

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

**SEVENTH MEETING**

(Bangkok, 1 and 2 November 2006)

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

**REPORTS ON CONCLUSIONS OF THE SADISOPSG/11 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 eleventh meeting of the SADIS Operations Group (SADISOPSG/11, Cairo, 23-25 May 2006), as well as two specific Reports from the Chairman of the SADISOPSG Group on SADIS operational efficacy and inventory.

**2. Action by the Group**

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

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## **ELEVENTH MEETING**

### **SADIS OPERATIONS GROUP (Cairo, Egypt, 23 to 25 May 2006)**

#### **EXECUTIVE SUMMARY<sup>1</sup>**

#### **1. INTRODUCTION**

1.1 The eleventh meeting of the SADIS Operations Group (SADISOPSG/11) was held in the Middle East (MID) Regional Office, Cairo, 23 to 25 May 2006. The meeting was attended by twenty-one experts from seven States, the representative of the focal point of the EUR OPMET Bulletin Management Group (BMG) and three international organizations (the Agency for the Safety of Aerial Navigation in Africa and Madagascar (ASECNA), the International Air Transport Association (IATA) and the World Meteorological Organization (WMO)).

1.2 The Chairman, Mr. T. van Steijn, presided over the meeting throughout its duration.

#### **2. FOLLOW-UP OF SADISOPSG/10 CONCLUSIONS**

2.1 With regard to the follow-up of the conclusions and draft conclusions, the group noted that action had been completed on all the issues except for Conclusions 10/12 a), and 10/19 b), action on which was expected to be completed by the SADISOPSG/12 Meeting (Decision 11/1).

#### **3. OPERATION OF THE SADIS**

3.1 The group reviewed the operation of SADIS during 2005/2006 based on the annual management report from the SADIS Provider State and on responses from fifty-five States to the annual questionnaire on the operational efficacy of the SADIS broadcast. Concerning the annual questionnaire, the responses received showed that the number of reports of serious difficulties with the SADIS very small aperture terminal (VSAT) had remained low over the past year. However, the group expressed some concern related to the continued low level of implementation of the BUFR-decoding software amongst the SADIS users. Therefore, the WAFSOPSG was invited to consider adopting mitigating actions to ensure the effective reception of SIGWX forecasts by users after 30 November 2006 (Conclusion 11/3). The group concluded that the SADIS broadcast had continued to meet the operational requirements during the period under review (Conclusion 11/5). This statement would be forwarded to the SADIS Cost Recovery Administrative Group (SCRAG). With regard to the format of questionnaire, the Secretariat was tasked to make it available in an interactive format (Conclusion 11/4).

3.2 With regard to the list of SADIS operational focal points, the group concurred that it provided useful contacts for the SADIS Provider State and the ICAO regional offices to resolve operational issues, and agreed that ICAO should update this list (Conclusion 11/2).

3.3 The group reviewed the SADIS inventory 2005/2006. In order to ensure that SADIS continued to meet the approved operational requirements, amendments to the inventory were made based

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<sup>1</sup>The full report is available at the following website: [www.icao.int/anb/sadisopsg](http://www.icao.int/anb/sadisopsg)

on proposals by the SADIS Provider State to take account of minor changes in the proportions of resource usage, and to improve failover between contingent links and the operator visibility of network performance. The updated inventory would be forwarded to the SCRAG (Conclusion 11/6).

3.4 With regard to the SADIS implementation, the group noted that the number of States and users had slightly increased during 2005/2006 with eighty-eight Contracting States now operating a total of 135 SADIS VSAT receivers and six FTP servers. It was considered that the increase was due to the growing interest in the SADIS FTP service. With regard to the format of the SADIS implementation table, the group agreed that the deployment of SADIS 2G VSATs should be included therein (Conclusion 11/7).

## **4. CONTENT OF THE SADIS BROADCAST**

### **4.1 OPMET data**

4.1.1 The group considered the content of Annex 1 to the *SADIS User Guide* (SUG) which lists the requirements of OPMET data to be broadcast on the SADIS. To improve the availability of OPMET data, the users suggested that the Secretariat should invite States to fully implement the dissemination of OPMET data from all AOP aerodromes to the SADIS uplink station, in accordance with the *SADIS User Guide*, Annex 1 (Conclusion 11/8).

