International Civil Aviation Organization

EIGHTEENTH MEETING OF THE METEOROLOGY SUB-GROUP (MET SG/18) OF APANPIRG

ICAO Regional Sub-Office, Beijing, China
18 – 21 August 2014

Agenda Item 7: Research, development and implementation issues in the MET field

7.5 Data exchange

SWIM TEST AND DEMONSTRATION

(Presented by the United States of America)

SUMMARY

This paper summarizes results of initial testing and demonstrations of exchanging SWIM-enable MET information. The demonstrations included both ground-to-aircraft as well as ground-to-ground.

1. Introduction

1.1 This paper relates to the topic of research and demonstrations of the exchange of aeronautical meteorological (MET) information in the future system-wide information management (SWIM) enabled environment.

1.2 SWIM is an integral component of the ICAO Global Air Navigation Plan's Aviation System Block Upgrades. SWIM introduces a significant change in the business practices regarding how information is managed during its entire life cycle. The implementation of SWIM seeks to provide the required information of known quality to the right people at the right time for the intended purpose. The SWIM environment or more formally, the global ATM interoperability framework, will shift the ATM information architecture paradigm form point-to-point data exchanges to system-wide interoperability.

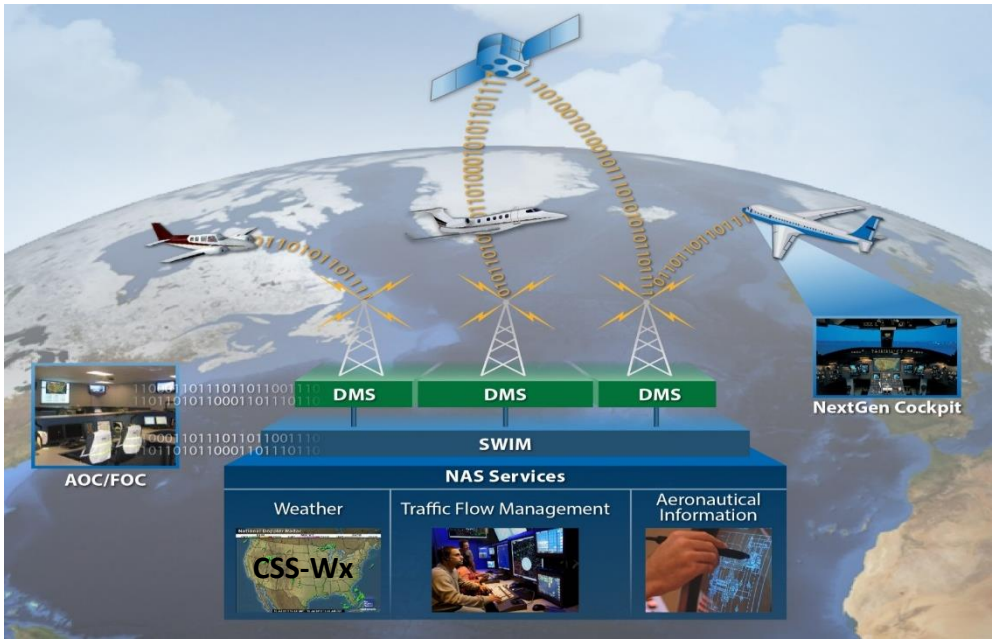
1.2.1 For more information on SWIM refer to Information Paper 06 from the 2014 MET Divisional Meeting (*Evolution of aeronautical meteorological information exchange in the context of the system-wide information management (SWIM)*).

1.3 This paper informs on the results of initial interoperability demonstrations of both Ground-to-Air and Ground-to-Ground exchanges of SWIM-enabled MET information.

2. Ground to aircraft demonstrations

2.1 During June and July last year (2013), joint Capability Evaluations (CEs) were conducted at the FAA William J Hughes Technical Centre (WJHTC) in Atlantic City, New Jersey. The joint CEs were a collaborative effort between three FAA programs and the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS). The FAA Common Support Services-Weather (CSS-Wx) program in conjunction with NOAA/NWS provided the Extensible Markup Language (XML) MET information; the FAA Weather Technology in the Cockpit (WTIC) program provided research applications of turbulence data; and the FAA Aircraft Access to SWIM (AAtS) program provided the data link connection to the aircraft via a Data Management Service (DMS).

2.2 The CEs demonstrated accessing and displaying MET information via SWIM as illustrated in the figure below. Transmissions of live as well as archived MET information were displayed on an FAA research aircraft as well as on air traffic controller research displays.



2.3 The FAA CSS-Wx program is the single source of MET information for support to the FAA National Airspace System operations. For the joint CEs, CSS-Wx published via SWIM the following MET information:

- METARS
- TAFs
- AIRMETs/SIGMETs
- PIREPs
- NEXRAD Weather Radar

- Graphic Turbulence Guidance (GTG)

- Eddy Dissipation Rate (EDR) reports

2.4 The joint CEs illustrated how providing the common weather picture to the aircraft as well as ground users could enable more proactive pilot and air traffic control interactions as well as airline operations centres as appropriate. They also demonstrated the maturing of the technologies for including MET information in the evolving SWIM enabled environment.

3. Ground to ground demonstrations

3.1 Two tests have been conducted in transmitting XML based OPMET messages over the Air Traffic Service message handling system (AMHS). The first test was done in December 2010 between the United States and Hong Kong, China. The results of that test were presented by the United States to the Fifteenth Meeting of the Aeronautical Fixed Services Group (AFSG) of the European Air Navigation Planning Group (ref AFSG/15-IP/12). The second test was done in November 2012 between the United States, Singapore and the United Kingdom. The initial results of the second test were presented to the Eighth Meeting of Aeronautical Telecommunication Network (ATN) Implementation Co-Ordination Group of APANPIRG (ref ATNICG/8 – IP/18).

3.2 Both tests resulted in conclusions and observations that the exchange of XML-based OPMET data is a feasible endeavour. Further testing is required, however, since both tests used relatively small example test data sets. Fully loaded testing is needed to determine impacts such as configuration management, communications loading of larger OPMET data sets and the priority and response times for user access.

4. Action by the meeting

4.1 The meeting is invited to note the information contained in this paper.

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