



SIXTEENTH MEETING
OF THE SADIS OPERATIONS GROUP (SADISOPSG/16)

(Paris, France, 23 to 25 May 2011)

INTERNATIONAL CIVIL AVIATION ORGANIZATION

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TABLE OF CONTENTS

	<i>Page</i>
List of SADISOPSG decisions	i-3
List of SADISOPSG conclusions	i-3
List of conclusions for consideration by the ICAO planning and implementation regional groups	i-3
Agenda Item 1: Opening of the meeting	
Place and duration.....	1-1
Attendance	1-1
Chairman and officers of the Secretariat.....	1-1
Agenda Item 2 Organizational matters	
Adoption of working arrangements	2.1-1
Adoption of the agenda.....	2.2-1
Agenda Item 3 Follow-up of SADISOPSG/15 conclusions	3-1
Agenda Item 4: Operation of the SADIS	
SADIS management report	4.1-1
SADIS focal points	4.2-1
Operational efficacy of SADIS	4.3-1
SADIS inventory.....	4.4-1
SADIS implementation	4.5-1
Agenda Item 5: Content of the SADIS broadcast	
OPMET information:	5.1-1
WAFS forecasts	5.2-1
Agenda Item 6: Development of the SADIS	
Report of the SADISOPSG Gateway Development Team	6.1-1
Report of the SADISOPSG Strategic Assessment Team.....	6.2-1
Report of the SADISOPSG Technical Developments Team.....	6.3-1
SADIS Internet-based FTP Service	6.4-1
Agenda Item 7: Long-term planning of SADIS	7-1
Agenda Item 8 The SADIS User Guide	8-1
Agenda Item 9 Future work programme	9-1
Agenda Item 10 Any other business	10-1
Appendix A — List of participants	A-1
Appendix B — SADIS operational focal points	B-1
Appendix C — SADIS Inventory	C-1
Appendix D — Status of implementation of SADIS (Listed by ICAO Regions).....	D-1

Appendix E	— States' willingness to provide OPMET information from non-AOP aerodromes (since 2011).....	E-1
Appendix F	— Draft amendment to OPMET information from non-AOP aerodromes	F-1
Appendix G	— Ad-hoc team on the future of the satellite broadcast beyond 2015.....	G-1
Appendix H	— SADIS long-term plan for the years 2012-2016.....	H-1
Appendix I	— Deliverables, executive summaries and task teams of the SADISOPSG	I-1
Appendix J	— Proposed update of the SADIS workstation software evaluation criteria (Round 4, 2011/2012)	J-1
Appendix K	— Proposed agreement between SADIS Provider and SADIS workstation software providers, relating to the evaluation of SADIS workstation software.....	K-1

LIST OF SADISOPSG DECISIONS

Decision 16/1	— Follow-up of the SADISOPSG/15 conclusions	3-1
Decision 16/3	— SADIS efficacy questionnaire	4.3-2
Decision 16/6	— Monitoring of concurrence by States to provide OPMET information’ from non AOP aerodromes	5.1-2
Decision 16/8	— Updated Annex 4 to the SADIS User Guide	5.2-1
Decision 16/10	— Dissolution of the SADISOPSG Gateway Development Team	6.1-2
Decision 16/11	— Dissolution of the SADISOPSG Strategic Assessment Team	6.2-1
Decision 16/17	— SADIS long-term plan 2012-2016	7-1
Decision 16/18	— Amendments to Chapters 1, 2, 3, 4 and 6; and Appendices C, F (deletion), I and L of the <i>SADIS User Guide</i>	8-1
Decision 16/19	— Future work programme of the SADISOPSG.....	9-1
Decision 16/22	— Agreement between SADIS Provider State and SADIS workstation software providers, relating to the future evaluations of SADIS workstation software.....	10-2

LIST OF SADISOPSG CONCLUSIONS

Conclusion 16/2	— Update of the list of SADIS focal points	4.2-1
Conclusion 16/4	— Annual statement of operational efficacy of SADIS 2010/2011	4.3-3
Conclusion 16/5	— SADIS Inventory 2011-2012.....	4.4-1
Conclusion 16/7	— Revision of Annex 1 to the SUG concerning OPMET information from non-AOP aerodromes	5.1-3
Conclusion 16/9	— Harmonization of the OPMET content of the SADIS and ISCS	6.1-1
Conclusion 16/12	— Prioritization of GRIB2 data over GRIB1 data.....	6.3-2
Conclusion 16/13	— Recommendations concerning the future of SADIS satellite broadcast beyond 2015.....	6.3-3
Conclusion 16/14	— Back-up to the Secure SADIS FTP service	6.4-2
Conclusion 16/15	— Extension to service life of SADIS FTP service.....	6.4-3
Conclusion 16/16	— Hosting of WAFC forecasts in the GRIB2 code form issued by WAFC Washington on the Secure SADIS FTP	6.4-4
Conclusion 16/20	— Plans to implement tropical cyclone advisories in graphical format	10-1
Conclusion 16/21	— Criteria for fourth round of SADIS workstation software evaluations	10-2
Conclusion 16/23	— SADIS 2G data losses.....	10-3
Conclusion 16/24	— Procurement of an additional vadEDGE 4200 unit	10-4
Conclusion 16/25	— Establishment of a threshold for an “operational data volume” concerning the SADIS FTP/Secure SADIS FTP services	10-6

LIST OF CONCLUSIONS FOR CONSIDERATION BY THE ICAO PLANNING AND IMPLEMENTATION REGIONAL GROUPS

Nil

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Agenda Item 1: Opening of the meeting**1.1 Place and duration**

1.1.1 The sixteenth meeting of the Satellite Distribution System Operations Group (SADISOPSG/16) was held at the European/North Atlantic (EUR/NAT) Regional Office, Paris, France, 23 to 25 May 2011.

1.1.2 The meeting was opened on 23 May 2011 at 1000 hours by Mr. Luis Fonseca, Regional Director, ICAO EUR/NAT Regional Office, who welcomed the group to the EUR/NAT Regional Office, and by Dr. T. van Stijn, the Chairman of the group, who highlighted the role of SADIS and the group's main tasks.

1.2 Attendance

1.2.1 The list of participants is given in Appendix A.

1.3 Chairman and officers of the Secretariat

1.3.1 The Chairman of the group, Dr. T. van Stijn, presided over the meeting throughout its duration.

1.3.2 Dr. O. M. Turpeinen, from the International Civil Aviation Organization (ICAO) Headquarters, Montréal, was the secretary of the meeting, assisted by Mr. G. Brock, and Mr. C. Keohan from the EUR/NAT Regional Office, Paris.

Agenda Item 2: Organizational matters
2.1: Adoption of working arrangements

2.1.1 The meeting adopted appropriate working arrangements.

Agenda Item 2: Organizational matters
2.2: Adoption of the agenda

2.2.1 The following agenda was adopted:

Agenda Item 1: Opening of the meeting

Agenda Item 2: Organizational matters

2.1: Adoption of working arrangements

2.2: Adoption of the agenda

Agenda Item 3: Follow-up of SADISOPSG/15 conclusions

Agenda Item 4: Operation of the SADIS

4.1: SADIS management report

4.2: SADIS focal points

4.3: Operational efficacy of the SADIS

4.4: SADIS inventory

4.5: SADIS implementation

Agenda item 5: Content of the SADIS broadcast

5.1: OPMET information

5.2: WAFS forecasts

Agenda item 6: Development of the SADIS

6.1: Report of the SADISOPSG Gateway Development Team

6.2: Report of the SADISOPSG Strategic Assessment Team

6.3: Report of the SADISOPSG Technical Developments Team

6.4: SADIS Internet-based FTP Service

Agenda item 7: Long-term planning of SADIS

Agenda item 8: The SADIS User Guide

Agenda item 9: Future work programme

Agenda item 10: Any other business

Agenda Item 3: Follow-up of SADISOPSG/15 conclusions

1.1 The group recalled that the SADISOPSG/15 Meeting had formulated seventeen conclusions (requiring follow-up) and eight decisions (with no follow-up required). No draft conclusions had been formulated for consideration by the ICAO planning and implementation regional groups (PIRGs).

1.2 The group was pleased to note that action on all the conclusions except for Conclusion 15/9 could be considered completed; therefore, the group formulated the following decision:

Decision 16/1 — Follow-up of the SADISOPSG/15 conclusions

That, the follow-up action on the SADISOPSG/15 conclusions be considered completed except for Conclusion 15/9.

Note. - Conclusion 15/9 related to the harmonization of the OPMET content of the SADIS and ISCS broadcasts is reinstated under Agenda Item 6.

Agenda Item 4: Operation of the SADIS
4.1: SADIS management report

4.1.1 The group noted that, in accordance with Conclusion 7/1, the SADIS Provider State had prepared a management report which had been placed on the ICAO SADISOPSG website more than two months prior to this meeting. The group noted the key highlights of the satellite distribution system for information relating to air navigation (SADIS) programme between March 2010 and February 2011 and expressed its compliments to the SADIS Provider State for providing a detailed and informative report on the web. The group was pleased to note that the complete management report includes statistics on the non-scheduled operational meteorological (OPMET) messages received at the SADIS uplink station (as called for by Conclusion 8/8) and a list of aerodromes, corresponding to Annex 1 to the SADIS User Guide, whose OPMET data had not been received at the SADIS uplink station (as called for by Conclusion 8/7 b)).

Agenda Item 4: Operation of the SADIS**4.2: SADIS focal points**

4.2.1 The group recalled that the PIRGs had endorsed the SADISOPSG/4 draft conclusion concerning the nomination by SADIS user States of SADIS operational focal points; such a list had been considered to provide useful contacts for the SADIS Provider State and the ICAO regional offices to resolve issues regarding, inter alia, missing or incorrectly formatted messages and headers. The current list of focal points, updated by the Secretary based on a consultation with all SADIS user States in response to Conclusion 15/2, is given in Appendix B to this report.

