



World Meteorological Organization
Organisation météorologique mondiale

Secrétariat

7 bis, avenue de la Paix – Case postale 2300 – CH 1211 Genève 2 – Suisse

Tél.: +41 (0) 22 730 81 11 – Fax: +41 (0) 22 730 81 81

wmo@wmo.int – www.wmo.int

Weather • Climate • Water
Temps • Climat • Eau

Our ref.: OBS/WIS/DRMM/DRC

GENEVA, 21 February 2014

Annexes: 2 (available in English, French, Russian and Spanish only)

Subject: Amendments to the *Manual on Codes*

Action required: To consider the amendments to the *Manual on Codes* (WMO-No. 306) and inform the Secretariat of your concurrence on the amendments by **21 April 2014**

Dear Sir/Madam,

In accordance with the procedure for the adoption of amendments between CBS sessions, and as requested by the president of CBS, I am pleased to attach herewith in Annex I draft amendments to the *Manual on Codes*, Volumes 1.1 and 1.2.

The procedure for the adoption of amendments between CBS sessions is extracted in Annex II, which was approved by the sixty-first session of the Executive Council (Geneva, June 2009) in view of the rapid development of new requirements and last revised by the sixty-fifth session of the EC (Geneva, May 2013).

I would be grateful if you could consider these draft amendments for implementation on 5 November 2014, and if you could inform me of your concurrence on these amendments, as soon as possible but within the two months following the date of dispatch of this letter, so that the amendments will be incorporated in the next edition of the *Manual on Codes* in an appropriate manner.

If you have comments or disagreements on all or some of these draft amendments, I would be grateful if you could designate a focal point responsible to discuss these comments/disagreements with the CBS Inter-Programme Expert Team on Data Representation, Maintenance and Monitoring (IPET-DRMM). Please note that those WMO Members having not replied within the two months following the dispatch of this letter are implicitly considered as having agreed with the draft amendments.

To: Permanent Representatives (or Directors of Meteorological or Hydrometeorological Services) of Members of WMO (PR-6745)

cc: President and vice-president of CBS)
Chair of OPAG-ISS) (for information)

The list of amendments approved by the WMO Members will be included in an issue of the Operational Newsletter on the World Weather Watch and Marine Meteorological Services available on the WMO server (http://www.wmo.int/pages/prog/www/ois/Operational_information/Newsletters/current_news_en.html) after the two months following the dispatch of this letter. The date of issue of this Operational Newsletter will be considered as the date of notification of the approved amendments. With a view to limiting the mailing costs, the Secretariat will not issue any other correspondences to inform the WMO Members of this list of approved amendments. However, if you experience difficulties in accessing the Operational Newsletter on the WMO server, do not hesitate to inform us and the Secretariat will send you the list by mail.

Yours faithfully,

A handwritten signature in dark ink, consisting of a stylized 'J' followed by a long, sweeping horizontal line that extends to the right.

(J. Lengoasa)
for the Secretary-General

WORLD METEOROLOGICAL ORGANIZATION
=====

OBSIWIS/DRMM/DRC, ANNEX I

AMENDMENTS TO THE *MANUAL ON CODES* (WMO-No. 306)

In accordance with the procedure for amending the Manual on Codes (see Annex II), the draft amendments to the Manual have been approved by the president of CBS. The proposed date of implementation is 5 November 2014.

CONTENTS

	PAGE
[Manual on Codes, Volume I.1] Section A, Part A	
1. Adjustments to FM 15 METAR and FM 16 SPECI	ANNEX I.2
2. Adjustment to FM 51 TAF	ANNEX I.3
[Manual on Codes, Volume I.2] Part B	
3. GRIB2 Code tables 4.2 and 4.5 on ice internal pressure	ANNEX I.3
[Manual on Codes, Volume I.2] Part C	
4. Regulation for reporting SHIP data	ANNEX I.3
5. Regulations for reporting height of station ground	ANNEX I.3
6. Regulations for synoptic reports from fixed land stations suitable for SYNOP data in compliance with reporting practices in RA II.....	ANNEX I.4

