



International Civil Aviation Organization
CAR/SAM Regional Planning and Implementation Group (GREPECAS)
**Eleventh Meeting of the GREPECAS Aeronautical Meteorology Subgroup
(AERMETSG/11)**
Lima, Peru, 28 to 30 November 2011

**Agenda Item 2: Review the status of implementation of the World Area Forecast System
(WAFS) in the CAR/SAM Regions**

SUMMARY OF RECENT AND FORTHCOMING DEVELOPMENTS TO THE WAFS

(Presented by WAFC Provider States)

SUMMARY

This paper provides an overview of the recent and planned developments for the WAFS.

1. Introduction

1.1 This paper presents developments to the WAFS since the last meeting of the AERMETSG/10. 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/Lists/Meetings/AllItems.aspx>. This paper was also presented as Working Paper 54 at the Fifteenth Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/15) of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG).

2. Recent Developments

2.1 Introduction of WAFS upper-air data in the GRIB2 code form

2.1.1 WAFSOPSG/5 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 It should be noted that the CB cloud, icing and turbulence forecasts in GRIB1 form were withdrawn in November 2010.

2.1.2 GRIB2 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.

2.1.3 Users should contact the suppliers of their visualization systems in order to confirm that their systems can visualize GRIB2 data from both WAFCs.

2.2 **WAFS Quality Management System Certification**

2.2.1 At WAFSOPSG/6, 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.

2.3 **WAFC text administrative messages for SIGWX corrections**

2.3.1 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.

2.4 **Implementation of enhanced WAFS performance indicators**

2.4.1 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 3.6 regarding a study of the feasibility of the provision of additional performance

2.5 **WAFC backup tests**

2.5.1 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. Results of these tests and additional information are posted on the WAFSOPSG website at URL: <http://www2.icao.int/en/anb/met/wafsopsg/Reference%20Documents/Forms/AllItems.aspx>

2.6 **Introduction of OCNL CB in high level SIGWX forecasts**

2.7 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).

3. **Forthcoming Developments**

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

3.1.1 WAFSOPSG/6 was appraised 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. Reports and information on WIFS are provided in separate papers presented to the meeting.

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

3.2.1 The WAFc 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).

3.3 **Prioritization of GRIB2 WAFS Aviation Forecasts against the GRIB1 WAFS Aviation Forecasts**

3.3.1 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 2.

3.4 **Withdrawal of WAFS upper-air forecasts in GRIB1 code form**

3.4.1 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.

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

3.5.1 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 WAFc Provider States to organize training seminars on the use of the new gridded WAFS forecasts for CB clouds, icing and turbulence.

3.5.2 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 also 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.

3.5.3 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 WAFc Provider States should continue with the provision of WAFS SIGWX forecast in the current formats (BUFR code and PNG chart forms (Decision 6/17)).

3.6 **WAFS output performance indicators**

3.6.1 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

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

3.7.1 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 aero planes (ETOPS) flight planning.

3.8 **Harmonization and Verification of WAFS CB cloud, icing and turbulence WAFS Forecasts**

3.8.1 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.

4. **Conclusion**

4.1 The subgroup is invited to consider information in this paper.