4.1.2 To draw the full benefit of the data-base oriented format of Annex 1 and to ensure its concurrence with the FASID Tables MET 1A of the regional ANP/FASID, the group agreed that the requirements for TAF expressed in FASID Tables MET 1A be also converted into the data-base oriented format by the ICAO Secretariat (Conclusion 11/9).

4.1.3 The group endorsed the draft amendment to Annex 1 to the SUG by the users, with the understanding that a) METAR/SPECI to be required from all AOP aerodromes; b) TAF to be required in accordance with the FASID Tables MET 1A concerned; and c) TAF included in VOLMET broadcasts to have a validity period of 9 hours (Conclusion 11/10).

### **4.2 WAFS forecasts**

4.2.1 With regard to Annex 4 to the SUG listing the WAFS forecasts included in the SADIS broadcast, the group endorsed amendments thereto related, inter alia, to changes to the description of SWH and SWM bulletins in the BUFR code form (Decision 11/11). In view of the discontinuation of supersonic flights, the group agreed that the provision of GRIB-coded temperature and wind forecasts for FL 530 should be removed as of 22 November 2007, conditional to the outcome of the final review of draft Amendment 74 to Annex 3 by the Air Navigation Commission in October 2006 (Conclusion 11/12).

## **5. DEVELOPMENT OF THE SADIS**

### **5.1 Report of the SADISOPSG Gateway Development Team**

5.1.1 In order to improve the availability and validation of OPMET data at the SADIS gateway, the group agreed that, the SADISOPSG Gateway Development Team should:

- a) study the feasibility of harmonisation of the OPMET content between the SADIS broadcast, SADIS FTP service and ISCS broadcast;

- b) complete work related to the automatic verification of the FIR location indicator in SIGMET; and
- c) update the *SADIS Gateway Handbook* to ensure that the SIGMET formats used in examples be compatible with Annex 3.

Furthermore, it was agreed that the implementation of the routine validation of SIGMET should be delayed until a compliance of 80 per cent has been achieved (Conclusion 11/13) and that frequently incorrectly formatted SIGMET bulletins would not be validated, to ensure their timely promulgation on the SADIS (Decision 11/14).

5.1.2 In accordance with its work programme, the SADIS Gateway Development Team was requested to assess the impact of the introduction of BUFR-coded OPMET messages on the SADIS gateway operations, taking into account the general plan elaborated by the Secretariat, with the assistance of the Aerodrome Meteorological Observing Systems Study Group (AMOSSG) (Conclusion 11/15).

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

5.2.1 Based on a report provided by the Rapporteur of the SADISOPSG Strategic Assessment Team, the group reviewed the format and content of the strategic assessment tables and requested that ICAO forward copies of the tables to the PIRGs concerned so that they may form the basis for the next regional update in respect of future SADIS requirements (Decision 11/16 and Conclusion 11/17).

## **5.3 Report of the SADISOPSG Technical Development Team**

5.3.1 Over the last twelve months, the major technical development was related to the implementation of the second-generation SADIS broadcast (SADIS 2G), and therefore, the Technical Developments Team had addressed the developments in this area. The group was pleased to note that the steps taken to deal with the data loss problems, which had occurred initially at some SADIS 2G installations, had been successful and that this issue could now be considered fully resolved.

## **5.4 Report of the SADISOPSG Workstation Software Team**

5.4.1 The group noted the action taken by the Fifty-Seventh Session of the WMO Executive Council (2005) which had reiterated the need for urgent actions to replace their current SADIS VSAT and workstations, and to install the latest visualisation software. The SADISOPSG Workstation Software Team was requested to pursue its work to ensure that the least developed countries and other States without adequate cost recovery processes in place were in a position to upgrade their SADIS workstation software by 30 November 2006 and their SADIS receivers by 31 December 2008.

## **5.5 Visualization software for the BUFR-Coded WAFS forecasts**

5.5.1 The group was pleased to note the results of the evaluations of visualization software undertaken by the SADIS Provider State which indicated that six of software vendors were in a position to produce visualisation software that could depict WAFS data compatible with ICAO Standards.

5.5.2 The group's attention was drawn to work carried out by WAFC Washington, which had revealed that some workstation packages did not process BUFR-coded bulletins issued during times of WAFC back-up in a transparent way to the users. The group felt that it would be desirable to include a

new feature in the SADISOPSG software functionality list that would require the software to process products issued during periods of back-up in an entirely transparent way (Conclusion 11/18).