[Manual on Codes, Volume I.1] Section A, Part A*Editorial notes:*

- (1) *Amendments in red are the new proposals while those in blue have been implemented on 14 November 2013.*
- (2) *The new amendments are to adjust inconsistencies between the WMO Technical Regulations, Volume II (WMO No. 49) (ICAO Annex 3) and the Manual on Codes.*

1. Adjustments to FM 15 METAR and FM 16 SPECI**Amend Regulation 15.7.4.2:****15.7.4.2**

The mean value of the runway visual range over the 10-minute period immediately preceding the observation shall be reported for $V_R V_R V_R V_R$. However, when the 10-minute period includes a marked discontinuity in the RVR (for example, sudden advection of fog, rapid onset or cessation of an obscuring snow shower), only data after the discontinuity shall be used for obtaining mean RVR values ~~and variations thereof~~, hence the time interval in these circumstances shall be correspondingly reduced.

Notes:

~~(1) See Regulation 15.7.5.~~

- (1) *The extreme values of the runway visual range are indicated in accordance with Regulation 15.7.5 and the trend is indicated in accordance with Regulation 15.7.4.3.*
- (2) Any observed value which does not fit the reporting scale in use should be rounded down to the nearest lower step in the scale.
- (3) A marked discontinuity occurs when there is an abrupt and sustained change in runway visual range, lasting at least two minutes *and during which it reaches or passes 800, 550, 300 and 175 m, consistent with the issuance of aerodrome special meteorological reports (SPECI) given in the Technical Regulations (WMO No. 49), Volume II, [C.3.1.] 4.3.3.*

Amend Regulation 15.9.1.5:

15.9.1.5 The height of cloud base shall be reported in steps of 30 m (100 ft) up to 3 000 m (10 000 ft). Any observed value which does not fit the reporting scale in use shall be rounded down to the nearest lower step in the scale.

Note: See Note (12) to Regulation 15.7.4.2.

Amend Regulation 15.13.6.1:

15.13.6.1 Subject to regional air navigation agreement, information on the state of the runway provided by the appropriate airport authority shall be included. The runway deposits E_R , the extent of runway contamination C_R , the depth of deposit e_{RER} and the *estimated surface friction coefficient/braking action* $B_R B_R$ shall be indicated in accordance with code tables 0919, 0519, 1079 and 0366, respectively. The state of the runway group shall be replaced by the abbreviation *R/SNOCLOSNOGLO* when the aerodrome is closed due to extreme deposit of snow. If contaminations on a single runway or on all runways at an aerodrome have ceased to exist, this should be reported by replacing the last six digits of the group by CLRD//.

Note: Concerning runway designator $D_R D_R$, Regulation 15.7.3 applies. Additional code figures 88 and 99 are reported in accordance with the European Air Navigation Plan, FASID, Part III-AOP, Attachment A.: The code figure 88 indicates "all runways"; the code figure 99 shall be used if a new runway state

report is not available in the time for dissemination of the appropriate METAR message, in which case the previous runway state report will be repeated.

2. Adjustment to FM 51 TAF

Amend Regulation 51.1.5:

- 51.1.5 The group w'w' and/or the group N_sN_sN_sh_sh_sh_s, or VVh_sh_sh_s shall be omitted if the corresponding element(s) is (are) expected to be absent or not significant. After change groups TTTT YYGG/Y_eY_eG_eG_e, elements shall be omitted if they are not expected to differ significantly from the preceding values they possessed in the coded forecast (see Regulations 51.5.2, ~~51.6.1.7~~ and 51.6.3). However, in case of significant change of the clouds, all cloud groups, including any significant layer(s) or masses not expected to change, shall be given.

[Manual on Codes, Volume I.2] Part B

3. GRIB2 Code tables 4.2 and 4.5 on ice internal pressure

Amend the entry 9 in Product discipline 10, parameter category 2 of Code table 4.2 and add a note to the entry.

9	Module of ice internal pressure*	Pa m
---	----------------------------------	------

- * Ice internal pressure or stress (Pa m) is the integrated pressure across the vertical thickness of a layer of ice. It is produced when concentrated ice reacts to external forces such as wind and ocean currents.

Delete the Note 4 in Code table 4.5 and renumber the Note 5 to 4.

