

**CBS Lead Centres for GCOS
Coordination Meeting**

TEHRAN, ISLAMIC REPUBLIC OF IRAN
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MIGRATION TO TABLE-DRIVEN CODE FORMS (TDCF)

(Submitted by the Secretariat)

Summary and purpose of document

This document provides information on the decision of CBS-Ext(06) relevant to the migration to the TDCF (Appendix I) and other useful information on the TDCF provided by Mr Atsushi Shimazaki from Japan Meteorological Agency (Appendix II).

ACTION PROPOSED

The group is invited to take into account the information provided in the document when considering individual agenda items.

DRAFT TEXT FOR INCLUSION IN THE GENERAL SUMMARY OF CBS-Ext.(06)

6.2 INFORMATION SYSTEMS AND SERVICES (ISS) (*agenda item 6.2*)

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Data Representation and Codes

Migration to Table-Driven Code Forms (MTDCF)

6.2.69 The Commission noted also with appreciation the work of the Coordination Team on Migration to Table Driven Code Forms (CT-MTDCF) and thanked Mr Fred Branski, (USA), who chaired the team.

6.2.70 The Commission recalled that Fourteenth Congress had endorsed the migration plan developed by CBS; however CBS noted that Member countries were having difficulties implementing the migration process, even with developing national migration plans in many cases. These could be derived from the international plan, with analysis of impacts, costs, solutions, sources of funding (as necessary), national training, technical planning and scheduling. The Commission noted that a very important milestone had been reached by the start of the operational exchange of migrated data, which began on 2 November 2005. The Commission also took note that more BUFR bulletins were exchanged than recorded in the WMO monitoring file; however their number was still small.

6.2.71 The Commission considered the difficulties slowing implementation of migration by the WMO Members. The Commission noted that some Members, who have the technology, were not yet beginning migration. Developing countries needed the benefit of experience from more advanced countries. The Commission agreed that there was a problem of visibility of migration activities. The Regional Associations, the Regional Rapporteurs on ISS, Data Management (and/or Codes) and the RTH Focal points should be systematically involved and informed. The Commission requested the CT-MTDCF to prepare a letter, which the Secretariat should send to the WMO Members, with two annexes: a short, one or two page outline of the main actions or tasks which should be considered and possibly undertaken, and a Migration Guidance document. The Migration Guidance document would be targeted at executive management to increase their awareness of the migration and related issues and activities, including a list of all the benefits expected from the migration to TDCF.. This would stimulate the relay of requirements to and accomplishment of actions by the experts involved more directly with the different aspects of the implementation of the migration to TDCF. The procedure to start the dissemination of new BUFR/CREX bulletins should be clearly explained in the guidance as well as a procedure for completion of migration at MTN level.

6.2.72 The Commission stressed the need for Members to inform the WMO of the insertion onto the GTS of new BUFR or CREX bulletins by following the procedures currently used when informing the WMO of the insertion onto the GTS of any new bulletins. This makes it possible to distribute relevant METNO messages on the GTS informing all Members of the insertion onto the GTS of new BUFR/CREX bulletins and to update Volume C1 of WMO Publication No. 9 (catalogue of meteorological bulletins) which consequently also allows updating of the WMO monitoring file.

6.2.73 The Commission stressed that numerous tasks remained to be done, especially to help developing countries. The Commission stressed that it would be highly desirable to have a web site offering test data for decoding, and centrally coordinated preoperational testing of encoded messages in BUFR or CREX, for helping members perform operational implementation. To demonstrate to users the advantages of BUFR, an example of a simple application, with a demonstrated implementation should be made available. The Commission requested the CT-

MTDCF to take action in this respect. The need for “turn-key” encoder/decoder software running under WINDOWS operating system to be made available at no cost was stressed by several Members. Financial assistance to developing Countries for the migration should be considered through cooperation mechanisms (trust funds, VCP, etc..).

6.2.74 The Commission also stressed a coordination scheme should be systematically introduced at the regional level and the migration plans should be coordinated between countries. All new workstations for data acquisition implemented in NMHSs should have the capability to decode and display BUFR.

