

**SADIS COST RECOVERY ADMINISTRATIVE GROUP
(SCRAG)**

FOURTH MEETING

(Bangkok, 4 and 5 November 2003)

**Agenda Item 2: Consideration of issues relevant to the SCRAG's work addressed by the
SADIS Operations Group (SADISOPS)**

REPORTS ON CONCLUSIONS OF THE SADISOPSG/8 MEETING

(Presented by the Chairman of the SADIS Operations Group)

1. Introduction

1.1 This paper includes in **Attachments 1 to 3** the Executive Summary of the eighth meeting of the SADIS Operations Group (SADISOPSG/8, Bangkok, 7-10 July 2003), as well as two specific Reports from the Chairman of the SADISOPSG Group on SADIS operational efficacy and on inventory.

2. Action by the Group

2.1 The Group is invited to review the information presented in this paper

(13 pages)

EIGHTH MEETING

SADIS OPERATIONS GROUP

(Bangkok, Thailand, 7 to 10 July 2003)

EXECUTIVE SUMMARY¹

1. INTRODUCTION

1.1 The eighth meeting of the SADIS Operations Group (SADISOPSG) was held in the Asia and Pacific (ASIA/PAC) Regional Office, Bangkok, 7 to 10 July 2003. The meeting was attended by 15 experts from seven States, the focal point of the EUR OPMET Bulletin Management Group (BMG) and two international organizations (the International Air Transport Association (IATA) and the World Meteorological Organization (WMO)).

1.2 Mr. W. van Dijk, the member from the Netherlands, acted as the Chairman of the meeting.

2. SADIS FOCAL POINTS, ANNUAL STATEMENT OF SADIS OPERATIONAL EFFICACY AND UPDATE OF SADIS INVENTORY

2.1 With regard to the SADIS operational focal points, the group concurred that the focal points provided useful contacts for the SADIS Provider State and the ICAO regional offices to resolve operational issues and agreed that ICAO should consult all the SADIS user States to update the information, including e-mail addresses, if available (Conclusion 8/1).

2.2 The group reviewed the operation of SADIS during 2002/2003 based on responses from sixty States to the annual questionnaire and the annual management report from the SADIS Provider State. The responses received showed that the number of reports of serious difficulties with SADIS very small aperture terminal (VSAT) had remained low over the past year. The group concluded that the SADIS broadcast had continued to meet the operational requirements during the period under review (Conclusion 8/4). As is customary, this statement would be sent to the Chairman of the SADIS Cost Recovery Administrative Group (SCRAG). With regard to the format of the questionnaire, the group considered that no changes thereto were required, except for the inclusion of the BUFR-coded SIGWX forecasts (Decision 8/3). Based on the consultation with the SADIS users, it transpired that there was no need to change the means of transmission of, or the subjects to be covered by, administrative messages (Decision 8/2).

2.3 The group reviewed the SADIS inventory 2003/2004 and only minor changes were proposed. The updated inventory would be forwarded to the Chairman of the SCRAG (Conclusion 8/5).

2.4 With regard to the SADIS implementation, the group noted that no marked change in the number of systems in operation had occurred in 2002/2003, with eighty-six Contracting States now operating a total of 127 SADIS VSAT receivers. The mandatory cost recovery had not markedly influenced the number of SADIS users and the potential growth had been slowed down by temporary cessation in the supply of new receivers and by the fact that SADIS could now be considered as a mature system.

¹ The full report is available at the following Web site: www.icao.int/anb/sadisopsg

3. MAINTENANCE OF THE CURRENT SADIS BROADCAST AND ORGANIZATION OF THE FLOW OF OPMET MESSAGE TRAFFIC

3.1 OPMET data

3.1.1 The group reviewed Annex 1 to the SADIS User Guide (SUG) and agreed that it should be amended to include OPMET data from all the AOP aerodromes, and that the AOP and non-AOP aerodromes should be listed in separate columns. It was also agreed that ICAO should invite all the States concerned to make sure that the required OPMET data were provided to the SADIS and ISCS uplink stations in the formats specified in Annex 3. The group next reviewed an amendment proposal to Annex 1 by IATA calling for additional OPMET information from non-AOP aerodromes. This proposal was endorsed and would be circulated to the States concerned for approval (Conclusion 8/6). The group identified aerodromes whose OPMET data were not received reliably at the SADIS uplink station; this list would be provided to the regional offices for follow-up with the States concerned. Similar lists would be provided in the future by the SADIS Provider State as a part of the annual management report (Conclusion 8/7).

