



International Civil Aviation Organization

**Eight Meeting of the Communications/Navigation/Surveillance and
Meteorology Sub-Group (CNS/MET/SG/8) of APANPIRG**

Bangkok, Thailand, 12 – 16 July 2004

Agenda Item 8: Review of the implementation of WAFS

REVIEW OF THE WAFSOPSG/1 REPORT

(Presented by Secretariat)

SUMMARY

This paper presents the executive summary of the WAFSOPSG/1 report.

1 INTRODUCTION

1.1 The first meeting of the World Area Forecast System Operations Group (WAFSOPSG/1), held in the ICAO South American (SAM) Regional Office, Lima, Peru, 10 to 13 November 2003, was attended by 23 experts from ten States, representing all the ICAO regions except for the AFI Region, the International Air Transport Association (IATA) and the World Meteorological Organization (WMO).

1.2 The executive summary of the report of the first meeting of the WAFSOPSG is provided in Attachment A. The meeting formulated five decisions and 25 conclusions listed in Attachment B to this paper.

1.3 The paper is intended to facilitate the discussions on WAFS by the CNS/MET SG/8 meeting.

2. ACTION BY THE MEETING

2.1 The meeting is invited to:

- a) note the executive summary of the WAFSOPSG/1 report.

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FIRST MEETING

WAFS OPERATIONS GROUP

(Lima, Peru, 10 to 13 November 2003)

EXECUTIVE SUMMARY¹

1. INTRODUCTION

1.1 The first meeting of the World Area Forecast System Operations Group (WAFSOPSG/1), held in the ICAO South American (SAM) Regional Office, Lima, Peru, 10 to 13 November 2003, was attended by 23 experts from ten States, representing all the ICAO regions except for the AFI Region, the International Air Transport Association (IATA) and the World Meteorological Organization (WMO).

1.2 Mr. D. Visoiu (Romania) was elected Chairman; and Mr. A. Al Harthy (Oman) was elected Vice-Chairman. Mr. D. Visoiu presided over the meeting throughout its duration. Dr. O. M. Turpeinen, from ICAO Headquarters, Montreal, was Secretary of the meeting and he was assisted by Mrs. N. Arias, the Regional Officer, Meteorology from the SAM Office.

2. Tasks of the WAFSOPSG

2.1 The group noted that, in accordance with its terms of reference, it was expected to:

- a) undertake work on specific tasks included in its work programme;
- b) ensure the currency of
 - 1) world area forecast system (WAFS)-related provisions in Annex 3 — *Meteorological Service for International Air Navigation*; and
 - 2) WAFS-related procedures in the air navigation plan/facilities and services implementation documents (ANP/FASID).

2.2 With regard to specific tasks, the group addressed nine outstanding tasks of the disbanded World Area Forecast System Study Group and four WAFS-related issues raised by the MET Divisional Meeting (2002) and referred to the WAFSOPSG for follow-up.

2.3 With regard to the currency of Annex 3 provisions, the group agreed that Chapter 9 which had not undergone any major revision during the recent restructuring of Annex 3 should be subject to a thorough review by the Secretariat, in close coordination with the member from the WMO (Conclusion 1/1 refers). Furthermore, the group updated the WAFS procedures contained in ANP/FASID (Conclusion 1/2 refers); these procedures were now global in nature and could no longer be considered in isolation by a single region.

¹ The full report is available in English at the following open Web site: www.icao.int/anb/WAFSOPSG

3. Operation of the WAFS

3.1 To facilitate the future assessments of the WAFS implementation and operation, it was agreed that, similar to the Satellite Distribution System Operations Group (SADISOPSG), the world area forecast centre (WAFS) Provider States should prepare a joint concise management report for consideration by each WAFSOPSG Meeting which would cover the period elapsed since the previous meeting addressing the WAFS operations, highlighting recent developments and future plans for operational updates (Conclusion 1/3 refers). The group considered that the development of performance indicators for WAFS was an operational matter and that IATA should address this issue (Conclusion 1/4 refers).

3.2 Noting that all WAFS forecasts in the T4 chart form would be discontinued as of 1 July 2005, the group agreed that the WAFCs did not need to issue a new WAFS chart to cover polar air routes; the users requiring this chart should produce it from the operational WAFS BUFR data (Decision 1/5 refers).

