*International Civil Aviation Organization*

**The Third Meeting of ICAO Asia/Pacific Air Traffic Flow Management Steering Group (ATFM/SG/3)**

Singapore, 10 – 14 March 2014

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

# THAILAND CAPACITY ENHANCEMENT INITIATIVES

(Presented by Thailand)

**SUMMARY**

This working paper presents Thailand's capacity enhancement initiatives, which could potentially be adopted and integrated into Interim Framework for Collaborative ATFM or Asia-Pacific Regional Framework for Collaborative ATFM.

## 1. INTRODUCTION

1.1 The Asia-Pacific region has been experiencing rapid traffic growth as a part of economic development. For illustrative purposes, Thailand has been experiencing 12-16 percent traffic growth for the past few years. Such rapid traffic growth quickly puts stress on Air Navigation Services infrastructure throughout the region.

1.2 In recognition of the need to enhance Air Navigation Service capacity to handle such rapid growth, ICAO developed Aviation System Block Upgrade (ASBU) framework, with module on regional networked Air Traffic Flow Management forming major part of the ASBU framework since Block 0 (2013) through B0-NOPS.

1.3 In support of the B0-NOPS module, ICAO Headquarters enlisted a group of experts from States, ANSPs, and International Organizations with ATFM experience (ATFM Manual Coordination Team) to develop the ICAO Manual on Collaborative ATFM (Doc 9971), providing guidance on Collaborative ATFM implementation. A draft of Doc 9971 was released during the ICAO Air Navigation Conference (AN-Conf/12) in November 2012, soliciting comments and suggestions from States. In response, ICAO continued to further develop the manual through the ATFM Manual Coordination Team with updated document to be released at the Advanced ATM Techniques Symposium and Workshop in November 2013 at Montreal, Canada.

1.4 Thailand, along with other States in Asia-Pacific region including Hong Kong, China; India; Japan and the United States, was privileged to be invited to contribute in development of the manual.

1.5 Meanwhile, ICAO Asia-Pacific moved forward to develop ICAO Asia/Pacific Seamless ATM Plan, including provision on CDM/ATFM development to support Seamless ATM Operations in the region. Version 1.0 of the Seamless ATM Plan was endorsed by APANPIRG/24 meeting in June 2013.

1.6 Along with endorsement of the ICAO Asia/Pacific Seamless ATM Plan, APANPIRG/24 meeting approved Conclusion 21/15 that States participate in and support the Asia/Pacific ATFM Steering Group to develop a common Regional ATFM framework, which addresses ATFM implementation and ATFM operational issues in the Asia/Pacific region.

1.7 Moreover, the ATFM/SG/2 meeting in Hong Kong, China in September-October 2013 made the decision to form the ATFM Specialist Team of experienced ATM/ATFM specialist and other stakeholders to develop the Interim Framework for Collaborative ATFM with the goal for consideration at APANPIRG/25 and the Asia Pacific Regional Framework for Collaborative ATFM.

## 2. DISCUSSION

2.1 While regional CDM/ATFM development continued, Thailand continued to experience traffic increase to such extent that various sectors in the Bangkok ACC would become saturated during peak hours by a margin of 20-30%. Fortunately, saturated sectors currently service traffic mostly originating from airports within the Bangkok FIR.

2.2 In response to ACC sector saturation, Thailand is planning to implement the following capacity enhancement initiatives at the minimum:

a) Route structure enhancements;

b) Civil-Military ATM Coordination;

c) Electronic aircraft hand-offs;

d) New ATS automation eliminating flight progress strips;

e) Dynamic sector configuration;

f) Departure and Arrival Manager (DMAN/AMAN); and,

g) ATFM automation support.

*Route Structure Enhancements*

2.3 Thailand initiated some route structure enhancement initiatives to introduce parallel unidirectional RNAV5 route structure with the goal to transition to RNAV2 over time. Meanwhile, SID/STAR infrastructure surrounding busy airports would also be restructured to enhance capacity and efficiency. It is expected that route structure enhancement would assist in enhancing safety while reducing ATC conflict resolution workload, thus enhancing capacity by approximately 10 percent in affected areas.

