FOURTH MEETING

OF THE SADIS OPERATIONS GROUP (SADISOPSG/4)

(Paris, 7 to 11 June 1999)

INTERNATIONAL CIVIL AVIATION ORGANIZATION

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INTRODUCTION

i.1 **Place and duration**

i.1.1 The Fourth Meeting of the SADIS Operations Group was held in the EUR/NAT Regional Office, Paris.

i.1.2 The meeting was opened at 0900 hours by the Vice-Chairman, Mr. T.J. Potgieter.

i.2 **Attendance**

i.2.1 The list of participants is given in **Appendix A**.

i.3 **Officers of the Secretariat**

i.3.1 The newly elected Chairman of the group, Mr. T. J. Potgieter presided over the meeting throughout its duration.

i.3.2 Mr. T. Fox, from ICAO Headquarters, Montreal was secretary of the meeting, assisted by Mr. B. Hellroth, RO/MET, EUR/NAT Regional Office

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AGENDA ITEM 1: ORGANIZATIONAL MATTERS

Election of Chairman

1.1 The Vice-Chairman, the member for South Africa, Mr. T.J. Potgieter, opened the meeting and informed the group that the incumbent Chairman, Mr. Roland Baumann, had left the Swiss Administration and that Switzerland had informed ICAO that they wished to withdraw from membership of the group. In view of this, the group had to elect a new Chairman and the Vice-Chairman requested nominations accordingly. The member for France nominated the Vice-Chairman, Mr. Potgieter as Chairman which was duly seconded by the member for the SADIS provider State, the United Kingdom. There being no other nominations, Mr. Potgieter was elected as Chairman of the SADISOPSG and proceeded to conduct the remainder of the fourth meeting.

1.2 The group expressed its appreciation for the dedication of the outgoing Chairman, Mr. R. Baumann, and wished him well in his new work.

1.3 The group noted that the next EANPG meeting in November 1999 would be requested to select a State, replacing Switzerland, to nominate a member to represent the EUR Region interests in the group together with Ukraine.

1.4 It was agreed that the election of a Vice-Chairman for the group should be postponed until the fifth meeting.

1.5 The group noted with deep regret the tragic death, earlier this year, of Mr. Barry Skipworth, who had represented the SADIS service provider at the first two meetings of the group. Condolences had been passed to the family by the Secretary on behalf of the group.

Adoption of working arrangements

The meeting adopted appropriate working arrangements.

Adoption of the agenda

The following agenda was adopted:

Agenda Item 1: Organizational matters
- a) Election of Chairman
- b) Adoption of working arrangements
- c) Adoption of the agenda

Agenda Item 2: Annual statement of SADIS operational efficacy and update of SADIS inventory

Agenda Item 3: Maintenance of the current SADIS broadcast and organization of the flow of OPMET message traffic

Agenda Item 4: Development of the SADIS

Agenda Item 5: SADIS User Guide and amendment process

Agenda Item 6: Future work programme

Agenda Item 7: Other business

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AGENDA ITEM 2: ANNUAL STATEMENT OF SADIS OPERATIONAL EFFICACY AND UPDATE OF SADIS INVENTORY

2.1 The group began by reviewing the completed questionnaires returned by SADIS user States and users. It was noted with pleasure that forty-eight States had completed and returned questionnaires, a total which compared favourably with the twenty-two completed questionnaires returned for review at SADISOPSG/3 in 1998. Nevertheless, further improvement was to be sought and in this context, ASECNA expressed concern that only one ASECNA Member State had returned the questionnaire. The Secretary confirmed that the questionnaire had been sent to all SADIS user States, ASECNA, IATA and members of the SADISOPSG as requested in Decision 3/1 of SADISOPSG/3. ASECNA considered that it was possible that the ICAO letter had not been passed by the civil aviation authorities (CAA) to the meteorological authorities, who operate the SADIS VSATs. To address this possibility, ASECNA undertook to arrange for the ASECNA Member States to inform ICAO that State letters pertaining to aeronautical meteorology sent to ASECNA Member States should also be copied to the Directors of Meteorology.

2.2 As indicated in paragraph 2.2 of the report of SADISOPSG/3, the questionnaires should, ideally, be forwarded through the CAA unless that authority had expressly agreed that the meteorological authority should reply to ICAO direct with a copy to the CAA. This would continue to ensure that the comments received from States were official, and not the views of one individual.

2.3 In lieu of the completed questionnaires from fourteen of the fifteen AFI ASECNA Member States, ASECNA informed the group that more than ten VSATs were operational in the States concerned. Only a few had experienced equipment problems that had required the return of the VSAT to Matra Marconi for repair. Otherwise, ASECNA was satisfied with the service provided by SADIS.

2.4 ASECNA raised two additional points for clarification, the first being the occasional absence from the SADIS broadcast of OPMET messages from ASECNA Member States, and the second, that the RAFC Dakar SWH charts for the western half of the AFI Region were not uplinked on SADIS. It was agreed that the question of routing OPMET information to the SADIS uplink was one for the regional COM/MET sub-groups concerned to decide. In the case of the RAFC Dakar SWH charts, it was noted that WAFC London produced and uplinked on SADIS SWH charts for WAFS maximum area of coverage "C", which covered the whole of the AFI Region. It appeared pointless to uplink two SWH charts for the AFI Region. However, noting that the RAFC Dakar SWH charts were available in Toulouse, the member for France undertook to investigate if these could be sent to the WAFC London to assist in the preparation of WAFS area "C" as part of the AFI Planning and Implementation Regional Group (APIRG) plan for the phased transfer of Dakar, Las Palmas and Nairobi RAFCs' responsibilities to the WAFC London.

2.5 In making a report from the operators' point of view, IATA indicated that Lufthansa, for example, had been operating SADIS VSAT units for nearly three years with no equipment problems. There had been minor problems with data content but those were generally covered by repeat GRIB data, and excellent assistance from the help desk. As Lufthansa had not been able to secure authorization to move the VSAT unit in Hong Kong from Kai Tak to Chek Lap Kok, consideration was being given to moving it to Gdansk in Poland.

Specific comments made by user States

2.6 Turning to the specific comments made by user States, an analysis of the completed questionnaires received indicated the following:

a) nineteen States had indicated that they had returned VSATs or parts e.g. receivers for repair. However, not all States had understood that the questionnaire applied to the period 1998/99 and some referred back to 1996. Notwithstanding the foregoing caveat, the overall impression was of continued significant VSAT downtime in some States. In many others, it seemed clear that the equipment had worked faultlessly throughout;

b) a significant number of States did not appear to be aware of the existence of SADIS admin messages on the broadcast. It seemed likely that, for some reason, their software was not recognizing the message headers;

c) the BUFR trials had caused temporary difficulties for some States not taking part in the trials;

d) climatic conditions affected some VSATs, for example, heavy precipitation in the Netherlands, extremely low temperatures in Sweden, extremely high temperatures in Azerbaijan; and

e) problems were reported with the T4 charts in some States, but it was difficult to ascertain if this was associated in some way with their processing equipment.

A statistical analysis of the replies to the questionnaire is given in **Appendix B**.

