

## B/C35 – Regulations for reporting CLIMAT TEMP and CLIMAT TEMP SHIP and data in TDCF

### General

A BUFR (or CREX) message shall contain reports for one specific month only. [75.8]

### TM 309054 - BUFR template for reports of monthly aerological means suitable for CLIMAT TEMP and CLIMAT TEMP SHIP data

<b>3 09 054</b>		<b>Sequence for representation CLIMAT TEMP and CLIMAT TEMP SHIP data</b>
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Sequence BUFR descriptor <3 09 054> expands as it is shown in the leftmost column below:

		<b>Identification of launch site</b>	Unit, scale
3 01 001	0 01 001	WMO block number	Numeric, 0
	0 01 002	WMO station number	Numeric, 0
0 01 011		Ship's call sign	CCITT IA5, 0
		<b>Date/time<sup>(1)</sup></b>	
3 01 011	0 04 001	Year <sup>(1)</sup>	Year, 0
	0 04 002	Month <sup>(1)</sup>	Month, 0
	0 04 003	Day (= 1) <sup>(1)</sup>	Day, 0
3 01 012	0 04 004	Hour (= 0) <sup>(1)</sup>	Hour, 0
	0 04 005	Minute (= 0) <sup>(1)</sup>	Minute, 0
		<b>Horizontal and vertical coordinates</b>	
3 01 021	0 05 001	Latitude (high accuracy)	Degree, 5
	0 06 001	Longitude (high accuracy)	Degree, 5
0 07 030		Height of station ground above mean sea level	m, 1
0 07 031		Height of barometer above mean sea level	m, 1
0 07 007		Height release of sonde above mean sea level	m, 0
		<b>Monthly mean data</b>	
0 04 023		Time period (= number of days in the month)	Day, 0
0 04 059		Times of observations used to compute the reported mean values	Flag table, 0
1 15 000		Delayed replication of 15 descriptors	
0 31 001		Delayed descriptor replication factor	Numeric, 0
0 08 001		Vertical sounding significance	Flag table, 0
0 08 023		First order statistics (= 4; mean value)	Code table, 0
0 07 004		Pressure	Pa, -1
0 10 009		Geopotential height	gpm, 0
0 12 101		Temperature/dry-bulb temperature	K, 2
0 12 103		Dew-point temperature	K, 2
0 08 023		First order statistics (= 32; vector mean)	Code table, 0
0 11 001		Wind direction	Degree true, 0
0 11 002		Wind speed	m s <sup>-1</sup> , 1
0 08 023		First order statistics (= 63; missing value)	Code table, 0
0 11 019		Steadiness of wind	%, 0
0 08 050		Qualifier for number of missing values in calculation of statistic (= 2; temperature)	Code table, 0
0 08 020		Total number of missing entities (days)	Numeric, 0

0 08 050		Qualifier for number of missing values in calculation of statistic (= 9; wind)	Code table, 0
0 08 020		Total number of missing entities (days)	Numeric, 0

**Note:**

- (1) The time identification refers to the beginning of the one-month period.

## Regulations:

- B/C 35.1 Section 1 of BUFR or CREX
- B/C 35.2 Identification of launch site
- B/C 35.3 Date/time (of the beginning of the one-month period)
- B/C 35.4 Horizontal and vertical coordinates of launch site
- B/C 35.5 Monthly mean data
- B/C 35.5.1 Period of reference for monthly mean data
- B/C 35.5.2 Times of observation used to compute the reported mean values
- B/C 35.5.3 Number of reported pressure levels
- B/C 35.5.4 Monthly mean data reported for a pressure level
- B/C 35.6 Data required by regional or national reporting practices

### **B/C 35.1 Section 1 of BUFR or CREX**

#### **B/C 35.1.1 Entries required in Section 1 of BUFR**

The following entries shall be included in BUFR Section 1:

- BUFR master table,
- identification of originating/generating centre,
- identification of originating/generating sub-centre,
- update sequence number,
- identification of inclusion of optional section,
- data category (= 002 for CLIMAT TEMP and CLIMAT TEMP SHIP data),
- international data sub-category <sup>(1), (2)</sup>,
- local data subcategory,
- version number of master table,
- version number of local tables,
- year (year of the century up to BUFR edition 3) <sup>(3)</sup>,
- month (for which the monthly mean values are reported) <sup>(3)</sup>,
- day (= 1) <sup>(3)</sup>,
- hour (= 0) <sup>(3)</sup>,
- minute (= 0) <sup>(3)</sup>.

