

APPENDIX E

SADIS TWO-WAY ENHANCEMENT

Summary and Introduction

In September 1997 a specification was written for the enhancement of the SADIS two-way system under the objectives required of the SADISOPSG/2. The specification was reviewed and amended at a meeting of the *SADIS Two-Way Operational Clearance Team* on 23/24 September 1997. A Project Board was developed under the Chairmanship of the Head of IT (UKMO) and the UK CAA and the Chairman of the SADISOPSG were invited as members on behalf of the users.

The procurement specification was subsequently presented to the supplier **Matra Marconi Space** (MMS) with an invitation to tender or the provision of a proposed solution. There have been two main areas of work undertaken within the year:

1. the procurement of the enhanced two-way; and
2. the user trials with Switzerland and South Africa.

The timetable of events since the SADISOPSG/2 has been:

Two-way procurement

23 September 1997:	Develop & Agree Procurement Specification: Set up UK Project Board.
November 1997:	Invitation to tender to MMS.
January 1998:	Reply to tender by MMS on 13th. Project Board convened: 21 January to discuss MMS reply.
28 February 1998:	2nd Meeting of Project Board to discuss cost proposals and possible rescheduling of costs.
March 1998:	Liaison with Chairman SADISOPSG and ESCRAG and ICAO Montreal.
2 April 1998	Agreement to go ahead in letter from UK CAA after discussions with ICAO Montreal.
May/June 1998:	Contract negotiations with MMS by UKMO contracts branch: Year 2000 issues, further cost breakdown.

Two-way trial

January 1998:	Two-way trials commenced with SAWB and Meteo Swiss. Problems receiving from both sites. SAWB OK for OPMET.
March 1998:	Visit by MMS to Meteo Swiss to resolve technical problems. Reception good after visit. SAWB have T4 problems.

May 1998:

T4 problems resolved in SAWB. Both sites finally achieving requirements of the trial and satisfactorily sending T4 and OPMET and received and displayed at the K message-Switch.

Additionally **Appendix B** of this report identifies other requirements as a result of the work undertaken.

1. TWO-WAY PROCUREMENT SPECIFICATION**MMS proposal and invitation to contract**

A proposed costed solution to the requirement was presented to the United Kingdom Met Office (UKMO) by MMS on 13 January 1998. A project board meeting was then convened on 21 January to discuss the content of the proposal. The enhanced system development costs were generally as budgeted but there were some additional costs relating to HUB spares, Simulator upgrade and costs associated with the installation of future Two-Way systems.

The full costs of the Two-Way enhancement project including development, installation, support and project management were presented to members of the Project Board by the UKMO and MMS in January and February 1998. A proposal was finally made by the UKMO which was acceptable to the Chairman and the Secretary of the SADIS Administration Cost Recovery Group in April 1998 and the contract negotiations with MMS then commenced.

By June 1998 all contractual issues had been resolved with the exception of a satisfactory 'Year 2000 Compliance Statement' from MMS. However a contract is expected to be signed by the time of SADISOPSG/3.

Project lifetime

The project will take 12 month to complete and two new 2 Way-VSAT systems will be available from the end of month nine. This contract should therefore be completed by July 1999 following final acceptance tests and trials. Consideration will have to be given to the locations for the two new Two-Way systems. It would also be advantageous to identify as many sites as possible that will require a SADIS Two-Way VSAT system. It will be more cost effective for production in quantity rather than on a one off basis.

2. USER TRIALS: SWITZERLAND AND SOUTH AFRICA**Two-way VSAT trials**

There are currently three in number SADIS Two-Way systems installed, one in the UK, one in Zurich and one in Pretoria. The UK system is soon to be re-located to Bracknell HQ where data can be passed to and from the system more readily and enabling direct management. This has been made possible due to the recent successful application for a C Band transmission licence at this location, a procedure which must not be overlooked when considering future SADIS Two-Way VSAT sites.

In January 1998 a set of trials for the SADIS Two-Way systems in Pretoria and Zurich commenced. The tests had a varying degrees of success. The main objective was to receive OPMET and

Chart products simultaneously from more than one site and test the impact on the UK Message-Switch and the Engineering configurations at Pretoria and Zurich.

Initially, a series of problems were encountered with the Zurich system which prevented management of the uplink carrier and subsequent loss of communication with the other two systems (full report attached). The problems were eventually resolved, to a large extent, by a UKMO funded visit by MMS to Zurich to replace suspected faulty units and to correctly configure the system. There is still, however, a further outstanding fault - as a result of changing the '2470 RF Terminal' we now have a previous version of firmware which causes a continuous alarm to be generated. Whilst not preventing the flow of data it does cause unnecessary events to be sent to the Network Management Facility at the UKMO.

3. FUTURE TESTING AND USE OF BANDWIDTH

SADIS two-way simulator

Work is continuing at MMS premises in Poynton on the production of a SADIS broadcast and Two-Way system Simulator to enable off-line testing for post design and development activities. Completion of the Simulator is expected by the end of next week (12/6/98). The first role of this Simulator will be to prove the functionality of new firmware for the existing system to enable the broadcast data throughput to be increased in order to take advantage of the full 64Kbps rate. Once proven the first step will be to upgrade the firmware in the HUB equipment which will continue to operate with SADIS VSAT systems running either version of firmware. A roll out program will then commence to upgrade all of the existing SADIS VSAT systems. When this stage is complete the data throughput rate will be increased as described.

4. TWO-WAY: ISSUES & CONCLUSIONS

One of the main lessons to be learned from this experience is that it is essential for a SADIS Two-Way system to be installed and fully commissioned by experts in the 'field' and for a full set of spare modules to be held on site to aid rapid recovery in the event of faults occurring.

Another important fact which has emerged is that the present method of polling each station in turn, to bring up a transmission carrier on a common frequency, is highly vulnerable to mass failure, i.e. if a station carrier fails to drop when required this will effectively corrupt the transmissions from all other stations which use that frequency. Added to this it has not been possible, with the NMF software provided, to link the polling times to the actual time of day. The Two-Way enhancement project will resolve these problems by allocating a separate up-link frequency for each and every Two-Way station such that a polling system will no longer be used. The existing three in number Two-Way systems will continue to operate in their present form, the only change required will be the allocation and configuration of a new, unique up-link frequency.

For the above reason it is recommended that no further action be taken, for trial purposes, regarding the polling aspects of the present system. Efforts should be concentrated upon successful transmission and reception of the various types of data required.

OPMET data has been successfully received by the UKMO from both SADIS Two-Way stations in Zurich and Pretoria. However, the reception of chart data was only successful from Zurich for much of the period. Charts have been received from Pretoria but have proved troublesome to decode until the end of May when satisfactory reception was achieved.
