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Agenda Item 5: Air Navigation
5.7 Other Air Navigation Matters

THE MINI-GLOBAL DEMONSTRATION

(Presented by United States)

EXECUTIVE SUMMARY	
This paper provides an update on the Mini-Global Demonstration, a program that has a goal of simulating a seamless transfer of data between air navigation service providers to ultimately promote more efficient operations across Flight Information Regions (FIRs). The Mini-Global Demo also fully supports the validation of ICAO Flight and Flow-Information for a Collaborative Environment (FF-ICE). The Demonstration is planned for September 2014.	
Strategic Objectives:	• Safety • Air Navigation Capacity and Efficiency • Security & Facilitation
References:	• ICAO NACC/WG/4 WP/

1. Introduction

1.1 Several air navigation service providers (ANSPs) emphasize the use of demonstrations as a way to test systems and processes. One such demonstration is the Mini-Global Demonstration. This project is aimed at developing seamless information sharing across Flight Information Regions (FIRs), and involves collaboration among several service providers.

1.2 The Mini-Global Demonstration is scheduled to be held in September 2014, and will help participants observe the benefits of using standardized information exchange models of communication to transmit data, paving the way for a more efficient air traffic management system. It also aims to reduce the use of antiquated flight plan formats. Many ANSPs have committed to participating, while others will observe the full Demonstration.

2. Discussion

2.1 The Mini-Global Demonstration will work to increase global interoperability, and decrease inefficiencies. This purpose is fully in line with the goals of the Global Air Navigation Plan (GANP) and the Aviation System Block Upgrades (ASBUs). As noted before, to operate internationally, operators must be able to easily traverse multiple FIRs. To facilitate this, the Mini-Global Demonstration will seek to advance collaborative flight information exchanges amongst operators and other ANSPs worldwide. The Demonstration supports the ultimate goals of interoperability and harmonization.

2.2 To date, several air navigation service providers (ANSPs) and operators have committed to participating in or observing the Mini-Global Demonstration. Participants will be from Australia, Canada, South Korea, Singapore, Japan, and Portugal, with others scheduled to observe.

2.3 Several ANSPs held a Risk Mitigation Demonstration (RMD) on March 5, 2014, to identify associated demonstration risks and challenges that need to be addressed prior to the full Mini-Global Demonstration. The results generated from the RMD will be used to update the Mini-Global architecture, demonstration scenarios, and methodologies prior to the final demonstration, as needed. Additionally, technical interchange meetings are being held in Europe and Asia to finalize technical details.

2.4 The full Mini-Global Demonstration will provide a scenario using simulated and live flight data in support of the concept of a seamless global sky. The demonstration capabilities that will be included in the Mini-Global Demo include flight plan submission, boundary coordination, dangerous goods, fleet prioritization, and common viewer.

2.5 The Demonstration will also show support for FF-ICE in its description of how flight information should develop for airspace users to reach and maintain the benefits as articulated in ICAO documents. FF-ICE covers important aspects of ATM flow management, flight planning, and trajectory management. Specifically, FF-ICE addresses data supporting performance-based collaborative decision-making, data related to managing the performance of a particular flight, and standard mechanism(s) to share flight information across collaborating participants. The global flight information exchange model (FIXM) will help with early realization and harmonization of FF-ICE.

2.6 The Mini-Global Demonstration will enable ANSPs to determine their current capabilities and level of compatibility with other air traffic management systems. It will also help States determine what changes, if any, are needed to further harmonize on the international level. The demonstration will help to identify and convey the benefits that can be achieved through the global harmonization of data exchanges. In addition to FIMX, aeronautical and weather exchange systems will also be utilized (AIXM and WXXM) during Mini-Global.

2.7 In order to fully participate in the full Mini-Global Demonstration, participants had to note their commitment and sign a participation agreement by February 8, 2014. There are several levels of participation as part of the program.

3. Conclusion

3.1 In support of global harmonization and interoperability, the Mini-Global will also be part of ICAO's Block Upgrade Demonstration Symposium & Showcase (BUDSS) scheduled for May 2015. Papers on the Mini-Global Demo were also presented at the ICAO Assembly in 2013, again in support of global harmonization.

4. Suggested Actions

4.1 The meeting is invited to note the updated information provided in this paper and in the **Appendix**; and prepare for participation in the Mini-Global Demonstration, if applicable.

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APPENDIX
MINI-GLOBAL SCENARIO USE CASES

The Mini-Global project will demonstrate the exchange and applicability of FIXM, WXXM, and AIXM. Two demonstrations will be held as part of the Mini-Global program: the Risk Mitigation Demonstration (RMD) and the Final Demonstration.