3.3 In response to Conclusion 14/34 of the fourteenth meeting of the ASIA/PAC Air Navigation Planning and Implementation Regional Group (APANPIRG/14) (2003), calling for the WAFSOPSG to develop notification procedures to ensure that all States/users concerned be informed, with enough lead time, concerning significant changes to the WAFS operations, the group referred this issue to the WAFS Provider States (Conclusion 1/6 refers). The group's attention was drawn by IATA to the discrepancies in the SIGWX forecasts in the areas where the products issued by the two WAFCs overlapped. To overcome the issue, the depiction of SIGWX would be harmonized by the WAFCs (Conclusion 1/12 refers).

3.4 It was noted that Attachment E to Annex 3 (Operationally desirable accuracy of forecasts) was being reviewed, with the assistance of the Aerodrome Meteorological Observing Systems Study Group (AMOSSG). With regard to the route and area forecasts, the AMOSSG had felt, however, that these should be referred to the WAFSOPSG for a final review, which was undertaken by the group (Conclusion 1/7 refers).

3.5 Concerning back-up procedures between the two WAFCs, the group was pleased to note that WAFS London was installing a back-up circuit between WAFS Washington and the SADIS uplink site. This facility would provide higher levels of resilience, which was considered to be sufficient for the WAFS (Decision 1/8 refers). The group also reviewed the guidance on back-up included in Attachment C to Annex 3 and agreed that the latest version should be placed on the WAFSOPSG Web site (Conclusion 1/9 refers).

3.6 The group reviewed and endorsed a draft BUFR coding convention developed by WAFS London related to cloud information in medium-level SIGWX forecasts (SWM) (Conclusion 1/10 refers). Concerning the BUFR-coded SWM forecasts, the group recalled that SWM forecasts were produced only for the limited areas in accordance with the requirements in the ANPs/FASIDs whilst the end user visualisation software was global in its scope. The group agreed therefore that it was essential that the States and software vendors be made aware of the limited coverage of the SWM data and that charts be only produced by the users over the areas covered by the WAFS SWM forecasts. (Conclusion 1/11 refers).

4. Development of the WAFS

4.1 With regard to additional wind levels, it was noted that the current vertical resolution was about 40 hPa around the tropopause and that its improvement down to 25 hPa would be a major undertaking. In support of the opinion expressed by IATA, the group agreed that work on improved vertical resolution should nevertheless be pursued, taking full advantage of aircraft observations available from the flight levels around the jet stream. (Conclusion 1/13 refers). Concerning the inclusion of volcanic ash (VA) clouds in SIGWX forecasts, the group concurred that, in view of the availability of timely information from volcanic ash advisories, SIGMET, NOTAM/ASHTAM, disseminated to States and users through the ICAO satellite broadcasts, there was no need to include VA clouds in WAFS SIGWX forecasts (Decision 1/14 refers).

4.2 Regarding the forecasting of icing and turbulence, the group took note of the improvements of the numerical weather prediction models used by the two WAFCs, in terms of spatial resolution and the parametrization of micro-physics and agreed that a progress report on the development of an objective icing index to be used in WAFS SIGWX forecast should be presented by the WAFS Provider States to the WAFSOPSG/2 Meeting (Conclusion 1/15 refers). Concerning the improved forecast algorithms for turbulence and icing for operational use in WAFS SIGWX forecasts, the group considered that it would be feasible to provide new WAFS output products for turbulence and icing in grid point format in the foreseeable future, as a result of the improving model performance. The group tasked the WAFS Provider States to pursue this issue and to report back regularly to the WAFSOPSG meetings on progress made (Conclusion 1/16). To stimulate the development of forecast algorithms, the group concurred with the WAFS Provider States' proposal to convene a workshop on turbulence and icing in Exeter, the United Kingdom in autumn 2004, to deal with the technical issues surrounding the forecasting of icing and turbulence by the WAFCs (Conclusion 1/17 refers).

4.3 To meet the needs for a growing number of non-stop operations of 15 hours or longer, the group considered the feasibility of extending the lead time for issuance of SIGWX forecasts with the understanding that there was a need to reconcile the accuracy of the forecasts with the requirements of long-haul flights, and agreed that the issue should be studied by the WAFS Provider States (Conclusion 1/18 refers).

4.4 The group, when considering the requirement to indicate clouds other than cumulonimbus (CB) and towering cumulus (TCU) in SWM forecasts, recalled that Annex 3 stated that clouds (both the *cloud type* and *cloud coverage*) associated with SIGWX phenomena should be indicated in these forecasts. The group agreed that SWM forecasts should only include phenomena that may impact aircraft operations and that cloud coverage and types, other than CB and TCU, should be eliminated from SWM forecasts. (Conclusion 1/19 refers).