## **5.6 SADIS Internet-based FTP Service**

5.6.1 At its tenth meeting, the group had supported the principle of enhancing security and resilience of the SADIS FTP service. The SADIS Provider State had subsequently prepared an implementation plan, which the group reviewed and endorsed. Since the plan would evolve in time, input from the group would be required between annual meetings. The group therefore requested that the SADIS Provider State implement the plan with the understanding that the SADISOPSG Technical Developments Team provide assistance and input, as necessary. (Conclusion 11/19).

## **5.7 Inclusion of ASHTAM and NOTAM for volcanic ash in the SADIS broadcast**

5.7.1 The group was pleased to note that ASHTAM and NOTAM for volcanic ash (VA), which were correctly addressed, were currently promulgated on the SADIS broadcast. However, the number of ASHTAM and NOTAM for volcanic ash available on SADIS had remained small. Since States may not be aware of the requirement to forward ASHTAM and NOTAM for VA to the SADIS uplink, the Secretariat was tasked to remind the States of the requirement to transmit all ASHTAM and NOTAM related to VA to the AFTN address EGZZVANW (Conclusion 11/20).

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

5.8.1 The group considered various options for the back-up configuration, which were necessary due to a number of short-period interruptions experienced during a failure of the operational SADIS service. The establishment of a permanent link between WAFC Washington and the SADIS gateway would be the ideal solution; however, it was still at least 12 months away. Therefore, the installation of an International satellite communications system (ISCS)/2 receiver on the NATS premises was considered by the group to be the optimum short-term solution, provided that the SADIS Provider State ensures that full set of BUFR back-up data, including medium-level SIGWX forecasts, be made available on the ISCS/2 broadcast at all times (Conclusion 11/21).

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

5.9.1 In response to the ASIA/PAC Air Navigation Planning and Implementation Regional Group (APANPIRG) Conclusion 16/40, the group concurred that the development of a long-term plan for the SADIS development would be warranted to facilitate planning by SADIS user States of maintaining and upgrading their SADIS receiving equipment. Therefore, the SADIS Provider State was requested to elaborate a concise roadmap, covering a period of five years and addressing major changes to the system, for endorsement by the SADISOPSG/12 Meeting (Conclusion 11/22).

## **6. FUTURE WORK PROGRAMME**

6.1 The group reviewed and updated its work programme and executive summaries for the tasks in the work programme (Decision 11/23).

7. **ANY OTHER BUSINESS**

7.1 The SADIS Provider State had been informed by a workstation vendor of its intentions to develop a piece of hardware that could be used as an alternative to the SADIS 2G user “MegaPAC”. The group agreed that the SADIS Provider State should seek further information about the alternative hardware offered by the vendor concerned to understand fully the functionalities of the proposed product and address this issue with other hardware suppliers concerned. It should also assess, in coordination with the SADISOPSG Technical Developments Team, the desirability, or otherwise, of recommending that the alternative SADIS 2G hardware be brought into the commercial marketplace (Conclusion 11/24).

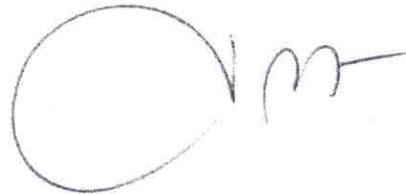
— END —

SWG 5/1.4.1

12 June 2006

To: Chairman, SCRAG  
From: Chairman, SADISOPSG  
Subject: **Annual statement of operational efficacy of SADIS 2005/2006**

I wish to inform you that the SADISOPSG, in Conclusion 11/5, instructed me to advise you that the operational efficacy of the SADIS had continued to be satisfactory, meeting all operational requirements since the SADISOPSG/10 Meeting (24 to 27 May 2005).

A handwritten signature in black ink, consisting of a large, stylized 'O' followed by a series of loops and a horizontal line extending to the right.

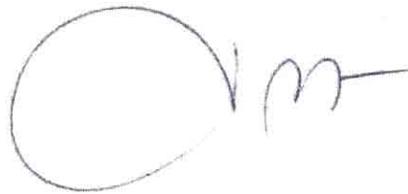
T. van Stijn

SWG 5/1.4.1

12 June 2006

To: Chairman, SCRAG  
From: Chairman, SADISOPSG  
Subject: **SADIS inventory 2006/2007**

I wish to inform you that the SADISOPSG, in Conclusion 11/6, instructed me to forward to you the attached updated SADIS inventory.