3.1.2 In view of the importance of tropical cyclone advisories for aviation, the group agreed that the reception of these messages should be monitored by the SADIS Provider State. A short monitoring period used for regular OPMET data would not be appropriate due to the seasonal nature of these advisories. Therefore, the group agreed that the SADIS Provider State should prepare annual statistics for all non-scheduled OPMET data, including tropical cyclone advisories, received at the SADIS uplink station (Conclusion 8/8).

3.2 WAFS forecasts

3.2.1 The ISCS broadcast included GRIB bulletins with forecast height above ground level of different standard WAFS flight levels, which were not currently subject to a requirement in Annex 3, nor included in the SADIS broadcasts; however, some users, including IATA, had expressed an interest in obtaining these bulletins via SADIS. Since the inclusion of these bulletins would have only a marginal operational impact, the group agreed that they should be added to the SADIS broadcast. Furthermore, the group was of the opinion that the WAFSOPSG should consider whether these forecasts should be subject to a genuine aeronautical requirement in Annex 3 (Conclusion 8/9).

4. DEVELOPMENT OF THE SADIS

4.1 Under this agenda item, the group reviewed progress on the future developments of the SADIS.

4.2 Migration within WAFS from T4 charts to the BUFR and GRIB code forms

4.2.1 With regard to the testing of SADIS workstation software used for converting BUFR and GRIB coded forecasts into WAFS charts, the group recalled that it had endorsed a list of the “SADIS software functionalities for testing”. The group agreed that the original list had to be slightly amended to take account of the fact that it had proved impossible for the software packages to be able to produce a SIGWX chart from the corresponding BUFR messages or a wind-temperature chart from the corresponding GRIB messages that would be *identical* to the equivalent T4 product as far as the *non-meteorological* features were concerned. Furthermore, the group concurred that the issue required further study and referred it to the WAFSOPSG for consideration (Conclusion 8/10).

4.3 Bulk purchasing of workstation software

4.3.1 The SADIS Provider State presented a proposal related to the bulk purchasing of workstation software, i.e. a collective tender process to procure new SADIS software. There would be multiple software upgrades in the future that were expected to be costly to SADIS users. In view of the advantages of bulk purchasing (i.e. savings offered by software vendors and reduced maintenance costs), the group agreed that the issue merited further study and agreed that it should be addressed by the SADISOPSG Workstation Software Team. The team should seek solutions concerning how to facilitate software and service upgrades in those SADIS user States which are included in the United Nations list of least developed countries. The ICAO regional offices would consult the SADIS users within their area to ascertain whether they wish to be involved in a collective tender process to procure new SADIS software, with the option for on-going maintenance, support and software upgrades, and as necessary, on-site installation and training (Conclusion 8/11).

4.4 SADIS Second-Generation prototype (SADIS 2G)

4.4.1 A report on the on-going SADIS 2G trials was presented to the group by the SADIS Provider State. The group agreed that the trials should be completed as soon as possible and that the remote site for these tests should be in Switzerland. Subject to the resolution of all the outstanding issues, the SADISOPSG Technical Developments Team was tasked to declare the trial complete.

4.4.2 With regard to the implementation of the SADIS 2G, the group agreed that it should be implemented in view of its undeniable benefits, i.e. an improvement in satellite performance; a future reduction in required bandwidth and cost; a wider market for the supply of cost-effective receiving equipment. It was realized that the SADIS 2G implementation would mean that all the VSAT stations would have to be changed over the next few years; therefore, it was essential that endorsement for this proposal be sought from all the PIRGs concerned. Furthermore, there would be cost implications at the system level, mainly related to the establishment of an operational infrastructure. Therefore, the SCRAG would have to be involved as of this year. The group agreed that, as soon as the SADIS 2G has been endorsed by the PIRGs concerned, it should be implemented (Conclusion 8/12 and (Draft) Conclusion entitled “Implementation of the SADIS second-generation system (SADIS 2G)”).

