



*International Civil Aviation Organization*

**SEVENTEENTH MEETING OF THE METEOROLOGY  
SUB-GROUP (MET SG/17) OF APANPIRG**

Bangkok, Thailand, 13 – 16 May 2013

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**Agenda Item 10: MET support to ATM**

10.1) review of relevant ICAO meetings (ATMRPP, MARIE-PT)

**ICAO AVIATION SYSTEM BLOCK UPGRADES (ASBU) FOR METEOROLOGY**

(Presented by the United States)

**SUMMARY**

This information paper presents an overview of the Aviation System Block Upgrades (ASBU) for Meteorology which were presented and endorsed at the 12<sup>th</sup> Air Navigation Conference.

**1. Introduction**

1.1 At the 12<sup>th</sup> Air Navigation Conference (ANC), the Committee on Agenda Item 4 noted that meteorological (MET) information was an integral component of the future system-wide information management (SWIM) environment, alongside aeronautical information, flight and flow information and other information sources. As MET information transitions to interoperable, non-proprietary code forms within the SWIM environment using new exchange models, it was noted that tremendous potential existed to enhance the safety and the efficiency of the global ATM system through enhanced availability and use of MET information. With this in mind, the Committee endorsed a planning thread promoting the use of integrated MET information to enhance operational decision making, as proposed for inclusion in the Aviation System Block Upgrade (ASBU) framework to be included in the Global Air Navigation Plan.

1.2 This information paper presents a brief overview of the ASBUs which pertain to MET information.

**2. Discussion**

2.1 The ASBUs will enable aviation to realize global harmonization, increased capacity, and improved environmental efficiency that modern air traffic growth now demands in every region around the world. There are four blocks with the following time frames:

Block 0 = 2013 to ~ 2018  
Block 1 = ~2018 to ~2023  
Block 2 = ~2023 to ~2028  
Block 3 = ~2028 onward

2.2 Each Block contains several Modules which have been determined and cross-referenced to specific Performance Improvement Areas. These Performance Improvement Areas are: (1) Airport Operations, (2) Globally Interoperable Systems and Data, (3) Optimum Capacity and Flexible Flights, and (4) Efficient Flight Path.

2.3 For MET there are 4 Modules, B1-30, B0-105, B1-105 and B3-105. (*The number after the letter B refers to the block number, e.g., B1 belongs to Block 1*).

**2.4 Module B1-30: Service Improvement through Integration of all Digital ATM Information.**

2.4.1 The module implements the ATM information reference model which integrates all ATM information using common formats (UML/XML and WXXM) for MET information and FIXM for flight and flow information.

2.4.2 WXXM, which was recently renamed to ICAO Meteorological Information Exchange Model (IWXXM), will be introduced in November 2013 (in Amendment 76 to ICAO Annex 3 – *Meteorological Service for International Air Navigation*) for the exchange of SIGMET, TAF and METAR/SPECI between States is a position to do so. The ICAO Meteorological Aeronautical Requirements and Information Exchange Project Team (MARIE-PT) has proposed that this exchange be made a recommendation as part of Amendment 77 to Annex 3, and then a standard with Amendment 78 to Annex 3. The MARIE-PT currently expects a transition period where both the traditional alphanumeric code (TAC) form meteorological products and matching XML/GML form will be distributed concurrently.

2.4.3 More information on IWXXM is provided in an accompanying IP to this meeting, titled *ICAO Meteorological Information Exchange Model (IWXXM)*.

**2.5 Module B0-105: MET Information Supporting Enhanced Operational Efficiency and Safety.**

2.5.1 This module begins as a baseline of today's MET information. Recognizing the importance of space weather in support of international air navigation it was agreed that space weather should be incorporated into Block 0 as well as Amendment 77 to Annex 3 in November 2016. This is expected to be further discussed at the proposed ICAO (MET) Divisional meeting in July 2014.

**2.6 Module B1-105: Enhanced Operational Decisions through Integrated MET Information (Planning and Near-term Service).**

2.6.1 This module enables the identification of solutions when forecast or observed meteorological conditions impact aerodromes or airspace. Full ATM-MET integration is needed to ensure that MET information is included in the logic of a decision process and the impact of the MET conditions (the constraints) are automatically calculated and taken into account. The decision time-horizons range from minutes, to several hours or days ahead of the ATM operation (this includes optimum flight profile planning and tactical in-flight avoidance of hazardous MET conditions) to typically enable near-term and planning (>20 minutes) types of decision making.

2.6.2 This module improves the current baseline case where ATM decision makers manually determine the amount of change in capacity associated with an observed or forecast MET condition (e.g., thunderstorm activity), manually compare the resultant capacity with the actual or projected demand for the airspace or aerodrome, and then manually devise ATM solutions when the demand exceeds the MET-constrained capacity value.

2.6.3 This module also improves in-flight avoidance of hazardous MET conditions by providing more precise information on the location, extent, duration and severity of the hazard(s) affecting specific flights.

2.6.4 Note that Module B1-105 encompasses the timeframes of Block 1 and Block 2.

**2.7 Module B3-105: Enhanced Operational Decisions through Integrated MET Information (Near-term and Immediate Service).**

2.7.1 The aim of this module is to enhance global ATM decision making in the face of hazardous MET conditions in the context of decisions that should have an immediate effect. Key points are: a) tactical avoidance of hazardous MET conditions, especially in the 0-20 minute timeframe; b) greater use of aircraft based capabilities to detect MET parameters (e.g. turbulence); and c) display of MET information to enhance situational awareness.

2.8 It should be noted that the Committee on Agenda Item 4 (12<sup>th</sup> ANC) recognized that some support would be needed for States that may struggle to implement the ASBUs for MET information.

2.9 More detailed information can be found at: <http://www.icao.int/Meetings/anconf12/Pages/asbus.aspx> as well as 12<sup>th</sup> ANC Working Paper (WP)/3, draft update to Doc 9750 - *Global Air Navigation Plan*, and WP/159 *Draft Report of the Committee on Agenda Item 4*.

**3. Action by the Meeting**

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

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