectivity and ATFM infrastructure development, etc. was completed and met expectations.

2.3 Now, the Asia/Pacific Cross-Border ATFM trial operation has entered stage-II, where LEVEL3 members will carry out trials in different conditions and scenarios through desktop manoeuvres, demonstration flight and flight with preselected scope, etc., and will further enable the proper calculation, distribution, reception and execution of the calculated take-off time (CTOT) through improvements in the requirements forecast capability and the development of a standard working procedure in domestic and cross-border ATFM. The main objective of the stage-II trial operation is to further expand the participation and influence after 12 months of trial operation, and start the official operation of the cross-border ATFM to some extent in stage-III. The stage-III trial operation will find a solution to the capacity equilibrium problem for inbound flights through the cross-border ATFM under real operating conditions. Please refer to Figure One: Asia/Pacific Cross-Border ATFM Trial Overview.

Phase One-Airport Capacity Equilibrium		
Stage I	Stage II	Stage III
<ul style="list-style-type: none"> <li>✓ Information Connectivity</li> <li>✓ Portal Platform Development</li> <li>✓ Information Release, Reception and Processing Capability</li> </ul>	<ul style="list-style-type: none"> <li>✓ Requirements Forecast</li> <li>✓ Local Desktop Maneuvers</li> <li>➤ Cross-Border ATFM Working Procedure (through demonstration flight)</li> </ul>	<ul style="list-style-type: none"> <li>➤ Cross-Border ATFM Operations Service with Preselected Scope</li> </ul>
Phase Two-Airspace Capacity Equilibrium		
To Be Determined		

Figure One: Overview of Asia/Pacific Cross-Border ATFM Trial

2.4 The ninth meeting of the Asia/Pacific Cross-Border ATFM trial operation studied and analysed the local and cross-border desktop manoeuvres carried out by LEVEL3 players in January 2016, and developed the Asia/Pacific Cross-Border Air Traffic Flow Management Standard Operating Procedure (SOP).

2.5 The SOP was verified in the operations of the demonstration flight (DEMO FLIGHT) under various defined scenarios on the basis of the unanimous agreement to the SOP by players in the Asia/Pacific Cross-Border ATFM Cooperation. The “0 Delay” technology was adopted in CTOT calculation for the selected flights to ensure the normal operation of all participating flights, which trial was completed in March-April 2016. The CTOT calculation for DEMO FLIGHT was predicated on flights’ Estimated Off Block Time (EOBT) and airports’ default taxiing time. A feasibility evaluation of the SOP was conducted from multiple practical perspectives through testing under real-life conditions.

2.6 After major work is completed in the trial stage of the DEMO FLIGHT, the Asia/Pacific Cross-Border ATFM testing is about to enter stage III of the trial operation, which aims to verify and improve the work efficiency of the “Distributed Multi-Nodal” Operational Mode through the Cross-Border ATFM Operational Service with selected scope. The trial operation will mainly adopt the Ground Delay Program (GDP) technology based on CTOT calculation, release, reception and execution to guarantee the work efficiency of the cross-border ATFM. Meanwhile, conventional ATFM strategies, such as Minutes/Miles-in-Trail (MIT) and Minimum Departure Interval (MDI) will remain complements based on CTOT to provide more options for ATFM entities at non-busy airports in restriction-source locations. A combination of multiple strategies not only enhances the Asia/Pacific ATFM strategy system, but also helps controllers avoid the negative impact of divided management of flights in the same traffic flow at the tactical stage.

2.7 We are committed to continuously providing effective support for the Asia/Pacific Cross-Border ATFM Cooperation. The Asia/Pacific Cross-Border Air Traffic Flow Management Technical Group (ATFM/TECH GROUP) is made up of members selected by the core working group of the Asia/Pacific Cross-Border ATFM Cooperation. Now, experts from Australia, China, Hong Kong of China, Singapore, Thailand and the International Air Transport Association have jointly initiated the work of the technical group.

2.8 The Asia/Pacific Cross-Border ATFM Technical Group (ATFM/TECH GROUP) initiated its agenda at the ninth meeting of the Asia/Pacific ATFM Trial Operation. It has developed a tentative ATFM Implementation Roadmap based on system developments through in-depth study and discussions to support the rapid development of the Asia/Pacific Cross-Border ATFM Cooperation.

2.9 Given the different ATFM systems used by the 4 LEVEL3 members of the Asia/Pacific Cross-Border ATFM Cooperation, the ATFM/TECH GROUP proposed to realize the smooth integration of the CTOTs and relevant ATFM information among different systems at an early date with the efforts of the ATFM/TECH GROUP experts. The ATFM/TECH GROUP has customized objectives in three fields for LEVEL3 members: (1) Availability of the system information. (2) Requirement for the exchange of minimum user information. (3) ATFM system-system information exchange. The ATFM/TECH GROUP will provide differing support for technical requirements in all stages of the trial operation based on the implementation roadmap. For example, it will provide tailor-made technical programs for DEMO FLIGHT and cross-border ATFM operational service with selected scope, etc.

2.10 The ATFM/TECH GROUP will work to further extend the technical standards so as to meet the requirements of the concept of the Asia/Pacific Distributed Multi-Nodal Cross-Border ATFM Operations on the basis of the globally interoperable data exchange technology of the existing international standards, such as the Flight Information Exchange Model under the System Wide Information Management (SWIM) concept, etc.

2.11 The ICAO ATFM Information Requirements Small Working Group (ATFM/IR/SWG), whose creation was led by China, will design and develop the standards and framework for the Asia/Pacific Cross-Border ATFM Information Exchange, and the ATFM/TECH GROUP will provide support for its work. Besides, the ATFM/TECH GROUP will also update the ICAO Air Traffic Flow Management Steering Group (ATFM/SG) on the latest developments of the A

2.12 The tenth meeting of the Asia/Pacific Cross-Border ATFM will work to further improve the Asia/Pacific Cross-Border ATFM standard working procedure and multi-strategy ATFM technical integration mechanism based on results of the recent test, while making preparations for the cross-border ATFM operational service with selected scope to be conducted in the third stage.