A handwritten signature in black ink, consisting of a large, rounded 'O' followed by a stylized 'v' and 'm' with a horizontal line extending to the right.

T. van Stijn

**Attachment**  
Updated SADIS inventory

## SADIS INVENTORY

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.

### 1. EQUIPMENT

#### A. Key components of Hub infrastructure and communications circuits

The SADIS 1G hub infrastructure connection to the Met Office message switch (FROST) consists of a number of units developed in conjunction with EADS Astrium and other suppliers. These are installed either at Exeter or at the uplink site at Whitehill, Oxfordshire, UK.

Additional hub infrastructure has been installed at Exeter and Whitehill to provide resilient SADIS 2G service. This hardware is physically separate from the SADIS 1G infrastructure.

##### i) Solely procured for SADIS (major components)

SADIS gateway function software (developed specifically for the gateway as part of the NATS CoreMet system; see items under "Not procured principally for SADIS").

Hewlett Packard L-class servers to provide SADIS FTP service (see Section 1 C)

##### ii) Principally procured for SADIS

###### a) At the Met Office

See Section 1 C for itemized components.

###### b) Communications between Whitehill and Met Office

1) 2 Fibre Optic 64 Kbps circuits in support of SADIS 1G service; and

2) 2 Fibre Optic 64 Kbps circuits in support of SADIS 2G service

###### c) At the uplink site (Whitehill)

1) Units forming part of a totally integrated rack structure to provide SADIS 1G service, with back-up, referred to as Chain A and Chain B (see the list under Section 1.C);

- 2) Units and services leased from Cable and Wireless Communications Ltd. to support SADIS 1G and 2G services:
    - i) 1 (70 to 140 MHz) convertor<sup>1</sup>
    - ii) Use of 1 (140 to C band) convertor<sup>1</sup>
    - iii) Use of satellite hub C (Lease represents only a very small part of this large aperture) for SADIS 1G and 2G services; and
  - 3) Units forming part of a totally integrated rack structure to provide SADIS 2G service, with back-up (see the list under Section 1 C)<sup>1</sup>
- d) Communication link (SVC) between SADIS Gateway and Met Office in support of SADIS 1G service; and
  - e) Communication link (utilising WMO TCP/IP sockets protocol) between SADIS Gateway and Met Office in support of SADIS 2G service. *(Note. — It is expected that this single link will be upgraded to dual contingent links within the next 12 months.)*

iii) **Not procured principally for SADIS**

- a) Message switch (FROST): Total investment, £1.2M<sup>1</sup> of which ~~2.69~~3.15 per cent is attributable to SADIS usage: switching data to operational (1G) broadcast service and to 1G monitoring system — Corobor Comparitor (~~breakdown: 1.34 per cent to supply operational broadcast; 1.35 per cent to supply monitoring facility~~)<sup>1</sup>

*Note. — The percentage attributable to the SADIS 1G service has increased as a result of increased costs incurred to support the legacy X.25 protocol.*

- b) Message switch (FROST): Total investment, £1.2M<sup>1</sup> of which ~~1.06~~0.91 per cent is attributable to SADIS FTP ~~service~~ usage: switching data to operational FTP service;
- c) Message switch (FROST): Total investment, £1.2M<sup>1</sup> of which ~~1.14~~1.82 per cent is attributable to SADIS usage: switching data to ~~operational (2G) broadcast service and to 2G monitoring system (Corobor Comparitor)~~

*Note. — The SADIS 2G monitoring system (Corobor Comparitor) not activated at the time of the SADISOPSG/10 Meeting; implementation expected before the SCRAG/6 Meeting.*

- d) Allocated bandwidth (2 Mbps bursting to 4 Mbps) between server and Internet Service Provider (ISP) in support of the SADIS FTP service; and
- e) Message switch (CoreMet System)<sup>1</sup>

<sup>1</sup>Budgeted cost ~~1.195466 M£~~ for providing TROPICS/FROST service during the fiscal year 2005/2006.

*Note.* — Some elements of the CoreMet System are exclusively for the support of the SADIS gateway function.

## B. ISCS data back-up system

ISCS VSAT system, including TCP/IP receiver, and cables.

*Note.* — This hardware is not currently used in an operational environment.

*Note.* — The equipment, including leases, listed above are being capitalized over the SADIS contract period.

