



*International Civil Aviation Organization*

**SEVENTEENTH MEETING OF THE  
METEOROLOGY SUB-GROUP (MET SG/17) OF APANPIRG**

Bangkok, Thailand, 13 – 16 May 2013

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**Agenda Item 4: World Area Forecast System (WAFS)**

4.2) current status of WAFS implementation

**SUMMARY OF RECENT AND FORTHCOMING  
DEVELOPMENTS TO THE WAFS**

(Presented by WAFS Provider States)

**SUMMARY**

This paper describes WAFS developments since July 2012. Some of these developments have had a direct impact on end users. A number of important developments are planned to the WAFS in future years and these are highlighted in this paper for the consideration of the group.

**1. INTRODUCTION**

1.1 This paper presents developments to the WAFS since the last meeting of the CNS/MET SG/16 (as was) in July 2012. Since that meeting, the WAFSOPSG met in Lima, Peru for its seventh meeting (17<sup>th</sup> to 21<sup>st</sup> September 2012). For more details of the activities of the WAFSs and of WAFS generally, users are encouraged to review information available on the ICAO WAFS Operations Group website at URL: <http://www.icao.int/safety/meteorology/WAFSOPSG/Pages/default.aspx>.

**2. RECENT DEVELOPMENTS**

**2.1 Current availability times of WAFS Upper Air Forecasts in WMO GRIB Edition 1 and GRIB Edition 2 code forms.**

Following the successful re-prioritisation of WAFS Upper Air Forecasts in WMO GRIB Edition 2 over that of WAFS Upper Air Forecasts in GRIB Edition 1 (5<sup>th</sup> July 2012), the WAFS Providers were able to review the production and availability time of the WAFS GRIB1 data sets, essentially making the GRIB1 datasets available sooner than previously expected, but still delivering after WAFS GRIB2. The current schedule for delivery is provided in Appendix A. *Note, as per the separate item in 3.1 of this Working Paper, WAFS GRIB1 is scheduled to be withdrawn with applicability of Amendment 76 to Annex 3.*

**Suggested action:** *Note this information. See section 3.1. Users must ensure they are prepared for the withdrawal of WAFS GRIB1.*

### 3. FORTHCOMING DEVELOPMENTS

#### 3.1 **Withdrawal of WAFS upper-air forecasts in WMO GRIB Edition 1 code form**

In accordance with WAFSOPSG/7 Decision 7/9 WAFS upper-air forecasts in the GRIB1 code form will cease to be generated as part of the WAFS portfolio of datasets as of applicability of Amendment 76 to ICAO Annex 3. The last WAFS Upper Air Forecasts produced in GRIB1 code form will be those with observational data time of 1800 UTC 13 November 2013.

***Suggested action:** Users should test the ingestion and visualization of WAFS GRIB2 data before the termination of GRIB1 to ensure that their systems are fully compatible.*

#### 3.2 **Additional geopotential flight level data to be provided by the WAFCs**

The WAFS Provider States will make available data for an additional geopotential flight level - FL410 (175 hPa) - as part of the GRIB2 WAFS upper-air forecast dataset with the implementation of the next amendment to Annex 3 - *Meteorological Service for International Air Navigation* (14 November 2013). Appendix B provides details of the allocated WMO Abbreviated Header Lines.

***Suggested action:** Note this information.*

#### 3.3 **Removal of the 'trial' label in ICAO Annex 3 in relation to the WAFS Upper Air Forecasts of cumulonimbus cloud, icing and turbulence.**

WAFSOPSG/6<sup>1</sup> Conclusion 6/18, as re-affirmed by WAFSOPSG/7<sup>2</sup> Conclusion 7/14, endorsed the removal of the 'trial' label in relation to the WAFS Upper Air Forecasts of cumulonimbus cloud, icing and turbulence with effect from the applicability date of Amendment 76 to ICAO Annex 3. These products are declared to be operational effective 14 November 2013.