4.2.2 In view of the importance of the list of SADIS focal points, it was agreed that ICAO should consult all the SADIS user States to ensure that the information was current. The group reviewed the list of SADIS operational focal points and formulated the following conclusion:

Conclusion 16/2 — Update of the list of SADIS focal points

That, the Secretariat consult all the SADIS user States in order to update the list of the SADIS focal points in time for the dispatch of the SADIS efficacy questionnaire (i.e. 20 December 2011).

Agenda Item 4: Operation of the SADIS
4.3: Operational efficacy of the SADIS

Results of the consultation

4.3.1 It was recalled that, in accordance with SADISOPSG Conclusions 1/4 and 2/3, the group had agreed to provide an annual statement of SADIS operational efficacy to the SCRAG, based on the views of States/users on the subject, solicited by ICAO prior to each meeting, using a questionnaire. The Secretariat had brought this questionnaire to the attention of all SADIS user States (and the SADIS focal points therein, as called for by Conclusion 6/2) under the SADIS “footprint”. The group recalled that the SADIS questionnaire was, since a few years, available only on the SADISOPSG website in an interactive format. The group was disappointed to note that the number of replies had decreased from the last year, i.e. 43 compared to 57 in 2010. However, the response rate was comparable to the prior years (e.g. 44 in 2009).

4.3.2 A tabulated summary, including specific comments, had been compiled by the Secretariat based on the completed questionnaires. In accordance with Decision 9/3, the summary had been subsequently forwarded to the SADIS Provider State which had prepared, on behalf of the SADISOPSG Operational Efficacy Assessment Team, a report on the operational efficacy, as called for by Decision 4/4.

4.3.3 An analysis of the completed questionnaires indicated the following (the statistics for year 2009-2010 in brackets, in accordance with Conclusion 6/3; indicated in percentage, out of a total of 43 and 57 replies received from States, respectively, rounded to the nearest 5 per cent):

- a) Concerning the SADIS 2G satellite broadcast:
 - 1) 10 (10) per cent experienced signal quality problems;
 - 2) 95 (90) per cent reported good availability of WAFS bulletins in the GRIB code;
 - 3) 95 (90) per cent reported good availability of WAFS bulletins in the BUFR code; and
 - 4) 90 (95) per cent reported good availability of OPMET messages; and
- b) concerning the reliability of VSAT receiving equipment:
 - 1) 95 (95) per cent considered it to be “good”; and
 - 2) 15 (10) per cent of receivers had to be returned for repairs; and
- c) concerning the SADIS FTP service:
 - 1) 5 (10) per cent experienced problems in the service quality;

- 2) 95 (90) per cent reported good availability of WAFS bulletins in the GRIB code;
 - 3) 95 (95) per cent reported good availability of WAFS bulletins in the BUFR code;
 - 4) 90 (85) per cent reported good availability of OPMET messages; and
 - 5) 95 (95) per cent considered it to be “good”; and
- d) concerning the visualization of WAFS SIGWX forecasts:
- 1) 90 (80) per cent produced compliant WAFS charts from BUFR bulletins; and
 - 2) 65 (60) per cent used WAFS forecasts in the PNG format; and
- e) concerning the service desk and administrative messages:
- 1) 70 (75) per cent did not use the 24-hour service desk; and
 - 2) 5 (5) per cent considered that the administrative messages were not adequate.

4.3.4 It was agreed that the figures were comparable to, or better than, those received last year. The group was particularly pleased to note the increased capacity (i.e. 90 per cent of responses) of producing compliant SIGWX charts from the BUFR-coded WAFS forecasts.

4.3.5 Based on the responses received, the group reiterated its satisfaction with the quality of SADIS service considered good by a clear majority of users and with the fact that the number of States with serious difficulties with their SADIS VSAT had remained small.

Format of the questionnaire

4.3.6 The group recalled that the questionnaire on SADIS efficacy had been developed by the Secretariat in consultation with the Chairman of the SADISOPSG and the SADIS Provider State and thoroughly revised at the SADISOPSG/14 Meeting (Decision 14/3 refers) to improve its clarity and to add a section related to the SADIS FTP service which was being increasingly used. The group agreed that, at this stage, there was no need to undertake any further revisions. The group formulated the following decision:

Decision 16/3 — SADIS efficacy questionnaire

That, the questionnaire used in the next consultation with States/users on the operational efficacy of the SADIS broadcast and SADIS FTP service be unchanged.

Annual statement

4.3.7 The group, including IATA, agreed that, in the light of comments received, the SADIS satellite broadcast, SADIS FTP and Secure SADIS FTP services had continued to meet the operational requirements during the period under review and formulated the following conclusion:

Conclusion 16/4 — Annual statement of operational efficacy of SADIS 2010/2011

That, the Chairman of the SADISOPSG be invited to inform the Chairman of the SCRAG that, based on the replies received from SADIS users, during the period 2010/2011 the SADIS continued to meet the operational requirements.

Agenda Item 4: Operation of the SADIS
4.4: SADIS inventory

4.4.1 The latest inventory which formed the basis for SADIS cost recovery purposes had been developed by the SADISOPSG/15 Meeting and used by SCRAG at its eleventh meeting (SCRAG/11) held in Paris on 4 November 2010. The inventory had since been reviewed and updated by the SADIS Provider State. The group noted that the update had been prompted by the following changes:

- a) implementation of the Secure SADIS FTP Service;
- b) relinquishment of the satellite space segment reserved for SADIS 1G; and
- c) reduced use of the FROST message switching.

4.4.2 The draft inventory, reflecting the above changes, is in Appendix C to this report with changes highlighted using the track-changes markings. The group reviewed these draft amendments and formulated the following conclusion:

Conclusion 16/5 — SADIS Inventory 2011/2012

That, the Chairman of the SADISOPSG be invited to forward the updated SADIS inventory given in Appendix C to this report to the Chairman of SCRAG.

Agenda Item 4: Operation of the SADIS
4.5: SADIS implementation

4.5.1 The latest situation in respect of VSAT receivers and FTP servers in States is provided in Appendix D to this report. The group was pleased to note that the number of States and users had slightly increased during 2010/2011 with 105 (102 in 2009/2010) Contracting States relying on a total of 128 (121 in 2009/2010) SADIS 2G VSAT receivers and 136 (131 in 2009/2010) FTP servers. A further six (eight in 2009/2010) Contracting States had received authorized access, some of which were in the process of installing SADIS VSAT receivers or FTP servers.

Agenda Item 5: Content of the SADIS broadcast
5.1: OPMET information

METAR, SPECI and TAF

General considerations concerning the requirements and actual content of the SADIS broadcast

5.1.1 The group recalled that the requirements by States and users for aerodrome routine meteorological reports (in meteorological code form) (METAR), aerodrome special meteorological reports (in meteorological code form) (SPECI) and aerodrome forecasts (in meteorological code form) (TAF) to be broadcast on the SADIS were given in Annex 1 to the *SADIS User Guide* (SUG) which is extracted from a global OPMET database maintained by the ICAO Secretariat. Annex 1 included OPMET information from both aerodrome operational planning (AOP) (i.e. aerodromes included in the AOP tables of the regional air navigation plans) and non-AOP aerodromes.

5.1.2 In response to Conclusion 8/6, OPMET information from all the AOP aerodromes was included in Annex 1. All AOP aerodromes issue METAR and SPECI, as a minimum (with a few exceptions in the EUR Region), while the requirements for TAF were subject to formal regional air navigation (RAN) agreement which was reflected in the Tables MET 1A of all the facilities and services implementation documents (FASID). The group recalled that, since February 2008, similar to Annex 1, all FASID Tables MET 1A were extracted from the global OPMET database thus ensuring the consistency of information between the FASID Tables MET 1A and Annex 1. This arrangement also implied that Annex 1 now reflected, at all times, the formal requirements displayed in FASID Tables MET 1A. Furthermore, the group had agreed that any proposals for amendments related to OPMET data from AOP aerodromes should be addressed directly to the ICAO Regional Office concerned (Decision 13/8 refers). This approach eliminated the need for a lengthy procedure (i.e. formulation by the SADISOPSG of draft conclusions for endorsement by the PIRGs concerned) and substantially expedited the implementation of new requirements.

5.1.3 With regard to non-AOP aerodromes, the group was aware of the fact that OPMET information from these aerodromes could be included in Annex 1 only if the State concerned had no objection to its distribution on the SADIS and with the understanding that States did not have any obligation of providing such data for non-international aerodromes. OPMET requirements from these aerodromes could be amended by the group annually, subject to an agreement by the State concerned.

5.1.4 It was further recalled that the actual OPMET information that was currently broadcast on SADIS was indicated in Annex 2 (listing the aerodromes included in the bulletins) and Annex 3 (listing the bulletin headers) to the SUG. These annexes were updated bi-annually, with the assistance of the EUR OPMET Data Management Group (DMG).

Non-implementation of requirements for OPMET information by States

5.1.5 The variability of reception of OPMET information from some aerodromes had been cause for adverse comments from users in the past. However, where such comments concerned aerodromes not listed as a requirement in Annex 1, the SADIS Provider State was not obliged to ensure

that these aerodromes were available. Non-availability of OPMET information from aerodromes listed in Annex 1 was a different matter and, when notified by users, had been systematically brought to the attention of the States concerned by the appropriate ICAO regional office which had kept on monitoring such deficiencies until their resolution. The group concurred that such a real-time approach had turned out to be efficient and had led, in most cases, to the timely resolution of the deficiencies identified.

