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CHINA'S EFFORTS TO CARRY OUT INTERNATIONAL COOPERATION IN ATFM AND FUTURE PROSPECTS

(Presented by China)

REVISION NO. 1

EXECUTIVE SUMMARY	
This paper presents a brief introduction to China's efforts to carry out international cooperation in air traffic flow management and future prospects.	
Strategic Objectives:	This working paper relates to Strategic Objectives of Safety and Air Navigation Capacity and Efficiency
Financial implications:	N/A
References:	N/A

[1] English and Chinese versions provided by China.

1. INTRODUCTION

1.1 The concept of air traffic flow management (ATFM) was first put forward in the 1970s, and then continued to mature with the nearly 50 years' research, development and implementation in Europe, the United States and other developed countries. During such progress, new theories and methods were introduced such as ground delay program under collaborative decision-making and airport collaborative decision-making.

1.2 Different from Europe and the United States where air traffic flow is managed in a centralized way, the Asia-Pacific region includes many countries, which, due to their different levels of development, have varying desire for ATFM and largely differ from each other regarding understanding, development and implementation of the concept.

1.3 It is one of ICAO's highest priorities to promote the implementation of ATFM. Civil Aviation Administration of China (CAAC) has also made its effort to think, vision and plan for future international cooperation in ATFM. In April 2017, the Air Traffic Management Bureau of CAAC briefed the ICAO APAC RSO on its plan for international cooperation in ATFM at the CAAC headquarters. During the Global ATFM Seminar held in Singapore in November 2017, the Chinese civil aviation delegation communicated with ICAO headquarters and the Regional Offices regarding China's future plan for international cooperation in the field of ATFM.

2. DISCUSSION

2.1 In recent years, with the continuous rapid growth of air traffic in the Asia-Pacific region, ATFM is of increasing importance for ensuring air safety and improving capacity utilization efficiency. The building of ATFM system and ATFM cooperation between countries have also become one of the key issues for ICAO.

2.2 As it is difficult for the Asia-Pacific region to establish a centralized ATFM center as Europe did, the ICAO Asia-Pacific Office has developed the operation concept and cooperation framework for ATFM in the Asia-Pacific region, to promote the development of ATFM and international cooperation among these countries, with the concept of distributed multi-nodal ATFM as the core and the experience of the United States in the implementation of ground delay programs as the basis.

Landscape of China's domestic ATFM

2.3 At the beginning of the 21st century, based on traffic forecasting and development, China fully recognized the importance and urgency of ATFM for future development. With the help of projects such as the China-US Aviation Cooperation Program, China has defined a three-level structure for ATFM based on the best practices learnt from the United States. The three-level structure is as follows:

2.3.1 State level. Similar to the ATCSCC in the United States, it is under the responsibility of the Operation Management Center of the Air Traffic Management Bureau, CAAC.

2.3.2 Regional level. Similar to the ARTCC in the United States, it is under the responsibility of area control centers.

2.3.3 Terminal level. Similar to terminals and towers in the United States, it is under the responsibility of approach control and towers.

2.4 Although ATFM system development started quite early in China, due to insufficient resources such as land and personnel, building progress at state level has been slow (it is underway and is expected to be completed around 2021). At the end of 2013, the regional and terminal levels were initially completed and have since become more matured and played an important role after nearly six years of exploration and continuous improvement, laying a solid foundation for the development of the state level.

2.5 Although the state-level ATFM building has yet to be completed, the regional-level function has been playing an important role, and has outperformed many countries and regions in terms of the number of flights and airports managed.

Landscape of international cooperation in ATFM

2.6 As one of the countries with the largest air traffic in the Asia-Pacific region, China has 20 neighboring countries, with 14 of them sharing land borders with China and 6 others facing China across the sea. Most of these countries are in the ICAO Asia-Pacific region, and some are in the ICAO European region or the ICAO Central Asia region. Apart from air traffic, China also differs greatly from its neighboring countries in characteristics of major international air traffic flows.

