



International Civil Aviation Organization

**FIFTEENTH MEETING OF THE
COMMUNICATIONS/NAVIGATION/SURVEILLANCE AND
METEOROLOGY SUB-GROUP (CNS/MET SG/15) OF APANPIRG**

Bangkok, Thailand, 25 – 29 July 2011

Agenda Item 8: Regional Implementation of the World Area Forecast System

3) Other WAFS (ISCS/WIFS & SADIS/Secure SADIS FTP)

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

(Presented by WAFC Provider States)

SUMMARY

This paper describes WAFS developments since July 2010. 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.

This paper relates to – **Strategic Objectives:**

A: **Safety** – Enhance global civil aviation safety

Global Plan Initiatives:

GPI-19 Meteorological Systems

1. INTRODUCTION

1.1 This paper presents developments to the WAFS since the last meeting of the CNS/MET SG/14 in July 2010. For more details of the activities of the WAFS, users may wish to review information available on the ICAO WAFS Operations Group website at URL: <http://www2.icao.int/en/anb/met/wafsopsg/Pages/default.aspx>.

2. RECENT DEVELOPMENTS

2.1 Introduction of WAFS upper-air data in the GRIB 2 code form

WAFSOPSG/5¹ endorsed the implementation of the WAFS upper-air forecasts for the 'standard' parameters in the GRIB2 code form during 2010. Accordingly, the WAFCs made GRIB2 data available on their Internet based services (SADIS FTP/Secure SADIS FTP and WIFS) in March 2010 and over their satellite services (SADIS 2G, ISCS G2) in November 2010. The forecasts for CB cloud, icing and turbulence continue to be developed by the WAFCs and are available via the Internet based services only in folders marked 'TRIAL_FORECASTS'. It should be noted that the CB cloud, icing and turbulence forecasts in GRIB1 form were withdrawn in November 2010.

¹ 16th-18th September 2009, Paris, France

A brief summary of the benefits of GRIB2 WAFS upper-air forecasts is provided in Appendix A to this paper.

Suggested action: *Note this information. Users should contact the suppliers of their visualisation systems in order to confirm that their systems can visualise GRIB2 data from both WAFCs.*

2.2 WAFS Quality Management System Certification

At WAFSOPSG/6², the WAFCs updated the group with the status of Quality Management System (QMS) certification in relation to their respective operations.

WAFc London provided a Working Paper with a summary of its QMS processes and identified that it has independently audited ISO9001 certification.

WAFc Washington provided a working paper informing WAFSOPSG of its intent to establish an ISO9001 QMS process.

Suggested action: *Note this information.*

2.3 WAFc text administrative messages for SIGWX corrections

On 31 December 2010 the WAFCs implemented a process whereby simple, text administrative message would be transmitted in the event that errors were identified in the SIGWX forecasts. The messages are identified by WMO Bulletin AHLs of FXUK65 EGRR and FXUS65 KKCI for WAFc London and WAFc Washington respectively.

Some users have requested clarification on what to do on receipt of such messages, and the WAFSOPSG Secretary, in coordination with IATA, IFALPA and the WAFc Provider States will report back to the WAFSOPSG/7 meeting on this matter.

Suggested action: *Note this information, and monitor WAFSOPSG web site for future updates.*

2.4 Implementation of enhanced WAFS performance indicators

WAFSOPSG/6 was pleased to note that the following enhancements to the WAFS performance indicators had been implemented:

- a) mean and root-mean-square (RMS) vector wind error; mean and RMS temperature error;
- b) error against model analysis;
- c) at eleven flight levels: 050, 100, 180, 240, 300, 320, 340, 360, 390, 450 and 530;
- d) for the 00 UTC and 12 UTC model runs combined;

See section 3.8 regarding a study of the feasibility of the provision of additional performance indicators in the future.

Suggested action: *Note this information.*

² 21st-24th March 2011, Dakar, Senegal

2.5 WAFC backup tests

The WAFC Provider States have continued to test their SIGWX backup procedures in the event that one WAFC 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 at URL: <http://www.icao.int/anb/wafsopsg/Recent%20Chronology%20of%20WAFC%20Backup%20Tests.pdf>. Tests over the last 12 months have been largely successful, and transparent for the overwhelming majority of WAFS users. [EDITORIAL NOTE: AT TIME OF SUBMISSION LINK DOES NOT WORK DUE TO UPDATE OF WAFSOPSG WEBSITE]