Amendments to Annex 1 to the SUG concerning OPMET information from non-AOP aerodromes

5.1.6 The group recalled that it had formulated Conclusion 15/6 calling for the Secretariat to seek agreement from the States concerned to provide OPMET information from some 500 non-AOP aerodromes, in response to a request formulated by the International Air Transport Association (IATA). It had also requested the Secretariat to report back to the SADISOPSG/16 Meeting the number of aerodromes actually added in Annex 1, as a result of the consultation with States concerned. The results of the study revealed that States agreed to provide OPMET information from only 25 aerodromes while the provision of OPMET information from six aerodromes had been discontinued. These changes were now reflected in Annex 1. The group realized that the changes concerned a very small proportion (about 5 per cent) of approximately 500 non-AOP aerodromes from which OPMET information had been requested in the State letters concerned.

5.1.7 It was recalled that, based on requests by IATA, long lists of additional requirements for OPMET information from non-AOP aerodromes had been included in State letters, year after year, and that as a result, normally only a small number of States had *formally* concurred with such requirements. It was felt that repetitive State letters sent annually to the same States with an identical request could be counterproductive, in particular if the State has already clearly indicated their reluctance to provide OPMET information from the non-AOP aerodromes concerned. Under these circumstances, the group agreed that the time had come for the Secretariat to keep track on the requests made and to ensure that a State that had refused the provision of OPMET information from their non-AOP aerodromes not be approached before three years had elapsed. In this regard, the group formulated the following decision:

Decision 16/6— Monitoring of concurrence by States to provide OPMET information from non-AOP aerodromes

That, the Secretariat

- a) maintain a master list to be placed on the SADISOPSG website related to States' willingness to provide OPMET information from non-AOP aerodromes as displayed in Appendix E to the Report; and
- b) ensure that States that have been consulted on additional requirements for OPMET information from non-AOP aerodromes, and have indicated their reluctance to provide such information, not be re-consulted during the three-year period following their refusal.

5.1.8 The group reviewed the OPMET data required from non-AOP aerodromes based on a proposal made by IATA. It was noted that the proposal attempted to render the requirements in line with OPMET data that was actually made available by States. In this regard, the group concurred that any proposed deletions could be undertaken by the Secretariat without the need for consulting the States concerned while any proposed additions would have to be endorsed by them. It was noted that only those aerodromes with location indicators included in the *Location Indicators* (Doc 7910) could be included in Annex 1 to the SUG. The group endorsed the proposed changes taking into account the decision under 5.1.7 above and formulated the following conclusion:

**Conclusion 16/7 — Revision of Annex 1 to the SUG
concerning OPMET information
from non-AOP aerodromes**

That, the ICAO Secretariat

- a) seek agreement from the States concerned to provide OPMET information from non-AOP aerodromes as depicted in Appendix F to this report; and
- b) amend Annex 1 to the SADIS User Guide (SUG) accordingly by 31 December 2011.

Note 1 – Only non-AOP aerodromes for which location indicators are listed in Doc 7910, Location Indicators, will be considered in this context; and

Note 2 – States have the prerogative of not providing any OPMET data from non-AOP aerodromes, if considered not appropriate or desirable by them.

Non-scheduled OPMET information

5.1.9 In view of the importance of non-scheduled OPMET information for aviation (e.g. SIGMET, AIRMET, tropical cyclone and volcanic ash advisories), the group recalled that it had agreed that the reception of these messages should be monitored by the SADIS Provider State, which should compile annual statistics showing the number of all types of non-scheduled OPMET information received at the SADIS uplink station and present these results to the SADISOPSG as part of the annual management report (Conclusion 8/8 refers). The group was pleased to note that this information, which may be considered to be highly relevant, had been included in the management report.

Agenda Item 5: Content of the SADIS broadcast**5.2: WAFS forecasts**

5.2.1 The group recalled that the list of world area forecast system (WAFS) forecasts disseminated on SADIS was included in Annex 4 to the SUG which had been updated last time in 2008 to include the new GRIB 2-coded WAFS forecasts. This update had subsequently been endorsed by the SADISOPSG/14 Meeting. The group noted that since that meeting, the following changes had taken place:

- a) changes in the provision of WAFS forecasts in the GRIB 2 code form (including delivery schedules);
- b) deletion of WAFS forecasts for CB clouds, icing and turbulence in the GRIB 1 code form (in accordance with the decisions of the World Area Forecast System Operations Group (WAFSOPSG)); and
- c) changes in the issue times of WAFS significant weather (SIGWX) forecasts in the binary universal form for the representation of meteorological data (BUFR) code and portable network graphic (PNG) chart forms.

5.2.2 It was noted that the above changes had been incorporated in Annex 4 to the SUG during the intercessional period. In this context, the group endorsed Annex 4 and formulated the following decision:

Decision 16/8— Updated Annex 4 to the *SADIS User Guide*

That, the updated Annex 4 as given at the following website:
www.icao.int/anb/sadisopsg/sug/sug_annex4.pdf be endorsed.

Agenda Item 6: Development of the SADIS
6.1: Report of the SADISOPSG Gateway Development Team

6.1.1 The group recalled that the SADIS gateway function had been developed in response to the European Air Navigation Planning Group (EANPG) Conclusion 38/33 and that at subsequent meetings, it had developed a set of high-level technical requirements, including real-time monitoring. It had also finalized the *SADIS Gateway Operations Handbook* which was available on the SADISOPSG website, in accordance with Conclusion 8/15. The SADIS gateway had been fully operational since 2003.

6.1.2 The Rapporteur of the SADISOPSG Gateway Development Team reported on the progress made since the SADISOPSG/15 Meeting. The group noted the information provided, inter alia, related to the pending validation of SIGMET at the SADIS gateway. The group was pleased to note that the level of compliance of SIGMET messages had reached a level of 80 per cent in late 2010, and that the validation of SIGMET would be re-introduced before the SADISOPSG/17 Meeting.

6.1.3 The group recalled that at the SADISOPSG/15 Meeting, it had formulated Conclusion 15/9 calling for the harmonization of the OPMET content between the SADIS and international satellite communication system (ISCS) broadcasts. In this context it was understood that the required OPMET content was that contained in Annex 1 to the *SADIS User Guide* (SUG). The group noted that, unfortunately, little progress had been made to reach the required level of harmonization (i.e. the 95 per cent availability of OPMET data on both broadcasts). The slow progress could be attributed to the States' reluctance to route OPMET information to both the ISCS and SADIS gateways. Therefore, it agreed that this issue should be pursued and formulated the following conclusion:

Conclusion 16/9 — Harmonization of the OPMET content of the SADIS and ISCS

That,

- a) the SADIS Provider State, in coordination with the ISCS Provider State, continue its efforts to harmonize the required content of the SADIS broadcast/FTP Service and ISCS Internet-based service; and
- b) the ICAO Secretariat remind States of the importance to route all OPMET information to both the ISCS and SADIS Gateways.

Note 1.- The aim is to reach a 95 per cent availability of OPMET data on SADIS broadcast/FTP Service and ISCS Internet-based Service by the time of the SADISOPSG/17 Meeting;

Note 2. - Required OPMET content is listed in Annex 1 to the SUG; and

Note 3. - Monitoring comparing the content of the ISCS and SADIS services will be undertaken by the EUR OPMET Data Management Group (DMG) in September 2011, as a part of routine monitoring.

6.1.4 With regard to the deliverables (work programme) of the SADIS Gateway Development Team, the group agreed that over the last few years, the team had completed its main development tasks and that currently it only addressed two recurrent tasks, i.e. maintaining:

- a) Annexes 2 and 3 of the SUG (updated bi-annually on the SADISOPSG website); and
- b) technical requirements contained in the *SADIS Gateway Operations Handbook*.

6.1.5 In view of the nature of the deliverables, the group concurred that there was no need to maintain a SADIS Gateway Development Team and that the deliverables allocated to the team be addressed in the future by the SADIS Provider State, in coordination with the EUR OPMET DMG. In this context, it formulated the following decision:

Decision 16/10 — Dissolution of the SADISOPSG Gateway Development Team

That, in view of the routine, recurrent nature of the deliverables of the SADISOPSG Gateway Development Team, the team be dissolved and its deliverables be addressed in the future by the SADIS Provider State, in coordination with the EUR OPMET Data Management Group (DMG).

Agenda Item 6: Development of the SADIS
6.2: Report of the SADISOPSG Strategic Assessment Team

6.2.1 Based on a report provided by the SADISOPSG Strategic Assessment Team, the group reviewed the content of the strategic assessment tables. It was noted that the current figures for 2011 had been obtained from an analysis of the OPMET data promulgated to SADIS via the SADIS gateway and that the draft figures for 2012-2014 had been prepared by the SADIS Provider State using the current figures as a base line.

6.2.2 The group recalled that the Strategic Assessment Tables, containing an outlook of the expected OPMET and the aeronautical information service (AIS) data volumes for the next five years, had been prepared since the early days of the SADISOPSG, in response to the SADISOPSG/3 draft decision that had been subsequently endorsed by the Asia Pacific (ASIA/PAC) Air Navigation Planning and Implementation Regional Group (APANPIRG), Africa-Indian Ocean (AFI) Planning and Implementation Regional Group (APIRG), European Air Navigation Planning Group (EANPG) and Middle East Air Navigation Planning and Implementation Regional Group (MIDANPIRG). It was intended that the tables be completed on an annual basis by the MET sub-groups of the PIRGs to ensure that the SADISOPSG continued to be responsive, in a timely manner, to any new requirements that may arise from various regions. In practice, little input had been received over the years from the regional MET sub-groups and the annual update had become a routine exercise, based exclusively on the input of the SADIS Provider State. Therefore, the group concurred that the time had come to dissolve the SADISOPSG Strategic Assessment Team and to simplify the process of establishing outlooks for future OPMET and AIS data volumes on the SADIS. In this context, the group formulated the following decision:

Decision 16/11 — Dissolution of the SADISOPSG Strategic Assessment Team

That,

- a) the Strategic Assessment Team be dissolved; and
- b) the OPMET (including World Area Forecast System (WAFS) forecasts) and AIS data volumes disseminated, and expected to be disseminated over the next 5 years, through SADIS be included in the Management Report prepared annually by the SADIS Provider State.

