



International Civil Aviation Organization

CAR/SAM REGIONAL PLANNING IMPLEMENTATION GROUP (GREPECAS)

**Fifth Meeting of the CNS Committee of the GREPECAS ATM/CNS Subgroup
(CNS/COMM/5)**

Lima, Peru, 13 to 17 November 2006

CNS/COMM/5-IP/02

23/10/06

Agenda Item 1:

Communication systems developments

1.4 Study of a communication system to support the migration towards the meteorological messages interchange (METAR/SPECI y TAF) in BUFR format code.

**FEDERAL AVIATION ADMINISTRATION (FAA)
BUFR CODE AMHS IMPLEMENTATION PLAN**

(Presented by the United States of America)

SUMMARY

This paper conveys the background information of Binary Universal Form Representation (BUFR) code that will be used on Aeronautical Telecommunications Network/Air Traffic Service Message Handling System (ATN/AMHS) service. The FAA supports the use of User Agent Interface (IAU) to support the BUFR Coded Attachment through ATN/AMHS as depicted. The FAA continues to investigate the operational impact to adopt BUFR coded format messages, however this paper is limited to the interface between ATN/AMHS and BUFR coded messages generated system.

1. Introduction

1.1 Based on Doc7475: working arrangements between International Civil Aviation Organization (ICAO) and World Meteorological Organization (WMO), the Meteorological (MET) codes are the prerogatives of the WMO and ICAO is obliged to follow them.

1.2 Transition from Traditional Alphanumeric Code (TAC) to BUFR for Operational Meteorological Message (OPMET) was generated during the ICAO Met Division Meeting in 2002.

1.3 It is driven by the WMO plan, endorsed by at its 14th Congress in May 2003, for transition of all types of meteorological information.

1.4 Time frame, as defined by WMO, to replace the alphanumeric codes with binary code is 2007-2015.

2. Discussion

2.1 ICAO Aerodrome Meteorological Observing Systems Study Group (AMOSSG) held a meeting in April 2005 to address the adoption of the BUFR coded messages.

2.2 Aeronautical Communications Panel (ACP) was invited to develop a plan or guidance for a uniform global approach for the transition; a suggested outline of a global transition plan is as follows:

2.2.1 End of year 2007: complete Amendment 74 to Annex 3 to allow the use of BUFR code OPMET in addition to TAC between States

2.2.2 Year of 2010: complete Amendment 75 to Annex 3 to exchange/distribute BUFR data between OPMET databanks including Regional OPMET Data Banks (RODBs) sites. These provisions would be presented as Recommended Practices (RP).

2.2.3 Year of 2013: complete Amendment 76 to Annex 3 approving that the above RP becomes a standard and all states issue OPMET data in BUFR coded format to the OPMET databank as a recommended practice.

2.2.4 Year of 2016: approve Amendment 77 to Annex 3 as the recommend standard and fully implement the BUFR coded format.

2.2.5 Necessary amendments to other ICAO Docs such as Doc9705 will be require

2.2.6 Asia/Pacific Region – The ATN Implementation Co-Ordination Group has been tasked to develop the communication support for BUFR code over ATN/AMHS. APANPIRG has indicated the need to migrate to BUFR code by 2010, for use between the five OPMET data banks (Bangkok, Brisbane, Nadi, Singapore and Tokyo) in the ASIA/ PAC region (). They also acknowledged that the Basic ATN/AMHS may not be able to support BUFR coded format without modification.

2.2.7 Europe – establish a BUFR Transition Assessment Task Force (TF) in response to Decision 45/13 of the European Air Navigation Planning Group (EANPG). European region has postponed their communication planning to support BUFR code pending the final configuration of BUFR code generated system.

2.3 WMO developed a very informative paper on BUFR-coded OPMET considerations, prepared by the ICAO METG, for the upcoming Commission for Aeronautical Meteorology meeting to be held in Geneva in November this year. ICAO will also be represented at the meeting. The following are possible approaches toward implementing the BUFR coded format.

