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| WORLD METEOROLOGICAL ORGANIZATION  COMMISSION FOR BASIC SYSTEMS  -----------------------------  THIRD MEETING OF  INTER-PROGRAMME EXPERT TEAM ON DATA REPRESENTATION MAINTENANCE AND MONITORING  BEIJING, CHINA, 20 - 24 JULY 2015 |  | IPET-DRMM-III / Doc. 7.2(4a)  (25. 6. 2015)  -------------------------  ITEM 7.2(4)  ENGLISH ONLY |

MIGRATION TO TABLE-DRIVEN CODE FORMS (TDCF)

**Migration to BUFR within the U.S.A.**

*Submitted by Jeff Ator (U.S.A.)*

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**Summary and Purpose of Document**

This document summarizes progress and issues related to the migration to BUFR within the U.S.A.

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**ACTION PROPOSED**

The meeting is invited to take note of the contents and offer suggestions or comments.

**DISCUSSION**

There has been considerable progress towards migration within the U.S.A. during the past year. The National Weather Service (NWS), which has primarily responsibility on the civilian side of the U.S. weather community, has been meeting regularly with counterparts on the military side (e.g. U.S. Navy, U.S. Air Force) to discuss issues and coordinate progress, as well as disseminate information and promote awareness of the migration throughout the rest of the U.S. community. Of particular note is the recent chartering of a project within NWS to deliver high-resolution radiosonde data from the U.S. Radiosonde Replacement System (RRS) to the GTS, to replace BUFR data currently generated from separate TAC TTAA, TTBB, etc. parts for all NWS-controlled radiosonde sites. This project, expected to be completed within the next 7-8 months, will deliver soundings with reported data levels every 1 second of the ascent (for upwards of 6000 total levels per sounding) in full accordance with the B/C 25 regulations. A few preliminary samples have already been generated and made available to the U.S. Navy, Air Force and ECMWF for review.

With regards to U.S. efforts to assimilate migrated BUFR data from the entire world community, we are encountering many of the same issues being experienced by others in the community, including but not limited to:

* Lack of advance notice when countries discontinue their TAC transmission. This often leads to numerous inquiries and frantic remediation efforts by other countries that were not informed and therefore unprepared for the cessation of the TAC messages.
* Migrated BUFR data for certain countries is not always automatically made available or easily accessible. We’ve found some cases where we were receiving TAC TEMP and SYNOP reports from certain countries, but we were not receiving the corresponding migrated BUFR reports from those countries even though previous WMO monitoring periods had noted the availability of such reports. Upon further investigation, we learned that migrated BUFR reports from such countries were available, but those bulletins were not being made available to RTH Washington for internal dissemination to U.S. customers. We believe all such bulletins should be automatically “pushed” onto the GTS for easy discoverability and access by other countries, rather than each country having to individually notice such discrepancies in their own data receipts and then initiate action to remedy those discrepancies.
* Improperly-encoded BUFR reports. As many others have also noted, we are finding numerous errors in migrated BUFR reports, including missing or erroneous metadata values, units-conversion errors when translating from TAC to BUFR (e.g. knots vs. m/s), missing significance qualifier values, reporting bit numbers for flag tables rather than the proper corresponding value, etc. Should there be some minimum mandatory validation through which migrated BUFR reports from a country should be required to pass before that country is permitted to cease their corresponding TAC transmissions or otherwise declare their migration as being “complete”? We know there are at least a few web-based portals available which perform such validations, and though it’s likely that some are more rigorous than others, their usage is entirely voluntary and there is no requirement that new products must pass through any such check before being released onto the GTS. Should we re-consider this?
* One of the many original rationales for the migration to BUFR was that station location metadata would be available in each report alongside the data, rather than having to look up the metadata in a separate station table at each processing center based on an identifier in the TAC report. However, some of the BUFR-encoding errors we are seeing are in this metadata, e.g. latitude and longitude reported in degrees, minutes and seconds rather than being converted to fractional values, elevations reported in feet instead of meters, etc. Furthermore, and despite these conversion issues, some countries apparently believe that the migration to BUFR means that they no longer need to maintain their station information in Volume A. Until such conversion errors are a thing of the past, we believe that countries should be directed to continue maintaining their correct information in Volume A and any successor references; otherwise, the ability to diagnose such metadata errors would be significantly degraded.