Note. - A format similar to the SADIS Strategic Assessment Tables is to be used.

Agenda Item 6: Development of the SADIS
6.3: Report of the SADISOPSG Technical Developments Team

6.3.1 The group recalled that the SADISOPSG Technical Developments Team was expected to monitor, report, and propose action on, technological developments having an impact on SADIS. Over the last 12 months, the major technical developments addressed by this team were related to:

- a) SADIS 2G future bandwidth requirements (Conclusions 15/12 c) and 15/21 refer);
- b) future tests over SADIS 2G of GRIB2 data to enable workstation vendors to develop and test their systems (Conclusion 15/13 refers); and
- c) the SADIS FTP service (to be discussed under Agenda Item 6.4).

Since action on Conclusion 15/13 had been completed, this Section deals only with issues related to the SADIS 2G future bandwidth requirements.

Future utilization of the SADIS satellite bandwidth

6.3.2 The group recalled that, at its fifteenth meeting, it had formulated Conclusion 15/12 c) calling for the SADIS Provider State, in coordination with the SADIS Technical Developments Team, to prepare an implementation plan to ensure that the GRIB1 and GRIB2 datasets were not transmitted at the same time. The group reiterated its earlier position, i.e. for the optimum use of the satellite bandwidth, the two datasets should not be transmitted simultaneously.

6.3.3 It had been understood that the initial implementation plan established in 2010 would include a prioritization of the GRIB1 over GRIB2 datasets. In the meantime, however, the sixth meeting of the WAFSOPSG had reconsidered the prioritization and had come to the conclusion that for operational reasons, as of 5 July 2012, WAFS forecasts in the GRIB2 code form should be transmitted ahead of those in the GRIB1 code form (WAFSOPSG Conclusion 6/10 refers). In view of the foregoing, the group formulated the following conclusion:

Conclusion 16/12 — Prioritization of GRIB2 data over GRIB1 data

That, with effect from 1200 UTC on 5 July 2012 the SADIS Provider State make available WAFS forecasts in the GRIB2 code form before those in the GRIB1 code form.

Note 1. – Forecasts in the GRIB2 code form will be made available in the timeslots currently used by the forecasts in the GRIB1 code form, while the forecasts in the GRIB1 code form will subsequently be made available in the timeslots currently used by those in the GRIB2 code form; and

Note 2. – WAFS gridded forecasts for CB clouds, icing and turbulence will only be transmitted over the satellite broadcast as and when endorsed by the WAFSOSPG.

6.3.4 The group noted that the SADIS Provider State would inform users and workstation vendors of the planned changes to the SADIS service (the first message at least six months prior to the change) using:

- a) WAFS Change Implementation Notification Board; and
- b) a series of administrative messages over the SADIS.

6.3.5 It was recalled that a related issue had been raised by the group in Conclusion 15/21 which had called for the Secretariat to consult SADIS user States and users on the need for continued satellite distribution of OPMET data (including WAFS forecasts) beyond 2015 and report back the results of the consultation for consideration and future action by the SADISOPSG/16 Meeting. The reasons for questioning the future of satellite broadcast (i.e. the high cost of lease of satellite space segment and the foreseen need for a major refresh in 2015 of the SADIS 2G uplink infrastructure supporting the satellite broadcast) were clearly indicated in the State letter.

6.3.6 Subsequently, all the SADIS user States had been consulted. Disappointingly, only 32 States replied— equating to less than one-third of the SADIS user States. The group noted that a clear majority of the replies (23 out of 32) expressed a need for continued satellite broadcast beyond 2015. In particular, States outside the (western and northern parts of the) EUR Region were, with one exception, unanimous about the need for continued satellite broadcast. The arguments for maintaining the satellite broadcast put forward by States included the unreliability and data congestion of the Internet, in particular in the developing world.

6.3.7 Based on these results, the group agreed that it would be premature to draw any final conclusions concerning the future of the satellite broadcast at this meeting. The group agreed therefore that an ad hoc team should be established to formulate recommendations concerning the future of the SADIS satellite broadcast beyond 2015, in time of the SADISOPSG/17 Meeting. In this context, the group formulated the following conclusion:

Conclusion 16/13 — Recommendations concerning the future of SADIS satellite broadcast beyond 2015

That, an ad hoc team consisting of the SADISOPSG Members from China, Netherlands, South Africa, United Kingdom (Rapporteur), ASECNA, IATA, WMO and the Rapporteur of the SADISOPSG Technical Developments Team be established to prepare recommendations concerning the need for continued SADIS satellite broadcast beyond 2015, in time of the SADISOPSG/17 Meeting.

Note.1. – The high costs inherent to satellite distribution are to be weighed against the low reliability and data congestion of the Internet affecting, in particular, developing States;

Note 2. – The recommendations will be forwarded to all the PIRGs concerned through a draft conclusion; and

Note 3. – Three options are to be considered taking into account their associated costs of implementation and delivery, and operational impacts: a) status quo; b) discontinuation of satellite broadcast; or c) alternative satellite or other technologies. Issues to be addressed are in Appendix G.

**Agenda Item 6: Development of the SADIS
6.4: SADIS Internet-based FTP Service**

6.4.1 The group recalled that the SADIS FTP service had been in operation for a number of years, and had consistently seen the number of users accessing the service grow year-upon-year, as well as seen a growth in the number of products being accessed by those users.

6.4.2 The group addressed three specific issues related to the SADIS file transfer protocol (FTP) Service:

- a) back-up to the Secure SADIS FTP Service (Conclusion 15/22 refers);
- b) current status of software compatible with the Secure SADIS FTP Service; and
- c) proposal to host world area forecast centre (WAFC) Washington GRIB2 upper-air forecasts on the Secure SADIS FTP Service.

Back-up options for the Secure SADIS FTP Service

6.4.3 Concerning the back-up options for the Secure SADIS FTP Service, it was recalled that the SADISOPSG/15 Meeting had formulated Conclusion 15/22 calling for the SADIS Provider State, in coordination with the SADISOPSG Technical Developments Team, to prepare proposals for establishing contingency arrangements related to the technical infrastructure at the SADIS Provider State for the Secure SADIS FTP service, in time for the SADISOPSG/16 Meeting.

6.4.4 The group concurred that the SADIS users did require a highly reliable delivery service; the Secure SADIS FTP service had been demonstrated to be reliable being designed upon redundant and resilient hardware. Nonetheless, the group emphasized that consideration must be given to contingency in the event of a catastrophic disaster at the Secure SADIS FTP Provider's complex.

6.4.5 The group noted that the SADIS Provider State had identified three high-level back-up options:

- a) provide a purpose-built remote, "mirror" site, independent of the Secure SADIS FTP Provider's current complex;
- b) use the existing United States administered world area forecast centre (WAFC) Internet File Service (WIFS) as an alternative source of OPMET data (including WAFS forecasts); or
- c) provide a separate "server" at the same location as the SADIS gateway that can be populated with equivalent data sourced from the United States and delivered over the Integrated Services Digital Network (ISDN) connection direct to the SADIS gateway.

6.4.6 Based on preliminary cost estimates, the SADIS Provider State had concluded that Option b) above would be the most cost effective and most independent option. Furthermore, the group

noted that it was already effectively available. Under these circumstances, the group formulated the following conclusion:

Conclusion 16/14 — Back-up to the Secure SADIS FTP service

That, in view of formalizing back-up and contingency arrangements for the Secure SADIS FTP Service, the SADIS Provider State be invited to:

- a) inform SADIS users through administrative messages that the United States administered WAFS Internet file service (WIFS) be considered the official alternative site during back-up for obtaining OPMET data (including WAFS forecasts), and
- b) provide guidance to the Secretariat on how to obtain access to the WIFS, in view of its inclusion in the SADISOPSG web-site, by 31 December 2011.

Note 1. – It is the responsibility of authorized SADIS users to apply for, and obtain, WIFS user accounts for the purposes of back-up/contingency. Such accounts will not be arranged on behalf of users by the SADIS Provider State; and

Note 2. – The foregoing WIFS accounts should not be used to undermine the provisions of the Regional Air Navigation Plans with regard to obtaining WAFS forecasts.

Current status of software compatible with the Secure SADIS FTP Service

6.4.7 It was recalled that the Secure SADIS FTP Service had been implemented on 17 November 2010, in response to Conclusion 15/18. The group was also aware that it was tentatively planned to cease the provision of the prevailing SADIS FTP service in November 2011.

6.4.8 The group noted that by early March 2011, only one workstation vendor had confirmed that they had Secure SADIS FTP Service compliant software available which had been rolled out to some users. Two vendors were understood to be very close to rolling out software updates in the next one to three months. Whilst many of the other workstation vendors appeared to be making good progress, roll out by November 2011 was considered optimistic. Furthermore, it was believed that a couple of vendors had not yet fully started projects to provide software compatible with the Secure SADIS FTP Service. Finally, it was noted that some 60 of 133 existing SADIS FTP users had registered and been provided with Secure SADIS FTP Service accounts and that there were still more than 70 existing SADIS FTP users who had not yet registered for the Secure SADIS FTP Service.

6.4.9 Based on the foregoing, the group concurred that the SADIS Provider should extend the service life of the prevailing SADIS FTP by 12 months to allow for remaining software systems to be rolled out to users, and all remaining users to register for, and gain access to, the Secure SADIS FTP Service. To achieve a full implementation, it was agreed that the Secretariat should inform the SADIS user States that there would be no further extensions to the prevailing SADIS FTP service beyond the date agreed, and that all users must be able to access data via the Secure SADIS FTP Service by 30 November 2012. The early migration to the Secure SADIS FTP Service was considered important since it was the only FTP service that was compatible with ICAO guidance contained in the *Guidelines on the use of the Public Internet for aeronautical applications* (Doc 9855). In this context, the group formulated the following conclusion:

Conclusion 16/15 — Extension to service life of SADIS FTP service

That, in order to enable the complete roll-out of the Secure SADIS FTP compatible software by workstation vendors,

- a) the SADIS Provider State be invited to extend the existing FTP service until 30 November 2012;
- b) the ICAO Secretariat inform SADIS user States that there will be no further extensions to the existing SADIS FTP service and all users will have to be registered by 30 November 2012 to ensure continued access to SADIS via Internet.