2.7 Dealing with these points in turn, and drawing on relevant information from the management report provided by the member for the SADIS provider State, the group expressed some concern with the significant VSAT downtime in some States. This downtime comprised the time the equipment was in transit to and from Matra Marconi and the time spent in the factory. It was not easy to ascertain the relative times, but Matra Marconi claimed in the management report a meantime to repair (MTTR) of four weeks, based on a return of thirty-three units for repair since January 1998 (thirty-two original model 8465 units and one new model 8467F unit). The service provider also continued to encounter incorrect customs clearance paper work which caused unnecessary delays, and tampering with warranty seals. The failures summarized by Matra Marconi were as given below:

Fault	*Total*	*8465*	*8467*
FRAD card FR970	13	12	1
Modem card	19	17	2 *
IF card 568217-G01	6	6	0
PAU	6	6	0
OFF/Lightning strike	14	13 **	1
Reconfigure/interconnect	4	4	0

* Evidence of Customer tampering inside of chassis on 2 units
** Modem card on 8467 model is not the same card in 8465 models

Note: — Above figures include failures on repeat returns.

2.8 On the other hand, at least two members of the SADISOPSG had reported difficulties with contacting Matra Marconi to resolve specific questions, and delays in equipment returns when poor shipping documentation etc. was not involved. Although the situation appeared to be improving, perhaps, with the better returns procedures, the group agreed that the rate of returns in the next reporting period must be closely monitored to see if there was a need to advise user States to consider upgrading models 8465 to 8467, and the expected costs of the upgrade.

2.9 Regarding the comments by some States that they were unaware of the existence of SADIS admin messages, the group considered that, at this stage, such a situation was totally unacceptable and had to be remedied quickly with all means available. Firstly, it was considered insufficient that the admin messages were only broadcast on the SADIS, but should also be included on the SADIS web site. Additionally, the existence of the admin messages, which were already mentioned in the SADIS User Guide, should be brought to the attention of States by letter together with advice how to ensure that the data processing equipment connected to the SADIS VSAT unit was programmed to recognize the headers and display them. This led to a discussion of the need for an operational focal point for each SADIS user State with whom this and other similar operational issues could be resolved directly with the SADIS provider State, without losing valuable time waiting for the next SADISOPSG meeting. In order to give effect to the foregoing considerations, the group developed the following decision, conclusion and draft conclusion:

Decision 4/1 — SADIS web site content

That the SADIS provider State arrange to list current valid SADIS admin messages on the SADIS web site.

Conclusion 4/2 — SADIS admin messages

That ICAO inform States of the existence and purpose of SADIS admin messages and the inventory of all SADIS and EUR OPMET admin message headers given in **Appendix C** and the need for States to be able to access these messages from the SADIS broadcast and the SADIS web site.

(draft) Conclusion ../.. — SADIS operational focal point in user States

That ICAO request SADIS user States to nominate an operational person involved with day to day SADIS operations in that State, to act as the SADIS operational focal point, and to provide the person's name, official title and contact coordinates.

Note: —
a) to assist States in nominating the appropriate officer, the request to States should indicate clearly that the SADIS operational focal point would be expected to be

available to respond to queries and receive information from the SADIS provider State and Secretary, SADISOPSG on operational matters, and maintain contact with any other SADIS users in the State concerned; and

b) on receipt of the information from States, the Secretary of the SADISOPSG should provide the information to the SADIS provider State, and include the list of the SADIS operational focal points in a future amendment to the SADIS User Guide.

2.10 Moving on to the problem related to the first BUFR trial which had caused problems for States not involved in the trials, the group noted that, although the SADIS provider State had issued relevant admin messages on the SADIS broadcasts, as indicated above, many States were not able to display them, and even those who could do so would assume that the trial did not affect them as they were not involved. Once the trial ceased (as configured) it was presumed that the temporary need to reboot the system due to buffer overflow had ceased also. Information on the BUFR trials and the question of future BUFR trials are dealt with in detail under Agenda Item 4.

2.11 The group found it difficult to account for the reports from some States of problems with the T4 facsimile charts, especially as it was not normally possible to isolate the unique data processing equipment, software and configurations in each State concerned. The SADIS provider State informed the group, that the mention by some States of intermittent packet loss seemed to be linked to the receiver itself and the byte substitution to the broadcast chain in use (A or B). It was noted that both problems should be eliminated when the system was upgraded for the enhanced two-way capability.

SADIS management report

2.12 The group had the benefit of information provided in the management report to assist the foregoing discussions of problems reported by States. It was agreed that the management report had been well prepared and had met the requests of SADISOPSG/3, Conclusion 3/5 to include MTBF figures for components returned for repair. The group expressed its appreciation to the SADIS provider State and the SADIS service provider for providing such a useful report. As the report addressed all aspects of the SADIS that would be considered under the agenda, the group agreed to report the information under the relevant agenda items, as necessary.

SADIS questionnaire

2.13 The review of the returned questionnaire had not indicated any misunderstanding of the questions posed. In view of this, the group agreed that this format should continue to be used for future consultations with States concerned. However, it was agreed that the title of the questionnaire should be changed to "Assessment of SADIS broadcast operational efficacy", and provision should be made at the end to enable the "future" SADIS operational focal points to sign the questionnaire on behalf of the State.

Decision 4/3 — SADIS efficacy questionnaire

That the questionnaire provided in **Appendix D** to this report continue to be used in future consultations with States/users on the operational efficacy of the SADIS broadcast.

2.14 The group agreed that the tabulation of replies to the questionnaire prepared by the Secretary should be continued at future meetings but, in addition, an analysis of the comments should be done by a team

comprising the Chairman of the SADISOPSG, the member for the SADIS provider State and the Chairman of the MOTNEG.

Decision 4/4 — Analysis of SADIS efficacy questionnaire

That the Secretary continue to produce a tabular list of replies to the questionnaire for each meeting of the group and forward this to the SADIS Operational Efficacy Questionnaire Assessment Team for analysis sufficiently prior to each meeting to permit documentation of the analysis.

Note: — The SADISOPSG Operational Efficacy Questionnaire Assessment Team should comprise the Chairman of the SADISOPSG, the member for the SADIS provider State and the Chairman of the MOTNEG.

2.15 Following its review of the responses from States/users and the reports made by members of the group representing user's interests in specific regions and the report made by IATA, the group agreed that the SADIS broadcast had continued to meet the operational requirements during the period under review, and developed the following conclusion:

Conclusion 4/5 — Annual statement of operational efficacy of SADIS broadcast 1998/1999

That:

a) during the period 1998/99 the SADIS had continued to meet the operational requirements; and

b) the Chairman of the SADISOPSG inform the Chairman of the (E)SCRAG accordingly.

SADIS inventory

2.16 The group noted that the latest inventory, which formed the basis for SADIS cost recovery purposes, had been developed by the SADISOPSG/3 and used by (E)SCRAG at its fifth meeting held in Norrkoping, 8 to 9 September 1998. A revised inventory proposed by the SADIS provider State to take account of the implementation of the SADIS enhanced two-way capability at the hub, and for field trials and other projects was reviewed by the group. A number of editorial amendments were introduced and the group updated the inventory, as necessary, in the course of its discussions on each relevant agenda item. In particular, the group agreed that there was a need to amend the inventory to reflect the overall upgrade of the system for the enhanced two-way VSAT capability, and the increase in the staff support to cope with:

a) the enhanced two-way VSAT trials (including the support of two new test sites at some date in 2000);

b) the resumption of the BUFR trials in 2000; and

c) the maintenance of the SADIS web site to include the two new annexes (OPMET tables) of the SADIS User Guide and admin messages transmitted on SADIS.