***Suggested action:** Users should note this information.*

#### 3.4 **Guidance and Training for States on the use and visualization of new gridded WAFS forecasts**

The WAFCs have produced a guidance document (Guidance on the Harmonized WAFS Grids for Cumulonimbus Cloud, Icing and Turbulence Forecasts - 11 September 2012), and this is available on the WAFSOPSG website:  
(<http://www.icao.int/safety/meteorology/WAFSOPSG/Pages/GuidanceMaterial.aspx> ).

In addition, WAFSOPSG Conclusion 7/13 invited the WAFS Provider States to develop computer based (including voice over) initial training material for the WAFS gridded global forecasts for cumulonimbus clouds, icing and turbulence, and to make available on the WAFSOPSG website.

*Once the training material is approved States and other users will be notified and encouraged to access the material on the WAFSOPSG webpage. States are encouraged to monitor the WAFS Change Implementation Notice Board on a routine basis to be advised when the training material will be made available.*

***Suggested action:** Note this information and review the training material when made available*

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<sup>1</sup> 21st-24th March 2011, Dakar, Senegal

<sup>2</sup> 17<sup>th</sup> -21<sup>st</sup> September 2012, Lima, Peru

### 3.5 **Provision of WAFS GRIB and SIGWX timeliness statistics.**

In accordance with WAFSOPSG/7 Conclusion 7/4, the WAFCs will provide timeliness statistics for their respective WAFS GRIB and WAFS SIGWX forecasts in future WAFS Management Reports (the first set of statistics being presented to WAFSOPSG/8 in September 2013).

*Suggested action: Note this information.*

## 4. **STANDING ARRANGEMENTS**

### 4.1 **W AFC backup tests**

The W AFC Provider States have continued to test their SIGWX backup procedures in the event that one W AFC is unable to produce SIGWX forecasts in the BUFR-code and PNG-chart format. Routine backup tests are conducted quarterly, with the results posted on the WAFSOPSG website in the document Forthcoming and Historical Record of W AFC Backup Tests' available via URL:

<http://www.icao.int/safety/meteorology/WAFSOPSG/Reference%20Documents/Forms/AllItems.aspx>.

Tests over the last 12 months have been largely successful and transparent for the overwhelming majority of WAFS users.

Forthcoming backup tests are outlined in the same document: Notification of W AFC backup tests is promulgated on the SADIS broadcasts in advance, by way of administrative messages.

In addition, W AFC backup procedures are outlined in the 'W AFC Backup Procedures' available from the same URL.

*Suggested action: Note this information and regularly visit the WAFSOPSG website to obtain information pertaining to W AFC backup tests and procedures.*

### 4.2 **Access to Internet based services (Secure SADIS FTP/WIFS).**

The policies regarding the development of clear guidelines with regard to the accessing of data from SADIS FTP/Secure SADIS FTP and from WIFS have been endorsed by WAFSOPSG, SADISOPSG<sup>3</sup> and SCRAG<sup>4</sup>.

*Suggested action: Note this information. Users are encouraged to establish and regularly test backup accounts with the alternative provider to be used in the rare event that their normal service (Secure SADIS FTP or WIFS, as specified by Regional Air Navigation Plan) is unavailable.*

<http://www.icao.int/safety/meteorology/sadisopsg/SADIS%20User%20Guide/Obtaining%20access%20to%20WIFS%20as%20a%20backup%20to%20SADIS%20FTP.pdf>

## 5. **ACTION BY THE MEETING**

5.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) discuss any relevant matters as appropriate.

