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North American, Central American and Caribbean Office

INFORMATION PAPER

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Second NAM/CAR Air Navigation Implementation Working Group Meeting (ANI/WG/2)
Puntarenas, Costa Rica, 1 to 4 June 2015

Agenda Item 3: Global/Regional Air Navigation Developments
3.5 Other Global/Regional Air Navigation Developments

MINI-GLOBAL PROJECT DEMONSTRATIONS

(Presented by United States of America)

EXECUTIVE SUMMARY	
This paper presents information on the first Mini-Global Demonstration conducted on 16-17 September 2014 by the United States and its partners. The Mini-Global Demonstration is a collaborative effort between the US Federal Aviation Administration (FAA) and other Air Navigation Service Providers around the globe to enhance and streamline the flow and management of information.	
Strategic Objectives:	• Safety • Air Navigation Capacity and Efficiency • Environmental Protection
References:	• FAA Document: Mini-Global Demonstration - Integration and Test Checklist and Procedures; OTA DTFWA-08-A-00001; Document Number - Deliverable #5.2; dated 27 September 2013 • FAA Document: Task R: Mini-Global Architecture & Capabilities Package (Phase I); OTA DTFAWA-08-A-00001; Deliverable Number - 12.2; dated April 28, 2014

1. Introduction

1.1 Demonstrations allow for new technologies, procedures, and programs to be tested and improved upon, all to promote modernization and harmonization of aviation systems across the globe.

1.2 The Mini-Global Demonstration is a program that tests the exchange of flight, aeronautical and weather information across borders using standard information exchange models. Its ultimate goal is to promote the seamless exchange of data across borders to create a more harmonized global aviation system. The FAA completed its first Mini-Global Demonstration in September 2014 with plans underway for the Mini-Global II Demonstration in the Spring 2016 timeframe.

2. Discussion

2.1 More than 100 participants contributed to the success of the international exchange of information in the multi-day Mini-Global Demo, led by the FAA's NextGen Office during the week of September 16-17, 2014.

2.2 This event, held at the NextGen Florida Test Bed in Daytona Beach, included international partners, aviation industry representatives, academics, and observers conducting demonstrations exhibiting various use cases via the Mini-Global Enterprise Messaging Service (EMS) in the international and national airspace systems.

2.3 The demonstration supported the System Wide Information Management or SWIM concept, and showed how Aeronautical Information Exchange Model (AIXM), Flight Information Exchange Model (FIXM), and Weather Information Exchange Model (WXXM) messages could be exchanged to demonstrate collaboration between Air Navigation Service Providers (ANSPs) and other aviation stakeholders.

2.4 The FAA team brought together representatives from Australia, Singapore, Canada, South Korea, Japan, Portugal, and Thailand, with observers from Europe's SESAR team, the United Arab Emirates, Colombia and Brazil. The international participants provided live, near-real-time data in support of the exchange of AIXM, FIXM, and WXXM data for the demonstration's scenarios.

2.5 Demonstration scenarios involved submitting flight plans, issuing a Notice to Airmen (NOTAM) for airspace restrictions, sending Terminal Area Forecast (TAF) messages concerning adverse weather, issuing Significant Meteorological Information (SIGMET) on a volcanic ash cloud requiring an amendment to a flight plan, and more. The scope of Mini-Global served as a reminder of the technical complexity involved in orchestrating a multidiscipline international demonstration.

2.6 Mini-Global II will leverage the information learned in Mini-Global I to further mature and demonstrate the usefulness of a seamless global Air Traffic Management (ATM) system. With a focus to add more international air navigation service providers and airlines as partners, this project will be able to explore utilization of additional datasets to support new scenarios. The demonstration project will identify global policies, protocols, security, and business sensitivity requirements, mediate between diverse messaging systems, and provide the infrastructure for future applications/services to benefit Global ATM.