[Manual on Codes, Volume I.2] Part C

Editorial notes:

- (1) *Partial amendments* are indicated *in red* to differentiate existing (unchanged) texts, where necessary.
- (2) *Texts in blue* do not mean amendments here.
- (3) *The following part does not exist in French, Russian and Spanish languages and is given for consideration purposes.*

4. Regulation for reporting SHIP data

Add Note 2 to B/C 10.4.4.1:

- 2) When cloud cover is observed in Oktas the cloud cover shall be converted to percent, with fractional numbers rounded up (e.g. 1 Okta = 12.5%, rounded to 13 %).

5. Regulations for reporting height of station ground

Add a Note to B/C 1.2.3, 20.4, 25.4 and 30.2.1.3:

Note:

The official altitude of the aerodrome (HA in Volume A) shall not be used to report Height of station ground above mean sea level 0 07 030 in BUFR or CREX messages from aerodromes. Those are two different vertical coordinates. "Height of station ground above mean sea level" for each station should be made available to the encoding centre concerned, which may be a centre within the same NMHS or other NMC/RTH.

6. Regulations for synoptic reports from fixed land stations suitable for SYNOP data in compliance with reporting practices in RA II

Amend the TM number in ANNEX to B/C1 - BUFR template for synoptic reports from fixed land stations suitable for SYNOP data in compliance with reporting practices in RA II, and replace 0 12 121 (Ground minimum temperature) by 0 12 120 (Ground temperature):

TM 307182 – BUFR template for synoptic reports from fixed land stations suitable for SYNOP data in compliance with reporting practices in RA II

3 07 182

3 01 090	Fixed surface station identification, time, horizontal and vertical coordinates	Unit, scale
3 02 031	Pressure data	
3 02 035	Basic synoptic "instantaneous" data	
3 02 036	Clouds with bases below station level	
3 02 047	Direction of cloud drift	
0 08 002	Vertical significance (= missing to cancel the previous value)	Code table, 0
3 02 048	Direction and elevation of cloud	
3 02 037	State of ground, snow depth, ground minimum temperature (past 12 hours)	
0 12 120	Ground temperature $s_n T'_g T'_g$	K, 2
0 12 122	Ground minimum temperature of the preceding night $s_n T_g T_g$	K, 2
3 02 043	Basic synoptic "period" data	
3 02 044	Evaporation data	
1 01 002	Replicate next descriptor 2 times	
3 02 045	Radiation data (from 1 hour and/or 24 hour period)	
3 02 046	Temperature change	

Amend Regulations in ANNEX to B/C1 - BUFR template for synoptic reports from fixed land stations suitable for SYNOP data in compliance with reporting practices in RA II:

Regulations:

General

- (i) BUFR template **TM 307182** shall not be mandatory for Member States in Region II. Either the template TM 307080 or any of the templates TM 307081, **TM 307182**, **TM 307083** to TM 307086, whichever is the most convenient, may be used.
- (ii) Regulations **B/C 1.1** to **B/C 1.9**, inclusive, shall apply.
- (iii) Regulations **B/C 1.10** to **B/C 1.14**, inclusive, shall apply.
- (iv) **BUFR template TM 307182 is recommended to be used instead of TM 307082 to allow reporting of Ground temperature (0 12 120).**

B/C 1.9.2.1 Ground temperature

Ground temperature measured at the time of observation (0 12 120) shall be reported in degrees Kelvin (with precision in hundredths of a degree Kelvin); if produced in CREX, in degrees Celsius (with precision in hundredths of a degree Celsius).

Notes (1) and (2) under Regulation B/C 1.8.3 shall apply.

Inclusion of this datum into reports at least at 0000 and 1200 UTC shall be left to national decision. [2/12.6.1]

Amend Regulations in TM 307081, TM 307083, TM 307084 and TM 307086:**TM 307081****General**

- (i) BUFR template TM 307081 shall not be mandatory for Member States in Region I. Either the template TM 307080 or any of the templates TM 307081, TM 307182, TM 307083 to TM 307086, whichever is the most convenient, may be used.