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<sup>3</sup> Satellite Distribution System Operations Group

<sup>4</sup> SADIS Cost Recovery Administrative Group

**APPENDIX A**

**AVAILABILITY TIMES<sup>1,2</sup> OF WAFS FORECASTS IN GRIB1 AND GRIB2 CODE FORM**

	Time that DT 0000 UTC data will be made available on:			Time that DT 0600 UTC data will be made available on:			Time that DT 1200 UTC data will be made available on:			Time that DT 1800 UTC data will be made available on:		
	SADIS 2G	WIFS	Secure SADIS FTP	SADIS 2G	WIFS	Secure SADIS FTP	SADIS 2G	WIFS	Secure SADIS FTP	SADIS 2G	WIFS	Secure SADIS FTP
GRIB2	0330-0430	0335-0410	0330-0355	0930-1030	0935-1010	0930-0955	1530-1630	1535-1610	1530-1555	2130-2230	2135-2210	2130-2155
GRIB1 <sup>4</sup>	0430-0500	0400-0435	0345-0420	1030-1100	1000-1035	0945-1020	1630-1700	1600-1635	1545-1620	2230-2300	2200-2235	2145-2220
GRIB2 CB, icing and turbulence	N/A <sup>3</sup>	0500-0510	0520-0530	N/A	1100-1110	1120-1130	N/A	1700-1710	1720-1730	N/A	2300-2310	2320-2330

*Note 1.— All these times are well within the availability requirement in Annex 3, Appendix 2, 1.2.1, which is 6 hours after standard time of observation.*

*Note 2.— The overlapping availability times on WIFS and Secure SADIS FTP allow for some day-to-day variability in availability. In all cases, GRIB2 will be available before GRIB1.*

*Note 3.— WAFS GRIB2 forecasts for CB clouds, icing and turbulence are not currently disseminated via satellite.*

*Note 4. – WAFS GRIB1 forecasts will be withdrawn with the applicability of Amendment 76 to ICAO Annex 3. The last WAFS Upper Air Forecasts produced in GRIB1 code form will be those with observational data time of 1800 UTC 13 November 2013.*

**APPENDIX B**

**WMO Abbreviated Header Line (WMO AHL) assignments for FL410 data to be provided as part of the WAFS Upper Air Forecast gridded dataset**

The table below lists the allocated WMO AHLs that will be used for the FL410 data to be introduced with applicability of Amendment 76 to ICAO Annex 3 – *Meteorological Service for International Air Navigation* (14 November 2013).

The table below identifies the allocations for the T<sub>1</sub>T<sub>2</sub>A<sub>1</sub>A<sub>2</sub>ii elements of the WMO AHL. The CCCC elements will be set to EGRR for WAFS London data, and to KWBC for WAFS Washington data.

Time Step	Geopotential Height	Temperature	U wind component	V wind component
	M	K	m/s	m/s
T+06 (C)	YHXC18	YTXC18	YUXC18	YVXC18
T+09 (D)	YHXD18	YTXD18	YUXD18	YVXD18
T+12 (E)	YHXE18	YTXE18	YUXE18	YVXE18
T+15 (F)	YHXF18	YTXF18	YUXF18	YVXF18
T+18 (G)	YHXC18	YTXG18	YUXG18	YVXC18
T+21 (H)	YHXC18	YTXH18	YUXH18	YVXH18
T+24 (I)	YHXC18	YTXI18	YUXI18	YVXI18
T+27 (J)	YHXC18	YTXJ18	YUXJ18	YVXJ18
T+30 (K)	YHXC18	YTXK18	YUXK18	YVXK18
T+33 (L)	YHXC18	YTXL18	YUXL18	YVXL18
T+36 (M)	YHXC18	YTXM18	YUXM18	YVXM18

**Table 1:** T<sub>1</sub>T<sub>2</sub>A<sub>1</sub>A<sub>2</sub>ii allocation for WAFS FL410 data.

As a consequence of the introduction of the above bulletins, the number of bulletins received each run will change:

**Prior to the introduction of FL410 data, and not including CB, icing or turbulence data:**

61 bulletins per time step, = 671 bulletins per run.

**Following the introduction of FL410 data, and not including CB, icing or turbulence data:**

65 bulletins per time step, = 715 bulletins per run.

*WAFS GRIB2 Cumulonimbus, icing and turbulence data will continue to contain 37 bulletins per time step, = 407 bulletins per run.*

Users should take account of the above changes.

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