INTERNATIONAL CIVIL AVIATION ORGANISATION

AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP (APIRG)
METEOROLOGY SUB-GROUP ELEVENTH MEETING (MET/SG/11)
(Nairobi, Kenya, 8-10 July 2013)

Agenda Item 6: New Challenges facing AFI Meteorological Services: Future Developments with regards to OPMET information

AERONAUTICAL METEOROLOGICAL REQUIREMENTS FOR AIR TRAFFIC MANAGEMENT OPERATIONAL CONCEPT.

(Presented by the Secretariat)

SUMMARY

This paper gives an overview of the Global ATM operational concept and the MET information that will be tailored to meet the ATM requirements, and presents a brief on the Aviation System Block Upgrades (ASBU) related OPMET information and plans for the introduction the transition to table-driven data representation (XML/GML) for METAR/SPECI, TAF and SIGMET. The paper also provides a draft report for the preparation of the MET related regional air navigation implementation action plan, based on the ASBU as recommended by PIRG-RASG Coordination meeting and the 12th Air Navigation Conference.

Ref:
- APIRG/18 meeting report;
- Doc. 9854 *Global Air Traffic Management Operational Concept*
- AN-Conf/12 Report
- PIRG-RASG Coordination meeting report

1. Introduction

1.1 The meeting may recall that the Global Air Traffic Management (ATM) Operational Concept contained in ICAO Doc. 9854, describes the ATM system including scope of the concept, guiding principles, expected benefits, system performance, different expectations and coordination, the manner in which the ATM system will deliver services and benefits to airspace users by 2025. The Aviation System Block Upgrades (ASBU) is a methodology to implement the ATM system based on operational concepts extracted from the NEXTGEN (USA), SESAR (Europe) and CARATS.

1.2 This paper presents a brief on the Aviation System Block Upgrades (ASBU) related related to MET. The paper also introduces a report to prepare the MET related regional air navigation implementation action plan, based on the ASBU as recommended by PIRG-RASG Coordination meeting and the 12th Air Navigation Conference, Recommendation 6/1. Information concerning plans for the introduction of XML/GML for METAR/SPECI, TAF and SIGMET as part of draft Amendment 76 to Annex 3 will be provided to the MET/SG.

2. **Discussions**

2.1 In 2005, ICAO published the first edition of its 'Global Air Traffic Management Operational Concept' (Doc 9854 AN/458). It recognizes that the air transport industry plays a major role in world economic activity and remains one of the fastest growing sectors; however, in many places, demand often exceeds the available capacity of the system, resulting in significant negative consequences, not only to the aviation industry, but also to general economic health.

2.2 The ICAO developed Doc 9854 as a means to guide the implementation of communications, navigation, surveillance and air traffic management (ATM) technology by providing a description of how the emerging and future ATM system should operate. This, in turn, will assist the aviation community through the transition from today's technology centred air traffic control to tomorrow's performance-based and collaborative ATM environment.

2.3 The primary functions of the ATM system will enable flight from/to an aerodrome into airspace, safely separated from harzards, within capacity limits, making optimum use of all system resources.

2.4 The ICAO's global ATM concept acknowledges that the provision of aeronautical meteorological (MET) information is a key enabler of the future ATM system, with MET information tailored to fulfill user expectations.

2.5 The Aviation System Block Upgrades (ASBU) is a foundation of blocks originates from existing, near term implementation plans and access to benefits that already exist (NEXTGEN, SESAR and CARATS). It is aligned with ICAO ATM Operational Concept and its Intent is to apply key capabilities and performance improvements across other regional and local environments. Aviation Block upgrades will allow structured approach to meet needs of individual aviation communities worldwide while considering associated business cases. They reflect recognition that all modules are not required in all airspaces.

2.7 The ASBU is a methodology to facilitate interoperability of different technologies, accommodate different procedures, cover all elements of AN systems (ATM, CNS, AGA, AIM and MET) and provide harmonization thus leading to seamlessness across regions. This is achieved through progressive, cost effective and cooperative implementation of air navigation systems worldwide. The Block upgrades will allow for a structured approach to meet the needs of individual aviation communities worldwide and that the use of meteorological (MET) information in a net-centric ATM environment and satisfying the foreseen performance requirements for MET will have an impact on the information that needs to be made available and exchanged between information providers and users.

2.8 The meteorological support to tomorrow's ATM will be based on:

- Service delivery and benefits for airspace users by 2025;
- Network-based (net-centric) environment that is globally interoperable;
- Fusing MET information with aeronautical information and flight information.

