INTERNATIONAL CIVIL AVIATION ORGANIZATION

Fourth Meeting of the APIRG Infrastructure and Information Management Sub-Group (IIM/SG4)

(Virtual, 31 August - 3 September 2021)

Agenda Item 5: ***Implementation of ASBU Modules***

WP5.4B – MET ASBU MODULES ACCORDING TO THE SIXTH EDITION OF THE GANP

(Presented by the Secretariat)

SUMMARY
This paper provides an overview of the ASBU Modules according to the Sixth Edition of the GANP in the area of Aeronautical Meteorology (MET)of Action by the meeting is in **paragraph 3**
REFERENCE(S): ▪ Sixth Edition of the GANP (Doc 9750)
Related ICAO Strategic Objective (s): ▪ **A:** Aviation Safety and **B:** Capacity & Efficiency **Related ASBU KPIs & B0 Modules:** all KPIs applicable to the MET domain

1. INTRODUCTION

1.1. The Sixth Edition of the GANP takes on a four-layers approach:

a) **Global Managerial level**, providing Vision, Conceptual Roadmap, Global Performance Ambitions in accordance with the Global ATM Operational Concept (GATMOC;

b) **Global Technical**, build on two Global Technical Frameworks (Basic Building Blocks (BBB), Aviation System Block Upgrades (ASBU), Performance-based Decision-making Method);

c) **Regional Level,** addressing regional and sub-regional needs in line with the global objectives;

d) **National level**, development by States, in accordance with relevant stakeholders, of air navigation plans aligned with the regional and global objectives.

1.2. The **Basic Building Block (BBB) framework** outlines the foundation of any robust air navigation system. It is nothing new but the identification of the **essential services** to be provided for international civil aviation in accordance with ICAO Standards.

1.3. These essential services are defined in different areas, including Aeronautical Meteorology (MET). The BBB framework identifies the end users of these services as well as the assets (communications, navigation, and surveillance (CNS) infrastructure) that are necessary to provide them. They **constitute the baseline** for any operational improvement.

1.4. The current paper will focus on t the Sixth Edition of GANP regarding the ASBU AMET Modules applicable.

2. DISCUSSIONS

2.1. The APIRG/19, through its Conclusion 19/20 adopted 18 ASBU Block 0 Modules for the AFI Region. Those Modules were organized in four categories (Essential (E), Desirable (D), Specific (S) and optional (O)) associated to two levels of priorities (priority 1 with immediate implementation, priority 2 with recommended implementation).

2.2. The AMET-B0 *Meteorological Information Supporting Enhanced Operational Efficiency and Safety*, is part of those adopted B0 Modules and identified in category E with priority 1. Planning targets, implementation challenges and performance indicators/supporting metrics have been determined as per Appendix 3.0A of APIRG/19 Report to support the implementation of the said module.

2.3. APIRG IIM/SG Regional MET Projects (IIM MET Project 1, IIM MET Project 2, IIM MET Project 3) have been committed to assist States in the implementation of AMET-B0 as required.

2.4. The Sixth Edition of the Global Air Navigation Plan (GANP) has restructured and refined the AMET Thread as Enabler Thread for operational ones. The restructured AMET Thread is associated to 5 Blocks (AMET-B0, AMET-B1, AMET-B2, AMET-B3, AMET –B4).

2.5. The AMET-B1 stands with "Ready for Implementation" Level and is structured as per the table 1 below.

<table>
<tr><td colspan="2">AMET-B0 : Global, regional and local meteorological information to support flexible airspace management, improved situational awareness, collaborative decision-making and dynamically optimized flight trajectory planning.</td><td rowspan="2"><u>Moving from Products-Services net-centric</u> to <u>Data-Information Net Centric</u></td><td colspan="2">AMET-B1 : Meteorological information supporting automated decision process or aids, involving meteorological information, meteorological information translation, ATM impact conversion and ATM decision support.</td></tr>
<tr><td>AMET-B0/1</td><td>Meteorological observations products</td><td>AMET-B1/1</td><td>Meteorological observations information</td></tr>
</table>

AMET-B0/2	Meteorological forecast and warning products		AMET-B1/2	Meteorological forecast and warning information
AMET-B0/3	Climatological and historical meteorological products		AMET-B1/3	Climatological and historical meteorological information
AMET-B0/4	Dissemination of meteorological products		AMET-B1/4	Dissemination of meteorological information

AMET 1 AMET Thread and associated Modules

2.6. The Table below provides details regarding the AMET-B0/1 and AMET B1/1 as per the 6th Ed of the GANP made available in ICAO Secure Portal.