Note. – The SADIS Provider State will continue to issue occasional “invitation to register” communications over the remaining months, as well as continuing to attempt to contact all users via e-mail.

Proposal to host WAFC Washington GRIB2 upper-air forecasts on the Secure SADIS FTP Service

6.4.10 The group noted that, since the introduction of WAFS upper-air forecasts in the GRIB2 code form, the WAFC Provider States had been considering whether to host each others' GRIB2 forecasts on the Internet-based services. It was recalled that both the prevailing SADIS FTP service and the Secure SADIS FTP Service did host upper-air forecasts in the GRIB1 code form issued by WAFC Washington.

6.4.11 It was noted that hosting WAFC Washington GRIB2 data on the Secure SADIS FTP Service would not be technically difficult. Furthermore, it was known that some users would benefit from being able to access both sets of WAFS forecasts in the GRIB2 code form, thus avoiding the need to register and configure their systems to use both SADIS Internet-based services and WIFS. It was understood that the provision of the WAFC Washington GRIB2 data from WAFC Washington on the Secure SADIS FTP Service would incur additional switching costs which were estimated to be £2 500

annually. The group concurred that the WAFC Washington forecasts in the GRIB2 code form should only be made available on the Secure SADIS FTP Service, since the prevailing SADIS FTP would be phased out in November 2012, in accordance with the Conclusion 16/15. Furthermore, the group realized that it would not be feasible to transmit WAFC Washington forecasts in the GRIB2 code form on the SADIS satellite broadcast due to bandwidth limitations.

6.4.12 In light of the foregoing, the group agreed that hosting of the upper-air forecasts in the GRIB2 code form issued by WAFC Washington would be advantageous to the SADIS users, and formulated therefore the following conclusion:

Conclusion 16/16 — Hosting of WAFS forecasts in the GRIB2 code form issued by WAFC Washington on the Secure SADIS FTP

That, the SADIS Provider State be invited to host the WAFS forecasts issued by WAFC Washington in the GRIB2 code form on the Secure SADIS FTP as of 1200 UTC on 22 June 2011.

Note. – These forecasts will not be made available on the existing SADIS FTP due to plans to withdraw that service.

Agenda Item 7: Long-term planning of SADIS

7.1 The group recalled that it had formulated Conclusion 11/22 calling for the SADIS Provider State to elaborate and maintain a concise long-term plan for the major development of the SADIS system covering a period of five years, for review and endorsement by the SADISOPSG. It was also recalled that the group had formulated Conclusion 12/22 calling for the SADIS Provider State to include an estimate of the scope (i.e. major *versus* minor) and nature (i.e. hardware and/or software impacted) of the changes on SADIS users as part of the long-term plan.

7.2 The group was pleased to note that an update to the long-term plan had been prepared by the SADIS Provider State. It paid due consideration to the life expectancy of SADIS related services and systems and also took into account the amendment cycle of Annex 3 – *Meteorological Service for International Air Navigation* in order to minimize the frequency of changes, and the corresponding operational and financial implications to the users. Furthermore, the SADIS Provider State had ensured that the updates to the plan were harmonized with the equivalent WAFS 5-year plan that had been developed by the WAFC Provider States and endorsed by the WAFSOPSG.

7.3 The group reviewed the updated 5-year plan covering years 2012 to 2016 and formulated the following decision:

Decision 16/17 — SADIS long-term plan 2012-2016

That, the concise long-term plan covering a period of five years, given in Appendix H be endorsed.

Note. – The long-term plan is a planning tool and certain milestones are still subject to formal endorsement by the SADISOPSG or WAFSOPSG.

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Agenda Item 8: The SADIS User Guide

8.1 The group recalled that it had endorsed the new fourth edition of the SUG at its thirteenth meeting (Decision 13/22 refers) in 2008. It was noted that minor updates to the SUG had been introduced through Amendments 1 and 2 (in 2008 and 2010, respectively) which had been subsequently endorsed by the fourteenth and fifteenth meetings of the group.

8.2 Since the SADISOPSG/15 Meeting, changes had been made to the SUG which reflected:

- a) the introduction of the Secure SADIS FTP;
- b) the introduction of WAFS forecasts in the GRIB2 code form in SADIS 2G and Secure SADIS FTP;
- c) the withdrawal of gridded WAFS forecasts of CB, icing and turbulence in the GRIB 1 code form;
- d) the clarification of the nature of the annexes to the SUG; and
- e) the replacement of Appendix F (containing the agreement for sharing of costs for SADIS) by a link introduced in the body of the SUG.

8.3 Furthermore, a number of URLs that were no longer valid had been updated. The opportunity had also been taken to introduce editorial updates to Appendices C, I and L.

8.4 The group reviewed the updated SUG (including Appendices C, I and L) available on the SADISOPSG website, endorsed their contents and formulated the following decision:

**Decision 16/18 — Amendments to Chapters 1, 2, 3, 4 and 6;
and Appendices C, F (deletion), I and L of
the *SADIS User Guide***

That, the amended *SADIS User Guide* (including Appendices C, I and L) given at

www.icao.int/anb/sadisopsg/sug/SUG-English/SUG-4th-EN.pdf

be endorsed.

*Note. – Changes to Annexes 1, 2, 3 and 4 are
addressed under Agenda Item 5.*

8.5 The group agreed that no other amendments to the SUG were required, except for an editorial change related to amending the “EUR OPMET BMG” to read “EUR OPMET DMG” in the glossary.

Agenda Item 9: Future work programme***Terms of reference***

9.1 The group noted the composition of the group and its terms of reference. It recalled that the terms of reference reflected the overall tasks of the group and needed to be revised only when major changes were introduced to the SADIS programme. Furthermore, any change (except for editorials and factual changes) would have to be subject to a draft conclusion to be endorsed by all PIRGs concerned. It was agreed that there was no need to amend the terms of reference at this meeting. However, it was noted that the SADIS Provider State intended to review the terms of reference as far as the respective roles of the SADISOPSG and the EUR OPMET DMG were concerned and prepare an amendment proposal, as necessary, in coordination with the SADISOPSG Technical Developments Team, for consideration by the SADISOPSG/17 Meeting.

Revision of the work programme

9.2 The group reviewed its work programme expressed in terms of deliverables. When reviewing the work programme, the group updated the following elements:

- a) future work programme (2011 to 2015);
- b) executive summaries for each recurrent task; and
- c) terms of reference of the following teams; and
 - 1) SADISOPSG Technical Developments Team; and
 - 2) SADISOPSG Operational Efficacy Assessment Team.

9.3 It was recalled that the group had agreed under Agenda Items 6.1 and 6.2 that, in view of the stability of the SADIS Programme, work by the SADISOPSG Gateway Development Team and the SADISOPSG Strategic Assessment Team be discontinued. Therefore, the terms of reference related to these teams had been eliminated. It was noted that otherwise, the draft work programme had been subject to only editorial improvements which did not influence its substance.

9.4 The group endorsed the foregoing changes and formulated the following decision:

Decision 16/19 — Future work programme of the SADISOPSG

That, the deliverables of the group be updated as shown in Appendix I to this report.

Note. – The Secretariat will place the updated work programme on the SADISOPSG website.

Agenda Item 10: Any other business**Availability of tropical cyclone advisories in graphical format**

10.1 The group was aware that the provision of tropical cyclone advisories in graphical format had been introduced in Annex 3 as part of Amendment 75. With regard to their availability, it was noted that based on information provided by the SADIS Provider, it appeared that:

- a) tropical cyclone advisory centres (TCAC) Miami and Honolulu would not be issuing tropical cyclone advisories in graphical format;
- b) TCAC La Réunion would issue tropical cyclone advisories in graphical format; and
- c) the plans for the provision of tropical cyclone advisories in graphical format from the remaining TCACs were unknown.

10.2 The group was pleased to note that the SADIS Provider State was prepared to disseminate tropical cyclone advisories in graphical format received from TCAC La Réunion via the SADIS 2G broadcast, SADIS file transfer protocol (FTP) Service and Secure SADIS FTP Service. Since the SADIS Provider States had not been successful in obtaining tropical cyclone advisories in graphical format from other TCACs, the group felt that the Secretariat should contact all the TCACs to establish a clear picture as far as the plans to implement such advisories were concerned. In this context, the group formulated the following conclusion:

Conclusion 16/20 — Plans to implement tropical cyclone advisories in graphical format

That, the Secretariat

- a) consult all the tropical cyclone advisory centres concerning their plans to implement tropical cyclone advisories in graphical format; and
- b) prepare a report on the results thereof, in time for the SADISOPSG/17 Meeting.

Note 1. – The consultation will inquire about the WMO abbreviated header lines to be used for such advisories and will encourage the TCAC Provider States to enter into bilateral arrangements with the SADIS Provider State concerning their transmission to the SADIS gateway; and

Note 2. - In accordance with harmonization between the SADIS and ISCS/WIFS services, it would be expected that the same bulletins would also be transmitted to the ISCS/WIFS Provider State.

Proposal for a fourth round of SADIS workstation evaluations

10.3 The group was aware of the fact that, since the last round of SADIS workstation software evaluations (2008/2009), there had been significant changes to the data disseminated (e.g. introduction of WAFS forecasts in the GRIB2 code form); implementation of the Secure SADIS FTP Service; and a number of additional changes brought about by Amendment 75 to Annex 3. Therefore, the group agreed that time had come to undertake a fourth round of SADIS workstation evaluations. It reviewed and endorsed the updated criteria, which would contribute to improvements and clarifications. In this regard, the group formulated the following conclusion:

Conclusion 16/21 — Criteria for fourth round of SADIS workstation software evaluations

That, the SADIS Provider State:

- a) encourage SADIS workstation software suppliers to have their software packages evaluated during 2011 and 2012 against the criteria for SADIS workstation software evaluations, endorsed by the SADISOPSG, and contained in Appendix J to this report; and
- b) report back to the SADISOPSG/17 Meeting the results of all the evaluations undertaken by that time.