Forthcoming backup tests are outlined at URL: <http://www.icao.int/anb/wafsopsg/Forthcoming%20WAFC%20Backup%20Tests.pdf>. Notification of WAFC backup tests is promulgated on the SADIS broadcasts in advance, by way of administrative messages. [EDITORIAL NOTE: AT TIME OF SUBMISSION LINK DOES NOT WORK DUE TO UPDATE OF WAFSOPSG WEBSITE]

In addition, WAFC backup procedures are outlined at: <http://www.icao.int/anb/wafsopsg/backup.pdf>. [EDITORIAL NOTE: AT TIME OF SUBMISSION LINK DOES NOT WORK DUE TO UPDATE OF WAFSOPSG WEBSITE]

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

2.6 Introduction of OCNL CB in high level SIGWX forecasts

Following a review of Annex 3 - *Meteorological Service for International Air Navigation* the WAFCs had identified the requirement to include OCNL CB in high level SIGWX forecasts (separate to and in addition to OCNL EMBD CB). The WAFCs implemented this change with effect from the SIGWX forecasts issued at approximately 1900 UTC on 15th June 2011 (SIGWX forecasts valid for 1200 UTC 16th June 2011).

Suggested action: Note this information.

3. FORTHCOMING DEVELOPMENTS

3.1 Access to Internet based services (SADIS FTP/Secure SADIS FTP/WIFS).

WAFSOPSG/6 was apprised of the need to confirm and clarify the access policies for the Internet based services for delivering WAFS data; namely SADIS FTP/Secure SADIS FTP and WIFS. This particular subject will be addressed by a separate paper presented to the meeting.

Suggested action: Note this information. Users may wish to consider applying for WIFS accounts as backup/contingency option in the event of the (highly unlikely) failure of the SADIS FTP/Secure SADIS FTP services.

3.2 Fixed areas of WAFS forecasts in chart form

WAFSOPSG/6 was informed that when WAFC London implements its new SIGWX production platform (date to be advised) it would take the opportunity to remove differences between the dimensions/orientation of its SIGWX forecasts in PNG format and those of WAFC Washington. This would remove the problems encountered by some users during WAFC Backup events (test or real) when charts of different dimensions/orientation are received from the WAFC performing the backup role. As a result of this work, it was identified that the areas the WAFC SIGWX charts actually covered were not identical to the definitions in Annex 3 - *Meteorological Service for International Air Navigation*, and that since the WAFCs had been issuing their charts for many years without any day

to day impact, it would be appropriate to update the definitions in Annex 3 (App 8, Figures A8-1, A8-2 and A8-3).

Suggested action: Note this information. Monitor WAFS Change Implementation Notice Board, and administrative messages relating to this.

3.3 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* (November 2013).

Suggested action: Note this information.

3.4 Prioritization of GRIB2 WAFS Aviation Forecasts against the GRIB1 WAFS Aviation Forecasts

In order to manage the transition from WAFS upper-air forecasts in the GRIB1 code form to those in the GRIB2 form, and the eventual withdrawal of GRIB1 (planned for November 2013) it is necessary to change the priority of GRIB1 and GRIB2 data. As such, it is currently planned that GRIB2 data will be made available before GRIB1 with effect from the 1200 UTC data time on 5th July 2012. This date will be confirmed closer to the time, and the subsequent timetable for delivering data is as given in Appendix B to this paper.

Suggested action: Note this information.

3.5 Withdrawal of WAFS upper-air forecasts in GRIB1 code form

The long term plan of the WAFSOPSG continues to indicate the intention to withdraw WAFS upper-air forecasts in the GRIB1 code form in November 2013.

Suggested action: Users should confirm that their visualisation systems have been (or will be) updated to display GRIB2 data; and that they are using GRIB2 data before the withdrawal of GRIB1 data.

3.6 Withdrawal of ISCS G2

The ISCS Provider will withdraw the ISCS G2 satellite based service at the end of June 2012. Thereafter the WAFS data provided by the USA will be available only via the WAFS Internet File Service (WIFS).

Suggested action: Note this information.

3.7 Guidance and Training for States on the use and visualization of new gridded WAFS forecasts

The WAFSOPSG/5 meeting noted that the need for training related to the “roll-out” of the new gridded forecasts had been recognized by most planning and implementation regional groups (PIRGs) which had formulated conclusions calling for the WAFS Provider States to organize training seminars on the use of the new gridded WAFS forecasts for CB clouds, icing and turbulence.

WAFSOPSG/6 reviewed the status concerning guidance and training for States and WAFS users on the intended use of new gridded WAFS forecasts for CB clouds, icing and turbulence. The group concurred that the development of such training should be deferred until visualization standards for these elements had been finalized.

The group agreed to develop guidance on the interpretation (Conclusion 6/12) of the forecasts for CB cloud, icing and turbulence, and that the WAFS Provider States would then review the training requirements.