2.7 According to statistics of 2018, international and inter-regional flights accounted for 27.36% of all flights in China's mainland. Specifically, international flights between China's mainland and Southeast Asian countries and regions accounted for 10.73% of the total number of flights, and 39.23% of all international and inter-regional flights in China's mainland; international flights between mainland China and Japan and South Korea accounted for 8.82% of the total number of flights, and 32.26% of all international and inter-regional flights in China's mainland; international flights between China's mainland and Europe, Mongolia and Russia accounted for 2.28% of the total number of flights, and 8.34% of all international and inter-regional flights in China's mainland. These three major traffic flows accounted for about 80% of the total international and inter-regional flight traffic in China's mainland.

2.8 International cooperation in ATFM in the Asia-Pacific region continues to grow under the efforts of the ICAO Asia-Pacific Office. Based on the current status of China's domestic ATFM and the differences in the conduct of ATFM, China has participated in several international cooperation projects on ATFM.

2.8.1 Around 2014, China joined the international cooperation project of multi-nodal ATFM initiated by Thailand-Singapore-Hong Kong, China. With Sanya Area Control Center (ACC) as the node, China selected four airports, including Haikou Airport, Sanya Airport, Guangzhou Airport and Shenzhen Airport to participate in the Southeast Asia ATFM cooperation project and gradually became a Level-3 member (publish/receive/execute CTOT), proposed the new operational concept of CMCP on the basis of ATFM procedures.

2.8.2 Under the leadership of ICAO Asia-Pacific Office, and with the specific support and assistance of RSO, after some preliminary preparation, the representatives of the civil aviation authorities of China, Japan and South Korea signed the Memorandum of Understanding on Cooperation in Air Traffic Flow Management in Northeast Asia in Shanghai on October 28, 2015, under the witness of ICAO Asia-Pacific Office. The North Asia Regional ATFM Harmonization Group (NARAHG) was established, which opened up international cooperation in cross-border ATFM in Northeast Asia.

2.8.3 In 2018, the Mekong/Lancang River ATFM Cooperation Group was established under the Mekong River Air Traffic Management Coordination Group.

2.8.4 In 2019, China held the first conference on ATFM cooperation between China, Mongolia and Russia. The three parties agreed to set up a China-Mongolia-Russia cross-border coordinated ATFM group to jointly promote China-Mongolia-Russia ATFM cooperation and discussed the signing of a memorandum of understanding and related issues.

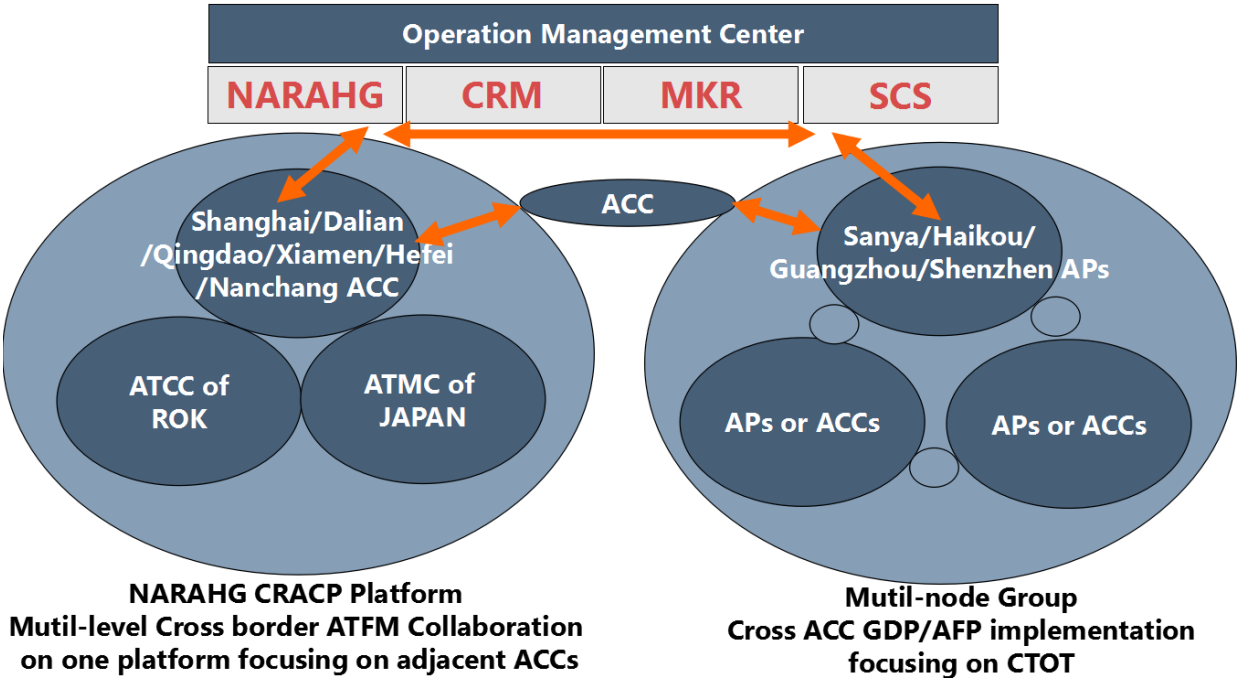
2.9 In recent years, due to the rapid growth of air traffic, and with airspace capacity increasingly running at ceiling level and impact from complex weather phenomena becoming more severe, there has been an increase in the number of inter-regional ATFM measures taken. Although safety is one of the important purposes of ATFM, excessive and unreasonable ATFM measures would affect operations. Thus, in cross-border ATFM cooperation, it is necessary to strengthen collaborative decision-making and manage air traffic flow in a more scientific way, so as to achieve balance between air traffic safety and efficiency.