6.2.75 The Commission was pleased to note in all WMO Regions from 2003 to 2005, the total number of countries, where at least one participant had been trained on TDCF, was 100 out of 183 countries. Because of the critical need to correctly implement BUFR and CREX processing by software and equipment producers, the Commission strongly recommends having a training seminar targeting this group. CBS was pleased to note that representatives from the HMEI assisted as observers to the last meeting of the Coordination Group for the Migration and are now engaged with the efforts of this group. The Commission took note of the need for additional training in several Regions, and asked the Secretariat to implement all possible forms of training on TDCF including CAL and web services. The Commission called on support from developed countries for this matter.

6.2.76 The Commission was pleased that some countries in Africa were trying to implement SYNOP observations in CREX as an interim solution. In West Africa, CREX is also being used for reporting squall lines. The Commission recommend that training be completed for countries not yet covered and repeated for RA I. The representative of ASECNA stated the plan of the Agency to move forwards the migration to TDCF in its Member Countries. It reported its plan to organize training events on TDCF and wished WMO to be associated with it.

6.2.77 The Commission recommended that pilot projects be implemented with a view to helping developing countries. These pilot projects, called Migration Implementation Programmes (MIPs), should be supported only if they have implementation as the defined result of their completion.

6.2.78 The Commission was pleased that, as stated in its terms of reference, the Coordination Team on migration coordinated its activities with other relevant international bodies. There had been contacts with ICAO, CAeM, IOC, JCOMM and the satellite operators in order to coordinate, agree and resolve migration issues related to specific code types. The Commission took note that ICAO wished to target completion of migration to BUFR only in 2016. The new proposed schedule for the Migration is listed in Annex to this paragraph.

6.2.79 EC-LVIII had requested CBS to address the data representation requirements of the user community, in view of the demand for the use of modern industry standards, such as XML; it noted in this regard the emerging requirements from the aeronautical community, which should be addressed in collaboration with CAeM and ICAO. The Commission also noted the reports from several countries on the use of XML and NetCDF; the Commission decided to study the real implications of using these data forms for meteorological data, especially in operational meteorological real time exchanges, and assessing the development efforts and resources that would be required. The Commission requested its Management Group to establish an Expert Team within the OPAG-ISS for assessing advantages and disadvantages, including implications (need for defining standardization, data processing development and integration, costs and benefits: flexibility, compression, feasibility of implementation, etc.), of different data representation systems (e.g. BUFR, CREX, XML, NetCDF, HDF) for use in real time operational international exchanges between NMHSs and in transmission of information to users outside the NMHSs. The

Expert Team should develop recommendations on the most appropriate system depending on the type of exchange applications and report on the possible impacts of its findings on the migration to TDCF. All WMO Technical Commissions should be invited to participate in this Ad-Hoc Expert Team.

6.2.80 The Commission requested its Management Group to urgently establish an inter-Commission dialogue between the relevant expert teams of CBS and CAeM, in coordination with ICAO, with the remit to discuss concerns raised by aviation specialists regarding the migration of OPMET codes to TDCF