Notes:

- (1) Inclusion of this entry is required starting with BUFR edition 4.
- (2) If required, the international data sub-category shall be included as follows:
  - = 025 for CLIMAT TEMP data,
  - = 026 for CLIMAT TEMP SHIP data.
- (3) The time identification refers to the beginning of the one-month period for which the monthly mean values are reported.

#### **B/C 35.1.2 Entries required in Section 1 of CREX**

The following entries shall be included in CREX Section 1:

- CREX master table,
- CREX edition number,
- CREX table version number,
- version number of BUFR master table <sup>(1)</sup>,
- version number of local tables <sup>(1)</sup>,
- data category (= 002 for CLIMAT TEMP and CLIMAT TEMP SHIP data),
- international data sub-category <sup>(1), (2)</sup>,
- identification of originating/generating centre <sup>(1)</sup>,

- identification of originating/generating sub -centre <sup>(1)</sup>,
- update sequence number <sup>(1)</sup>,
- number of subsets <sup>(1)</sup>,
- year <sup>(1), (3)</sup>,
- month (for which the monthly mean values are reported) <sup>(1), (3)</sup>,
- day (= 1) <sup>(1), (3)</sup>,
- hour (= 0) <sup>(1), (3)</sup>,
- minute (= 0) <sup>(1), (3)</sup>.

Notes:

- (1) Inclusion of these entries is required starting with CREX edition 2.
- (2) If inclusion of international data sub -category is required, Note (2) under B/C 35.1.1 applies.
- (3) Note (3) under B/C 35.1.1 applies.

### **B/C 35.2 Identification of launch site**

WMO block number station (0 01 001) and WMO station number (0 01 002) shall be always included as a non-missing value in reports from land stations.

Ship identifier (0 01 011), if available, shall be included in reports from a sea station not exceeding 9 characters.

### **B/C 35.3 Date/time (of the beginning of the one-month period)**

Date <3 01 011> and time <3 01 012> shall be reported, i.e. year (0 04 001), month (0 04 002), day (0 04 003) and hour (0 04 004), minute (0 04 005) of the beginning of the one-month period for which the monthly mean values are reported. Day (0 04 003) shall be set to 1 and both hour (0 04 004) and minute (0 04 005) shall be set to 0.

### **B/C 35.4 Horizontal and vertical coordinates of launch site**

Latitude (0 05 001) and longitude (0 06 001) of the launch site shall be reported in degrees with precision in  $10^{-5}$  of a degree.

Height of station ground above mean sea level (0 07 030) and height of barometer above mean sea level (0 07 031) shall be reported in meters with precision in tenths of a meter.

Height release of sonde above mean sea level (0 07 007) shall be reported in meters.

### **B/C 35.5 Monthly mean data**

The monthly mean values of temperature, dew-point and wind data shall include information for station level (surface) and for standard levels 850, 700, 500, 300, 200, 150, 100, 50, and 30 hPa. Each of the levels shall be reported even if the monthly mean data are not available. Any missing element shall be reported as a missing value. [75.4]

#### **B/C 35.5.1 Period of reference for monthly mean data**

Time period (0 04 023) represents the number of days in the month for which the monthly mean data are reported, and shall be expressed as a *positive value* in days.

Note:

- (1) A BUFR (or CREX) message shall contain reports for one specific month only. [75.8]

#### **B/C 35.5.2 Times of observation used to compute the reported mean values –**

Flag table 0 08 059

This datum shall be used to specify the observation times used to compute the reported mean values:

- (a) Bit No. 1 set to 1 indicates usage of data from 0000 UTC.
- (b) Bit No. 2 set to 1 indicates usage of data from 0600 UTC.
- (c) Bit No. 3 set to 1 indicates usage of data from 1200 UTC.
- (d) Bit No. 4 set to 1 indicates usage of data from 1800 UTC.
- (e) Bit No. 5 set to 1 indicates usage of data from other hours.

### **B/C 35.5.3 Number of reported pressure levels**

The number of reported pressure levels shall be indicated by Delayed descriptor replication factor 0 31 001 in BUFR and by a four-digit number in the Data Section corresponding to the position of the replication descriptor in the Data Description Section of CREX.

Notes:

- (1) The number of pressure levels shall never be set to a missing value.
- (2) The number of pressure levels shall be set to a positive value in a NIL report.
- (3) In compliance with Regulation B/C 35.5, the number of pressure levels shall be set to 10. If reporting of monthly mean data for additional levels is requested, the number of pressure levels shall be modified accordingly.