## C. Hub equipment and services located at Exeter and Whitehill

<i>Item</i>	<i>Description</i>	<i>Quantity</i>
<b>1. Exeter Equipment to support SADIS 1G</b>		
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
1.6	Communications rack floor space in IT hall 1 and space in stores to locate spare equipment	1
<b>2. Exeter Equipment (Spares) to support SADIS 1G</b>		
2.1	Telecoms interface units Megabox	2
2.2	NMS Spare CPU	1
2.3	MemoTech PAD (for NMS)	1
2.4	CX1000 Frame Relay Switch (for NMS)	1
<i>Note.</i> — communication links in support of SADIS 1G service are included in Section 1.1 of the inventory.		
<b>3. Whitehill earth station (SADIS 1G uplink equipment)</b>		
3.1	Telecoms controller Megapac V rack assembly	2
3.2	Station interface unit (SIU)	2
3.3	8360 Modulator	2
3.4	8471 Receive Demodulators	12
3.5	8550 Modem Switch	1
3.6	140 - L band upconverter	2
3.7	X Term NMS simulator	1

3.8	Equipment Rack Assembly (Chain 1)	1
3.9	Equipment Rack Assembly (Chain 2)	1
3.10	Communications rack floor space for two communications racks	2

**4. Whitehill earth station SADIS 1G (spares)**

4.1	8471 Receive Demodulators	1
4.2	Station interface unit (SIU)	1
4.3	Megapac V rack assembly	2
4.4	Mega PACV Frad units	2
4.5	140 - L band upconverter	1
4.6	8360 Modulator	1
4.7	8550 Modem Switch	1

**5. Whitehill services (leased from Cable & Wireless)**

5.1	70 MHz to 140 MHz converters	2
5.2	140 MHz to C band converter	2
5.3	Satellite Hub leased bandwidth	1 slot

**6. Test Rig at Poynton**

6.1	Enhanced (SADIS 1G) Simulator	1
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**~~7. Communications equipment for SADIS second generation (2G) trial~~**

<del>7.1</del>	<del>Megapac 2003</del>	<del>1</del>
<del>7.2</del>	<del>QPSK De Modulator/Receivers (Comtech EFD)</del>	<del>1</del>

*Note. — One QPSK De-modulator/Receiver (Comtech EFD) and MegaPAC located in Zurich for use in the SADIS 2G trial.*

**8.7. ISDN back-up service to Washington (NWSTG)**

8.7.1	Mega PAC 2003 router (MP-2003)	1
8.7.2	Mega PAC 2003 router plus expansion (MP-2003-3-B)	1
8.7.3	ISDN 2e circuit	1
8.7.4	A/B switch	1
8.7.5	Interface cables	1

*Note. — Hardware listed items under Section 8.7 are located at Whitehill.*

**9.8. SADIS FTP service**

9.8.1	HP L2000 servers with 2Gb RAM	2
9.8.2	18 Gb internal disk drives	2
9.8.3	DVD-ROM	2
9.8.4	Processors	2
8.5	Licenses, misc. support and maintenance costs	1

*Note.— The SADIS FTP service as of 1 July 2005.*

**10.9. Operational SADIS 2G Infrastructure**

10.9.1	Frost port	1
10.9.2	MegaPAC V	3*
10.9.3	MegaPAC 2003	4*
10.9.4	Uplink modem (Comtech EF Data SDM-300a)	3
10.9.5	Communications cabinet and lease	1
10.9.6	MegaWatch including Enterprise Reports, and PC	1
10.9.7	Corobor comparator software and PC	1
10.9.8	Comtech EF Data CR100 redundancy switch	1
10.9.9	X10 Modules	8
10.9.10	SIO Modules	2
10.9.11	8 Mb RAM Modules	2
9.12	Communications rack floor space at Exeter in IT Hall 1 and IT Hall 2, and at Whitehill	3
9.13	Space in stores at Exeter to locate spare hardware	1
9.14	vadEDGE 4202 – IU	2*
9.15	WAN Module	2
9.16	Comtech EF Data SMS 301 – redundancy switch	1*
9.17	Misc cables	5

*Note.— \* Includes one unit stored as a cold spare.*

**2. PROCURED SERVICES**

- A. Space segment annual lease: 1.2 Mhz wide frequency band dedicated to SADIS 1G and 2G with minimum data rates at 38.4 Kbps for both services;
- B. Annual maintenance of Met-Office and Whitehill site equipment (SADIS 1G, 2G and SADIS FTP server)-which is not leased; and
- C. Gateway function:
  - i) Communication circuits between Met Office and NATS infrastructure site; and
  - ii) System maintenance.