2.17 The group considered that, as the headings in the inventory stood at present, it was not easy to see the resources needed for individual development on other projects, e.g. trials. The group offered in Appendix E, Part II a possible revised format for this purpose which would show a breakdown of each project for consideration of the (E)SCRAG. The changes to the inventory were developed in redline/strikeout format for ease of reference. Following completion of its review, the group developed the following conclusion:

Conclusion 4/6 — SADIS Inventory 1999/2000

That the Chairman of the SADISOPSG forward the updated SADIS inventory and proposed amended format, as given in **Appendix E,** Parts I and II , respectively, to this report, to the Chairman of (E)SCRAG.

SADIS implementation

2.18 The group noted with pleasure that the system had continued to expand in 1998/99 with 72 Contracting States and three other locations now operating a total of 101 SADIS VSAT receivers. A further nineteen Contracting States and other locations had requested and received authorized access to SADIS. The current status of implementation is given in **Appendix F** to this report.

Concern express by IATA regarding SADIS funding

2.19 IATA reiterated that the operators continued to be satisfied with the SADIS and lent it their full support. IATA was, therefore, extremely concerned with the continued difficulties with the voluntary cost recovery scheme, especially as it had been made abundantly clear that the costs to States joining the scheme could be fully recovered from air navigation charges. Given the finance already invested in the SADIS and the increasing dependence of States and many airlines on the SADIS, IATA considered that allowing the collapse of the system was not a viable option, ways must be found by ICAO to ensure the successful funding of the system.

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AGENDA ITEM 3: MAINTENANCE OF THE CURRENT SADIS BROADCAST AND ORGANIZATION OF THE FLOW OF OPMET MESSAGE TRAFFIC

3.1 The group first reviewed the two annexes in the SADIS User Guide: Annex 1 being the official list of aerodromes and their associated SA/SP/FC and FT messages that provider States had agreed could be included on the SADIS broadcast. These aerodromes were shown in two type faces, roman indicating that the aerodrome was already included in the relevant AOP Table as an international aerodrome, and *italics* indicating that, although these aerodromes were not listed in the AOP Tables, the provider States had agreed to their inclusion on the SADIS broadcast. The list of aerodromes in Annex 1 were therefore formal requirements and the absence of their data from the SADIS broadcast could be questioned by users through the relevant ICAO Regional Office.

3.2 The current Annex 2 simply provided a snapshot of the OPMET data that was actually uplinked on SADIS. Annex 2 was in terms of bulletin name as ordinate. A proposal made at SADISOPSG/3 that a third annex be included which would be the inverse of Annex 2 (but derived from the same data) showing the aerodromes as the ordinate had been developed by the SADIS provider State for consideration by SADISOPSG/4.

3.3 The group noted that, in the meantime, the MOTNEG EUR Bulleting Management Group (BMG) had developed tables in a different format though with similar, but more extensive data to Annex 2 in the SADIS User Guide and the proposed new Annex 3 developed by the SADIS provider State. The Chairman of the MOTNEG proposed that the SADISOPSG consider using the BMG tables instead of Annexes 2 and 3, in the interest of efficiency and standardization. The group reviewed both sets of tables and noted that although either could be used, the BMG tables had a number of intrinsic advantages. Notably, the production of the BMG tables was fully automated and it was easy to compare "required" OPMET data to "available" OPMET data. One disadvantage was that the first table (in terms of aerodrome location indicator) listed the aerodromes by ICAO regions, whereas the second table listed the bulletins by WMO geographical designator, some of which referred to States and others to regional areas (i.e. drawn from two different geographical designator tables in the WMO Manual on the GTS). However, it appeared that the second table would in any case be of most use to meteorologists and telecommunications personnel dealing with bulletins (and presumably familiar with the WMO geographical designators). The first table would be of most use to operators who normally deal with ICAO regions.

3.4 The group agreed that the BMG tables should be used to replace the current Annex 2 in the SADIS User Guide and the proposed Annex 3. The question was raised why Annex 1 should not also be replaced because its information was included in the first BMG table (new Annex 2). The group was advised that Annex 1 represented the formal list of aerodromes (and their OPMET data) that provider States had agreed, explicitly or implicitly, could be broadcast on SADIS. It was in the exact format to which they had agreed and had to remain under the direct control of ICAO. Copying the "requirement" information to the BMG tables was perfectly admissible, although consideration should be given to providing an annotation on the "requirements" column referring to a footnote indicating that "the list of aerodromes that are required to be broadcast on SADIS is contained in Annex 1 of the SADIS User Guide". Based on this advice, it was agreed that the current Annex 1 (updated) would be retained in the SADIS User Guide and the two BMG tables would replace the current Annex 2, and the new Annex 3 proposed by SADISOPSG/3.

3.5 The inclusion of some military aerodromes in all the tables and indeed on the SADIS broadcast was questioned. IATA indicated that they had firm requirements for OPMET data for certain

military aerodromes, some as alternates and others for flight-following purposes to permit a rapid reaction by centralized operational control to potential emergency situations. The group was aware of the difficulties associated with listing military aerodromes. It was clear that the decision regarding the availability of OPMET data from military aerodromes rested with the States concerned, and if IATA needed such aerodromes for well founded operational reasons, they should approach the States to provide the data. On the other hand if OPMET data for military aerodromes were broadcast on SADIS (under the procedure whereby **all** available OPMET data were broadcast), but the State concerned complained to ICAO, this OPMET data would be removed forthwith.

3.6 IATA requested clarification of the procedure to be adopted to obtain amendments to Annex 1 of the SADIS User Guide, primarily the addition of aerodromes or OPMET data. The Secretary explained the procedure in some detail, and the group agreed that the procedure should be recorded in **Appendix G** to the report to assist all users. The group also agreed that the procedure for proposing amendments to Annex 1 to SADIS User Guide could be of assistance to the MOTNEG and the BMG in revising the EUR OPMET update procedure referred to in Conclusion 4/8. The group agreed to develop the following conclusion:

Conclusion 4/7 — New Annexes 2 and 3 for the SADIS User Guide

That the OPMET tables given in **Appendix H** to this report (labelled as Annexes 2 and 3) be included in the SADIS User Guide, replacing the current Annex 2.

EUR OPMET data update procedure

3.7 The group heard a report from the Chairman of MOTNEG concerning the work undertaken by the MOTNEG and its working groups since his last report at SADISOPSG/3. It was noted that the BMG had developed a EUR OPMET data bank catalogue and the two OPMET tables discussed in paragraphs 3.3 and 3.4 above, instituted an automated OPMET monitoring function and developed the EUR OPMET data update procedure. Following a trial period this procedure had been endorsed by EANPG/40.