TM 307083**General**

- (i) BUFR template TM 307083 shall not be mandatory for Member States in Region III. Either the template TM 307080 or any of the templates TM 307081, TM 307182, TM 307083 to TM 307086, whichever is the most convenient, may be used.

TM 307084**General**

- (i) BUFR template TM 307084 shall not be mandatory for Member States in Region IV. Either the template TM 307080 or any of the templates TM 307081, TM 307182, TM 307083 to TM 307086, whichever is the most convenient, may be used.

TM 307086**General**

- (i) BUFR template TM 307086 shall not be mandatory for Member States in Region VI. Either the template TM 307080 or any of the templates TM 307081, TM 307182, TM 307083 to TM 307086, whichever is the most convenient, may be used.

Add an entry in BUFR Table D:

3 07 182		(Sequence for representation of synoptic reports from a fixed land station suitable for SYNOP data in compliance with reporting practices in RA II)	
	3 01 090	Fixed surface station identification, time, horizontal and vertical coordinates	
	3 02 031	Pressure data	
	3 02 035	Basic synoptic "instantaneous" data	
	3 02 036	Clouds with bases below station level	
	3 02 047	Direction of cloud drift	

	0 08 002	Vertical significance (= missing to cancel the previous value)	Set to missing (cancel)
	3 02 048	Direction and elevation of cloud	
	3 02 037	State of ground, snow depth, ground minimum temperature (past 12 hours)	Past 12 hours
	0 12 120	Ground temperature	$s_n T'_g T'_g$
	0 12 122	Ground minimum temperature of the preceding night	$s_n T_g T_g$
	3 02 043	Basic synoptic "period" data	
	3 02 044	Evaporation data	
	1 01 002	Replicate next descriptor 2 times	
	3 02 045	Radiation data (from 1 hour and/or 24 hour period)	
	3 02 046	Temperature change	

Add a note to Category 07 of BUFR Table D:

(x) 3 07 082 is deprecated.

WORLD METEOROLOGICAL ORGANIZATION

=====

OBSIWIS/DRMM/DRC, ANNEX II

INTRODUCTION

Volume I of the *Manual on Codes* contains WMO international codes for meteorological data and other geophysical data relating to meteorology; it constitutes Annex II of the WMO *Technical Regulations* and has therefore the status of a Technical Regulation. It is issued in two volumes: Volume I.1, containing PART A, and Volume I.2, containing PART B and PART C.

VOLUME I.1:

Part A – Alphanumeric Codes consists of five sections. The standard coding procedures are distinguished by the use of the term “shall” in the English text, and by suitable equivalent terms in the French, Russian and Spanish texts. Where national practices do not conform with these regulations, Members concerned shall formally notify the Secretary-General of WMO for the benefit of other Members.

VOLUME I.2:

Part B – Binary Codes consists of the list of binary codes with their specifications and associated code tables. Explanatory notes are sometimes added to regulations.

Part C – Common Features to Binary and Alphanumeric Codes consists of the list of table-driven alphanumeric codes with their specifications and associated code tables, and of common code tables to binary and alphanumeric codes.

The attachments (yellow background) to Volume I.2 do not have the status of WMO *Technical Regulations* and are given for information only.

PROCEDURES FOR AMENDING THE *MANUAL ON CODES*

1. General validation and implementation procedures

1.1 Proposal of amendments

Amendments to the *Manual on Codes* shall be proposed in writing to the WMO Secretariat. The proposal shall specify the needs, purposes and requirements for the proposed amendment. A contact point for technical matters shall be identified to facilitate collaboration for validation and drafting recommendation.

1.2 Drafting recommendation

The Inter-Programme Expert Team on Data Representation and Codes (IPET-DRMM),¹ supported by the Secretariat, shall validate the stated requirements (unless it is consequential to an amendment to the WMO Technical Regulations) and develop a draft recommendation to respond to the requirements, as appropriate.

1.3 Date of implementation

The IPET-DRMM should define a date of implementation in order to give sufficient time to WMO Members to implement the amendments after the date of notification; the IPET-DRMM should document the reasons to propose a time span of less than six months except for the fast-track procedure.