4.5 Enhanced two-way capability

4.5.1 With regard to the future of the SADIS two-way programme, the group was of the opinion that the existing two-way programme was unable to meet the requirements of increasing the quantity of OPMET data available for SADIS uplink, or improving its timeliness of availability in a cost-effective manner. It was felt that the main reason for this failure was the long lead-time between the project conception and its operational implementation; during this period technologies had evolved, and more cost-effective solutions were available. The group agreed, therefore, that the first-generation two-way programme should be discontinued and that the SADISOPSG Operational Two-way Clearance Team be disbanded ((Draft) Conclusion entitled “Discontinuation of the current first-generation SADIS two-way VSAT programme” and Decision 8/13).

4.5.2 With regard to the two-way programme in general, the group considered that the SADIS second-generation two-way programme (hereafter referred to as “SADIS 2G+”) would be a step forward in resolving the long-standing issue of missing OPMET data. The group realized that the SADIS 2G+ would be quite different from the current two-way programme; it would rely on well-proven, off-the-shelf technology which would render maintenance easy and fairly inexpensive. The price of the SADIS 2G+ VSAT (at current market prices) was less than £ 10 000; furthermore, it could be used to send BUFR-coded OPMET data and SIGWX forecasts to the SADIS uplink. In view of its far-reaching consequences, the group felt that a number of issues should be addressed before any decision could be taken concerning the SADIS 2G+. It was considered that the fundamental prerequisite was the existence of a genuine operational requirement.

Furthermore, an assessment of the impact of SADIS 2G+ on the OPMET traffic and operating costs should be undertaken. It was also emphasized that the difference between this proposal and the first-generation two-way programme should be highlighted to the PIRGs which would eventually have to endorse the SADIS 2G+. The group agreed that a proposal for a clear operational concept for the SADIS 2G+ based on approved VSAT technology would have to be developed as a first step. The concept should include a plan with the proposed scale of implementation of the SADIS 2G+. The development of the concept should be undertaken by an *ad-hoc* drafting group. Furthermore, the operational concept should address issues customarily included in business plans, i.e. costs, benefits (for airlines and other users) and related risks. It was expected that the results of the work of the drafting group would be presented for consideration by the SADISOPSG/9 Meeting (Decision 8/14). If endorsed by the SADISOPSG/9 Meeting, the implementation plan of the SADIS 2G+ would be circulated to the SCRAG (November 2004) and to all the PIRGs concerned (second half of 2004) for final endorsement.

4.6 **SADIS Gateway Function**

4.6.1 The group was pleased to note that the system was now fully operational, apart from the real-time monitoring, to be implemented by 31 July 2003. The group agreed that the SADIS Gateway Operations Handbook should be placed on the SADISOPSG and SADIS Provider State's Web sites. Since the scope of future work in this area would change, the group agreed that the SADIS Gateway Working Group should be converted into a SADISOPSG task team with revised terms of reference (Conclusion 8/15 and Decision 8/16).

4.7 **Strategic assessment of SADIS requirements**

4.7.1 The group reviewed the tables provided by of the SADISOPSG Strategic Assessment Team and concluded that the completed SADIS strategic assessment tables should form the basis for the future development of the SADIS (Conclusion 8/17).

5. **SADIS USER GUIDE AND AMENDMENT PROCESS**

5.1 The group recalled that the latest version of the SUG had been placed on the ICAO Web site at: <http://www.icao.int/icao/en/anb/met>. With regard to Chapters 1 to 7 and Appendices A to M of the SUG, these parts had not been subject to any major revisions since 1997. Therefore, the group agreed that the SADIS Provider State should prepare, in coordination with the ICAO Secretariat, an amendment to these parts for review by the SADISOPSG/9 Meeting. The group concurred that, to expedite the publication of the SUG, the new edition should be placed on the Web site as soon as it has been completed. (Conclusion 8/18).

6. **FUTURE WORK PROGRAMME**

6.1 The group reviewed and updated its work programme and executive summaries for the tasks in the work programme. Furthermore, the group invited the ICAO Regional Director, Paris to make the necessary arrangements for the Chairman of the EUR BMG to attend as an *ex-officio* member of the SADISOPSG in replacement for the *ex-officio* member of the Meteorology Communications Group (MOTNEG) of the European Air Navigation Planning Group (EANPG) which had been dissolved (Conclusion 8/19).