3.8 Although the SADIS Operations Group had seen the draft of the EUR OPMET update procedure at SADISOPSG/3, there had been no discussion, as the procedure did not specify that there was any relation to the SADIS. It was now clear, however, that the procedure was intended to relate to the updating of OPMET data to be carried on SADIS and, moreover, the EANPG had also endorsed (Conclusion 40/36) a proposal by the MOTNEG that the procedure be brought to the attention of other ICAO regional groups for their consideration. The group supported the proposal, in principle, noting that further coordination between the SADISOPSG and MOTNEG would be required in order to agree on the mechanism by which the SADISOPSG could meet its responsibilities, under its terms of reference, concerning, *inter-alia,* the "content and schedule of broadcasts" and the "identification of user States' requirements". It was agreed that this coordination would proceed after SADOSOPSG/4. One point in the procedure which the group considered required some clarification was the exact mechanism referred to as "Requirement accepted" and "Requirement not accepted". The use of "requirements" was considered very specific in ICAO and where this meant acceptance of a requirement for additional aerodromes or OPMET data, the procedure discussed in 3.6 above and included in Appendix G would apply. When it meant simply "changes" to bulletins, headers etc. such "acceptance" by the BMG would seem to be a straight forward matter. It was agreed that these different types of "requirement" should be distinguished and the terminology would be reviewed by the BMG in light of these discussions. One final point concerned the complete absence of any reference to "SADIS",

and yet the procedure sought to amend the SADIS broadcast data content. In response it was explained that the SADIS was considered a "user" of the data. However, the group considered it difficult for "SADIS" to act as a "user" in the BMG flow diagram. In order to reflect the foregoing considerations the group agreed to develop the following conclusion:

Conclusion 4/8 — EUR OPMET update procedure

That the EUR OPMET update procedure, in so far as it concerns SADIS, is supported, in principle, by the SADISOPSG pending clarification of the terminology used in respect of "requirements" and the mechanism through which the SADIS broadcast content is to be changed by the SADISOPSG.

Note:— It was understood that when the revised procedure had been satisfactorily coordinated between the SADISOPSG and MOTNEG, and confirmed by ICAO Montreal that it complied, as necessary, with ICAO regional amendment procedures, the revised procedure would be forwarded for consideration of other regions concerned with SADIS by the Secretary of the SADISOPSG, in accordance with EANPG/40, Conclusion 40/36.

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AGENDA ITEM 4: DEVELOPMENT OF THE SADIS

4.1 Under this agenda item the group heard, and based its discussions on, reports from the Rapporteurs of its Gateway Working Group, Strategic Assessment Team, Two-way Operational Clearance Team and Technical Developments Team.

SADIS enhanced two-way capability

4.2 At the outset, the group had noted from discussions on the responses to the questionnaire that the enhancement of the SADIS two-way capability would improve performance in a number of areas and would have a positive effect on overall performance.

4.3 The group recalled that Appendix F of the report of SADISOPSG/2 had identified the original terms of reference for the SADIS Clearance Team. Specifically the Clearance Team was expected to:

a) endorse SADIS two-way procurement specifications;

b) determine the objectives of the test programme on the collection element of SADIS;

c) conduct the test programme as determined in a) above;

d) endorse the test report prepared by South Africa, Switzerland and the United Kingdom for presentation to the SADISOPSG; and

e) refine the two-way installation instructions in order to remove any ambiguity which may exist.

4.4 Following the endorsement of the specification, the United Kingdom instituted the necessary contractual action. The contractual action identified five main components:

a) enhancement of SADIS terrestrial communications infrastructure at Bracknell and the "Whitehill" hub;

b) two-way VSAT design, development, manufacture and testing;

c) hub spares;

d) modify simulator to new design; and

e) training.

4.5 The group was informed that contractual action had been completed with Matra Marconi on 5 June 1998 and the milestones for action were then monitored by the United Kingdom Project Board working to a Project Identification Document (a United Kingdom MET office project requirement) which included members from the United Kingdom CAA and Chairman of the SADISOPSG. These milestones envisaged implementation over a twelve-month period. A further Project Board meeting in October 1998 had identified changes in the expected milestones and identified the need for the publication of regular charts showing a

detailed break-down of project tasks to be completed. Work had progressed since SADISOPSG/3 in line with the time lines given below. The group noted that there had been some slippage from the initial schedule for the upgrade of the hub as indicated, and the enhancement was running 3 to 4 weeks late with completion now expected to be by July 1999. The schedule is given below.

Chronological events: Status of two-way enhancement implementation

Management Briefings	*Report & Events*
June 1998	Contract signed
July 1998	Work commenced
August 1998	APANPIRG/8 paper regarding test-site in Western Asia region
October 1998	SADIS Project Board
5 November 1998	Interim report
16 December 1998	Interim report
9 February 1999	SADIS progress meeting
10 May 1999	Final status report

4.6 The group next turned its attention to the SADIS enhanced two-way field trials. Two aspects were considered:

a) the readiness of the SADIS Hub to conduct the trials; and

b) the implementation of two-way VSATs at field trial sites.

In the case of the hub, the group agreed that even if the hub were to be ready in July 1999, in the latter half of 1999 all administrations' resources would be fully extended in dealing with the Y2K problem, so it would be imprudent to consider beginning the field trials in 1999. Moreover, whether the hub were to be ready or not, the VSATs in the existing field trial sites, London, Pretoria and Zurich, would not have been enhanced, and the two additional enhanced two-way VSATs purchased under the SCAR Agreement for the trials would not have been installed at the test sites. In view of the foregoing, the group agreed to the following conclusion:

Conclusion 4/9 — SADIS enhanced two-way VSAT field trials

That the field trials should not be commenced until some time after 1 January 2000.

4.7 At this point in the discussions, the group reviewed the situation regarding the field trial test sites, beginning with the existing test sites in London, Pretoria and Zurich. Accepting that a test site was essential in London, there was some uncertainty over whether the two-way VSATs already installed in Pretoria and Zurich would automatically form part of the future operational system. It was clear that the sites had been selected as suitable two-way sites by APIRG and EANPG, respectively. In the case of the other test sites, there were two enhanced two-way VSATs available in the inventory for this purpose. The APANPIRG had advised the group that Singapore would be suitable and was interested subject to clarification of the costs to be borne by State. Thailand had also expressed interest but considered that, in the current economic situation, finance would be difficult. The group was informed that the SADIS provider State had recently responded to a request from Singapore for detailed information and that a decision would be likely be made by Singapore before the next APANPIRG Meeting. It was agreed that, bearing in mind the decision to postpone the trials into 2000, the delay in selecting a site in the western part of the ASIA Region would not be critical.

4.8 This still left one enhanced two-way VSAT for another, as yet unidentified, trial site. Originally it had been considered that Cairo might serve that purpose, but ultimately it appeared that financing the site and the trials would be difficult.

4.9 The group also had to take into account that the withdrawal from the group of Switzerland meant that it would be prudent for ICAO to confirm that Switzerland was still interested in conducting the SADIS enhanced two-way VSAT field trials. If not, then depending on the agreement between the SADIS provider State and the Swiss Administration regarding the installation of the two-way VSAT and who was to pay for its enhancement, a decision would have to be made whether to move the two-way VSAT to a State that was interested in conducting the field trials. It was agreed, therefore, to request ICAO to ascertain the willingness or otherwise of Switzerland to take part in the future SADIS enhanced two-way VSAT field trials. The group developed the following conclusion:

Conclusion 4/10 — SADIS enhanced two-way VSAT field trials — Zurich test site

That the ICAO European and North Atlantic Regional Office ascertain from Switzerland if they are willing to continue to offer Zurich as a test site for the SADIS enhanced two-way VSAT field trials scheduled for 2000.

Note: — The SADIS provider State should provide to the EUR/NAT Regional Office an estimate of the costs involved which Switzerland would be expected to pay including enhancement of the VSAT and resources for testing and data analysis, etc.