2.7 Interested ANSPs and industry were able to contribute and participate in the Mini-Global I in varying degrees. These levels of participation are outlined below as Service Levels. These levels of participation will remain the same, or similar, for the 2016 Mini-Global II demonstration and are as follows:

a) Service Level 1 – Consumer

Service level 1 (Figure 1) is a consumer only by participation and does not require partners to publish information. Data can be consumed through traditional file transfer means, such as email and secure FTP. Additionally, a secure VPN connection may be established to access the Mini-Global enterprise messaging infrastructure and services to request data directly from participating data providers. To ensure that observers receive the full benefits of the Mini-Global program, representatives of the observer organization must be present for the Mini-Global Demonstration at the NextGen Test Bed in Florida, or at a location of a Service level 2, 3, or 4 Participant.

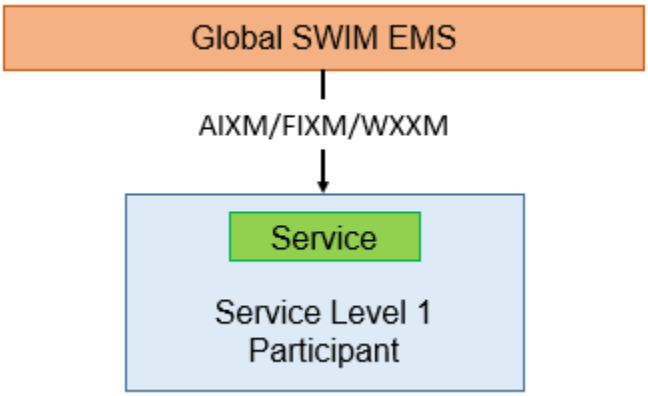

Figure 1: Service Level 1 Participant

b) Service Level 2 - Native System Consumer & Producer

Service level 2 (Figure 2) participation involves producing and consuming flight information using the participant's native system formats. The data transmitted and received by the participant will be exchanged in its legacy system formats. A FIXM conversion service will be provided by a Mini-Global enterprise messaging service provider for each participant. Participants should note that only ICAO 2012 related content will be converted into FIXM format. Data consumed from the Mini-Global enterprise will be in AIXM, WXXM, or FIXM formats. ICAO 2012 content may be converted back to legacy format depending on requirements of the participant.

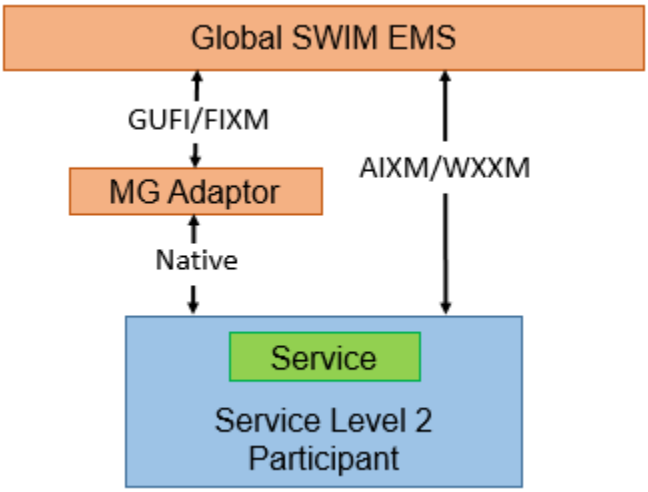

Figure 2: Service Level 2 Participant

c) Service Level 3 - AIXM/WXXM/FIXM Consumer & Producer

This service level (Figure 3) produces and consumes data using standardized exchange models AIXM, WXXM, and FIXM. Globally Unique Flight Identifier (GUFI) services may be provided either by the participant or via the Mini-Global GUFI Service. The GUFI is a unique identifier assigned to each unique flight. It is assumed this participant will not be providing a Flight Object Manager (FOM) function.