2.3.1 The OPMET text and data will be preset in a BUFR data definition table by WMO, which will be loaded and updated to the user terminals for decoding into text tokens.

2.3.2 A BUFR-coded message will contain a set of data table entries for reference to the WMO-maintained BUFR Table. Each message type is associated with a BUFR template. A decoder program and/or user application software is required for decoding and formatting the display in text.

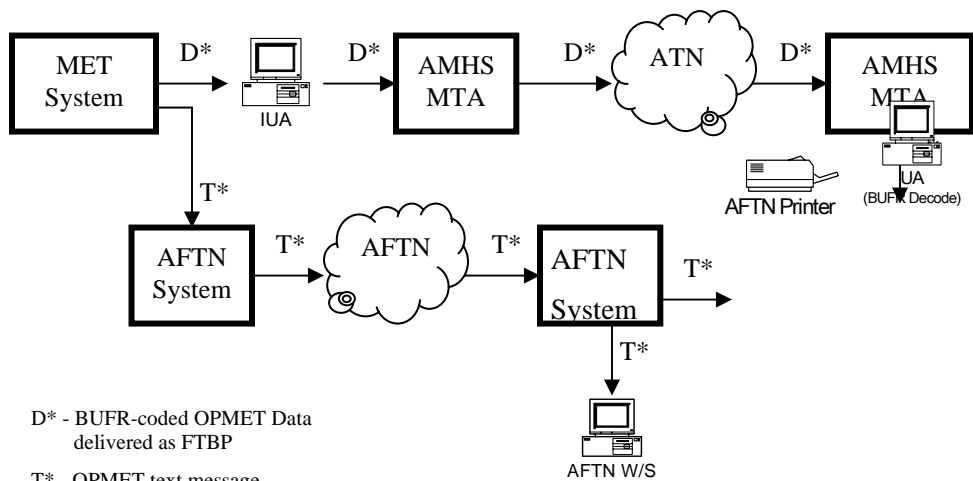
2.3.3 The decoder program is available in source code free of charge from the WMO website. The decoder converts the BUFR table references into text. Customization of the decoder software (using the source code) for specific applications such as OPMET will be required.

2.3.4 For each type of OPMET message, WMO will develop a BUFR template with the preset data set up in the centrally maintained BUFR table.

2.3.5 Only the METAR template has been developed by WMO. Templates for AIRREP, TAF etc. would unlikely be developed by end of 2007 (Hence would not meet our program of having operational BUFR support on AMHS in 2007).

2.3.6 Even if the OPMET templates are developed on time, standardization will be required to define how the OPMET data should be converted into text format, in particular the accuracy/decimal places to be presented. This work will be substantial, but it appears that very little work, if any, has been done in this area.

2.4 The FAA believes the BUFR transition strategy, can provide support for the existing OPMET user and implementation of BUFR code using the BUFR coded attachment through the IUA and AMHS. The existing weather messages based on Aeronautical Fixed Telecommunication Network (AFTN) will continue to be supported while the BUFR coded messages will be supported by AMHS. It is envisioned that a centralized BUFR coded message decoder/encoder will be required for the processing of OPMET data to avoid incurring extraordinary costs of having a decoder/processor on each platform requiring OPMET data. The figure below depicts the ATN/AMHS configuration to distribute BUFR coded messages. The FAA is still in the process of formulating how OPMET data in a BUFR coded message will be processed and disseminated within the National Airspace System (NAS).



Separate OPMET Messaging Support on AMHS and AFTN

3. Conclusion

3.1 The meeting is invited to note the information provided in this paper. The FAA believes the ICAO should consider adopting a standard of interface between ATN/AMHS and BUFR coded generated system. This will avoid a costly modification of ATN/AMHS needed to support BUFR Coded messages in the future.