4.10 Looking ahead to the future SADIS two-way operational system, the group noted that the APIRG had selected Dakar, Nairobi and Pretoria as suitable sites for operational SADIS two-way VSATs. The group examined whether it would be possible to propose either Dakar or Nairobi as the fifth test site and, if neither Singapore nor Thailand agreed to host a test site, possibly the fourth test site. The question of financing would have to be addressed and, although the cost of the trials could be included in the State air navigation charges, the execution of this, in a particular State in practice, depended upon the cost recovery procedures in force in the State concerned. ASECNA advised that they would be in a position to assist in this regard in Senegal, an ASECNA Member, and if the State did agree to host a test site, the cost recovery would be arranged accordingly. IATA indicated that their Regional Office in Nairobi was available to assist the Kenyan Administration in this if requested by the government.

4.11 In this context, some members questioned whether there was a requirement for SADIS two-way VSATs in either Dakar or Nairobi, as both were connected to EUR centres (Toulouse and Offenbach) via high speed GTS circuits, which did in fact already carry OPMET data. It was pointed out that it was not the role of the SADISOPSG to question decisions made by one of its parent bodies and, in any case, there was no ICAO requirement for OPMET data to be carried on the GTS circuits, aside from temporary measures, these were bilateral agreements between the States concerned. The installation of SADIS two-way VSATs in Dakar and Nairobi would provide efficient AFS means to carry OPMET data, as required by Annex 3, and indeed to carry any other aviation data which APIRG might require to be included. The view was expressed, however, that there were places where the installation of two-way VSATs was expected to have a larger impact on the improvement in the transmission of OPMET data.

4.12 Returning to the subject under discussion, the group was also reminded that some years ago the METG had been informed of difficulties in obtaining OPMET data from, and transmission of OPMET data to, the Russian Federation. The member for the Russian Federation and IATA confirmed that these difficulties were still adversely affecting flights from Western Europe to and over the Russian Federation. The member for the United States added that similar difficulties were experienced in flight planning for the increasing number of flights from North America to and over the Russian Federation. At the time the difficulty had first been discussed in the METG, it had been considered that the location of a two-way VSAT in the Russian Federation could be an effective way to resolve this problem.

4.13 In view of the foregoing, the group discussed whether the installation of one of the SADIS enhanced two-way VSATs in Moscow as part of the two-way test programme would be a viable option. The member for the Russian Federation confirmed that if selected as a test site, the Russian Federation would be prepared to support the test programme with the necessary resources. The question of funding the additional costs of VSAT installation and spares, etc. was of critical importance and would have to be settled before proceeding. The group agreed that, from the point of view of the SADISOPSG, the selection of Moscow as a two-way test site would be a contribution to the programme for both the technical aspects and also for developing experience in the funding of the installation of operational two-way VSATs in the future. It would also assist in resolving the operational problem of the lack of OPMET data exchanges with Moscow. It was agreed that the following table represented the most effective way of employing the two-way enhanced VSATs already procured for the test programme.

VSAT No.	*SITE*	*REMARKS*
1	London	Existing test site and essential as uplink station.
2	Pretoria	Existing test site and already part of test programme and will continue to be so.
3	Zurich	Existing test site but Switzerland's position on the future enhanced two-way test programme had to be ascertained by ICAO, in coordination with SADIS provider State.
4	Singapore	Advised as suitable test site by APANPIRG but commitment of Singapore to the future two-way test programme to be clarified in near future. Thailand may be a fall back option if Singapore not interested.
5	Moscow (to be	The group suggested that the Russian Federation

proposed)	propose to METG that Moscow should be considered for a two-way test site. If endorsed by EANPG, then SADISOPSG would proceed on technical side and SADIS provider State, in coordination with ICAO, would investigate funding.

Note:— If either Zurich or Singapore(or Thailand) declined to take part in the tests, or the Moscow proposal failed in the EANPG, consideration should be given through APIRG next, in order of priority, to Dakar and Nairobi as two-way test sites, using VSATs released by the other States.

4.14 The group next considered the situation regarding the future operational SADIS two-way VSAT system. It was considered that without a clear idea of where the two-way VSATs would be required it was difficult to plan and take advantage of the economies of batch purchasing from the service provider. It was noted that all the PIRGs had endorsed the SADIS two-way VSAT siting criteria developed by SADISOPSG/2 and also, as appropriate, the SADISOPSG conclusion that volcanic ash advisory centre provider States consider installation of two-way VSATs, but beyond this nothing further had been done. The view was advanced that perhaps it was, to an extent, attributable to the cost of the two-way VSAT system. In the view of some members, the SADIS two-way system investment, and current costs, was too expensive. However, the group was aware that the original SADIS two-way VSAT system had been based on polling and could not even come close to meeting the required OPMET transit times, and the number of two-way VSATs which could be supported was in single figures. These facts alone had dictated the need for the enhancement of the system. The group also noted that the SADIS enhanced two-way VSAT capability recommended by this group had been endorsed by the PIRGs concerned and approved by Council. It was the task of the SADISOPSG, therefore, to implement the enhanced system. It was also noted that, as the regional COM groups completed the strategic assessment tables, the requirement for two-way VSATs may be expected to become clearer. The group agreed that the terms of reference of the SADISOPSG Two-way Operational Clearance Team should be revised to reflect the enhancement project and field trials. In order to reflect this the group developed the following decision:

Decision 4/11 — Terms of reference for SADISOPSG Two-way Operational Clearance Team

That the terms of reference of the team be revised as given in **Appendix I** to this report.

Dissemination of WAFS SIGWX forecasts in BUFR format

4.15 The group was briefed on the status of the BUFR trials, The first trial had been held from 1 March 1999 to 14 April 1999. The set of BUFR data transmitted comprised nine messages, the first six were as follows:

Jetstreams	—	Message ID's JUWD96 & JUWE96
Clear air turbulence	—	Message ID's JUCD00 & JUCE00
CB clouds	—	Message ID's JUBD99 & JUBE99
Tropopause levels	—	Message ID's JUTD97 & JUTE97
Frontal systems	—	Message ID's JUFD00 & JUFE00
Tropical revolving storms, sandstorms and volcanoes	—	Message ID's JUVD00 & JUVE00

The other three products concerned medium-level phenomena such as icing and in-cloud turbulence. These were generated and distributed but did not form part of the official trial. The messages were disseminated every six hours on PVC4. WAFC London issued repeated admin messages, advising users of the trial.

4.16 The group was informed that, part of the trial was to determine whether or not the introduction of BUFR messages on the SADIS broadcast had any effect on the rest of the broadcast. The results showed that the OPMET, GRIB and T4 chart data continued to be distributed normally with no adverse effects. However, as the trial progressed problems were encountered by SADIS users. VSATs were reported to be malfunctioning with excessive amounts of data remaining in the memory 'buffer' within the VSAT, which necessitated rebooting the system every time. In order to eliminate these problems, the trial was suspended on 14 April 1999.

4.17 It was noted that the BUFR trial had, however, identified other problems that had to be resolved:

a) not all messages had been successfully transmitted every time; and

b) some messages had been truncated.

Both these faults were traced to software problems at WAFC London. In the former, it was discovered that some threshold values had been arbitrarily defined and hard-coded into the software. An appropriate new value had overcome this problem. The truncation was also caused by a hard-coded variable in a software module. This had also been fixed.