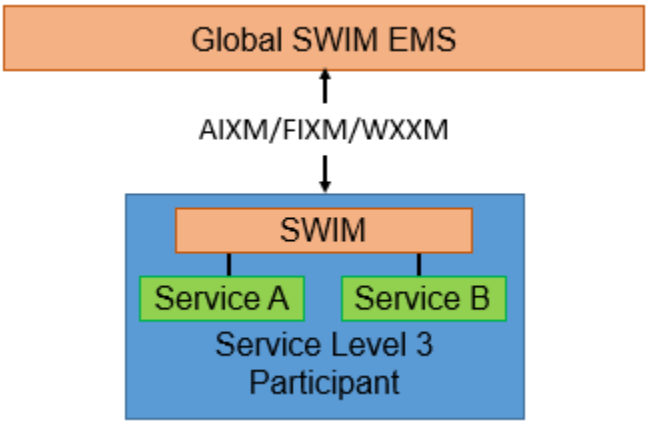

Figure 3: Service Level 3 Participant

d) Service Level 4 - AIXM/WXXM/FIXM Flight Object Manager

This service level (Figure 4) produces and consumes data using standardized exchange models AIXM, WXXM, and FIXM. Connection can be made via an existing Mini-Global service provider or an ANSP's Global SWIM service connected to the Mini-Global enterprise messaging infrastructure. The rules for SWIM connections are defined by the FAA "SWIM Service Compliance Requirements" document. A Flight Object Manager (FOM) service must be provided by the participant to manage Flight Object governance and validation policies.

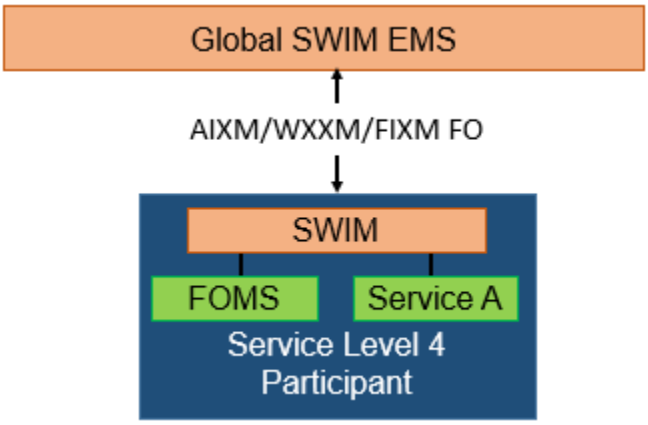

Figure 4: Service Level 4 Participants

e) Additional Information

Multiple diverse EMS connectivity and data sharing will be utilized and explored during Mini-Global II. This will allow for the inclusion of new applications and services to be developed and demonstrated to enhance defined scenarios and use cases. The demonstration project will identify global policies, protocols, security and business sensitivity requirements. It will also mediate between diverse EMS systems, and provide the infrastructure for future applications/services to benefit the global aviation system.

2.8 As with Mini-Global I, international collaboration and partnerships, both air navigation service providers and operators, are crucial to the demonstration's success. Outreach has begun to identify new potential partners for the program with several regional technical interchange meetings taking place in 2015. Once our partners have confirmed their involvement and participation in Mini-Global II, the NextGen office will follow up with engineering checkpoint demos to mitigate risks before the final Mini-Global II Demonstration planned for April/May 2016. The first checkpoint demonstration will focus on multiple EMS functionalities, while the second will focus on initial applications and services in support of varying scenarios and use cases.

3. Conclusion

3.1 The Mini-Global II Demonstration supports the ultimate goal of international harmonization and interoperability of systems, as detailed in ICAO air traffic management modernization programs. The success of Mini-Global I has laid the foundation for this project's next iteration.

3.2 The Meeting is invited to Note the information regarding the Mini-Global II demonstration; and for interested countries, air navigation service providers and operators, should contact the Federal Aviation Administration contacts below for more information on participation and timelines.

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