

SADIS COST RECOVERY ADMINISTRATIVE GROUP (SCRAG)

SEVENTH MEETING

(Bangkok, 1 and 2 November 2006)

Agenda Item 5: Amendment to Annex II, SADIS Inventory, to the Agreement on the Sharing of Costs of the Satellite Distribution System relating to Air Navigation

AMENDMENT TO ANNEX II, SADIS INVENTORY, TO THE SADIS AGREEMENT

(Presented by the Secretariat)

REFERENCES

SADIS Agreement
SCRAG/7-WP/3
SADISOPSG/11 Executive Summary

1. Introduction

1.1 This paper presents a draft amendment to Annex II, SADIS Inventory, to the SADIS Agreement as a result of conclusions of the SADISOPSG, at its Eleventh Meeting (SADISOPSG/11, Cairo 23-25 May 2006).

2. Discussion

2.1 The SADISOPSG reviewed the SADIS inventory and agreed upon some minor amendments to ensure that it would continue to meet the approved operational requirements. The amendments were made based 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.

(9 pages)

2.2 The **Attachment** presents the revised text of Annex II, SADIS inventory, to the SADIS Agreement. Additions and deletions to the actual text of Annex II appear in outline and strikeout formats.

2.3 The proposed amendments have received the consent of the United Kingdom as the SADIS provider, in accordance with Article XVII, paragraph 5 of the SADIS Agreement.

3. **Action by the Group**

3.1 The Group is invited to review the proposed amendments to Annex II, SADIS inventory, to the SADIS Agreement.

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;
 - 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, £1.2M¹ 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);~~

Note.— The percentage attributable to the SADIS 1G service has increased as a result of increased costs incurred to support the legacy X25 protocol.

- b) Message switch (FROST): Total investment, £1.2M¹ 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, £1.2M¹ 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);

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

¹ budgeted cost ~~1.195466 M£~~ for providing ~~TROPICS~~/FROST service during the fiscal year 2005/2006.

B. ISCS data back-up system

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

Note.— ~~The equipment, including leases, listed above are being capitalized over the SADIS contract period~~ 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> |
|--|--|-----------------|
| 1. | Exeter Equipment to support SADIS 1G | |
| 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 |
| 2. | Exeter Equipment (Spares) to support SADIS 1G | |
| 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> | | |
| 3. | Whitehill earth station (SADIS 1G uplink equipment) | |
| 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 |
|-----|-------------------------------|---|

~~7. Communications equipment for SADIS second generation (2G) trial~~

| | | |
|----------------|--|--------------|
| 7.1 | Megapac 2003 | 1 |
| 7.2 | QPSK De Modulator/Receivers (Comtech EFD) | 1 |

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

87 ISDN back-up service to Washington (NWSGT)

| | | |
|------|---|---|
| 87.1 | Mega PAC 2003 router (MP-2003) | 1 |
| 87.2 | Mega PAC 2003 router plus expansion (MP-2003-3-B) | 1 |
| 87.3 | ISDN 2e circuit | 1 |
| 87.4 | A/B switch | 1 |
| 87.5 | Interface cables | 1 |

Note. — Hardware listed items under Section 87 are located at Whitehill.

98. SADIS FTP service

| | | |
|------|---|---|
| 98.1 | HP L2000 servers with 2Gb RAM | 2 |
| 98.2 | 18 Gb internal disk drives | 2 |
| 98.3 | DVD-ROM | 2 |
| 98.4 | Processors | 2 |
| 8.5 | Licenses, misc. support and maintenance costs | 1 |

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

109. Operational SADIS 2G Infrastructure

| | | |
|--------|--|----|
| 109.1 | Frost port | 1 |
| 109.2 | MegaPAC V | 3* |
| 109.3 | MegaPAC 2003 | 4* |
| 109.4 | Uplink modem (Comtech EF Data SDM-300a) | 3 |
| 109.5 | Communications cabinet and lease | 1 |
| 109.6 | MegaWatch including Enterprise Reports, and PC | 1 |
| 109.7 | Corobor comparator software and PC | 1 |
| 109.8 | Comtech EF Data CR100 redundancy switch | 1 |
| 109.9 | X10 Modules | 8 |
| 109.10 | SIO Modules | 2 |
| 109.11 | 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 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.

| <i>Normal working hours</i> | <i>Grade and Skill</i> |
|---------------------------------------|------------------------|
| 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>Grade and Skill</i> |
|---|----------------------------|
| 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 |

| <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 X 24-hour rosters of six staff each and a additional three-man team (GPM), and one further 5-roster team providing further the (normal working-hours) help desk support.

ii) **Additional support**

| <i>Additional support</i> | <i>Grade and Skill</i> |
|---|---|
| 1. Systems integration team | 230 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 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 |
| 4. Engineering (one on-call) | 40 per cent of ATC T & SC 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.