1.4 Procedures for approval

After a draft recommendation of the IPET-DRMM is validated in accordance with the procedure given in section 6 below, depending on the type of amendments, the IPET-DRMM may select one of the following procedures for the approval of the amendments:

- Fast-track procedure (see section 2 below);
- Procedure for the adoption of amendments between CBS sessions (see section 3 below);

¹ The IPET-DRMM, the ICT-ISS and the OPAG-ISS are the current bodies dealing with data representation and codes within CBS. If they were replaced by other bodies performing the same function, the same rules would apply, by replacing the names of the entities appropriately.

- Procedure for the adoption of amendments during CBS sessions (see section 4 below).

1.5 Urgent introduction

Regardless of the above procedures, as an exceptional measure, the following procedure accommodates urgent user needs to introduce new entries in BUFR/CREX tables A, B and D, code and flag tables of BUFR, CREX and GRIB edition 2 and Common Code tables.

- (a) A draft recommendation developed by IPET-DRMM shall be validated according to 6.1, 6.2 and 6.3 below.
- (b) The draft recommendation for pre-operational use, which can be used in operational data and products, shall be approved by the chairs of IPET-DRMM and the Open Programme Area Group on Information Systems and Services (OPAG-ISS), and the president of CBS. The list of pre-operational entries is kept on-line on the WMO Web server;
- (c) Pre-operational entries need to be approved by one of the procedures in 1.4 for operational use.

1.6 Version number

The version number of the master table will be incremented.

1.7 Issuing the updated version

Once amendments to the *Manual on Codes* are adopted, an updated version of the relevant part of the Manual shall be issued in the four languages: English, French, Russian and Spanish. The Secretariat will inform all WMO Members of the availability of a new updated version of that part at the date of notification mentioned in 1.3.

2. Fast-track procedure

2.1 Scope

The fast-track procedure can be used for additions to BUFR or CREX Tables A, B, and D with associated code tables or flag tables, to code or flag tables or templates in GRIB and to common tables C.

2.2 Endorsement

Draft recommendations developed by the IPET-DRMM, including a date of implementation of the amendments, must be endorsed by the chair of OPAG-ISS.

2.3 Approval

2.3.1 Minor adjustments

The filling of reserved and unused entries in the existing code and flag tables, and Common Code tables is considered as a minor adjustment, and will be done by the Secretary-General in consultation with the president of CBS.

2.3.2 Other types of amendments

For other types of amendments, the English version of the draft recommendation, including a date of implementation, should be distributed to the focal points for codes and data representation matters for comments, with a deadline of two months for the reply. It should then be submitted to the president of CBS for adoption on behalf of the Executive Council (EC).

2.4 Frequency

The implementation of amendments approved through the fast-track procedure can be twice a year in May and November.

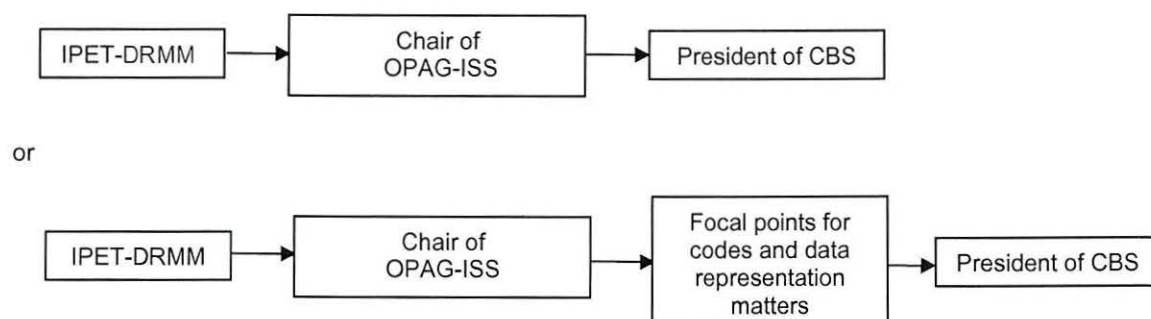


Figure 1. Adoption of amendments by fast-track procedure

3. Procedure for the adoption of amendments between CBS sessions

3.1 Approval of draft recommendation

For the direct adoption of amendments between CBS sessions, the draft recommendation developed by the IPET-DRMM, including a date of implementation of the amendments, shall be submitted to the chair of OPAG-ISS and president and vice-president of CBS for approval.