Note – In light of the withdrawal of the SADIS FTP service in 2012, references to this service have been removed from the evaluation pro-forma.

10.4 Furthermore, the group considered that it was necessary for all SADIS workstation software providers to be aware – ahead of any software evaluations – of the responsibilities that they would need to agree to. In this regard, the group formulated the following decision:

Decision 16/22 — Agreement between SADIS Provider State and SADIS workstation software providers, relating to the future evaluations of SADIS workstation software

That, the proposed agreement between the SADIS Provider State and SADIS Workstation Software providers as given in Appendix K to this report, relating to the evaluation of SADIS workstation software be endorsed for future evaluations.

Ongoing investigation into SADIS 2G data losses

10.5 The group recalled that for several years some concern had been expressed by the group regarding data losses in the transmission of data over SADIS 2G broadcast. It was noted that the investigation of this issue had been delayed due to the lack of automated comparison of SADIS 2G output/input at the SADIS gateway. The group was pleased to note that logs of missing data had been kindly compiled by the SADISOPSG Members of the Netherlands (KNMI) and Switzerland (MeteoSwiss).

10.6 Based on data monitoring over a one-year period at the KNMI, five different types of data issues had been identified. Moreover, available data logs from KNMI, MeteoSwiss and the SADIS Provider State had been compared; such comparisons showed little correlation amongst the data logs, which was an indication that the same data had not been missing at all the three sites. It appeared that all the sites seemed to have suffered from local reception issues, and that the transmission was of a high quality. It was further noted that the monitoring of data losses at the SADIS gateway had been complicated by the fact that the SADIS comparator had not been operational.

10.7 In view of the foregoing, the group concurred that that the SADIS Provider State should restore the comparator functionality as soon as practicable and, in coordination with the SADIS Technical Developments Team, investigate the feasibility of obtaining and combining real-time data logs from separate reception sources in order to identify data that has truly been lost or corrupted in the transmission. In this regard, the group formulated the following conclusion:

Conclusion 16/23 — SADIS 2G data losses

That, the SADIS Provider State, in time for the SADISOPSG/17 Meeting,

- a) restore the SADIS 2G comparator functionality; and
- b) study, in coordination with the SADIS Technical Developments Team and the IATA Member of the SADISOPSG,
 - 1) the five data error types identified by the Netherlands over the last year, in order to determine if they are local issues, or transmission issues; and
 - 2) the feasibility of obtaining/combining real-time data logs from separate reception sources in order to identify data that has truly been lost/corrupted in the transmission.

Note 1. – Considering the problems with quality controlled data feed experienced shortly after the implementation of the second Megapac splitter configuration,

this configuration is to be re-introduced step-by-step by the SADIS Provider State;

Note 2. - To gain a full understanding of data-loss issues, it may be necessary to convene a meeting amongst managers and technical experts from the SADIS Provider State, SADISOPSG Technical Developments Team, the SADISOPSG Members from the Netherlands and Switzerland;

Note 3. – The investigation should determine costs and timescales required for implementation related to the establishment of real time data logs; and

Note 4. – The proposed solution may expand upon the current monitoring system in place to which Switzerland provides alerts to the SADIS gateway.

Proposal to acquire an additional vadEDGE 4200 unit for SADIS 2G hub infrastructure

10.8 The group recalled that, to monitor the SADIS 2G signal, the SADIS Provider had installed a vadEDGE 4200 unit. In order to have a true indication of what other SADIS 2G users received and exactly how the signal was processed, the group considered that it would be important for the SADIS Provider State to have additional equipment, similar to that used by SADIS users, which would make troubleshooting of reported data losses more straightforward.

10.9 Following the rationale above, the group supported that an additional vadEDGE 4200 be purchased by the SADIS Provider State, its primary role to align the SADIS Provider's reception equipment with the systems used by other SADIS 2G users. It was noted that the estimated cost of such equipment would be £1 650. In this regard, the group formulated the following conclusion:

Conclusion 16/24 — Procurement of an additional vadEDGE 4200 unit

That,

- a) the SADIS Provider State procure an additional vadEDGE 4200 unit, at an estimated cost of £1 650, to align the SADIS Provider State's reception equipment with the systems used by SADIS 2G users; and
- b) the Chairman of the SADISOPSG be invited to notify the Chairman of the SCRAG accordingly.

Note. – The unit may also be used as an operational spare, should the other vadEDGE 4200s used in the transmission process fail.

Distribution of WAFS forecasts in light of the increased use of the Internet-based services

10.10 It was recalled that the provision of WAFS forecasts over satellite in the early days of the service had resulted in distinct areas of coverage (i.e. satellite footprints) which had effectively defined from which service (i.e. SADIS *versus* ISCS) user States would obtain their data. It was noted that the service to be used by States was reflected in the regional air navigation (RAN) plans.

10.11 It was noted that, subsequent to the introduction of Internet-based dissemination of OPMET information (i.e. SADIS FTP and WIFS), the footprint had become “global”. With the enabling clause in Amendment 75 to Annex 3 - allowing provision of non-time critical aeronautical data over the Public Internet; combined with the discontinuation by the ISCS Provider State of their satellite-based service in June 2012 and its replacement with the purely Internet-based WIFS system, the group felt that there was a need to re-address the provision of OPMET information (including WAFS forecasts) through Internet-based services. In particular, the group considered that, in order to ensure the future stability and viability of the SADIS, there was a need to clarify “the access rights” in the ASIA/PAC Regions, due to a large area currently served by both SADIS and ISCS satellite broadcasts.

10.12 The group was pleased to note that the issue had been addressed by the sixth meeting of the World Area Forecast System Operations Group, which had formulated Conclusions 6/4 calling for the Secretariat to clarify the position with respect to user States within the ASIA/PAC Regions. For the user States in other regions, it had been considered by the WAFSOPSG that the existing provisions of the RAN plans were sufficient, i.e. users under the SADIS footprint would have access to the SADIS FTP services while those under the ISCS footprint would be given access to WIFS. It was noted that the SADIS and ISCS Provider States intended to manage the future access to their respective systems and the distribution of OPMET information (including WAFS forecasts) in accordance with the principles emanating from the study to be undertaken in response to the WAFSOPSG Conclusion 6/4.

10.13 The group noted that States could receive data via SADIS FTP/Secure SADIS FTP services free of charge under exceptional circumstances, i.e. back-up purposes. It was noted that the maximum volume of data that could be received for this specific purpose had never been established. The group agreed that the time had come to establish such a threshold whereby any user exceeding the data volume threshold would be deemed to be using the service for operational purposes and would have to take part in the SADIS cost recovery scheme. It was further agreed that a State receiving OPMET data (including WAFS forecasts) operationally from both the SADIS and ISCS Provider States would have to participate in the SADIS cost recovery scheme (unless the State was a LDC). In view of the foregoing, the group formulated the following conclusion:

Conclusion 16/25 — Establishment of a threshold for an “operational data volume” concerning the SADIS FTP/Secure SADIS FTP services

That, the SADIS Technical Developments Team, in coordination with the SADIS Provider State, establish, by 31 August 2011, a threshold for data volume beyond which the user is considered to be receiving OPMET data (including WAFS forecasts) for operational purposes and be, as such, subject to SADIS cost recovery.

Note. – Information will be presented to the SCRAG/12 Meeting by the SADIS Provider State.

10.14 The group recalled that, in accordance with conclusions formulated by all the PIRGs concerned in 2004 and 2005, the SADIS FTP was (since 1 July 2005) a primary component of the SADIS service and therefore subject to cost recovery, similar to any facility or service included in the SADIS Inventory. Since the cost recovery issues were beyond the terms of reference of the SADISOPSG, it was noted that any potential outstanding issues related to the cost recovery of the SADIS FTP would have to be addressed by the SCRAG, as necessary. Furthermore, it was recalled that, in accordance with ICAO Annex 3/WMO Technical Regulations [C.3.1], ‘the telecommunication facilities used for the supply of WAFS products should be the AFS or the public Internet’; therefore, the group was pleased to note that the SADIS Provider State was taking action to terminate the use of non-aeronautical networks for distributing OPMET information (including WAFS forecasts).

ISDN back-up capability

10.15 It was noted by the group that there was an outstanding action to complete the implementation of the ISDN back-up capability. The group was informed that there had been progress and individual elements of the capability had been tested. There were, however, remaining actions necessary to fully test the end to end process. The SADIS Provider State agreed to provide an update to the group, through the Secretariat, regarding the status and future timeline of implementation by 30 July 2011.

Future meetings

10.16 The group reconfirmed that it continued to be necessary to schedule annual meetings of the group for the foreseeable future. Regarding the venue for the next meeting in 2012, it was noted that the group had held meetings in ICAO regions served by SADIS on a rotational basis. Since the last four meetings had been held in Dakar (2008), Bangkok (2009) and Paris (2010, 2011), the group noted that the SADISOPSG/17 Meeting should be held at the MID (Middle East) Regional Office in Cairo, Egypt. Therefore, the Secretary was tasked to investigate the possibility of holding the SADISOPSG/17 Meeting in the MID Regional Office, Cairo, 29 to 31 May 2012.

Acknowledgements

10.17 The group expressed special thanks to the members of the SADISOPSG Gateway Development and Technical Developments Teams, and the IATA Member of the group who had contributed towards the progress of a number of key issues.

10.18 The group also took the opportunity to express its appreciation to the SADIS Provider State, and Mr. C. Tyson, in particular, for his support both during the past year. His role was considered to be essential in the management of the highly successful SADIS Programme.