4.18 The group considered two options to resolve the problem experienced with the overloading of the buffer memory:

a) broadcast the BUFR data on PVC 6, Port 1, of the SADIS receiver;

It was noted that PVC 6 was not configured as standard on any of the receivers deployed in States. Any such receiver would therefore not attempt to process the data received on PVC 6, and therefore would not suffer from buffer overflow. On a standard receiver, PVC 6 was mapped to Port 2.

There were two ways which would allow the users to access the BUFR on PVC 6:

1) those States that wished to receive BUFR data would need to return their DROs to Matra Marconi to be reconfigured to map PVC 6 to Port 1; and

2) if the proposal to enable the data to be ingested using TCP/IP protocols were adopted in the future, the users could use this to translate the data normally received on PVC 6, via TCP/IP. This could be achieved either by using an add-on box connected to the composite port of the receiver, or by replacing the FRAD card in the receiver.

Whichever solution was adopted, the workstation or message switch would need to be re-configured to enable it to process the BUFR data from the appropriate port.

b) broadcast the BUFR data as part of the T-4 stream on PVC 3

Before this could be done, the group would have to investigate how each individual SADIS workstation supplier would handle these products. Once the group was assured that this would not cause a problem, the trial transmission could begin. It would be the responsibility of each user to arrange with their workstation supplier to enable them to process these bulletins.

4.19 In considering option a) , concern was expressed that, as there were over 100 SADIS VSATs in the system, sending them all back for reconfiguration to Matra Marconi would be a major undertaking and would need precise planning with the service provider. On balance, therefore, the group favoured option b), but as success was not necessarily assured with either option, it was considered that option b) should be tested thoroughly off-line first, and if successful then used in the next BUFR trial. If this option failed the tests, then option 1 should be tested off-line before any plans were made to reconfigure VSATs in the field and using it in the BUFR trials.

4.20 In answer to a question, the member for the SADIS provider State confirmed that minimum BUFR decoding software in FORTRAN was available free of charge to States from the United Kingdom, and consideration was being given to placing this software on a United Kingdom Meteorological Office server. He emphasized, however, that there were a number of BUFR decoding software packages available commercially, and most of them appeared to be more sophisticated than the software provided free by the United Kingdom.

Future technical developments

4.21 The group heard a report from the Rapporteur of its Technical Developments Team. It was noted with appreciation that the team had developed a change procedure for technical developments. The group reviewed the procedure, made some minor amendments and agreed to develop the following decision:

Decision 4/12 – SADISOPSG technical developments change procedures

That the change procedure given in **Appendix J** to this report be used by the Technical Developments Team to advise the group of technical developments having a bearing on the group's work.

4.22 The group discussed the initial investigation by the team of the advantages of moving to TCP/IP protocols. It was noted that there were a number of advantages to users in changing to the TCP/IP protocol. However, there were two main ways to make the change to the system – firstly as an end to end change of protocol or secondly as a workstation interface attachment to be made to the VSAT. The recommendation of the team was limited to the output from the VSATs to a workstation/end equipment owned by the user. A total change of end-to-end protocol from the provider, via satellite and VSAT, to end user equipment would mean a total re-engineering of the system, and this was not pursued by the team.

4.23 It was noted that it was possible to provide a local TCP/IP interface from the VSAT to the local work station or message switch. This could be achieved in one of two possible ways:

a) the addition of an external converter between the VSAT (composite port) and workstation; or

b) the replacement the FRAD-card inside the VSAT by a TCP/IP output card.

Advantages for future users — TCP/IP was a standardised protocol (already endorsed by WMO), support for which was already included in all new personal computers and workstations. This meant that there would be no need to buy a special X.25 card, which were becoming increasingly expensive, to accept the output from the VSAT; this would reduce the total cost of the end user systems.

Advantages to existing users — An advantage to existing users would only be achieved if and when they upgraded their systems and could take advantage of the cheaper LAN connections.

Other advantages — The use of TCP/IP may enable a more flexible allocation of virtual circuits, that would allow introduction of new services and data types with a minimal impact on the existing systems.

Disadvantages to future users — None

Disadvantages to existing users — If option b) were selected, there would be a need to return the equipment to Matra Marconi to exchange parts, with the associated expense.

4.24 In considering the two options, the group noted that the implementation of option b) would involve VSAT reconfiguration by Matra Marconi, with costs and down time similar to those already discussed in connection with the BUFR trials. Moreover, any proposed changes to the system as a whole could prompt the need for a study by the service provider which would have to be funded. With option a), the user had the choice to continue with the X.25 output or convert the composite output to TCP/IP. The group favoured a compromise proposal that the provider State could request costs from Matra Marconi of a) and b) (which may or may not involve development costs, etc.) and the users choose which they prefer. The user would then pay for any development costs and the SADIS system would not be faced with additional charges. In this regard, the group developed the following conclusion:

Conclusion 4/13 — Possibility of making TCP/IP protocol available on SADIS VSAT output

That the SADIS provider State inquire from the service provider the costs of the two solutions a) and b) referred to by the Technical Developments Team. On receipt of this information, and assuming that in the discussions with the service provider no unforeseen problems or disadvantages were disclosed, provide the information to States on the SADIS web site and, in due course, in the SADIS User Guide.

Note: — If unforeseen problems or disadvantages were disclosed, the SADIS provider State should inform the Technical Developments Team and take no further action pending a review of the situation by SADISOPSG/5.

Future increase in SADIS transmission speed

4.25 The group recalled that the transmission had initially been specified as 38,4 Kbps. Currently, the SADIS system had consistently lost packets of data when this data rate was exceeded. It was believed by the technical developments team that the upgrade of the hub system for the enhanced two-way capability

would eliminate this "packet loss" problem. Controlled tests would confirm the robustness of the enhanced system, and transmission rates approaching the 64 Kbps rate of the system would be possible. However it was believed that this increased rate could cause "buffer" problems in the end VSAT system as well as with the user work stations and message switches. It was noted that a higher data rate was not necessarily a pre-requisite for the possible transmission of other data such as WMO, WAFS SIGWX in BUFR format, and AIS, as the average capacity was only 15 per cent; outside the peak transmission period it was approximately 2 per cent.

4.26 The group felt that there was no doubt that an increased data rate would provide more capacity and TCP/IP could simplify local distribution, however it was emphasized that exhaustive tests on the SADIS simulator were essential to assess:

a) the effect in a controlled environment on the hub and end-VSAT receiver in an X.25 environment;

b) the effect on end systems provided by data processing equipment manufacturers and on message switches in an X.25 environment; and

c) the same tests on the end systems in a TCP/IP environment.

4.27 Unless tests were performed there was a real risk that changes to an operational system could have an impact on every one of the 100 or so existing users and their largely unknown and undefined end systems. The group noted that the maximum error-free transmission rate (from the hub to the VSAT) was not known, nor was it known whether all end user equipment could handle reception of the data at 64 Kbps. This must be investigated before a final decision could be made. In addition, the problems and costs that could be encountered in upgrading the internal FRAD card were as yet unknown. It was agreed therefore, that the matter would continue to be monitored by the Technical Developments Team.