3.2 Circulation to Members

Upon approval of the president of CBS, the Secretariat sends the recommendation in the four languages (English, French, Russian and Spanish), including a date of implementation of the amendments, to all WMO Members for comments to be submitted within two months following the dispatch of the amendments.

3.3 Agreement

Those WMO Members not having replied within the two months following the dispatch of the amendments are implicitly considered as having agreed with the amendments.

3.4 Coordination

WMO Members are invited to designate a focal point responsible to discuss any comments/disagreements with the IPET-DRMM. If the discussion between the IPET-DRMM and the focal point cannot result in an agreement on a specific amendment by a WMO Member, this amendment will be reconsidered by the IPET-DRMM.

3.5 Notification

Once amendments are agreed by WMO Members, and after consultation with the chair of the OPAG-ISS and the president and vice-president of CBS, the Secretariat notifies at the same time the WMO Members and the members of the Executive Council of the approved amendments and of the date of their implementation.

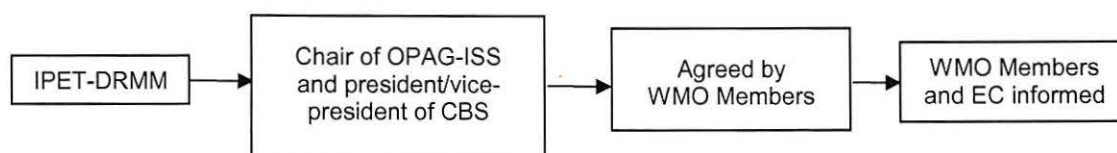


Figure 2. Adoption of amendments between CBS sessions

4. Procedure for the adoption of amendments during CBS sessions

For the adoption of amendments during CBS sessions, the IPET-DRMM submits its recommendation, including a date of implementation of the amendments, to the Implementation/Coordination Team on Information Systems and Services (ICT-ISS) of OPAG-ISS. The recommendation is then submitted to a CBS session and thereafter to an EC session.

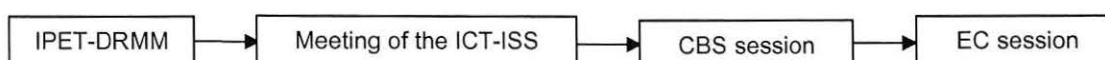


Figure 3. Adoption of amendments during a CBS session

5. Procedure for the correction of existing entries in the BUFR and CREX tables

5.1 Introducing a new descriptor

If an erroneous specification of an entry is found in an operational BUFR or CREX element descriptor or sequence descriptor, a new descriptor should preferably be added to the appropriate table through the fast-track procedure or the procedure for adoption of amendments between CBS sessions. The new descriptor should be used instead of the old one for encoding (especially if it concerns data width). An appropriate explanation shall be added to the notes of the table to clarify the practice along with the date of the change. This situation is considered a minor adjustment according to 2.3.1 above

5.2 Correcting erroneous specification

As an exceptional measure for erroneous entries in Table B, if it is found absolutely necessary to correct an erroneous specification of an existing entry by changing its specification, the following rules shall apply:

5.2.1 The name and unit of an element descriptor shall remain unchanged except for minor clarifications.

5.2.2 Scale, reference value and bit width may be corrected to required values.

5.2.3 Such a change will be submitted through the fast-track procedure.

6. Validation procedure

6.1 Documentation of need and purpose

The need for, and the purpose of, the proposal for changes should be documented.

6.2 Documentation of result

This documentation must include the results of validation testing of the proposal as described below.

6.3 Testing with encoder/decoder

For new or modified WMO code and data representation forms, proposed changes should be tested by at least two centres, using two independently developed encoders and two independently developed decoders which incorporated the proposed change. Where the data originated from a necessarily unique source (for example, the data stream from an experimental satellite), the successful testing of a single encoder with at least two independent decoders would be considered adequate. Results should be made available to the IPET-DRMM with a view to verifying the technical specifications.