Annex to paragraph 6.2.78 of the general summary

Code Migration Schedule

Category →	Cat.1: common	Cat.2: satellite observations	Cat.3: aviation⁽¹⁾	Cat. 4: maritime	Cat. 5⁽²⁾: miscellaneous	Cat. 6⁽²⁾: almost obsolete
Lists of → Traditional code forms	SYNOP SYNOP MOBIL PILOT PILOT MOBIL TEMP TEMP MOBIL TEMP DROP CLIMAT CLIMAT TEMP	SAREP SATEM SARAD SATOB	METAR SPECI TAF AMDAR ROFOR	BUOY TRACKOB BATHY TESAC WAVEOB SHIP CLIMAT SHIP PILOT SHIP TEMP SHIP CLIMAT TEMP SHIP	RADOB IAC IAC FLEET GRID(<i>to GRIB</i>) RADOF	CODAR ICEAN GRAF NACLI etc. SFAZI SFLOC SFAZU RADREP ROCOB ROCOB SHIP ARFOR WINTEM MAFOR HYDRA HYFOR
Schedule ↓						
Start experimental Exchange⁽³⁾	Nov. 2002 for some data (AWS SYNOP, TEMP USA)	Current at some Centres	2006 2002 at some Centres for AMDAR	2005 2003 for Argos data (BUOY, sub-surface floats, XBT/XCTD)	2004	Not applicable
Start operational exchange⁽³⁾	Nov. 2005	Current at some Centres	2008 2003 for AMDAR	2007 2003 for Argos data (BUOY, sub-surface floats, XBT/XCTD)	2006	Not applicable
Migration complete	Nov. 2010	Nov. 2006	2016 2007 for AMDAR	2012 2008 for Argos data (BUOY, sub-surface floats, XBT/XCTD)	2008	Not applicable

Notes:

- (1) Aviation Codes require ICAO coordination and approval, except for AMDAR
- (2) For category 5 consider that codes need to be reviewed in order to decide whether or not they should be migrated to BUFR/CREX. Codes in category 6 are not to be migrated.
- (3) All dates above are meant as "not later than". However, Members and Organizations are encouraged to start experimental exchange, and, if all relevant conditions (see below) are satisfied, to start operational exchange as soon as possible.

- Start of experimental exchange: data will be made available in BUFR (CREX) but not operationally, i.e. in addition to the current alphanumeric codes, which are still operational.
- Start of operational exchange: data will be made available in BUFR (CREX) whereby some (but not all) Members rely on them operationally. Still the current alphanumeric codes will be distributed (parallel distribution).
- Migration complete: at this date the BUFR (CREX) exchange becomes the standard WMO practice. Parallel distribution is terminated. For archiving purposes and at places where BUFR (CREX) exchange still causes problems the alphanumeric codes may be used on a local basis only.

Relevant conditions to be satisfied before experimental exchange may start:

- Corresponding BUFR/CREX-tables and templates are available;
- Training of concerned testing parties has been completed;
- Required software of testing parties (encoding, decoding, viewing) is implemented;

Relevant conditions to be satisfied before operational exchange may start:

- Corresponding BUFR/CREX-tables and templates are fully validated;
- Training of all concerned parties has been completed;
- All required software (encoding, decoding, viewing) is operational.

Information on the Migration to TDCFs

(Provided by Mr Atsushi Shimazaki, Japan Meteorological Agency)

Useful information and tools are available for pushing ahead with the Migration.

1. Templates for global and regional exchange

<http://www.wmo.int/pages/prog/www/WMOCodes/TemplateExamples.html>

NOTE: Templates that include data based on national coding practices are to be developed by each NMHS. However, it may be assisted by some of national focal points on codes and data representation matters, members of the CBS Expert Team on Data Representation and Codes, and members of the CBS Coordination Team on Migration to TDCFs.

2. List of national focal points on codes and data representation matters :

<http://www.wmo.int/pages/prog/www/FocalPoints.html>

NOTE: If you nominate or change national focal points, please email wwwmail@wmo.int, to the attention of Mr. Joel Martellet of the WMO Secretariat.

3. Web site for validation of BUFR data

ECMWF developed a web based verification service for BUFR/CREX data. This service will handle a data file with a maximum size of 500 K byte. The data file is uploaded to ECMWF's server and expanded, the content of the BUFR section 1 is checked and errors, if any, are reported.

<http://www.ecmwf.int/products/data/software/bufr.html> and go to [BUFR data validation](#)

4. Guide to BUFR

http://www.wmo.int/pages/prog/www/WMOCodes/Guides/BUFRCREXPreface_en.html

5. Software for encoding/decoding BUFR data (available free of charge)

From ECMWF (Europe) <http://www.ecmwf.int/products/data/software/>

From CPTEC/INPE (Brazil) for WINDOWS <http://tempo.cptec.inpe.br:9080/publicacoes>