SADIS strategic assessment tables

4.28 The group noted that the Strategic Assessment Team had developed initial "straw-man" strategic assessment tables for the AFI, ASIA, EUR and MID Regions, looking ahead for a period of five years. It was understood that it was the responsibility of the ICAO PIRGs concerned to assess the operational requirements in their regions, based on advice from their respective COM sub-groups. The PIRGs had agreed that these sub-groups should be requested to complete the SADIS strategic assessment tables for their regions to assist the SADISOPSG in its medium term planning. The initial strategic assessment tables developed by the team would be reviewed by the relevant COM sub-groups and amended, as necessary. In view of this, the group refrained from commenting on the content of the initial tables, except to emphasize that no operational requirements for carrying AIS data and SWL charts (except for the AFI Region) had so far been stated by the PIRGs concerned. It was also emphasized again that no investment or funding decisions could be made based on these tables, until such time as an operational requirement had been stated by a PIRG, and the means of meeting the requirement and its associated cost had been endorsed by the PIRG(s) concerned and approved by the ICAO Council.

4.29 Aside from the foregoing considerations in respect of regional requirements, it was noted that the possible need to increase WAFS GRIB data to four times per day and the addition of GRIB data for the 2 000 feet flight level would be considered by the WAFSSG at its next meeting in Kansas City in September 1999. This study group meeting would also consider a proposal to lower the base of the SWH charts to FL

180, thus effectively covering the WAFS SWM charts. This would have a significant positive impact on the communication loading on the SADIS broadcast. It was noted also that the development by ICAO of a graphical SIGMET in BUFR code, initially to cover volcanic ash and possibly severe icing/turbulence and lines of thunderstorms associated with tropical cyclones, would have an impact on the strategic assessment, but had not been included at this stage. IATA reminded the group that they would be proposing to the WAFS Study Group, the inclusion of humidity data in the WAFS GRIB data. This was to permit airlines to comply with the JAA rules for the operation of ETOPS flights, using icing forecasts based on GRIB temperature and humidity data. The member for the SADIS provider State made a rough estimate that this would increase the GRIB data transmitted by approximately 7MB. IATA emphasized that they had no requirement for SWL and limited regional requirements for SWM (e.g. the NAT Region). It was noted that the AFI Region was the only one requiring SWL charts on SADIS, which was a legacy of the combined SWL/SWM charts currently being issued by RAFC Nairobi.

4.30 The group estimated that it would be many years before all T4 charts could be eliminated from SADIS, as this was still an available option in accordance with Annex 3. At some point in the future the WAFS Study Group would have to consider the need for an amendment to Annex 3 in this respect.

4.31 In order to reflect the fact that the original tasks of the team had been completed, the group agreed to revise the team's terms of reference to reflect this in the following decision:

Decision 4/14 — Terms of reference for SADISOPSG Strategic Assessment Team

That the terms of reference for the SADISOPSG Strategic Assessment Team be revised as given in **Appendix K.**

Proposals made by the group for the development of SADIS

4.32 A question was raised whether cost-benefit analysis could be done before proposing developments having substantial cost implications. As matters stood at present , the terms of reference of the group required the group to "take into account the financial implications of its technical and operational decisions and conclusions". Liaison was also expected, as necessary, with financial experts in user States. The SADISOPSG and the (E)SCRAG endeavoured (within the constraints of synchronizing their meetings) to present a package to the PIRGs giving the proposal, its technical/operational justification and the cost. The benefit to operations or States up to now had been judged qualitatively, as neither group had access to expertise and resources necessary to conduct a full cost-benefit analysis. Moreover, it was emphasized that all developments of the SADIS proposed by the SADISOPSG (or other groups such as MOTNEG) had been endorsed by the PIRGs concerned, and approved by the ICAO Council. The group agreed nevertheless, that if a substantial SADIS development were to be proposed in the future, consideration would be given to subjecting the proposal to a cost benefit analysis with the assistance of the SCRAG, and experts in States, before submission of the proposal to the PIRGs.

SADIS Gateway Function

4.33 The group heard a report from the Rapporteur of its Gateway Working Group. It was noted that there had been no meeting of the working group since SADISOPSG/3. However, in the interim, some changes to the SADIS High-Level Technical Requirements document had been agreed by MOTNEG during November 1998 and the document had been converted into a new standard format according to the document

standards developed by MOTNEG at the same meeting. The amended document was now forwarded to the SADISOPSG for its approval. The group reviewed the document as amended by its working group.

4.34 It was noted that, during the specification of the system intended to provide the SADIS Gateway functionality, the United Kingdom had been scrutinising OPMET data received for uplink on SADIS. A number of regular errors had been identified which were considered as possible candidates for removal by automatic processing. The group was aware that the alternatives to automatic processing were either to let them pass through the system unchanged or to accept an unnecessarily high level of operator action which would impact on the costs of operating the SADIS Gateway. Emphasis had been placed on tightly-defined solutions which should eliminate the risk of modifying valid data. The group noted that the MOTNEG had endorsed the modifications. A full description of the problems and proposed modifications are included in **Appendix L**.

4.35 The group was informed that the technical requirements document for the SADIS Gateway had been modified to the format developed by the MOTNEG Group. This format had been adopted by the MOTNEG in order to provide better configuration control and authorisation of documents.

4.36 In answer to a question, the Rapporteur confirmed that the SADIS Gateway High-Level Technical Requirements had formed the basis of the specifications for tender. The tender had been put out under the European Union tendering process and the SADIS provider State was in the process of evaluating the tenders received. It was expected that a decision would be made by the end of June 1999. It was not possible to provide an expected time scale to the group at this stage due to the fact that the contract had not been let, but a time scale would be forwarded to all members and the Secretary when the contract had been let so that it may be included as an appendix**,** which would be held in reserve for this purpose[*] **(Appendix M).** The group noted that the next major task of the working group was to develop the SADIS Gateway Operational Handbook. Again, work on this could not begin until contract details were known.

4.37 IATA suggested that perhaps it would be prudent to await the stabilisation of the SADIS funding scheme before proceeding with the gateway. However, the group was advised that the Gateway Function had been endorsed by the EANPG, approved by Council, and the SADIS provider State had been invited to implement it. The contract had been placed at tender and the contract let was imminent. Moreover, no instructions had been received from the parent bodies of the SADISOPSG to slow progress or change direction. The work of managing and developing SADIS, as approved by the PIRGs and Council, must proceed until the group is instructed otherwise.

4.38 Returning to the question of automatic error correction, a number of other systematic errors in OPMET bulletins were discussed based on examples provided by ASECNA and the Chairman, and confirmed by other members. However, all of these appeared to require manual intervention and would be difficult to automate safely. The group was reminded of the standardization (i.e. elimination of options) to the date/time group in the METAR. The group was informed that the Air Navigation Commission had agreed that this should be included in Amendment 72 to Annex 3 for applicability in 2001. In the meantime, the EUR Region would propose an amendment to the EUR Plan, under regional agreement.

[*] In the event it was decided not to let the contract at this time, and the project procurement has been rescheduled (see Appendix M).

4.39 The group considered that the amendment of the SADIS Gateway Technical Requirements to include the additional automatic error correction procedures would be a positive step to improving the overall integrity of all OPMET data on SADIS. The group also approved the new format of the SADIS Gateway Technical Requirements document. The group congratulated its working group, and asked the Chairman of the MOTNEG to forward the SADISOPSG appreciation of the work done by MOTNEG in this issue. In order to reflect the foregoing, the group agreed to develop the following conclusions:

Conclusion 4/15 — Additional automatic error correction procedures

That the automatic error correction procedures given in Appendix L be included in the SADIS Gateway High-Level Technical Requirements.

