



WORKING PAPER

TWELFTH AIR NAVIGATION CONFERENCE

Montréal, 19 to 30 November 2012

**Agenda Item 4: Optimum capacity and efficiency – through global collaborative ATM
4.3: Enhanced operational decision-making through integrated meteorological
information**

METEOROLOGICAL INFORMATION SERVICES

(Presented by the United States)

EXECUTIVE SUMMARY

This paper identifies two items that should be addressed in the meteorological information (MET) modules of the aviation system block upgrade (ASBU) to achieve maximum benefit from the planned MET development and transition from today's meteorological reports and forecasts to tomorrow's integration of MET into operational decision-making systems in support of performance-based navigation.

Action: The Conference is invited to agree to the recommendations in paragraph 3.

1. INTRODUCTION

1.1 AN-Conf/12-WP/15 and its associated three appendices provide a proposed concept and framework for the future of meteorology (MET) and its use in global air traffic management (ATM) and performance-based navigation (PBN). The detailed information presented in the three appendices to WP/15 is in line with the United States plans for the Next Generation Air Transportation System (NextGen). However, this paper wishes to bring to the attention of the meeting, items that require further clarification or discussion. Specifically, the need for:

- a) a roadmap for MET; and
- b) provision of space weather forecasts.

2. BACKGROUND

2.1 Roadmap for MET

2.1.1 MET is an integral component of tomorrow's system-wide information management (SWIM) environment, alongside aeronautical information, flight and flow information and other information sources. As MET transitions from today's predominantly alphanumeric and graphical formats

to tomorrow's interoperable code forms (such as XML/GML) within the SWIM environment, using exchange models such as the weather exchange model (WXXM), great potential exists to enhance the safety and the efficiency of the global ATM system through enhanced availability and use of MET. For example, ongoing work in the ICAO project team¹ under the Air Navigation Bureau's (ANB) Meteorology Section includes a roadmap that identifies key milestones for implementation of WXXM. With this in mind, a roadmap in the ASBU for ATM MET in support of PBN would help States better understand the path forward for MET in preparation for implementation actions.

2.1.2 The MET roadmap is also expected to point out the need for the revision of global standards for MET content and format from today's alphanumeric and graphical formats to the future four-dimensional (4D) representations of MET. It is envisioned that the revision of global standards will need to begin in Block 0 and continue through Block 3 of the ASBU.

2.1.3 The revision of global standards for MET content and format should be supported by the introduction of Procedures for Air Navigation Services for Meteorology (PANS-MET). PANS-MET should clearly define how meteorological information will be provided and then integrated into ATM. The development of PANS-MET is a task assigned to a project team² under ANB's MET Section. It is expected that this task will be completed in 2013.

2.1.4 It is recommended that modules for MET be updated to include a roadmap that identifies critical milestones and pathways for the transition and evolution of MET from Blocks 0 through 3.

2.2 Space Weather

2.2.1 At the conjoint ICAO/WMO MET Divisional Meeting of 2002, Recommendation 1/20 c) called for the assessment of the need for the provision of information for international air navigation on solar radiation storms. It was pointed out in 2002 that, with the opening of new polar routes, aircraft operating in these high latitudes could be exposed to hazardous levels of solar radiation that could affect health, communications and the global positioning system.

2.2.2 Space weather is a critical meteorological element impacting high latitude operations. Solar radiation storms or coronal mass ejections can cause communication black-outs at higher latitudes with significant operational impacts. Operators, airline operation centres, and air navigation service providers need information on space weather in support of their flight planning and operational decision-making.

2.2.3 The Air Navigation Commission tasked the International Airways Volcano Watch Operations Group (IAVWOPSG) (Conclusion 1/33) to report on the issues with space weather. The IAVWOPSG developed guidance material on space weather (Conclusion 5/18) and noted the need to develop operational requirements for space weather services (Conclusion 5/19). This work has led to the development of a draft *Concept of Operations for International Space Weather Information in Support of Aviation* which is currently being reviewed in accordance with State letter AN 10/18.2-12/1. This concept of operations will also define the functional and performance requirements for space weather information.

2.2.4 It is expected that the provision of space weather forecasts for global air navigation will be implemented in the Block 0 time frame. Therefore, it is recommended that space weather be added to the MET elements in Module B0-105 (see Appendix A).

¹ Meteorological Aeronautical Requirements and Information Exchange Project Team (MARIE-PT)

² Meteorological Aeronautical Requirements and Information Exchange Project Team (MARIE-PT)

3. **RECOMMENDATIONS**

3.1 The Conference is invited to consider the following:

That the meteorology modules of the aviation system block upgrades (ASBUs) proposed by the Secretariat, with which the United States agrees, should be supplemented with the following two additions:

- a) a roadmap for meteorological information within the ASBU; and
- b) the inclusion of space weather as an element for the meteorological services contained in Module B0-105.

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