2.9 The result of such support will be a transition of Meteorological (MET) *products* into MET *information* supporting collaborative, knowledge-based, decision making through free-flowing information exchange trajectory/performance based operations.

2.10 With regard to OPMET, the AFI OPMET MTF/4 meeting indicated that International consensus exists on an overall migration of the numerous code forms and code descriptions for operational meteorological (OPMET) data towards the notion of one weather information exchange model (WXXM). The WXXM provides the semantics and abstract structure of all the information that needs to be made available by MET service providers as prescribed by Annex 3. It includes the intrinsic data requirements and structural business process rules. It provides a so-called

technology independent description (a static description, in the Unified Modeling Language (UML), of the structure of the 'Meteorological Information Exchange system' by showing the system's classes, their attributes, operations (or) methods and the relationships between the classes) not concerned with code form specifications such as GRIB, binary universal form for the representation of meteorological data (BUFR), and Traditional Alphanumeric Codes (TAC) for aerodrome routine meteorological report (in meteorological code form) (METAR), aerodrome forecast (in meteorological code form) (TAF), etc.

2.11 Considering the important role the databank provider States will be playing with the introduction of meteorological information in digital format, the MTF/4 encouraged AFI data bank provider States to start developing the necessary capability of handling OPMET bulletins in digital format as the exchange of the same on bilateral basis is expected after the applicability of Amendment 76 to Annex 3 in November 2013. The MTF/4 meeting then called for Recommendation 4/15 for the development of capabilities of handling OPMET information in digital format in the AFI region. In this regard the meeting may wish to adopt the following draft conclusion.

Draft Conclusion 11/XX: Development of Capabilities of Handling OPMET Information in Digital Format

That both Pretoria and Dakar RODBs be encouraged to:

a) **start developing capability of handling OPMET data in digital format as soon after November 2013 as possible;**

b) **test the codes based on the table-driven data representation (XML/GML) schema for METAR/SPECI, TAF and SIGMET with a view to fine tuning over the first year; and**

c) **take a leading role over the transition aspect of XML/GML and assist other AFI States in implementing table-driven data representation wherever possible.**

2.12 The meeting is informed that the outcome of the ICAO Global Planning and Implementation Groups (PIRG) and Regional Aviation Safety Groups (RASG) coordination meeting held in March 2013 as well as Recommendation 6/1 of the 12th Air Navigation Conference (AN-Conf/12) requires every PIRG to develop a Regional Air Navigation Implementation Action Plan, based on the ASBU methodology.

2.13 The Sub-Group is further informed that ASBU implementation is to be realized through tailored regional work programmes based on specific operational needs. This work programme will be designed first by identifying the operational characteristics of the homogeneous air traffic management (ATM) areas, major traffic flows and major international aerodromes. Analysis of this operational data will identify performance improvement opportunities and ASBU modules will then be evaluated to identify which of them best deliver the needed operational improvements. Once operational analysis and resulting implementations have been completed, the next step calls for air navigation performance monitoring through an established measurement and reporting strategy. APIRG/19 meeting will therefore focus on the development of the Air Navigation Implementation Plan for the AFI region, using a structured approach as called for by the Global Air Navigation Plan.

2.14 To complete this tasks, the APIRG Secretary is urging all APIRG Sub-Groups including MET/SG to include this activity in their agenda in preparing APIRG/19 meeting. To this end, the MET/SG is requested to provide a report to be submitted to APIRG/19 for the preparation of the MET related AFI Regional Air Navigation Implementation Action Plan. As requested by the APIRG Secretary, the said report shall be structured as follows:

1) Introduction,
2) Analysis of the current situation,
3) Identification of regional priorities and targets,

4) Determination of implementation and benefit indicators/metrics; and
5) Identification of implementation challenges.
6) Alignment with the ASBU.

2.15 Based on the above-mentioned structure, the Secretariat has prepared the draft report given in Appendix A to this paper for review by the MET/SG. In this regard, the meeting may wish to formulate the following Decision:

Decision 11/XX: MET/SG Report for the Preparation of the MET related AFI Regional Air Navigation Implementation Action Plan

That, the information provided in Appendix A to this paper, is adopted as the APIRG MET/SG report to be used by APIRG to develop AFI Regional Implementation Action Plan in the MET area.

3. ACTION BY THE MEETING

3.1 The task Force is invited to:

a) Note the information in this paper,

b) decide on the draft Conclusion and Decision proposed for the Sub-Group's consideration.