



**WORKING PAPER**

**SATELLITE DISTRIBUTION SYSTEM OPERATIONS GROUP (SADISOPSG)**

**THIRTEENTH MEETING**

**Dakar, Senegal, 27 to 29 May 2008**

**Agenda Item 6: Development of the SADIS**

- 6.1: Report of the SADISOPSG Gateway Development Team**
- 6.2: Report of the SADISOPSG Strategic Assessment Team**
- 6.3: Report of the SADISOPSG Technical Developments Team**
- 6.4: Alternative SADIS 2G hardware**
- 6.5: SADIS Internet-based FTP Service**
- 6.6: Changes to the back-up configuration**
- 6.7: Long-term planning of SADIS**

**OVERVIEW OF ISSUES RELATED TO THE DEVELOPMENT OF THE SADIS**

(Presented by the Secretary)

**SUMMARY**

All the aspects related to the development of the SADIS will be addressed under this agenda item. The discussions will be assisted by status reports from the Rapporteurs of the relevant SADISOPSG teams and the SADIS Provider State.

**1. INTRODUCTION**

1.1 All the aspects related to the development of the SADIS will be addressed under this agenda item. The discussions will be assisted by status reports from the Rapporteurs of the following SADISOPSG teams:

- a) Gateway Development Team;
- b) Strategic Assessment Team; and
- c) Technical Developments Team.

1.2 Furthermore, the following issues are expected to be dealt with by the group:

- a) development of alternative SADIS 2G hardware;

- b) enhancements of the SADIS Internet-based FTP Service;
- c) changes to the SADIS back-up configuration; and
- d) long-term planning of SADIS.

## 2. DISCUSSION

### 2.1 Report of the SADISOPSG Gateway Development Team

2.1.1 The group will recall that the SADIS gateway function was developed in response to the EANPG Conclusion 38/33 and that at subsequent meetings, it developed a set of high-level technical requirements, including the real-time monitoring. It also finalized the *SADIS Gateway Operations Handbook* which is available on the SADISOPSG website, in accordance with Conclusion 8/15. The system has been fully operational since 2003.

2.1.2 The Rapporteur of the SADISOPSG Gateway Development Team will report on the progress made since the SADISOPSG/12 Meeting (WP/11 refers). The group's attention is drawn to three specific issues:

- a) real-time monitoring and validation of SIGMET at the SADIS gateway;
- b) harmonization of the OPMET content between the SADIS broadcast, SADIS FTP service and the ISCS broadcast; and
- c) impact of the new TAF code form on the SADIS gateway, including the need to amend the *SADIS Gateway Operations Handbook*.

#### **Monitoring and validation of SIGMET at the SADIS gateway**

2.1.3 Concerning the real-time monitoring of SIGMET, the group will recall that the SADISOPSG Conclusion 12/11 called for the Secretariat to invite States to implement the SIGMET format in accordance with Amendment 74 to Annex 3. The implementation of the correct format was considered essential by the group since the low-level of implementation rendered the real-time monitoring of SIGMET at the SADIS gateway impracticable.

2.1.4 The results of the report by SADISOPSG Gateway Development Team (Appendix A to WP/11 refers) based on a 14-day monitoring period indicate a low rate of compliance of 29-per cent as far as the inclusion of the name of the FIR on the second line of SIGMET is concerned. The group will concur that such a poor level of compliance is insufficient to trigger the automatic real-time monitoring and validation of SIGMET at the SADIS gateway.

2.1.5 The group may wish to express its concerns about the slow progress in States in achieving compliance with the SIGMET format as specified in Annex 3 — *Meteorological Service for International Air Navigation*. It appears that a series of letters and reminders addressed to all States over the last few years have had little impact. Therefore, the group may wish to agree that this time, only the States that are known not to follow the correct SIGMET format based on the work of the SADISOPSG Gateway Development Team should be targeted and to formulate the conclusion as drafted in WP/11.

## **Harmonization of the OPMET content between SADIS and ISCS**

2.1.6 With regard to the harmonization of the OPMET content of the SADIS broadcast, it will be recalled that the SADISOPSG/12 Meeting formulated Conclusion 12/14 which called for the SADISOPSG Gateway Development Team, in time for the SADISOPSG/13 Meeting, to prepare a report, in consultation with the SADISOPSG member from the ISCS Provider State, on the harmonization of the OPMET content between the SADIS and ISCS broadcasts. The group will be pleased to note that a report has been prepared (Appendix B to WP/11 refers). It indicates that a road map to harmonize the contents of the SADIS and ISCS broadcasts has been elaborated. The group is invited to review the road map and endorse the plan. It may be noted that, as a first step, the bulletin format of the two broadcasts would be harmonized by August 2008, in response to the WAFSOPSG Conclusion 4/4. With the implementation of this plan, it may be expected that the harmonization of the contents of the two broadcasts would be fully resolved.