### 3. ANNUAL STAFF REQUIREMENTS

#### A. Met Office of the UK

##### i) 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~~ limited on call capability.*

*Normal working hours*

~~Grade and s~~ Skill

1. Help desk (first point of contact)

Scientific supervisor

*Note.— Outside normal working hours, the helpdesk facility is provided by the 24-hour positions below.*

*24-hour support*

~~Grade and s~~ Skill

1. Operations systems analyst (OSA)

Systems analyst

2. Production systems analyst

Systems analyst

3. Networks and services engineer (NSE)

Computer engineer

4. Networks and systems supervisor (NSS)

Technical supervisor

4. Nowcasting and Service Continuity  
Manager (NSCM)

Scientist

*Normal working hours support*

Skill

1. Change and problem manager (CPM)

Systems analyst

2. Additional helpdesk operator

Systems analyst

*Note.— The total support for SADIS is considered as 1 per cent of the total support provided by the help desk and operational support function. These functions comprise 4 X 24-hour rosters of six staff each and a additional three-man team (CPM), and one further 5-roster team providing further (the normal working-hours) help desk support.*

##### ii) Additional support

*Additional support*

~~Grade and s~~ Skill

- |    |  |   |
|----|--|---|
| 1. | Systems integration team                       | 250 per cent of network computer engineer |
| 2. | Administrator                                  | 75 per cent of executive officer          |
| 3. | International aviation management              | 15 per cent of manager                    |
| 4. | Data traffic                                   | 5 per cent communications engineer        |
| 5. | Contract procurement, management and Invoicing | 5 per cent of senior procurement officer  |
| 6. | UNIX support                                   | 10 per cent of computer engineer          |
| 7. | Web-team support                               | 10 per cent of website designer           |

*Note.— As a result of the audit of SADIS costs required by SCRAG, the help desk costs have been re-assessed and reduced to a level of 1 per cent of the total support offered. Support by the UNIX team of the SADIS FTP service will incur some additional costs in excess of simple human resources. These costs are applied to all Internet facing services and primarily relate to costs associated with ensuring high levels of IT security.*

#### **B. NATS infrastructure site — CACC (OPMET Gateway function)**

*Note.— See also note under 3. A, "Help desk", above. The CACC provides the OPMET Gateway function, which is provided from one operational site, but with a full contingent capability at an alternative site. Staff are available either on a 24-hour basis, or as a daytime support with on-call capability. The staff is made up of 6 watches of 1 ATSA4 and 1 ATSA3 each (operations), and ATCE4 (engineering watchkeeping) and 3 ATCE4 (engineering day support).*

#### *24-hour support*

#### *Grade and skill*

- |    |                           |   |
|----|---------------------------|---|
| 1. | Operational staff support | 50 per cent of air traffic services assistant (H24/365) 10 per cent of ATSA4 10 per cent of ATSA3 |
| 2. | Engineering staff support | 10 per cent of systems engineer   |

#### *Day Support*

- |    |                              |  |
|----|------------------------------|--|
| 3. | SADIS administration support | 75 per cent of day support engineer 50 per cent of air traffic services assistant 40 per cent of ATC T&S C |
| 4. | Engineering (one on-call)    | 10 per cent of ATCE4 75 per cent of ATCE4  |

#### **C. Bought-in services**

*Additional support and maintenance agreements with third parties are in place to provide third line support of the SADIS 1G and 2G services.*

## SADIS INVENTORY

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##### i) Solely procured for SADIS (major components)

SADIS gateway function software (developed specifically for the gateway as part of the NATS CoreMet system; see items under "Not procured principally for SADIS").

Hewlett Packard L-class servers to provide SADIS FTP service (see Section 1 C).

##### ii) Principally procured for SADIS

###### a) At the Met Office;

See Section 1 C for itemized components.