10.19 In closing, the group took the opportunity to extend its deep gratitude and appreciation to Dr. O. M. Turpeinen, who was retiring on 1 June 2011 after 21 years of service with ICAO, including serving as the Secretary of the SADISOPSG since 2001. The group wished him well for his retirement, and thanked him for his considerable contribution to the efficient support to the SADIS Programme for the past 11 meetings and to the safety and efficiency of international civil aviation in general throughout his ICAO career.

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APPENDIX B

SADIS OPERATIONAL FOCAL POINTS

(Updated on 23 May 2011)

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APPENDIX C**SADIS INVENTORY****(2011)**

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~~) (including all additions following the implementation of Secure SADIS FTP) 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 2G hub infrastructure connection to the Met Office message switch (Frost) consists of a number of units developed in conjunction with ~~VADOS Systems~~ AEP Networks and other suppliers. These are installed either at Exeter or at the uplink site at Whitehill, Oxfordshire, UK.

The SADIS FTP and Secure SADIS FTP hub infrastructure connection to the Met Office message switch (Frost) consists of a number of units installed at Exeter.

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”).

Dell Poweredge R900 servers to provide SADIS FTP Service and Secure SADIS FTP Service (see section 1C).

ii) Principally procured for SADIS

... a) At the Met Office

See section 1C for itemized components

b) communications between Met Office Exeter and Whitehill uplink facility

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

c) the uplink site (Whitehill)

- 1) units and services leased from Cable and Wireless Communications Ltd. to support SADIS 2G services:
 - (a) 1 (70 to 140 MHz) convertor
 - (b) use of 1 (140 to C band) convertor
 - (c) use of satellite hub (lease represents only a very small part of this large aperture) for SADIS 2G services; and
- 2) units forming part of a totally integrated rack structure to provide SADIS 2G service, with back-up, (see the list under sections 1C)
- d) dual contingent communication links (utilising WMO TCP/IP sockets protocol) between SADIS Gateway and Met Office in support of SADIS 2G service.

iii) Not procured principally for SADIS

- a) Met Office Message switch (FROST): Total investment, 1.02M¹ of which 1.71-1.48 per cent is attributable to SADIS FTP service usage: switching data to operational FTP service;

— Note. — The percentage attributable to the SADIS FTP service will increase as GRIB 2 WAFS data is routed to the server by FROST before the end of 2009.

- b) ~~1) Met Office Message switch (FROST): Total investment, 1.02M¹ of which 0.86 per cent is attributable to SADIS usage: switching data to operational (2G) broadcast service (excluding GRIB2) and to 2G monitoring system (Corobor Comparator);~~

12) Met Office Message switch (FROST): Total investment, £1.02M¹ of which 1.02-1.06 per cent is attributable to SADIS usage: switching data to operational (2G) broadcast service (including GRIB2) and to 2G monitoring system (Corobor Comparator);

— Note. — Information regarding the cost with (2) and without (1) the WAFS GRIB2 data are provided since delivery of WAFS GRIB2 data over SADIS 2G has yet to be endorsed by SADISOPSG, and a date of provision decided.

Note: WAFS GRIB2 data began to be transmitted operationally over SADIS 2G with effect from 18th November 2010.

- c) Allocated bandwidth 4 Mbps bursting to 8 Mbps between server and Internet Service Provider (ISP) in support of the SADIS FTP service;
- d) At the moment Secure SADIS FTP bandwidth is sufficient to deal with foreseen data traffic, and will be monitored. It is expected that as take up of Secure SADIS FTP increases, a 'guaranteed' 4 Mbps bursting to 8 Mbps between server and Internet Service Provider (ISP) arrangement, similar to that used for existing SADIS FTP, may be needed.
- e) NATS Message switch (CoreMet System):-

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

- f) SADIS FTP equipment running costs;

Note:— These costs are applied to all Met Office internet facing services and primarily relate to costs associated with ensuring high levels of IT security.

- g) Met Office Service Desk equipment; and

Note:— Equates to 3.5 per cent of the total share of Met Office IT Operations equipment.

- h) Met Office Serial Communications.

Note:— Equates to 20 per cent of total share of Met Office Serial Communications. Includes cost of switching serial data from FROST Message Switch to SADIS 2G, comprising staff and equipment costs of supporting serial WAN, TTL Routers, Serial Modems and TTL matrix switches.

B. SADIS data back-up system

ISCS VSAT receiving system, including TCP/IP receiver and cables, on SADIS Provider (UK Met Office) premises.

Note 1.— This hardware is not currently used in an operational environment

Note 2.— The SADIS Gateway (UK NATS) has procured a dedicated SADIS data backup arrangement with the ISCS Provider State. The backup infrastructure includes an ISDN connection between the NWS Telecommunications Gateway and the SADIS Gateway, and an ISDN connection between the SADIS Gateway and Whitehill uplink facility, to provision SADIS data backup. This hardware is currently undergoing final testing of functionality and process before becoming operationally acceptable.

C. Hub equipment and services located at Exeter and Whitehill

<i>Item</i>	<i>Description</i>	<i>Quantity</i>
1.	Whitehill services (leased from Cable & Wireless)	
1.1	70 MHz to 140 MHz converters	1
1.2	140 MHz to C band converter	1
1.3	Satellite Hub leased bandwidth	1 slot
2.	ISDN back-up service to Washington (NWSTG)	
2.1	VadEDGE 4202	3*
2.2	ISDN 2e circuit	1
2.3	Interface cables	2

Note.— Hardware listed under Section 2 is located at Whitehill.

3.	SADIS FTP Service	
3.1	Dell Poweredge R900 servers with 1 Gb RAM	2
3.2	26.8 Gb internal disk drives	2
3.3	VMWave Virtual Platform with Red Hat Linux 5.3 OS	2
3.4	Intel Xeon X7350, 2.93 GHz Processors	2
3.5	Licenses, misc. support and maintenance costs	1

Note. — Hardware listed under Section 3 is located at Exeter.

4.	Secure SADIS FTP Service	
4.1	Dell Poweredge R900 servers with 1 Gb RAM	2
4.2	Dell Poweredge R900 (4 core) servers with 32 Gb RAM*	2
4.3	Shared Storage Arrays (analogous to hard disk storage, but with dynamic upper limit)	2
4.4	VMWave Virtual Platform with Red Hat Linux 5.3 OS	2
4.5	Intel Xeon X7350, 2.93 GHz Processors	2
4.6	Licenses, misc. support and maintenance costs	1

Note - Item 4.2 relates to Digital Signing servers

54.	SADIS 2G Infrastructure	
54.1	FROST port	1
54.2	MegaPAC V-IX Base System Dual PSU including Chassis, 1 CP6000, and 1 switch.	2*
54.3	CP6000 for use with MegaPAC V-IX	1*
54.4	VadEDGE 4202	3*
54.5	Uplink modem (Comtech EF Data SDM-300a)	3*
54.6	Communications cabinet and lease	1
54.7	MegaWatch including Enterprise Reports, and PC	1
54.8	Comtech SDM300L demodulator (NER5 downlink)	1
54.9	Corobor comparator software and PC	1
54.10	Communications rack floor space at Exeter in IT hall 1 and IT hall 2, and at Whitehill	3
54.11	Space in stores at Exeter to locate spare hardware	1
54.12	WAN module	2
54.13	Comtech EF Data SMS 301 – redundancy switch	2*
54.14	BRI Module for VadEdge 4202	2
54.15	Interface cabling	8

**Includes one unit/module stored as a cold spare.*

Note. — Hardware listed under section 4 is located at Exeter and Whitehill.

2. PROCURED SERVICES

- A. Space segment annual lease: 1.53MHz wide frequency band of which 46.57 per cent is utilised to support SADIS 2G, with 64Kbps data rate (less communications overhead);

Note. — SADIS 1G was terminated on 5 January 2009. The percentage allocation of satellite space segment reserved for SADIS 1G was finally relinquished on 31st December 2010. has, however, remained unchanged because the SADIS 1G satellite bandwidth allocation was maintained in 2009 and 2010, as called for by SADISOPSG Decision 13/26.

B. Annual maintenance of Met Office Exeter and Whitehill uplink site equipment (SADIS 2G and SADIS FTP server); and

C. Gateway function:

- i) communication circuits between Met Office and NATS infrastructure site; and
- ii) system maintenance.

3. ANNUAL STAFF REQUIREMENTS

A. United Kingdom Met Office

i) Service Desk

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

24-hour Weather Desk support

Skill

- | | |
|--|---|
| 1. Service Desk (first point of contact) | Incident Management-Scientific supervisor |
| 2. Additional Service Desk operator | Customer Enquiries Systems analyst |

Note. — Total support for SADIS provided by the Met Office Service Desk team equates to 0.3 per cent of the total Weather Desk budget.

24-hour IT Operations support

Skill

- | | |
|--|---|
| 1. Technical Team Leader (TTL) | Technical Supervisor-Computer engineer |
| 2. Networks and Systems Supervisor (NSS) | Service Continuity-Technical supervisor |

Note. — Total support for SADIS provided by the Met Office IT Operations team equates to 3.5 per cent of the total IT Operations budget.