*Civil-Military ATM Coordination*

2.4 While Thailand has already implemented some Conditional Routes through Special Use Airspace for congested city domestic city pairs such as Bangkok – Chiang Mai and Bangkok – Phuket, it is expected that availability of those conditional routes could be further increased by implementation of targeted pre-tactical Airspace Management Cell (AMC). As such, Thailand plans to establish AMC, implementing Flexible Use of Airspace (FUA) concept through coordination of pre-tactical availability of Conditional Routes and relevant airspace. Such initiative is expected to assist in enhancing capacity from additional availability of enhanced route structure.

2.5 In addition, it should also be noted that there would be some cases where cross-border Civil-Military ATM Coordination would provide operational benefits.

*Electronic Aircraft Hand-Offs*

2.6 Airspace capacity within the Bangkok FIR has been limited due to unavailability of electronic aircraft hand-off between the Bangkok ACC and major TMAs in the Bangkok FIR as well as electronic aircraft hand-off with neighbouring FIRs. Such limitation can also be traced to outdated ATS automation system.

2.7 In order to address the limitation, Thailand has taken the initiative to procure new ATS automation system with system delivery timeline in late 2015. The new ATS automation will enable electronic aircraft hand-off within the Bangkok FIR as well as with neighbouring FIRs through AIDC Version 3.

2.8 In order to ensure implementation of electronic aircraft hand-off between Bangkok ACC and neighbouring ACCs, Thailand will enter into discussion with neighbouring States through appropriate forums as well as informal ATM coordination group meetings such as the Mekong ATM Coordination Group Meeting and Group of Five ANSP Informal ATM Coordination Meeting.

2.9 It is expected that automated hand-off will help to substantially decrease ATC workload and increase capacity by about 20-30 percent.

*ATS Automation with Eliminating Flight Progress Strips*

2.10 It is understood that while paper flight progress strips enables tactical ATC conflict detection and facilitates resolution, maintenance of content in flight progress strips could also raise ATC workload in congested airspace.

2.11 Therefore, Thailand's new ATS automation system will feature elimination of flight progress strip, transferring conflict detection mechanism to automation system. It is expected that this initiative could help to substantially reduce ATC workload and increase capacity by about 20 percent. Nevertheless, it is also understood that initial training and adjustment period associated with decreased capacity will be required.

*Dynamic Sector Configuration*

2.12 Thailand's new ATS support system will enable dynamic sector configuration beyond current sector configuration, enabling various sector configurations to support varying traffic patterns throughout the day. It is expected that the capability would help deliver airspace capacity when and where needed while optimizing resources. It should be understood that there could be regulatory issues in respect to ATCO licensing associated with implementation of dynamic sector configuration. Therefore, this initiative will be considered after full transition to the new ATS system. When considered, appropriate sector capacity assessment will also be carried out to optimize delivery of airspace capacity where necessary.

2.13 It is expected that other States could also face similar airport or airspace congestion. Therefore, initiatives outlined in this Working Paper should potentially be integrated into the Interim Framework for Collaborative ATFM and possibly the Asia Pacific Regional Framework for Collaborative ATFM to assist States in enhancing their airport/airspace capacity as a part of CDM/ATFM initiative.

*Departure and Arrival Manager*

2.14 Thailand's new ATS automation system would feature Arrival Manager (AMAN) and Departure Manager (DMAN) at major airports in Thailand. While AMAN and DMAN do not help to "increase capacity" on their own, it is expected that AMAN/DMAN will contributed in enhanced predictability, which will assist in reduction of schedule buffer and may enable further capacity increase indirectly.

*ATFM Automation Support System*

2.15 Meanwhile, Thailand has taken the initiative to secure appropriate budget for ATFM automation support system based on concepts outlined the ICAO Manual on Collaborative ATFM (Doc 9971), enhanced by Thailand CDM/ATFM Concept outlined in another Working Paper and in support of collaborative cross-border international ATFM initiative outlined in another Working Paper. It is of Thailand's interest to ensure interoperability with other cross-border international initiatives, while assisting to support demand increase and transition from current ATS system to new ATS system. Therefore, it is expected that the ATFM automation support system will be targeting Operational Trial in mid-2015.

## 3. ACTIONS BY THE MEETING

3.1 The meeting are invited to:

a) note information presented in this WP;

b) discuss potential capacity enhancement initiatives and various forms of ATFM measures;

c) discuss benefits of adapting and integrating capacity enhancement initiatives into the Interim Framework for Collaborative ATFM and the Asia Pacific Regional Framework for Collaborative ATFM; and,

d) discuss any relevant matters as appropriate.

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