Table 1 AMET Thread Modules: AMET-B0/1 and AMET-B0/1/1

	AMET-B0/1 Meteorological Observations **Products**	**AMET-B1/1** Meteorological Observations **Information**
Main purpose (WHY)	**Meteorological observations** in support of flexible airspace management, improved situational awareness, collaborative decision-making and dynamically optimized flight trajectory planning	Meteorological observations **information** in support of automated decision processes or aids and performance based requirements, involving meteorological information, meteorological information translation, ATM impact conversion and ATM decision support
New Capabilities (WHAT)	Provision of observations of additional meteorological parameters/elements. More automated observations. Higher temporal and spatial resolution for lightning, radar and satellite information.	**Commencement of change from <u>product-centric</u> to <u>data-centric</u> information.** Commencement of space weather and Sulphur dioxide (SO2) services. Enhanced hazardous weather services. Introduction of new and enhanced space-based observations. Introduction of new observational information from both un-manned and manned aircraft (ie. observations from LIDAR).
Description (HOW)	Automatic Weather Observation System (AWOS) information (including real-time exchange of wind and RVR data) Local reports (MET REPORT / SPECIAL) Aerodrome reports (METAR / SPECI) Lightning information Ground-based weather radar information Meteorological satellite imagery Aircraft meteorological report (ie. ADS-B, AIREP, AMDAR etc.) Vertical wind and temperature profiles Volcano Observatory Notice for Aviation (VONA) Wind shear alerts	Meteorological observations will begin to transition from traditional alphanumeric code (TAC) form to data-centric information to better support the common understanding on the various operational constraints, capabilities and needs. SWIM-compliant observational parameters and phenomena will begin to be made available to users including : Wind speed and direction (aerodrome) including gusts, Wind speed and direction from departure to Top of Climb (TOC) and then Top of Descent (TOD) to landing, Wind speed and direction en-route, etc. (Sixth refers)
Maturity Level	Ready to be implemented	Standardization

<table>
<tr><td>Human factor considerations</td><td colspan="4">1. Does it imply a change in task by a user or affected others? No
2. Does it imply processing of new information by the user? No
3. Does it imply the use of new equipment? Yes
4. Does it imply a change to levels of automation? Yes</td><td colspan="4">1. Does it imply a change in task by a user or affected others? No
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3. Does it imply the use of new equipment? Yes
5. Does it imply a change to levels of automation? Yes</td></tr>
<tr><td rowspan="2">Planning layers</td><td>Pre-tactical</td><td>Tactical-Pre operations</td><td>Tactical-During operations</td><td>Post Operations</td><td>Pre-tactical</td><td>Tactical-Pre operations</td><td>Tactical-during operations</td><td>Post Operations</td></tr>
<tr><td></td><td>x</td><td>x</td><td></td><td></td><td>x</td><td>x</td><td></td></tr>
<tr><td>Operations</td><td colspan="3">• Taxi-out • Departure
• En-route • Taxi-in
• Arrival • Turn-around</td><td colspan="4">• Taxi-out • Departure
• En-route • Taxi-in
• Arrival • Turn-around</td></tr>
<tr><td colspan="5">Dependencies and relations</td><td colspan="4">Dependencies and relations</td></tr>
<tr><td>Evolution[1]</td><td colspan="4"></td><td colspan="4">AMET-B0/1 - Meteorological observations products</td></tr>
<tr><td>Relation-technology benefit[2]</td><td colspan="4">ASUR-B0/3 - Cooperative Surveillance Radar Downlink of Aircraft Parameters (SSR-DAPS)</td><td colspan="4">COMS-B1/2 - PBCS approved ADS-C (FANS 1/A+) for procedural airspace</td></tr>
<tr><td>Relation-technology benefit</td><td colspan="4">COMS-B0/2 - ADS-C (FANS 1/A) for procedural airspace</td><td colspan="4"></td></tr>
<tr><td rowspan="3">Relation-technology need[3]</td><td colspan="4" rowspan="3">COMI-B0/7 - ATS Message Handling System (AMHS)</td><td colspan="4">COMI-B0/7 - ATS Message Handling System (AMHS)</td></tr>
<tr><td colspan="4">COMI-B0/1 - Aircraft Communication Addressing and Reporting System (ACARS)</td></tr>
<tr><td colspan="4">ASUR-B0/3 - Cooperative Surveillance Radar Downlink of Aircraft Parameters (SSR-DAPS)</td></tr>
<tr><td>Relation-technology benefit</td><td colspan="4">COMI-B0/1 - Aircraft Communication Addressing and Reporting System (ACARS)</td><td colspan="4"></td></tr>
<tr><td>Enablers</td><td colspan="4">Regulatory provisions - Operational procedures - Airborne system capability - Ground system infrastructure - Training</td><td colspan="4">Regulatory provisions - Operational procedures - Airborne system capability - Ground system infrastructure - Training</td></tr>
</table>

2.7. Considering the provisions of Annex 3 to the Convention relative to the International Civil Aviation requiring to provide aviation users with meteorological information in standardized

[1] **Evolution** : Capacity
[2] **Technology benefit**: Optional enhancement of said element related to the use of enhanced technology.
[3] **Technology need** : Required technological capability to achieve the implementation of the said element

formats, taking into account the introduction of requirements related to space weather information in the restructured AMET Modules in the Sixth Edition of the GANP, the Volume III of the eANP should be revised to reflect the new modules dealing with MET, including the update of their category and priority accordingly.

3. ACTIONS BY THE MEETING

3.1. The meeting is invited to:

a) Take note of the information contained in this paper;

b) Consider the Conclusion as formulated in the WP5.1A

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