



WORKING PAPER

SATELLITE DISTRIBUTION SYSTEM OPERATIONS GROUP (SADISOPSG)

THIRTEENTH MEETING

Dakar, Senegal, 27 to 29 May 2008

Agenda Item 6: Development of the SADIS

6.3: Report of the SADISOPSG Technical Development Team

GRIB 2 WAFS DATA TRIAL ON THE SADIS 2G SATELLITE BROADCAST

(Presented by the SADIS Provider State on behalf of the SADISOPSG Technical Development Team)

SUMMARY

This working paper outlines background discussions related to GRIB 1 to GRIB 2 migration, and makes a recommendation to perform a GRIB 2 data trial on the SADIS 2G satellite broadcast in 2009.

1. INTRODUCTION

1.1 The group's attention is drawn to discussions within the World Area Forecast System Operations Group (WAFSOPSG) related to the migration from the GRIB 1 to the GRIB 2 code form. The WAFSOPSG Conclusion 3/15 called on the WAFS Provider States, in co-ordination with the WAFSOPSG member from WMO, to develop a detailed implementation plan for the transition to GRIB 2. A detailed implementation plan was endorsed at the WAFSOPSG/4 meeting, held in Cairo in February 2008.

1.2 Milestones relating to GRIB 2 migration are presented within the SADIS long-term plan (WP/16 refers), and are in line with the endorsed plan of WAFSOPSG/4.

1.3 In order to fulfil the obligations of the plan, notably the future intention to disseminate GRIB 2 code form WAFS forecasts on the SADIS broadcast services, it is necessary for the SADIS Provider State to undertake a GRIB 2 data dissemination trial on SADIS 2G.

1.4 This working paper outlines some of the discussions that have taken place up to this point, and makes recommendations for future work in this area.

2. DISCUSSION

2.1 On 22 January 2008, the SADIS Provider State convened an ad hoc meeting at the UK CAA in London with a small number of SADIS users and technical experts to discuss GRIB 2 migration. A member of the SADISOPSG Technical Development Team was part of these discussions. A similar meeting was hosted by the US National Weather Service in Washington D.C. a week later to discuss ISCS GRIB 2 migration. The SADIS Provider State attended the Washington meeting to ensure commonality in the GRIB 2 migration plans proposed by the SADIS and ISCS Provider States.

2.2 Amongst a range of topics discussed, many of them technical, the SADIS and ISCS Providers agreed that, in principle, it would be advantageous to perform a GRIB 2 data trial over the respective satellite broadcasts. In the case of SADIS, the intention is to disseminate WAFS London compressed GRIB 2 WAFS data over the SADIS 2G satellite broadcast on a dedicated 4th data channel – once WAFS London has started to produce the data in a trial and evaluation format.

2.3 The fourth meeting of the WAFSOPSG (February 2008) endorsed an implementation plan for migration from the GRIB 1 to GRIB 2 code form within the WAFS. The group noted, however, that in view of the trial status of the gridded forecasts of icing, turbulence and cumulonimbus clouds, it would be unwise to disseminate these products on the SADIS and ISCS satellite broadcasts (in GRIB 2 code form) until such a time that a full and proper appraisal of their accuracy has been completed. Accordingly, the group determined that the GRIB 2 forecasts of the traditional wind/temperature/humidity and the new icing/turbulence/CB clouds are expected to be made available on SADIS FTP only before the next WAFSOPSG meeting (scheduled September 2009).

2.4 Nevertheless, the SADIS Provider State believes that it would be advantageous to perform a feasibility trial of disseminating GRIB 2 data on the SADIS 2G satellite broadcast in 2009. Noting the concerns expressed by the WAFSOPSG in respect of the operational applicability (i.e. status) of the gridded icing/turbulence/CB forecasts, the SADIS Provider State would impose certain conditions, including limiting the data to only a small number of users across a dedicated data channel.

3. PURPOSE AND SCOPE OF GRIB 2 TRIAL

3.1 Expected to commence in the second or third quarter of 2009, WAFS London will start producing WAFS grids for wind/temperature/humidity and icing/turbulence/CB in the GRIB2 code form. Each WAFS dataset is expected to be of the order of 20 to 30 Mb in size, per run, following data compression – compared to approximately 10 Mb for an existing (uncompressed) GRIB 1 WAFS dataset.

3.2 The purpose of the trial will be to transmit several full sets of compressed GRIB 2 WAFS data over the SADIS 2G satellite broadcast, and for a limited number of SADIS users to receive, decompress and decode this data successfully on their flight planning and/or visualisation workstations.