Conclusion 4/16 — SADIS Gateway High-Level Technical Requirements document

That the SADIS Gateway High-Level Technical Requirements document, amended to include the additional automatic error correction procedures referred to in Conclusion 4/15 above, and in the new format proposed by the MOTNEG as given in **Appendix N,** is approved by the SADISOPSG.

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AGENDA ITEM 5: SADIS USER GUIDE AND AMENDMENT PROCESS

New OPMET tables for Annexes 2 and 3 of the SADIS User Guide

5.1 Detailed discussion on these tables is reported under Agenda Item 3, together with a conclusion requiring the annexes to be placed in the SADIS User Guide. However, the group gave consideration to the fact that the new Annexes 2 and 3 were updated automatically every month and the question at issue was, how frequently should these annexes in the SADIS User Guide be amended. The group was aware that there was a need to balance the possible irritation of States with too frequent amendments, with allowing the two annexes to slip badly out of date. The representative of the EUR Bulletin Management Group (BMG) assured the group that the OPMET tables (Annexes 2 and 3) were stabilizing and amendments were becoming fewer. In view of this the group considered that annual amendment of Annexes 2 and 3, preferably within a month to six weeks following each SADISOPSG meeting, would be satisfactory. It was also agreed that Annexes 2 and 3 should be placed on the SADIS web site, and a cross-reference to the web site address given in the SADIS User Guide. This would permit easy access to the monthly updates of these documents via the web. ASECNA reminded the group that hard copy amendments had still to go to all States, especially because some States did not yet have access to the worldwide web. It was noted that this was envisaged in the current SADIS User Guide amendment process. In order to give effect to the foregoing, the group developed the following conclusion:

Conclusion 4/17 — SADIS OPMET tables on SADIS web site

That, the SADIS provider State and the focal point for the BMG coordinate the introduction and maintenance of Annexes 2 and 3 of the SADIS User Guide on the SADIS web site.

Note:— The latest version after each SADISOPSG meeting will be provided to ICAO Montreal by the SADIS provider State in order for an amendment to be issued to the SADIS User Guide.

5.2 The group next reviewed work programme Item 14 concerning the introduction of a new section in the SADIS User Guide describing States' experience in installing SADIS VSATs. The group noted that within a year or so all States under the SADIS footprint who wished to, would have installed SADIS VSATs. In view of this the group considered Item 14 to be redundant and agreed to delete it from the work programme.

5.3 The group agreed that, in light of the responses to the questionnaire regarding the effect of climatic conditions on the SADIS VSATs, a paragraph should be drafted for inclusion in the SADIS User Guide in accordance with work programme Item 23. The member for the SADIS provider State agreed to provide the text to the Secretary after the meeting.

5.4 It was agreed that the next amendment (No. 3) should be issued quickly after the meeting in order to sweep up a number of editorial corrections. The inclusion of the new Annexes 2 and 3, and the amendment of the WAFS areas of coverage etc., would be included in Amendment No. 4. The member for the SADIS provider State undertook to provide print-ready copies of these to the Secretary in due course.

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AGENDA ITEM 6: FUTURE WORK PROGRAMME

6.1 The group reviewed and updated its work programme and executive summaries to take account of its decisions/conclusions developed at this meeting. It was agreed that completed tasks would still appear once in the report of the meeting which recommended their deletion, but henceforth would be deleted from the work programme. The updated work programme, executive summaries, composition and terms of reference of SADISOPSG working groups and teams are given in **Appendix O** to this report.

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AGENDA ITEM 7: OTHER BUSINESS

Actions taken to ensure Y2K compliance

7.1 The group recalled that this subject had been discussed at its last meeting and information was presented to the group to update the situation. The status of Y2K progress in the satellite broadcast provider States (ISCS and SADIS) is provided in **Appendix P**.

7.2 The Rapporteur of the SADISOPSG Gateway Working Group provided information to the group on the results of an ICAO AFS Y2K Meeting held in Toulouse, France during the week of the SADISOPSG/4 Meeting. In particular, the group was interested to learn of the outcome of discussions on the possible contingency use of SITA to support the AFTN for forwarding OPMET data to the SADIS uplink. The AFS meeting had concluded that there were insurmountable difficulties in connection with the allocation of WMO abbreviated headers for individual aerodromes at SITA terminals and the likely volume of data was unknown. As there was no SITA representative at the meeting it had proved impossible to pursue the proposal any further. It was accepted that the GTS would be planned as the main contingency communications means to transmit OPMET data to the satellite broadcast uplink centres from regions in which the AFTN might be affected by the Y2K problem.

Joint use of satellite based telecommunication system by ICAO and the WMO

7.3 The group recalled that the satellite-based telecommunication system operated by the United Kingdom was supporting two applications, SADIS according to ICAO requirements on the one hand, and a national data-distribution for the United Kingdom Meteorological Office on the other. The group was informed that the United Kingdom had offered some spare capacity available from their national data distribution application to WMO as a contribution to the WMO World Weather Watch programme. The WMO Commission for Basic Systems studied the various technical aspects and the WMO Executive Council agreed that this satellite-based data-distribution capacity should be focussed at complementing the existing GTS in Region II (Asia). A pilot project was being developed, which would include Region II WMO Members willing to participate, and the United Kingdom. Participating Region II WMO National Meteorological Services were essentially from among those which received a SADIS VSAT though the WMO Voluntary Cooperation Programme. The implementation of the WMO pilot project had been postponed in view of technical problems experienced on the satellite-based data-distribution system which prevented the full use of the total available capacity (64 Kbit/s) to the various applications. These problems were expected to be solved in the very near future. The group noted with appreciation this joint use of satellite-based telecommunication systems by ICAO and WMO, to the benefit of the States.

Difficulties with authorized access by airlines

7.4 IATA reiterated their concern that airlines were not being permitted to install SADIS VSATs in some States. The group reviewed the guidelines for authorized access to the satellite broadcast and concluded that this was indeed a decision for the States themselves based on advice from the designated MET Authority.

Next meeting of the group

7.5 The group agreed that annual meetings of the SADISOPSG were still required, and the member for ASECNA invited the group to meet in the AFI Region in 2000. The proposal was to hold the meeting in Dakar, Senegal and confirmation of the site and available dates would be communicated to the Secretary in due course. ASECNA emphasized that there would be very positive benefits to holding the meeting in the AFI Region to both the group and the SADIS user States in the Region. The group gratefully accepted the offer by ASECNA.

7.6 The Chairman advised the group that he had been informed that John Charlesworth, the SADIS Manager for the SADIS provider State would likely retire before the next meeting of the group. While sincerely hoping that this would not be the case, the Chairman took the opportunity to express the group's appreciation for the work and enthusiasm John Charlesworth had put into the planning and implementation of the SADIS. The Secretary added the appreciation of ICAO to John for the ready cooperation that he had provided to the Secretary in serving what was a totally new type of sub-group in ICAO that reported to four PIRGs.

7.7 The Chairman thanked the Regional Director of the ICAO EUR/NAT Regional Office for permitting the group to avail themselves of the splendid new conference facilities and for the exemplary assistance provided by the regional office staff.

7.8 There being no other business, the Chairman closed the meeting at 12:00 hours.

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