Future prospects

2.10 China will carry out international cooperation in ATFM based on its national conditions, taking into account its domestic three-level ATFM system, and in light of the distribution of international air traffic and the characteristics of traffic flows. Four sub-regional ATFM cooperation groups have been identified, including the Southeast Asia group, Northeast Asia group, Mekong River group, and China-Mongolia-Russia group.

2.11 China will focus on collaboration in its international ATFM cooperation by conducting post-event analysis on specific issues with neighboring countries and regions to continuously improve collaborative work mechanisms and procedures to ensure the safety and efficiency of air traffic.

2.12 Meanwhile, in order to accommodate future international cooperation in ATFM, China's State-level ATFM unit (Operation Management Center) has set up international cooperation positions to serve the four sub-regional ATFM cooperation groups and will cooperate with relevant regional-level ATFM units and control units to jointly address the growing demand for international cooperation in future ATFM.



Features of air traffic between China and its neighboring countries and regions

2.13 **Sub-region of Southeast Asia.** The countries in the region differ greatly from each other, with different levels of development. In general, the airspace is not very busy or crowded, and flights operated between these countries and China's mainland are mainly long-haul ones. The implementation of high-priority cross-border ground delay programs in the region can help avoid the transmission of flow control measures. However, due to the large number of countries in the region, as traffic flows continue to increase, inter-country collaboration will become a major challenge.

2.14 **Sub-region of Northeast Asia.** Different from Southeast Asia, this region is featured by more dense traffic and more congested airspace, and flights between countries in the region and China's mainland are mainly short-haul ones. Due to the highly congested airspace, it is difficult for countries in this region to give the highest priority to flights connecting to their neighboring countries without considering their own traffic. There is a greater need for collaboration between countries in the region to form a seamless ATFM area.

2.15 **China-Mongolia-Russia.** The traffic flow along China-Mongolia-Russia is mainly composed of round flights from China, Japan and South Korea to Europe. Different from the sub-regions of Southeast Asia and Northeast Asia, there is a wide variance in the capacity utilization level of the airspace along China-Mongolia-Russia. Due to the particularly long ranges of flights, some portions of the airspace are particularly congested, and it is difficult to implement ground delay programs. Consideration should be given to the use of other ATFM measures, such as coordinated rerouting.

3. CONCLUSION

3.1 International flights between China and Southeast Asia, Northeast Asia and along China-Mongolia-Russia account for about 80% of the total number of international and inter-regional flights in China. These regions are the key areas for international cooperation in ATFM, which is of great significance to achieving a more reasonable balance between capacity and traffic demand and reducing cross-regional restrictions.

3.2 CAAC attaches great importance to international cooperation in ATFM and will, under the guidance of ICAO, continuously strengthen international cooperation with neighboring countries and regions in the implementation of ATFM, to achieve balance between capacity and flow, to continuously improve the safety level of air traffic and to improve the efficiency of capacity utilization.

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