### **New TAF code form**

2.1.7 Concerning the impact the new TAF code form (i.e. introducing the date in all the time groups) on the SADIS gateway, based on the report of the SADISOPSG Gateway Development Team (Appendix C to WP/11 refers), the group will expect that the amendment will have a limited impact on the SADIS Gateway; however, the change to the format of the TAF code form will require some modifications to both validation and correction procedures at the SADIS Gateway.

2.1.8 The group will concur with the SADISOPSG Gateway Development Team the optimum approach at the SADIS Gateway during the transition to the new TAF code form would be to support both pre-Amendment 74 and post-Amendment 74 TAF code forms until an acceptable level of compliance of *[figure to be inserted in the report]* per cent has been reached. As soon as this level has been reached, the SADIS Gateway should undertake a reconfiguration which would remove the validation of non-compliant (i.e. pre-Amendment 74) TAF without impacting the operational service. As soon as TAF bulletins become compliant with the new code form, they can be included in validation again. The group will note that a monitoring programme would have to be instigated to identify the emergence of newly compliant bulletins after the initial implementation date.

2.1.9 To comply with the foregoing, the group may wish to formulate the decision and conclusion as drafted in WP/11.

## **2.2 Report of the SADISOPSG Strategic Assessment Team**

2.2.1 Based on a report provided by the SADISOPSG Strategic Assessment Team (WP/12 refers), the group is invited to review the format and content of the strategic assessment tables. It may be noted that the current figures for 2008 have been obtained from an analysis of the OPMET data promulgated to SADIS via the SADIS Gateway. On completion of the review of the tables, the group may wish to request the Secretariat to forward copies of the tables to the PIRGs concerned in view of forming the basis for the next regional update of future SADIS requirements, including the figures pertaining to the year 2012. In this regard, the group may wish to formulate the conclusion as contained in WP/12.

2.2.2 It may be noted that revised draft figures for 2009-2012 will be prepared by the SADIS Provider State and presented for endorsement by the regional MET sub-group meetings during 2008 using the current figures as a base line. This will ensure that projected figures are consistent with the current OPMET data distributed on the SADIS.

## 2.3 Report of the SADISOPSG Technical Developments Team

2.3.1 The group will recall that the SADISOPSG Technical Developments Team is expected to monitor, report on and propose action on technological developments having an impact on SADIS. Over the last 12 months, the major technical development addressed by this team is related to the implementation of the second-generation SADIS broadcast (SADIS 2G) and in particular, to the associated data loss problems experienced by some users. The group will note that, in addition, the report of the SADISOPSG Technical Developments Team includes proposals on how to initiate within the SADIS system, the transition from the GRIB 1 to GRIB 2 code form.

2.3.2 Concerning the other tasks allocated to the SADISOPSG Technical Development Team, it will be recalled that, in response to the SADISOPSG Conclusion 12/19, the team was expected to review updated material prepared by the SADIS Provider State related to the SADIS FTP service and include its findings in the annual report to the SADISOPSG meeting. However, in view of the problems encountered by the SADIS Provider State (WP/21 under Agenda Item 6.5 refers), no updated material was developed, which rendered the completion of the action called for by Conclusion 12/19 impossible.

### Data loss problems with SADIS 2G

2.3.3 Regarding the implementation of the SADIS 2G and the associated data losses experienced during the last 12 months, the group will note with some concern that data losses continued to occur and that they appeared to be more frequent on the 2G service than on the 1G service. In order to improve the understanding of the data loss problem in view of its prompt resolution, the group may wish to concur with the SADISOPSG Technical Development Team that the following actions should be taken by the SADIS Provider State:

- a) take measures to ensure that no more than 5 gaps per channel and per month in the data availability occur;
- b) generate hourly admin messages with the transmitted headers available to the users;
- c) issue admin messages proactively in the case of a data loss problem; and
- d) report the reason for data loss via an administrative message.

2.3.4 In order to ensure that the SADIS Provider State complies with items a) to d) above, the group may wish to formulate the conclusion as drafted in WP/13.