###### b) Communications between Whitehill and Met Office;

1) 2 Fibre Optic 64 Kbps circuits in support of SADIS 1G service; and

2) 2 Fibre Optic 64 Kbps circuits in support of SADIS 2G service

###### c) At the uplink site (Whitehill);

1) Units forming part of a totally integrated rack structure to provide SADIS 1G service, with back-up, referred to as Chain A and Chain B (see the list under Section 1.C);

- 2) Units and services leased from Cable and Wireless Communications Ltd. to support SADIS 1G and 2G services:
    - i) 1 (70 to 140 MHz) convertor;
    - ii) Use of 1 (140 to C band) convertor;
    - iii) Use of satellite hub C (Lease represents only a very small part of this large aperture) for SADIS 1G and 2G services; and
  - 3) Units forming part of a totally integrated rack structure to provide SADIS 2G service, with back-up (see the list under Section 1 C).
- d) Communication link (SVC) between SADIS Gateway and Met Office in support of SADIS 1G service; and
  - e) Communication link (utilising WMO TCP/IP sockets protocol) between SADIS Gateway and Met Office in support of SADIS 2G service. (*Note. — It is expected that this single link will be upgraded to dual contingent links within the next 12 months.*)
- iii) **Not procured principally for SADIS**
- a) Message switch (FROST): Total investment, £1.2M<sup>1</sup> of which 3.15 per cent is attributable to SADIS usage: switching data to operational (1G) broadcast service and to 1G monitoring system — Corobor Comparitor.  
  
*Note. — The percentage attributable to the SADIS 1G service has increased as a result of increased costs incurred to support the legacy X.25 protocol.*
  - b) Message switch (FROST): Total investment, £1.2M<sup>1</sup> of which 0.91 per cent is attributable to SADIS FTP service usage: switching data to operational FTP service;
  - c) Message switch (FROST): Total investment, £1.2M<sup>1</sup> of which 1.82 per cent is attributable to SADIS usage: switching data to operational (2G) broadcast service and to 2G monitoring system (Corobor Comparitor);
  - d) Allocated bandwidth (2 Mbps bursting to 4 Mbps) between server and Internet Service Provider (ISP) in support of the SADIS FTP service; and
  - e) Message switch (CoreMet System).

*Note.— Some elements of the CoreMet System are exclusively for the support of the SADIS gateway function.*

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<sup>1</sup>Budgeted cost for providing FROST service during the fiscal year 2006/2007.

**B. ISCS data back-up system**

ISCS VSAT system, including TCP/IP receiver, and cables.

*Note. — This hardware is not currently used in an operational environment.*

**C. Hub equipment and services located at Exeter and Whitehill**

<i>Item</i>	<i>Description</i>	<i>Quantity</i>
<b>1. Exeter Equipment to support SADIS 1G</b>		
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
1.6	Communications rack floor space in IT hall 1 and space in stores to locate spare equipment	1
<b>2. Exeter Equipment (Spares) to support SADIS 1G</b>		
2.1	Telecoms interface units Megabox	2
2.2	NMS Spare CPU	1
2.3	MemoTech PAD (for NMS)	1
2.4	CX1000 Frame Relay Switch (for NMS)	1
<i>Note. — communication links in support of SADIS 1G service are included in Section 1.1 of the inventory.</i>		
<b>3. Whitehill earth station (SADIS 1G uplink equipment)</b>		
3.1	Telecoms controller Megapac V rack assembly	2
3.2	Station interface unit (SIU)	2
3.3	8360 Modulator	2
3.4	8471 Receive Demodulators	12
3.5	8550 Modem Switch	1
3.6	140 - L band upconverter	2
3.7	X Term NMS simulator	1
3.8	Equipment Rack Assembly (Chain 1)	1
3.9	Equipment Rack Assembly (Chain 2)	1
3.10	Communications rack floor space for two communications racks	2
<b>4. Whitehill earth station SADIS 1G (spares)</b>		
4.1	8471 Receive Demodulators	1

4.2	Station interface unit (SIU)	1
4.3	Megapac V rack assembly	2
4.4	Mega PACV Frad units	2
4.5	140 - L band upconverter	1
4.6	8360 Modulator	1
4.7	8550 Modem Switch	1

**5. Whitehill services (leased from Cable & Wireless)**

5.1	70 MHz to 140 MHz converters	2
5.2	140 MHz to C band converter	2
5.3	Satellite Hub leased bandwidth	1 slot

**6. Test Rig at Poynton**

6.1	Enhanced (SADIS 1G) Simulator	1
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**7. ISDN back-up service to Washington (NWSTG)**

7.1	Mega PAC 2003 router (MP-2003)	1
7.2	Mega PAC 2003 router plus expansion (MP-2003-3-B)	1
7.3	ISDN 2e circuit	1
7.4	A/B switch	1
7.5	Interface cables	1