3.3 Participants of the trial on behalf of the SADIS Provider State will be: WAFS London; VADOS Systems; and the SADIS Gateway. Participants of the trial on behalf of SADIS users will be: a member of the SADISOPSG Technical Development Team; one flight planning company and one workstation supplier.

3.4 The trial will determine the time taken to encode and compress the data at the UK Met Office (WAFS London); the time taken to transmit the data to select end-users over the SADIS 2G broadcast; and, the time taken to decompress and decode the data at the user end. Each end-user involved

in the trial will be expected to provide a short report on their findings to the SADISOPSG Technical Developments Team. The SADISOPSG Technical Developments Team will collate responses from the trial participants with a view to preparing advice to the SADIS Provider State and SADISOPSG on whether a) the new transmission performance is acceptable; and b) any changes to SADIS 2G system are required to accommodate the increased volume of data.

3.5 Notionally, WAFC London will disseminate 0600 Z model run data on 4 consecutive Tuesdays, at time periods that will not interfere markedly with the existing transmission schedule of WAFS data. The GRIB 2 trial data will comprise of wind/temperature/humidity and icing/turbulence/CB data transmitted over dedicated (new) 4th data channel.

3.6 At present, SADIS 2G data is transmitted across 3 data channels – namely, GRIB (for GRIB 1-coded WAFS forecasts), OPMET and T4 (for PNG and BUFR SIGWX). VADOS Systems, who support and maintain the SADIS 2G service, would configure SADIS 2G hub equipment and remote user equipment, to allow the transmission and reception of compressed GRIB 2 WAFS data over a 4th data channel. VADOS are also expected to provide telephone and e-mail support to the participants during normal working hours of the trial. WAFC London will provide decoded (and decompressed) data, on a dedicated FTP site, to facilitate comparison with user processed data.

3.7 There are a number of clear benefits of configuring a 4th data channel dedicated to the GRIB 2 WAFS data, including:

- a) WAFC London will be able to manage who is involved in the trial;
- b) only those participants in the trial will need to have their receiving systems reconfigured to accept and process the GRIB 2 data;
- c) there will be no confusion or contamination with existing GRIB 1 WAFS data;
- d) existing SADIS 2G users (i.e. those not involved in the trial) will not be affected by the trial (as it will be largely transparent to their operations); and
- e) the 4th channel could be utilised in future for operational dissemination purposes (including parallel GRIB 1 and GRIB 2 running period).

4. ESTIMATED COSTS FOR THE TRIAL

4.1 The group may wish to agree that in view of the re-configuration of transmission and reception systems, and the time required to support, run and report on the GRIB 2 trial, funding for the participants should be sanctioned by the SADISOPSG and the SCRAG.

4.2 Total cost for the GRIB 2 data trial on SADIS 2G will be limited to £30,000, based on average cost estimates provided by each of the participants.

5. CONCLUSIONS

5.1 In view of the foregoing, the group is invited to formulate the following draft conclusion:

Conclusion 13/.. – Trial of compressed GRIB 2 WAFS data on SADIS 2G

That,

- a) the SADIS Provider State, in co-ordination with the SADISOPSG Technical Development Team, be invited to:
 - 1) perform a trial of compressed GRIB 2 WAFS data on the SADIS 2G satellite broadcast; and
 - 2) minimise any downstream impacts on existing SADIS users, by ensuring that the SADIS 2G broadcast of the GRIB 2 trial data does not interfere with pre-existing GRIB 1 and SIGWX transmission schedules.

Note 1.— GRIB 2 data trial tentatively scheduled for the second or third quarter of 2009, pending availability of data from WAFS London, and will involve the participation of a limited number of SADIS 2G users determined by the SADIS Provider State;

Note 2.— Decompressed and decoded GRIB 2 data to be provided on a dedicated FTP site, to facilitate comparison with user processed data; and

Note 3.— Secretary to provide the total cost estimate(i.e. £30,000) for the GRIB 2 data trial to the SCRAG.

- b) the SADISOPSG Technical Development Team be invited to collate responses from the trial participants with a view to preparing advice to the SADISOPSG/14 meeting on whether:
 - 1) the new transmission performance is acceptable; and
 - 2) any changes to SADIS 2G system are required to accommodate the increased data volumes.

6. ACTION BY THE SADISOPSG

6.1 The group is invited to:

- a) note the information in this paper; and
- b) decide on a draft conclusion proposed for the group's consideration.

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