International Civil Aviation Organization
CAR/SAM Regional Planning and Implementation Group (GREPECAS)
Tenth Meeting of the GREPECAS Aeronautical Meteorology Subgroup (AERMETSG/10)
Buenos Aires, Argentina, 19 to 23 October 2009

Agenda Item 2: Implementation of the World Area Forecast System (WAFS)

WAFS OPTIMIZATION

(Presented by Chile)

SUMMARY

This Working Paper has the objective of submitting to the AERMETSG/10 Meeting a project for optimizing the WAFS system, incorporating information that will improve the level of accuracy of terminal, route meteorological forecasts and alerts.

1. Introduction

1.1 The WAFS is a safe aeronautical application that obtains satellite information and has invaluable characteristics for offering the specific solutions that international air navigation requires, by providing standardized and automated products to the operators, further allowing the display of Model GFS (Global Forecast System) information, valid up to 36 hours, which also allows the forecaster to prepare Terminal Area Forecasts (TAF).

1.2 For many States the possibility of having a WAFS work station is the only way to obtain products from numerical model forecasting. Consequently the best way to optimize the projections is to base their analyses and forecasts on GRIB information provided by WAFS.

1.3 The great capability of new WAFS work stations – that includes reception functions, display of analysis elements and printing of products to provide aeronautical users specific information for their operation – make of this system an invaluable element for the provision of aeronautical meteorological services.

1.4 However, everybody knows that there is not a single forecasting model that represents fully the reality and that has the best future perspective. Therefore, it is necessary to have several numerical forecasting models in order to analyze, validate and compare them for selecting the most appropriate one, according to actual meteorological conditions.

1.5 CAR/SAM regions terminal forecasts are prepared using the GFS model, which is obtained by WAFS ISCS an also through Internet, which is deployed and analyzed with PCGRIDDS software. With the purpose of improving the forecasts, meteorologists obtain information on other forecasting models from Internet. Said information is displayed through web pages of different services and organizations that make their results available for possible use by other States.

1.6 The work of looking for information in different web pages generally does not guarantee the preparation of quality forecasts, it is burdensome, little appropriate and unstable since in depends on Internet. In many cases, meteorologists use more time in searching, finding and comparing the information they need than in analyzing the information and preparing higher quality products.

1.7 The project itself intends to call the attention to the feasibility of optimizing the WAFS, considering fundamentally that it is a fast and safe means for the transmission of relevant information required by aviation. Therefore, it would allow to include other alternatives of numerical forecasting, which should be, as in the case of GFS, validated by its use in terminal forecasts, so that meteorologists do not continue using any available model without much knowledge about its functioning.

2. Discussion

2.1 As previously mentioned, WAFS information is the one that aircraft require for operating safely during take offs, en route and landings, for which reason it is the responsibility of States to provide alerts, SIGMET, terminal area (TAF) and en route forecasts, GAMET information.

2.2 In order to obtain a higher accuracy in aeronautical meteorological service provided by each State, it is necessary for WAFS to expand its capabilities and provide relevant information regarding other numerical forecasting models, which might be used, in order to prepare the above meteorological reports.

2.3 In this context, it is necessary to study the possibility of asking ICAO to conduct a study to determine in the first place which numerical forecasting models may be used for this purpose and, secondly, to disseminate selected information through the WAFS so that each State has more tools available for providing enhanced safety to air navigation. The feasibility of validating at least two models other than GFS should be evaluated, so that forecasters may analyze, validate and/or select the one that provides the higher safety for a given meteorological condition.

2.4 The new numerical forecasting models addressed by this working paper should be those with the highest resolution, which are disseminated in a binary format, that may be displayed by different WAFS stations and that obtain good results in the first 36 hours of its validity.

2.5 It is therefore proposed to ask the World Area Forecast Center (WAFC) in Washington to include in addition to GFS Model, two numerical forecasting models, validated by ICAO for its use in aviation with analysis information (00) with up to 36 hours of validity, considering also that these new models must have a vertical range not higher than 25,000 feet in order not to generate interference with the area forecast produced by means of the GFS model.

2.6 This information would make it possible to analyze, validate and compare the models. Thus, meteorologists could select the one offering the best resolution for the meteorological conditions of the area to be forecasted, and based on this information infer better the form of evolution of these conditions, both for preparing alerts and terminal and en route forecasts.

3. **Benefit**

3.1 The benefit for States that do not have numerical models for supporting their daily work is hard to quantify with the incorporation of this information. However, the guarantee of safety, timeliness and accuracy currently provided by area forecasts may be transferred to forecasts that are the responsibility of States and thus increase forecasts accuracy and flight operations safety.

4. **Suggested action**

4.1 The Meeting is invited to:

a) take note and analyze the information provided in this working paper;

b) discuss the possibility of asking ICAO to conduct a study to validate at least two additional numerical models to be used in aviation;

c) in case that proposal of b) is accepted and that a decision is made on the new numerical models to be used in support of air navigation, ask ICAO to make arrangements with WAFC in Washington in order to include said information in their disseminations.

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