### **B/C 35.5.4 Monthly mean data reported for a pressure level**

#### **B/C 35.5.4.1 Vertical sounding significance – Flag table 0 08 001**

This datum shall be used to specify vertical sounding significance in the following way:

- (a) Bit No. 1 set to 1 indicates surface (station level).
- (b) Bit No. 2 set to 1 indicates a standard level.
- (c) All bits set to 1 indicate a missing value.

#### **B/C 35.5.4.2 First order statistics – Code table 0 08 023**

This datum shall be set to 4 (mean value) to indicate that the following entries represent mean values of the elements (pressure, geopotential height, temperature and dew-point temperature).

#### **B/C 35.5.4.3 Monthly mean value of pressure**

Monthly mean value of pressure (0 07 004) shall be reported in pascals (with precision in tens of a pascal).

Notes:

- (1) The mean value of station-level pressure shall be reported in the first replication. It shall be the monthly mean value of station-level pressure data measured at the time of release of the radiosonde. [75.5]
- (2) The values 85000, 70000, 50000, 30000, 20000, 15000, 10000, 5000, and 3000 Pa shall be reported in the other replications in compliance with Regulation B/C 35.5.

#### **B/C 35.5.4.4 Monthly mean value of geopotential height**

Monthly mean value of geopotential height of the level (0 10 009) shall be reported in geopotential meters.

#### **B/C 35.5.4.5 Monthly mean value of temperature**

Monthly mean value of temperature (0 12 101) 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). Temperature data shall be reported with precision in hundredths of a degree even if they are measured with the accuracy in tenths of a degree.

Notes:

- (1) This requirement is based on the fact that conversion from the Kelvin to the Celsius scale has often resulted into distortion of the data values.
- (2) Temperature  $t$  (in degrees Celsius) shall be converted into temperature  $T$  (in degrees Kelvin) using equation:  $T = t + 273.15$ .
- (3) The mean value of station-level temperature shall be the monthly mean value of station-level temperature data measured at the time of release of the radiosonde. [75.5]

#### **B/C 35.5.4.6 Monthly mean value of dew-point temperature**

Monthly mean value of dew-point temperature (0 12 103) 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).

Note:

- (1) Notes (1) and (2) under Regulation B/C 35.5.4.5 shall apply.
- (2) The mean value of station-level dew-point temperature shall be the monthly mean value of station-level dew-point temperature data measured at the time of release of the radiosonde. [75.5]

#### **B/C 35.5.4.7 First order statistics – Code table 0 08 023**

This datum shall be set to 32 (vector mean) to indicate that the two following entries wind direction (0 11 001) and wind speed (0 11 002) represent the monthly mean vector wind.

#### **B/C 35.5.4.8 Monthly mean vector wind**

The wind direction (0 11 001) of the monthly mean vector wind shall be reported in degrees true and the wind speed (0 11 002) of the monthly mean vector wind shall be reported in meters per second (with precision in tenths of a meter per second).

Notes:

- (1) The mean vector wind data shall be reported for all standard levels specified in Regulation B/C 35.5. [75.7.1]
- (2) The mean vector wind data shall be reported as missing values for the station level.

#### **B/C 35.5.4.9 Steadiness of wind**

Steadiness of wind (0 11 019) at specified standard levels represents the ratio of speed of the monthly mean vector wind to the speed of the monthly mean scalar wind. It shall be reported in units of a percent.

Notes:

- (1) Steadiness of wind shall be reported for all standard levels specified in Regulation B/C 35.5.
- (2) Steadiness of wind shall be reported as a missing value for the station level.

#### **B/C 35.5.4.10 Number of days in the month for which temperature observations are missing**

Number of days in the month for which temperature observations are missing for the specified standard level shall be reported using Total number of missing entities (0 08 020) being preceded by Qualifier for number of missing values in calculation of statistic (0 08 050) set to 2 (temperature).

#### **B/C 35.5.4.11 Number of days in the month for which wind observations are missing**

Number of days in the month for which wind observations are missing for the specified standard level shall be reported using Total number of missing entities (0 08 020) being preceded by Qualifier for number of missing values in calculation of statistic (0 08 050) set to 9 (wind).

#### **B/C 35.6 Data required by regional or national reporting practices**

No regional requirements are indicated for reporting CLIMAT TEMP and CLIMAT TEMP SHIP data in Manual on Codes, WMO-No. 306, Volume II.

If national reporting practices require inclusion of monthly mean data at additional levels, these data shall be reported using sequence <3 09 054>. Note (3) under Regulation B/C 35.5.3 shall apply.

Note:

- (1) A level determined by national decision shall be indicated by Vertical sounding significance 0 08 001 – all bits set to 0.