*Note.— Hardware listed items under Section 7 are located at Whitehill.*

**8. SADIS FTP service**

8.1	HP L2000 servers with 2Gb RAM	2
8.2	18 Gb internal disk drives	2
8.3	DVD-ROM	2
8.4	Processors	2
8.5	Licenses, misc. support and maintenance costs	1

**9. Operational SADIS 2G Infrastructure**

9.1	Frost port	1
9.2	MegaPAC V	3*
9.3	MegaPAC 2003	4*
9.4	Uplink modem (Comtech EF Data SDM-300a)	3
9.5	Communications cabinet and lease	1
9.6	MegaWatch including Enterprise Reports, and PC	1
9.7	Corobor comparator software and PC	1

9.8	Comtech EF Data CR100 redundancy switch	1
9.9	X10 Modules	8
9.10	SIO Modules	2
9.11	8 Mb RAM Modules	2
9.12	Communications rack floor space at Exeter in IT Hall 1 and IT Hall 2, and at Whitehill	3
9.13	Space in stores at Exeter to locate spare hardware	1
9.14	vadEDGE 4202 – 1U	2*
9.15	WAN Module	2
9.16	Comtech EF Data SMS 301 – redundancy switch	1*
9.17	Misc cables	5

*Note.— \* Includes one unit stored as a cold spare.*

## 2. PROCURED SERVICES

- A. Space segment annual lease: 1.2 Mhz wide frequency band dedicated to SADIS 1 G and 2G with minimum data rates at 38.4 Kbps for both services;
- B. Annual maintenance of Office and Whitehill site equipment (SADIS 1G, 2G and SADIS FTP server); and
- C. Gateway function:
  - i) Communication circuits between Met Office and NATS infrastructure site; and
  - ii) System maintenance.

## 3. ANNUAL STAFF REQUIREMENTS

- A. **Met Office of the UK**
  - i) **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 limited on call capability.*

*Normal working hours*

*Skill*

- 1. Help desk (first point of contact)

Scientific supervisor

*Note.— Outside normal working hours, the helpdesk facility is provided by the 24-hour positions below.*

<i>24-hour support</i>	<i>Skill</i>
1. Operations systems analyst (OSA)	Systems analyst
2. Networks and services engineer (NSE)	Computer engineer
3. Networks and systems supervisor (NSS)	Technical supervisor
4. Nowcasting and Service Continuity Manager (NSCM)	Scientist

<i>Normal working hours support</i>	<i>Skill</i>
1. Change and problem manager (CPM)	Systems analyst
2. Additional helpdesk operator	Systems analyst

*Note.— The total support for SADIS is considered as 1 per cent of the total support provided by the help desk and operational support function. These functions comprise 4 24-hour rosters of six staff each an additional three-man team (CPM), and one further 5-roster team providing further (normal working-hours) help desk support.*

ii) **Additional support**

<i>Additional support</i>	<i>Skill</i>
1. Systems integration team	30 per cent of network computer engineer
2. Administrator	75 per cent of executive officer
3. International aviation management	15 per cent of manager
4. Data traffic	5 per cent communications engineer
5. Contract procurement, management and Invoicing	5 per cent of senior procurement officer
6. UNIX support	10 per cent of computer engineer
7. Web-team support	10 per cent of website designer

*Note.— Support by the UNIX team of the SADIS FTP service will incur some additional costs in excess of simple human resources. These costs are applied to all Internet facing services and primarily relate to costs associated with ensuring high levels of IT security.*

**B. NATS infrastructure site — CACC (OPMET Gateway function)**

*Note.— The CACC provides the OPMET Gateway function, which is provided from one operational site, but with a full contingent capability at an alternative site. Staff are available either on a 24-hour basis, or as a daytime support with on-call capability. The staff is made up of 6 watches of 1 ATSA4 and 1 ATSA3 each (operations), and ATCE4 (engineering watchkeeping) and 3 ATCE4 (engineering day support).*

*24-hour support*

*Grade and skill*

1. Operational staff support
2. Engineering staff support

10 per cent of ATSA4 10 per cent of ATSA3  
10 per cent of systems engineer

*Day Support*

3. SADIS administration support
4. Engineering (one on-call)

540 per cent of ATC T&S C  
10 per cent of ATCE4 75 per cent of ATCE4

**C. Bought-in services**

Additional support and maintenance agreements with third parties are in place to provide third line support of the SADIS 1G and 2G services.

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