International Civil Aviation Organization



INFORMATION PAPER

# MEETING OF THE METEOROLOGY PANEL (METP) WORKING GROUP MOG

# FIRST MEETING

## Gatwick, London, United Kingdom, 8 to 11 September 2015

## Agenda Item 4: Matters relating to WAFS 4.1: Review of Open Items from WAFSOPSG (Activity 2.3)

## DEVELOPMENT OF VERIFICATION OF WAFS GRIDDED GLOBAL FORECASTS OF CUMULONIMBUS (CB) CLOUDS, ICING AND TURBULENCE

(Presented by the WAFC Provider States)

## SUMMARY

This Information Paper apprises the group of the progress in relation to the development of verification of WAFS gridded forecasts of cumulonimbus clouds, icing and turbulence.

### 1. **INTRODUCTION**

1.1 The group will recall that the eighth meeting of the World Area Forecast System Operations Group (WAFSOPSG/8)<sup>1</sup> formulated WAFSOPSG Conclusion 8/10, inviting the World Area Forecast Centre (WAFC) Providers to enhance the verification statistics relating to the World Area Forecast System (WAFS) gridded global forecasts for cumulonimbus clouds (CB), icing and turbulence.

1.2 This Information Paper apprises the group of the progress.

## 2. **DISCUSSION**

2.1 As noted in 1.1 WAFSOPSG/8 formulated Conclusion 8/10, repeated below for reference.

METP-WG/MOG/1-IP/9 17/8/15

<sup>&</sup>lt;sup>1</sup> WAFSOPSG/8, 2-5 September 2013, Bangkok, Thailand

That:

a) the WAFC Provider States be invited to proceed with the implementation of enhanced verification statistics of WAFS gridded global forecasts for CB clouds, icing and turbulence as per the milestones in Appendix H to this report; and

b) report to the WAFSOPSG/9 meeting.

2.2

#### APPENDIX H

For convenience, Appendix H from the WAFSOPSG/8 Report is repeated below;

#### PROPOSED TIMELINE FOR THE DEVELOPMENTS TO THE VERIFICATION OF WAFS GRIDDED FORECASTS OF CUMULONIMBUS CLOUDS, ICING AND TURBULENCE

Year	Element	Activity
October 2013	CB and CAT	Routine verification published by WMO region
January 2014	CB and CAT	Verification for T+12 and T+36 added
Late 2014	Icing	Extend Icing verification to global coverage
Late 2014	CB	CB verification extended across North America using US Lightning data
2015	CB	MSG Satellite data included in CB verification
2015	CB	Develop CB cloud top height verification
2015	CAT	Start to use EDR data in turbulence verification
2016	CB	Expand coverage to East Asia using data from Himawari-8
2017	CB	Expand coverage over Americas, and E Pacific using GOES-R data

#### 2.3

WAFC London can confirm that it fulfilled the requirement in regard to the following;

a) Provision of CB and CAT verification data by WMO Region (where data of sufficient sample size permits) was implemented on 11 July 2014.

b) Provision of CB and CAT verification data for T+12 and T+36 (in addition to T+24) was implemented on 11 July 2014.

c) With regard to CB verification across North America using USA lightning data, WAFC London has verified 12 months of CB forecasts using USA lightning data and MSG satellite data. Work to combine these data sets with UK lightning data is ongoing.

2.4 WAFC Washington can confirm that it fulfilled following requirement:

a) Provision of icing verification data by WMO region was implemented on May 22<sup>nd</sup>, 2015 for all time steps. Statistics are online at <u>http://www.emc.ncep.noaa.gov/gmb/icao/</u>

2.5 The remainder of the stated requirements are due for delivery in the future. However, a brief summary of status:

a) MSG Satellite data to be included in CB verification

WAFC London expects to implement in March 2016

b) Develop CB cloud top verification

WAFC London expected to implement in March 2016

c) Use of Eddy Dissipation Rate (EDR) data in turbulence verification

Progress is being made in this area. WAFC London is in communication with 2 airlines in relation to obtaining EDR data along their routes.

WAFC Washington is receiving EDR data from 3 airlines.

d) Expand CB verification coverage to East Asia using data from Himawari-8

Himawari-8 has been launched. Availability of operational data is expected by September 2015. A dataset of sufficient sample size is expected to be available by March 2017.

e) Expand CB verification coverage over Americas and E Pacific using GOES-R data

Dependent upon launch of GOES-R (scheduled summer 2016) and availability of operational data.

2.6 Both WAFCs have made additional verification statistics available for Cb cloud, turbulence and icing grids. Previously, only the Hit Rate and False Alarm Rate were provided. The statistics now include Hits, False Alarms, Miss, Correct Rejection, Hit Rate and False Alarm Rate. The icing verification also contains Bias Statistics.

### 3. CONCLUSIONS

3.1 From foregoing, the group will be pleased to note the progress made to date, and the status of those requirements due for delivery at a future date.

### 4. **ACTION BY THE METP-WG/MOG**

### 4.1 The METP-WG/MOG is invited to:

a) note the information contained in this working paper.

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