With regard to the visualization of gridded WAFS forecasts, the group noted the continued need for receiving information presented in a similar manner to the existing SIGWX charts and agreed that the IATA Member should develop a concept of operations which would include requirements for the provision of probabilistic forecasts of icing and turbulence expressed in terms of indices (Conclusion 6/16). The group further agreed that for the time being, the WAFS Provider States should continue with the provision of WAFS SIGWX forecast in the current formats (BUFR code and PNG chart forms (Decision 6/17).

Suggested action: Note this information.

3.8 **WAFS output performance indicators**

WAFSOPSG/6 called for the WAFS Provider States study the feasibility of providing the additional WAFS performance indicators listed below, and to report back to WAFSOPSG/7:

- a) the number of times a complete set of SIGWX BUFR messages were not issued by the standard issue time;
- b) the number of times a complete set of SIGWX BUFR messages were not issued by the validity time of the data;
- c) the number of invalid or incomplete sets of SIGWX BUFR messages transmitted;
- d) the number of times a complete set of GRIB messages was not issued by the standard issue time, including the time at which each complete GRIB dataset was made available; and
- e) the number of SIGWX correction messages transmitted

See section 2.4 relating to actions implemented.

Suggested action: Note this information.

3.9 **Use of maximum icing for use in ETOPS operations**

Decision 6/14 of WAFSOPSG/6 stated that the WAFS gridding icing forecast be endorsed as operationally acceptable for the use in extended range operations by twin-engined aeroplanes (ETOPS) flight planning.

Suggested action: Note this information.

3.10 Harmonization and Verification of WAFS CB cloud, icing and turbulence WAFS Forecasts

The WAFSOPSG was informed of developments to harmonize the provision of forecasts of CB cloud, icing and turbulence, both in terms of the algorithms and processes used as well as the blending of the outputs, to improve the forecasts. The group was presented with promising initial verification results of blended forecasts and it was noted that further verification activities are planned and will be presented to WAFSOPSG/7. Noting the user requests to begin the operational evaluation and use of the forecasts, Conclusion 6/18 determined that Note 1 at Paragraph 1.2.2 of Appendix 2 to Annex 3 regarding the experimental label “trial forecasts”, be removed as part of Amendment 76.

Suggested action: Note this information.

4. ACTION BY THE MEETING

4.1 The meeting is invited to:

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

APPENDIX A

BRIEF SUMMARY OF THE BENEFITS OF WAFS UPPER-AIR FORECASTS IN THE GRIB2 CODE FORM COMPARED TO GRIB1

GRIB 2 WAFS data benefits from higher spatial and temporal resolution, and additional fields, compared to its GRIB 1 predecessor – for example, the GRIB 2 WAFS data is based on a regular 1.25*1.25 degree (unthinned) grid, provides forecast data from T+6 to T+36 at 3-hourly time intervals, and includes additional flight level information at FL270, FL320 and FL360. Forecasts for CB cloud, icing and turbulence continue to be developed, and currently have 'trial status'.

APPENDIX B

TABLES INDICATING THE DELIVERY SCHEDULE OF GRIB1/GRIB2 WAFS UPPER AIR FORECASTS BEFORE AND AFTER THE CHANGE OF PRIORITY

Priority up to and including 0600 DT dataset, 5th July 2012.

	<i>Time that DT 0000 UTC data is made available</i>	<i>Time that DT 0600 UTC data is made available</i>	<i>Time that DT 1200 UTC data is made available</i>	<i>Time that DT 1800 UTC data is made available</i>
GRIB1	0315-0345	0915-0945	1515-1545	2115-2145
GRIB2	0345-0500	0945-1100	1545-1700	2145-2300

Table 1: Table listing the current times at which WAFS Aviation GRIB1 and GRIB2 data are made available, and suggested to remain so until 0600 DT dataset on 5th July 2012, or until such a time as WAFSOPSG determines.

Priority from and including 1200 DT dataset, 5th July 2012.

	<i>Time that DT 0000 UTC data will be made available</i>	<i>Time that DT 0600 UTC data will be made available</i>	<i>Time that DT 1200 UTC data will be made available</i>	<i>Time that DT 1800 UTC data will be made available</i>
GRIB2	0315-0430	0915-1030	1515-1630	2115-2230
GRIB1	0430-0500	1030-1100	1630-1700	2230-2300

Table 2: Table listing the proposed times at which WAFS Aviation GRIB1 and GRIB2 data are made available, as of the 1200 DT dataset on 5th July 2012, or from such a time as WAFSOPSG determines.

Note - the transition date will be confirmed closer to the time of implementation