4.5 When addressing the quality control of MET information included in the automatic dependent surveillance (ADS) messages, the group noted that the WAFS Provider States had implemented procedures for the quality control of MET information in the ADS messages and agreed therefore, that as the next step, the WAFCs should address the feasibility of providing feed-back to the operators (Conclusion 1/20 refers).

4.6 The group addressed the guidelines for generating WAFS charts from the GRIB and BUFR coded data, in response to conclusions by the APANPIRG/14 and SADISOPSG/8 meetings. Concerning the requirement for producing WAFS charts for standard ICAO areas of coverage, the group agreed that, in view

of the inherent advantages of the GRIB and BUFR code forms (e.g. reduced bandwidth, flexibility etc.), the coding of WAFS forecasts by the WAFCs should continue to be in the GRIB and BUFR code forms only and that no changes to Annex 3 should be proposed in this regard. The provision of flight documentation by States, however, was another matter and the group agreed that ICAO provisions should stipulate that States be required to make available WAFS forecasts in the chart form for the fixed areas of coverage. (Conclusion 1/21 refers). With regard to the depiction of meteorological and other features on WAFS forecast charts derived from the BUFR and GRIB data, the group noted that a number of software packages included the ability for the user to manually modify the positions of features on the chart, which was considered a useful function for some items, such as text boxes. However, the group concurred that whenever users extended this function to meteorological features, the forecast should no longer be labelled as a WAFS product. It was agreed that this point should be explicitly stated in Amendment 74 to Annex 3 and in general guidelines for the depiction of meteorological and other features, which were being developed by the WAFCs. (Conclusion 1/22 refers). Concerning the so called “edge effect” (i.e. jet streams occurring close to the edge of the chart displayed without the proper indication of the flight levels affected), it was considered that this effect could be resolved by such visualization software that would permit the interpolation of the flight level at the start and end of the jet, and at any points in between, as required (Decision 1/23 refers).

4.7 With regard to guidance on software vendors, the group was pleased to note that the WAFC London, in response to a conclusion by the SADISOPSG, had become increasingly involved in assessing workstation software against a list of high-level criteria in the way in which the BUFR-coded WAFS products are displayed. To ensure that the software delivered products in compliance with Annex 3, it was agreed that the WAFCs should work together regarding the BUFR standard, in view of providing uniform guidance to software vendors related to high-level criteria (Conclusion 1/24 refers).

4.8 With regard to amendments to SIGWX forecasts, the group agreed that, with their frequent issuance (i.e. four times daily) and increasing quality, as of Amendment 74, no amendments to the SIGWX forecasts needed to be issued by the WAFCs. (Conclusion 1/25 refers). The group when dealing with the future of SWM forecasts, considered a number of options and favoured the one that would replace the SWM forecasts by new, global WAFS output products for turbulence, icing and CB and TCU clouds in grid point format; this solution, supported by IATA, was considered optimal since it would provide global information on all essential elements currently included in SWM forecasts in a user-friendly format. The group agreed that the WAFC Provider States should study the feasibility of this option (Conclusion 1/26 refers).

4.9 The group, when addressing the migration from GRIB1 to the GRIB2 code form, noted that the GRIB1 code form, maintained exclusively for aviation users, could not accommodate new parameters (e.g. WAFS output products). The group expressed interest in the migration to the GRIB2 code form; however, the migration should be undertaken only if its introduction would bring about benefits both for the WAFCs and WAFS users. The group agreed that the issue should be studied by the WAFCs (Conclusion 1/27 refers).

4.10 The group noted that the forecasts of heights above ground level of the standard WAFS flight levels were already provided to users through the ICAO satellite broadcasts, in response to a requirement by aeronautical users, including IATA. Since this information was being provided by WAFCs with a marginal cost, the group agreed that the corresponding requirement should be formalized in Annex 3 (Conclusion 1/28 refers).

4.11 With regard to the submission of proposals related to the development of the WAFS, it was agreed that all such proposals, to be considered by the WAFSOPSG, should first be evaluated by the WAFCs, not only based on their technical merits, but also taking into account the costs involved (Decision 1/29 refers).

5. **Future work programme**

5.1 The group reviewed the work programme and proposed additional changes based on the discussions under Agenda Items 5 and 6 (Conclusion 1/30 refers).

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