Realistic operational scenarios, each encompassing a set of use cases, will illustrate how the Mini-Global concept could be used to support the sharing of data in international air traffic operations. The operational scenarios provide a high-level description of how a variety of capabilities are enabled using Mini-Global. The use cases within the scenarios provide a much greater level of detail, and will be further refined in collaboration with international partners. The purpose of each use case is to highlight a specific capability within the operational scenario, and describe how each capability could be implemented using the Mini-Global infrastructure.

To demonstrate this data exchange and its potential use to enable international collaboration and interoperability, three operational scenarios are being considered for the two demonstrations:

- Scenario 1: International Flight Coordination and Harmonization
- Scenario 2: Arrival and Surface Management
- Scenario 3: Surface and Departure Management

For the Mini Global RMD, a select set of the Scenario 1 Use Cases is being considered (see Figure 1, below).

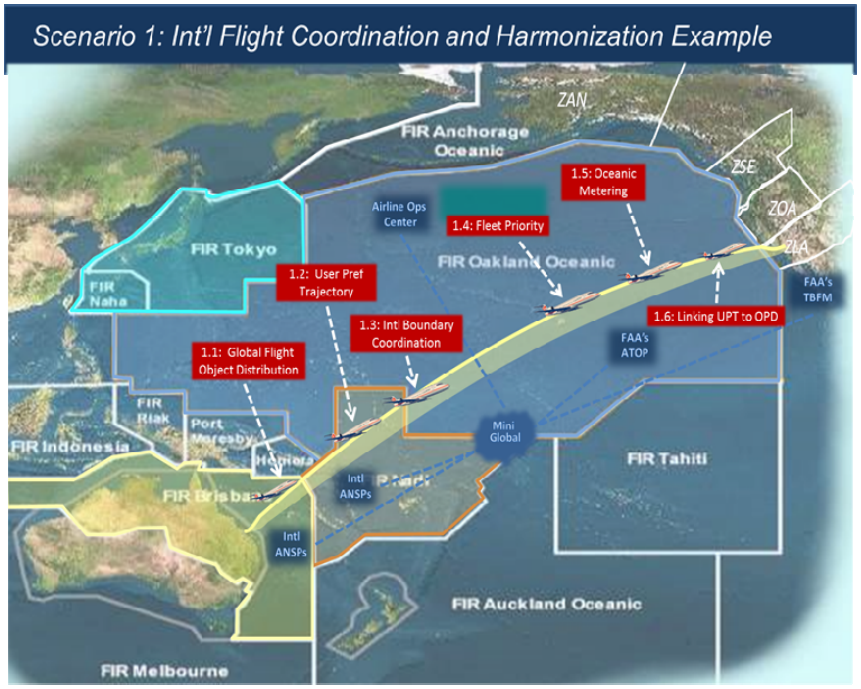

Figure 1: International Flight Coordination and Harmonization Scenario

The following provides a brief description of the Mini-Global Scenario 1 Flight Coordination and Harmonization Uses Cases. The Use Cases considered for the Mini-Global RMD are noted with an "**".

- Capability 1: Global Flight Object Distribution**

This set of Use Cases, one for an international inbound and another for an international outbound flight, illustrates the data exchange required prior to flight departure, including all stakeholders involved and all means of transmission required, and the data exchange required in order to share FIXM, AIXM, and WXXM data among stakeholders. Another Use Case within this set demonstrates the data exchange and access for Dangerous Goods information as a flight progresses from pre-departure through arrival.

- Capability 2: User Preferred Trajectories (UPT)

In this Use Case, the flight operator requests a route change that involves multiple Flight Information Regions. This request, as well as the subsequent negotiation, evaluation, collaboration, and approval are conducted without voice communication.

- Capability 3: International Boundary Coordination**

This Use Case illustrates the data exchange required by the transferring Air Navigation Service Provider (ANSP) to identify and resolve conflicts before handing off an aircraft to the receiving ANSP.

- Capability 4: Fleet Prioritization

This Use Case illustrates the data exchange required for the utilization of flight operator prioritization of an international flight during an arrival metering program.

- Capability 5: Oceanic Metering

In this Use Case, arrival metering programs have early information on oceanic flights, and incorporate this information into the metering program. This allows the constraint at the airport to be met with minimal airborne holding, or other large trajectory modifications.

- Capability 6: Linking User Preferred Trajectories (UPT) to Optimized Profile Descent (OPD)

This Use Case will illustrate the optimal flight profile afforded by combining all of the previous five capabilities, and will link that to the OPD.

For additional information concerning the Mini-Global Scenario Use Cases, please contact Thien Ngo at Thien.Ngo@faa.gov or 1-202-267-9447, for a copy of the deliverable “Operational Scenario Use Cases, v1.0”, August 30, 2013.

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