### Transition from the GRIB 1 to GRIB 2 code form

2.3.5 With regard to the transition from the GRIB 1 to GRIB 2 code form, the group will note that WAFS London will start producing WAFS forecasts for wind/temperature/humidity and icing/turbulence/CB in the GRIB2 code form in 2009. 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.

2.3.6 To assess the impact of the new data on SADIS, the group may wish to concur with the SADISOPSG Technical Development Team that a trial should be organized. The purpose of the trial is to transmit several full sets of compressed GRIB 2 WAFS data over the SADIS 2G satellite broadcast to a limited number of SADIS users who would receive, decompress and decode this data on their flight planning and/or visualisation workstations. The group may wish to agree that participants of the trial on

behalf of the SADIS Provider State should be: WAFC London; VADOS Systems; and the SADIS Gateway while participants of the trial representing SADIS users should be: a member of the SADISOPSG Technical Development Team; one flight planning company and one workstation supplier.

2.3.7 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.

A fourth data channel will be dedicated to the transmission of the compressed GRIB 2 WAFS forecasts which will have a number of advantages:

- 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) other SADIS 2G users (i.e. those not involved in the trial) will not be affected; and
- e) the 4<sup>th</sup> channel could be utilised in future for operational dissemination purposes.

2.3.8 To initiate such trials, the group is invited to formulate the conclusion as drafted in WP/19.

## 2.4 Alternative SADIS 2G hardware

2.4.1 The group will recall that it formulated Conclusion 12/18 calling for the SADIS Provider State to clarify the expected certification standards, market place and mean-time between failure of the NetSys SADIS Transcoder (NST) unit; complete the final operational evaluations and provide summary report to the SADISOPSG Technical Developments Team. On completion of the foregoing actions, the SADIS Provider State was requested to assess, in co-ordination with the SADISOPSG Technical Development Team, the desirability, or otherwise, of recommending that the alternative SADIS 2G hardware be brought into the commercial marketplace.

2.4.2 The group will be pleased to learn that the SADIS Provider State has undertaken a thorough assessment in coordination with the SADISOPSG Technical Developments Team (WP/14 refers). The assessment shows that:

- a) the NST unit has been operating in a real-time environment at the Met Office without any hardware or software issues for in excess of 6 months;
- b) the Met Office has been able to successfully manage the NST unit remotely in an operational environment on at least one occasion; and
- c) the comprehensive information has been provided by NetSys regarding NST deployment and certification standards.

If similar results can be achieved from further management tests performed by the Met Office in March and April 2008 (and in time for reporting to SADISOPSG/13), it is suggested that this alternative SADIS 2G hardware be bought into the commercial marketplace. In view of these results, the group is invited to formulate the decision as drafted in WP/14.

## 2.5 SADIS Internet-based FTP service

2.5.1 The group will be aware of the fact that at its twelfth meeting, it formulated Conclusion 12/19 calling for the SADIS Technical Development Team to review updated material prepared by the SADIS Provider State in relation to the enhancements to the SADIS FTP service.

2.5.2 The group will note that the progress towards the enhancements of the SADIS Internet-based FTP service has been slower than expected due to the reasons detailed in the report by the SADIS Provider State (WP/21 refers). In order to address these difficulties, the group will note that the SADIS Provider State has prepared new proposals for SADIS FTP enhancements which would fulfil the obligations of the SADIS FTP enhancements project detailed at previous meetings, paying due consideration to the *Guidelines on the Use of the Public Internet for Aeronautical Applications* (Doc 9855); the timescales and costs already endorsed by the SADISOPSG; and the impact that any changes in approach would have on end-users.

2.5.3 The group is invited to endorse the proposal by the SADIS Provider State (WP/21 and its appendix refer) which suggests that the SADIS FTP service should be improved in two stages:

- a) Phase 1: to gain enhanced service resilience by making use of recently-developed infrastructure within the Met Office; and
- b) Phase 2: to develop a secure version of SADIS FTP service (to be referred to as “secure SADIS FTP service”) with the required security enhancements.

2.5.4 The group will note that Phase 1 entails a rebuild of the existing SADIS FTP application onto the Met Office’s resilient operational internet FTP server. However, users would find the same data layout and have available their usual access methods and user-login procedure; no “migration” of users to the new system would be necessary. Based on the information by the SADIS Provider State, the group may wish to consider that the Phase 1 work is low risk, with easily implemented work packages that would attract little additional cost to support. The total set-up cost of the Phase 1 system is considered to be less than £5,000, and could be launched as an operational service by January 2009 at the latest.