ATTACHMENT 2

SWG 5/1.4.1

25 July 2003

To: Chairman, SCRAG
From: Chairman, SADISOPSG
Subject: **Statement of SADIS operational efficacy 2002/2003**

I wish to inform you that the SADISOPSG, in Conclusion 8/4, instructed me to advise you that the operational efficacy of the SADIS had continued to be satisfactory, meeting all operational requirements since the SADISOPSG/7 Meeting (9 TO 13 June 2002).

T. Potgieter

ATTACHMENT 3

SWG 5/1.4.1

25 July 2003

To: Chairman, SCRAG
From: Chairman, SADISOPSG
Subject: **SADIS inventory 2002/2003**

I wish to inform you that the SADISOPSG, in Conclusion 8/5 instructed me to forward to you the attached updated SADIS inventory.

T. Potgieter

Attachment
Updated SADIS inventory

APPENDIX D

SADIS INVENTORY

Note.— The inventory items identified below cover the equipment and staffing required to provide, operate and maintain the SADIS. The inventory includes: hub infrastructure (including all additions following the completion of the hub enhancement project) and communications circuits, ISCS data back-up system, procured services, and staff. It should be noted that some equipment items are under lease and form part of a wider infrastructure. Costs of individual items cannot be separated from the required infrastructure that includes a significant part of the development of the software and technical configuration. The inventory is in accordance with the SADIS User Guide and as listed (in part) in the ICAO ESCRAG/7 Meeting Report.

1. EQUIPMENT

1.1 Hub infrastructure and communications circuits

1.1.1 The hub infrastructure connection to the MET Office message switch (TROPICS) consists of a number of units developed in conjunction with Astrium and other suppliers. These are installed either at Bracknell or at the uplink site at Whitehills, Oxford. The components of the original inventory changed when the two-way enhancement project was fully implemented. ~~It should be noted that the Met Office is in the process of upgrading its message switch which will be known as FROST.~~

Solely procured for SADIS

- a) 2 two-way enhanced VSATs for enhanced two-way capability;
- b) SADIS gateway function software (developed specifically for the gateway as part of the NATS CoreMet system; see items under “Not procured principally for SADIS”).

Principally procured for SADIS

- a) at the Met Office
 - 1) product display console, including software;
- b) communications between Whitehill and Met Office
 - 1) 2 Fibre Optic 64 Kbps circuits;
- c) at the uplink site (Whitehill)
 - 1) units forming part of a totally integrated rack structure, with back-up, referred to as Chain A and Chain B (see the list at Sections 4 and 5); and
 - 2) units and services leased from Astrium under contract to Cable and Wireless Communications Ltd.:
 - 1 (70 to 140 MHz) convertor

- use of 1 (140 to C band) convertor
- use of satellite hub — lease represents only a very small part of this large aperture

Not procured principally for SADIS

- a) message switch (~~TROPICS~~FORST): total investment ~~£2.3M~~ £1.5M of which ~~1.25~~1.76 per cent is attributable to SADIS usage; and
- b) message switch (CoreMet System); and
- c) communication link (SVC) between SADIS Gateway and Met Office.

Note.— Some elements of this are exclusively for the support of the SADIS gateway function.

1.2 ISCS data back-up system

- a) ISCS VSAT system, including receiver, cables, break unit and X25 frame relay switch.

Note.— The equipment, including leases, listed above under a) and b), are being capitalized over the SADIS contract period.

