52ND CONFERENCE OF DIRECTORS GENERAL OF CIVIL AVIATION ASIA AND PACIFIC REGIONS

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AGENDA ITEM 3.3: AIR NAVIGATION MATTERS

MINI GLOBAL DEMONSTRATION PARTICIPATION TO FOSTER GLOBAL INTEROPERABILITY AND ENHANCE AIR TRAFFIC MANAGEMENT

(Presented by Japan, Singapore, and Thailand)

SUMMARY

This paper presents the participation of Japan, Singapore, and Thailand in the Mini Global Demonstration Project led by USA, to foster the global interoperability based on System-Wide Information Management (SWIM) concept, in order to enhance Air Traffic Management (ATM) in support of ICAO Global Air Navigation Plan (GANP), specifically the Aviation System Block Upgrades (ASBUs). In addition, the Mini Global Demonstration also fully supports the validation of ICAO Flight and Flow Information for a Collaborative Environment (FF-ICE). In this paper, the activities planned towards the demonstration in April 2016 as well as the operational scenarios of interest to the participating nations are discussed.

MINI-GLOBAL DEMONSTRATION PARTICIPATION TO FOSTER GLOBAL INTEROPERABILITY AND ENHANCE AIR TRAFFIC MANAGEMENT

1. INTRODUCTION

1.1 Mini Global Demonstration is the project led by Federal Aviation Administration (FAA) to exhibit the globally interoperable systems designed based on System-Wide Information Management (SWIM) concept and the use of internationally standardized information exchange models, i.e. Flight Information Exchange Model (FIXM), Aeronautical Information Exchange Model (AIXM), and ICAO Weather Information Exchange Model (IWXXM). The project demonstrates how Air Navigation Service Providers (ANSPs) and other aviation stakeholders are able to collaboratively make decisions by utilizing the information seamlessly shared within and across regions in order to improve Air Traffic Management (ATM) performance as envisaged in the ICAO Global ATM Operational Concept and Global Air Navigation Plan, specifically the Aviation System Block Upgrade (ASBU) Performance Improvement Area 2 – Globally Interoperable Systems and Data.

1.2 The Mini Global Demonstration can be also considered as the mechanism to validate the ICAO Flight and Flow Information for a Collaborative Environment (FF-ICE) which defines the information requirements for flight planning, flow management, and trajectory management. Flight information and associated trajectories are the principal components to support the global ATM community to achieve strategic, pre-tactical, and tactical performance management. The Mini Global infrastructure enables the exchange of this flight/flow information, and in turn supports the validation of the FF-ICE concept.

1.3 In September 2014, the Mini Global Demonstration Phase I (MG I) held at the Florida NextGen Test Bed at Embry-Riddle Aeronautical University was conducted successfully. FAA, JCAB (Japan Civil Aviation Bureau), CAAS (Civil Aviation Authority of Singapore), and AEROTHAI (Aeronautical Radio of Thailand Limited), together with other ANSPs and aviation industries showcased the possible architecture for global SWIM and performed the demonstration of many operational use cases. With the remarkable accomplishment of aforementioned demonstration, the Mini Global Demonstration project is thus continued in Phase II, namely MG II, to extend to the more complex use cases as well as to build on the lessons learnt form the first demonstration.

2. DISCUSSION

2.1 One of the MG II objectives is to develop and execute complex use cases. Specifically, there are three scenarios that are of particular interests to the participating partners in the Asia/Pacific region.

2.2 The first use case is to investigate how SWIM can be used to support the Distributed Multi-Nodal ATFM effort that is currently undertaken by the ANSPs concerned of which Singapore and Thailand are involved in the operational trial.

2.3 The second is to explore how Globally Unique Flight Identifiers (GUFIs) are assigned and handled for transit flights where the same aircraft is used for both legs of the flight with a short turn-around time.

2.4 The third one is about the management of data governance by the global enterprise messaging service providers. Essentially, partners in the MG II should be able to determine the recipients of the data that they distribute. For example, the transmission of surveillance track data, which is a flight departing and arriving from/to certain airports, should only be accessible to the ANSPs where the flight operates and traverses, in order to reduce the network bandwidth required for information exchange and for confidentiality reasons.

2.5 Based on participant's technological capability, participants in MG II can be divided into four service levels as follows.

- Service Level 1 – Consumer, i.e. the participant is only able to consume data from MG but not able to publish any data back;
- Service Level 2 – Native System Consumer & Producer, i.e. the participant is able to consume and produce FIXM/AIXM/IWXXM messages using the Mini Global adapter provided;
- Service Level 3 – FIXM/AIXM/IWXXM Consumer & Producer, i.e. the participant is able to consume and produce FIXM/AIXM/IWXXM messages using his own system; and
- Service Level 4 – FIXM/AIXM/IWXXM Flight Object Manager, i.e. the participant is able to consume and produce FIXM/AIXM/IWXXM messages using his own system having Flight Object Manager capability.

The MG II participants will gain not only a firsthand experience regarding information sharing towards global interoperability, but also an opportunity to enhance the international cooperation with other aviation-community stakeholders. Note that participation at Service Level 1 is still open until 4 January 2016.

2.6 As part of the MG II activities, the Technical Interchange Meeting among the Asian partners was held from 29 June to 3 July 2015 in Bangkok, Thailand. The main purpose of the meeting was to have a detailed discussion on the use cases to be demonstrated by the partners during the MG II demonstration which is scheduled for the week of 23 April 2016.

2.7 ICAO will schedule a SWIM workshop for April-June 2016 in accordance with APANPIRG Conclusion 25/43 – Promote understanding of SWIM in APAC Region with focus on both technical and operational aspects for SWIM development. It is expected that the audiences of such SWIM workshop would actually learn and understand the benefits of SWIM from the demonstration.

2.8 It can be thus considered that the MG II participation and the demonstration to be conducted will help support ICAO's strategic objective by increasing the awareness about SWIM as well as the understanding on the possible advantages SWIM may bring to the global ATM.

3. ACTION BY THE CONFERENCE

3.1 The Conference is invited to:

a) note the information contained in this Paper;

b) consider joining the MG II demonstration project as partners, taking into account that it is a good opportunity to learn and understand the benefits of SWIM;

c) consider supporting ICAO APAC's SWIM Workshop; and

d) discuss any relevant matters as appropriate.

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