2.5.5 Phase 2 would involve building a secure SADIS FTP service, requiring software and hardware architecture technologies. Preliminary discussions with relevant design authorities in these areas indicated that most of the security enhancements recommended by the SADIS FTP enhancements proposals could be provided as part of a properly managed project. However, the hardware architecture required, the development and application of IT security techniques, and the use of project-management and support team resources, implies a substantial cost to implement and maintain in the long term. There would be an initial set-up cost in the order to £30,000, plus project, development and licensing costs.

2.5.6 With regard to the advantages and challenges related to Phases 1 and 2 of the project, the group is invited to review the list provided by the SADIS Provider State and take them into account when assessing the proposal. Based on a careful assessment, the group may wish to endorse the implementation of Phase 1 which can be considered straightforward in view of the fact that existing IT architecture already used for the SADIS FTP service will be utilised. It may be expected that the Phase 1 system will be launched by January 2009 at the latest.

2.5.7 With regard to Phase 2 involving the development of a secure SADIS FTP service, the group will note that it will be a substantial undertaking requiring 12 to 18 months development work. Before proceeding, the group may wish to agree that further details should be provided by the SADIS Provider State at the SADISOPSG/14 Meeting; if endorsed by the group in 2009, the SADIS Provider State would be able to implement the secure SADIS FTP service by November 2010.

2.5.8 In order to progress the project, the group is invited to formulate the conclusion as drafted in WP/21.

## **2.6 Changes to the back-up configuration**

2.6.1 The group will recall that it formulated Conclusion 12/20, calling for the SADIS Provider State to, upon completion of the installation and testing of the back-up service, prove the resilience of the service within the real-time environment by way of planned back-up test(s), in co-ordination with the ISCS Provider State, and to report the outcomes thereof to the SADISOPSG/13 Meeting.

2.6.2 The group is invited to consider a progress report and a detailed plan on the changes to the back-up configuration (WP/15 and its appendix refer). The group will be aware of the difficulties outlined at the SADISOPSG/12 Meeting related to local problems encountered by SADIS Gateway concerning the installation of the ISCS VSAT receiving equipment on the NATS premises. In particular, the costs are significantly higher than the costs already endorsed by the SADISOPSG and SCRAP for the back-up configuration. Therefore, an alternative option, i.e. the use of the ISCS FTP service, is being investigated. This would remove the need for the installation of a VSAT station, which has proved to be a stumbling block. The group will be pleased to note that on the completion of the on-going investigations, the SADIS Provider State will implement the most cost-effective option.

2.6.3 The group may wish to agree that, as soon as the SADIS data back-up system has been implemented, the SADIS Provider State should prove resilience of the service within the real-time environment by way of planned back-up test(s). These tests, to be brought to the attention of SADIS users through SADIS administrative messages, should be performed in co-ordination with the ISCS Provider State.

2.6.4 In view of completing work on the back-up configuration, the group is invited to formulate the conclusion as drafted in WP/15.

## **2.7 Long-term planning of SADIS**

2.7.1 The group will recall that it formulated Conclusion 11/22 calling for the SADIS Provider State to elaborate and keep up-to-date a concise long-term plan for the major development of the SADIS system covering a period of five years for review and endorsement by the SADISOPSG. Furthermore, the group will also recall that it formulated Conclusion 12/22 calling for the SADIS Provider State to include an estimate of the scope (i.e. major versus minor) and nature (i.e. hardware and/or software impacted) of the changes on SADIS users as part of the long-term plan, in time for the SADISOPSG/13 Meeting.

2.7.2 To meet the intent of the above conclusions, the SADIS Provider has updated the 5-year plan (appendix to WP/16 refers) which has paid due consideration to the life expectancy of SADIS related services and systems. The plan has also taken into account the amendment cycle of Annex 3 – *Meteorological Service for International Air Navigation* in order to minimise the frequency of changes, and the corresponding operational and financial implications to the users. Furthermore, due consideration

has to be paid to the equivalent WAFS 5-year plan, developed by the WAFC Provider States and endorsed by the WAFSOPSG.

2.7.3 The group is invited to review the plan and to formulate the decision as drafted in WP/16.

### 3. **ACTION BY THE SADISOPSG**

3.1 The SADISOPSG is invited to:

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

— END —.