1.3 SADIS two-way development inventory of deliverable equipment

Note.— An asterisk () denotes equipment reused from original broadcast system.*

<i>Item</i>	<i>Description</i>	<i>Quantity</i>
1.	Bracknell Equipment	
1.1	Network Management System (NMS Computer)	1
1.2	MemoTech PAD (for NMS)	1*
1.3	Telecoms interface units Megabox	2
1.4	CX1000 Frame Relay Switch (for NMS)	1*
1.5	Product display console including software (COROBOR)	1*
2.	Bracknell Equipment (Spares)	
2.1	Telecoms interface units Megabox	2
2.2	NMS Spare CPU	
2.3	MemoTech PAD (for NMS)	1*
2.4	CX1000 Frame Relay Switch (for NMS)	1
3.	Communication link Whitehill / Bracknell	
3.1	Fibre optic 64 Kbps circuits	2*
4.	Whitehill earth station (uplink equipment)	
4.1	Telecoms controller Megapac V rack assembly	2
4.2	Station interface unit (SIU)	2
4.3	8360 Modulator	2*
4.4	8471 Receive Demodulators	12
4.5	8550 Modem Switch	1*
4.6	140 - L band upconverter	2
4.7	X Term NMS simulator	1
4.8	Equipment Rack Assembly (Chain 1)	1*
4.9	Equipment Rack Assembly (Chain 2)	1
5.	Whitehill earth station (spares)	
5.1	8471 Receive Demodulators	1
5.2	Station interface unit (SIU)	1
5.3	Megapac V rack assembly	2
5.4	Mega PACV Frad units	2
5.5	140 - L band upconverter	1
5.6	8360 Modulator 1	
5.7	8550 Modem Switch	1
6.	Whitehill services (leased from Astrium under contract to Cable & Wireless)	
6.1	70 MHz to 140 MHz converters	2*
6.2	140 MHz to C band converter	2*
6.3	Satellite Hub leased bandwidth	1 slot*
7.	Two-way VSAT Systems (2 in number)	

7.1	Channel master 2.4 metre type approved antenna	2
7.2	5 watt C Band Outdoor unit assembly	2
7.3	Low noise block downconverter	2
7.4	RF Integration kit	2
7.5	Indoor unit rack assembly	2
7.6	Station interface unit (SIU)	2
7.7	8471 Receive Demodulators	2
7.8	Telecoms interface units Megabox	2
7.9	8371 Modulator	2
7.10	Tool kit	2
7.11	Cross-site cables set 2	
8.	Test Rig at Poynton	
8.1	Enhanced Simulator 1	
9.	Communications equipment for SADIS second generation trial	
9.1	FROST or TROPICS port	1
9.2	Megapac	1
9.3	QPSK Modulator	1
9.4	QPSK De-Modulator/Receivers	2
9.5	Modem running Viterbi or Turbo coding	1
9.6	ISDN service between Bracknell and Whitehill	
9.7	ISDN call charges for the duration of the trial	

2. PROCURED SERVICES

- a) space segment annual lease: 900 MHz radio frequency dedicated to SADIS with data rates at 38.4 Kbps for the one-way channel and 19.2 Kbps for the two-way channel;
- b) annual maintenance of Met Office and Whitehills site equipment which is not leased; and
- c) gateway function:
 - 1) communication link between Met Office and NATS infrastructure site; and
 - 2) system maintenance.

3. ANNUAL STAFF REQUIREMENTS

3.1 Met Office of the UK

Help desk

Note.— The Help desk acts as a first point of contact for all inquiries, including those concerning the OPMET Gateway function. Complex inquiries will be passed to a relevant expert. Experts are available either on a 24-hour rota basis, or as a daytime support with a call-out capability.

<i>24-hour support</i>	<i>Grade and skill</i>
1. Help desk (first point of contact)	Scientific supervisor
2. Operational supervisor	Technical meteorologist
3. Systems supervisor	Computer engineer
4. HQ maintenance support	Telecommunication technical officer

Additional support

Note.— The total support for SADIS is considered as 10% of the total support offered by the four posts. These four posts are directly involved with SADIS operations and form part of a total roster of eight different skills and functions.

<i>Additional support</i>	<i>Grade and skill</i>
1. Systems integration team	2 per cent of engineer 20 per cent of network computer engineer
2. Administrator	55 per cent of executive officer 70 per cent of support specialist and meteorologist (providing support to ICAO Regions, SADIS users and SADIS User Guide)

Development & enhanced two-Way field trial support and other projects

<i>Other projects</i>	<i>Grade and skill</i>
1. Manpower	10 per cent of engineer
2. Budgets	10 per cent of data traffic manager Travel/Expenses (Consultants fees etc.)

SADIS second generation trial

<i>Second generation trial</i>		<i>Grade and skill</i>
1.	Manpower	5 per cent of engineer
2.	Budgets	5 per cent of specialist Engineering consultancy

3.2 NATS infrastructure site (OPMET Gateway function)

Note.— See also note under 3.1 "Help desk", above.

<i>24-hour support</i>		<i>Grade and skill</i>
1.	Operational staff support	50 per cent of air traffic services assistant
2.	Engineering staff support	20 per cent of systems engineer
3.	SADIS administration support	50 per cent of air traffic services assistant