Normal working hours support

Skill

- | | |
|-------------------------------------|------------------------------------|
| 1. Change and problem manager (CPM) | Process Specialist Systems analyst |
|-------------------------------------|------------------------------------|

ii) Additional support

-Day support

————Resource

- | | |
|--|---|
| 1. Systems integration team (Note 1) | 14 staff-days of network computer engineer |
| 2. Message Switching Manager | 15 staff-days of MSS manager |
| 3. Administrator | 160 staff-days of executive officer |
| 4. International aviation management | 30 staff-days of manager |
| 5. Data traffic | 5 staff-days communications engineer |
| 6. Contract Procurement and Management (Note 2) | 4 staff-days of senior procurement officer |
| 7. Message switching Team (Note 3) | 15 staff-days of technical officer |
| 8. Invoice Administration | 20 staff-days of invoicing officer and 15 staff-days of business accountant |

~~Note 1.— Due to re-organisation and rationalisation within the Met Office's IT services division, the CIDA role is now included within the Network Computer Engineer's responsibilities. Effort required also significantly reduced since decommissioning of SADIS 1G.~~

~~Note 2.— Reduced effort required since cessation of SADIS 1G.~~

~~Note 3.— Responsibility for support and maintenance to the SADIS FTP service transferred from the Web Team to the Message Switching Team during 2009.~~

B. NATS infrastructure site – CACC (OPMET Gateway function)

Note 1.— The CACC provides the OPMET Gateway function, which is provided from a single operational site, but with full capability at an alternative site. Staff are available either on a 24-hour basis, or as a daytime support with on-call capability.

Note 2.— The resource demand of 610 days required to provide the SADIS Gateway service comprises 6 watches of 1 ATSA4 and 1 ATSA3 each (Operations), 1 ATCE4 (Engineering Watchkeeping) and 3 ATCE4 (Engineering Day Support).

<i>24 hour support</i>	<i>Resource</i>
1. Operational staff support	523 man-days per annum
2. Engineering staff support	22 man-days per annum
<i>Day Support</i>	<i>Resource</i>
3. SADIS administration support	50 man-days per annum
4. Engineering (including on-call)	15 man-days per annum

C. Bought-in Services

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

APPENDIX D

STATUS OF IMPLEMENTATION OF SADIS (LISTED BY ICAO REGIONS)

(as of 23 May 2011)

Note. — Non-operational users are indicated in italics.

Key: 2G = operational SADIS second-generation (2 G) VSAT
 FTP = operational SADIS FTP service
 * = approved SADIS hardware and/or software supplier

ICAO Contracting State		User		Location	Type	
No	Name	No	Name		2G	FTP
AFI REGION						
1.	Algeria	1	National Meteorological Service	Dar El Beida	X	X
		2	National Meteorological Service	Essidikia Oran	X	X
2.	Angola	3	INAMET	Luanda Airport	X	X
3.	Benin	4	National Meteorological Service	Cotonou International Airport	X	X
4.	Botswana	5	National Meteorological Service	Gaborone Airport	X	X
5.	Burkina Faso	6	National Meteorological Service	Ouagadougou Airport	X	X
	<i>Burundi</i>		<i>National Meteorological Service</i>			
6.	Cameroon	7	National Meteorological Service	Douala Airport	X	X
7.	Cape Verde	8	National Meteorological Service (INMG)	Espargos		X
8.	Central African Republic	9	National Meteorological Service	Bangui	X	X
9.	Chad	10	National Meteorological Service	N'Djamena Airport	X	X
10.	Comoros	11	National Meteorological Service	Moroni Airport	X	
11.	Congo	12	National Meteorological Service	Brazzaville Airport	X	X
12.	Côte d'Ivoire	13	National Meteorological Service	Abidjan Airport	X	X
13.	Democratic Republic of the Congo	14	National Meteorological Service	Kinshasa Airport		X
14.	Djibouti	15	Service Météorologique	Djibouti Airport		X
15.	Egypt	16	National Meteorological Service	Cairo Airport	X	X
	Egypt	17	Main Military Weather Forecast Centre	Cairo	X	
16.	Equatorial Guinea	18	National Meteorological Service	Malabo Airport	X	X
	<i>Eritrea</i>		<i>National Meteorological Service</i>			
17.	Ethiopia	19	National Meteorological Service	Addis Ababa Airport	X	X
	Ethiopia	20	Ethiopian Airlines	Addis Ababa Airport		X
18.	Gabon	21	National Meteorological Service	Libreville Airport	X	X
19.	Gambia	22	National Meteorological Service	Banjul Airport	X	X
20.	Ghana	23	National Meteorological Service	Accra Airport	X	X
21.	Guinea	24	National Meteorological Service	Conakry Airport		X
22.	Guinea-Bissau	25	Administration Météorologique	Bissau Intl. Airport	X	
23.	Kenya	26	National Meteorological Service	Eldoret Airport	X	
	Kenya	27	National Meteorological Service	Mombasa Airport	X	
	Kenya	28	National Meteorological Service	Nairobi Airport	X	X
24.	Libyan Arab Jamahiriya	29	National Meteorological Service	NMC - Eswani	X	X

ICAO Contracting State		User		Location	Type	
No	Name	No	Name		2G	FTP
	Libyan Arab Jamahiriya	30	National Meteorological Service	Tripoli Int. Airport	X	X
25.	Madagascar	31	National Meteorological Service	Antananarivo/Ivato Airport	X	X
26.	Malawi	32	National Meteorological Service	Lilongwe	X	X
27.	Mali	33	National Meteorological Service	Bamoko Airport	X	X
28.	Mauritania	34	National Meteorological Service	Nouakchott Airport	X	X
29.	Morocco	35	National Meteorological Service	Casablanca		X
30.	Mozambique	36	National Meteorological Service	Maputo	X	X
31.	Namibia	37	National Meteorological Service	Windhoek	X	X
32.	Niger	38	National Meteorological Service	Niamey Airport	X	X
	Niger	39	National Meteorological Service	EAMAC Training School	X	X
33.	Nigeria	40	National Meteorological Service	Lagos Airport	X	X
	Nigeria	41	National Meteorological Service	Mallam Aminu Kano Airport	X	
	Nigeria	42	National Meteorological Service	Abuja Airport	X	
	Nigeria	43	National Meteorological Service	Port Harcourt Airport	X	
34.	Rwanda	44	Civil Aviation Authority	Kigali Airport	X	X
	<i>Sao Tome and Principe</i>		<i>Instituto Nacional de Meteorologia</i>			
35.	Senegal	45	National Meteorological Service	Dakar Airport	X	X
	Senegal	46	ASECNA – DTI Maintenance 1	Headquarters, Dakar	X	X
	Senegal	47	ASECNA – DTI Maintenance 2	Headquarters, Dakar	X	
	Senegal	48	ASECNA – DTI Maintenance 3	Headquarters, Dakar	X	
	Senegal	49	ASECNA – DTI Maintenance 4	Headquarters, Dakar	X	
	<i>Sierra Leone</i>		<i>National Meteorological Service</i>			
36.	Somalia	50	Civil Aviation Caretaker Authority for Somalia (CACAS)	United Nations, Nairobi		X
37.	South Africa	51	Weather Bureau	Pretoria	X	X
	South Africa	52	Netsys*	Pretoria	X	X
38.	Swaziland	53	National Meteorological Service	Mbabane		X
39.	Togo	54	National Meteorological Service – ASECNA	Lomé	X	X
40.	Tunisia	55	National Meteorological Service	Tunis Airport		X
41.	Uganda	56	National Meteorological Service	Entebbe Airport	X	X
42.	United Republic of Tanzania	57	National Meteorological Service	Dar Es Salaam		X
43.	Zambia	58	National Meteorological Service	Lusaka International Airport	X	
44.	Zimbabwe	59	National Meteorological Service	Harare International Airport	X	X
ASIA REGION						
45.	Bangladesh	60	National Meteorological Service	Dhaka Airport		X
46.	China	61	CAAC	Beijing Airport	X	X
	China	62	CAAC	Guangzhou Airport		X
	China	63	Hong Kong Observatory	Hong Kong Intl. Airport	X	X
	China	64	Civil Aviation Authority	Macau Airport	X	X
47.	Democratic People's Republic of Korea	65	Civil Aviation Authority	Pyongyang Airport	X	
48.	India	66	National Meteorological Service	New Delhi	X	X
	India	67	SDS Ltd.	Mumbai		X

ICAO Contracting State		User		Location	Type	
No	Name	No	Name		2G	FTP
49.	Lao People's Democratic Republic	68	Hydromet Unit	Laos Airport		X
50.	Maldives	69	National Meteorological Service	Male Airport	X	X
	Mongolia		Civil Aviation Authority	Ulan Bator Airport		
51.	Myanmar	70	DMH	Yangon		X
52.	Nepal	71	National Meteorological Service	Kathmandu Airport	X	X
53.	Pakistan	72	NMS	Karachi	X	X
54.	Sri Lanka	73	GHP Dharamaratna	Colombo	X	X
55.	Thailand	74	Thai Intl. Airways	Suvarnabhumi Airport	X	X
	Thailand	75	National Meteorological Service	Don Mueang Airport		X
56.	Viet Nam	76	Civil Aviation Authority	Hanoi	X	X
	Viet Nam	77	Southern Airports Corporation	Tan Son Nhat Airport, Ho Chi Min City	X	X
	Viet Nam	78	Northern Airports Corporation	Noi Bai Int. Airport	X	X
EUR REGION						
57.	Armenia	79	Hydromet	Yerevan Airport	X	X
58.	Austria	80	Austro Control	Vienna	X	X
59.	Azerbaijan	81	Air Navigation Service	Baku Airport	X	X
60.	Belgium	82	Belgocontrol	Brussels Airport	X	
	Belgium	83	Eurocontrol	Brussels	X	X
	Bosnia and Herzegovina	84	Civil Aviation Authority (BHDCA)	Banja Luka	X	
61.	Bulgaria	85	Air traffic services	Sofia Airport	X	X
62.	Croatia	86	Croatia Control Ltd.	Zagreb Airport	X	X
63.	Cyprus	87	National Meteorological Service	Nicosia	X	X
64.	Czech Republic	88	HydroMet	Prague	X	X
65.	Denmark	89	Meteorological Institute	Copenhagen	X	
	Denmark	90	SAS Airline	Copenhagen		X
	Denmark	91	Air Support A/S	Billund		X
66.	Estonia	92	Air Navigation Service (EANS)	Tallinn Airport	X	X
	Estonia	93	National Meteorological Service (EHMI)	Tallinn	X	X
67.	Finland	94	Air Navigation Services (Civil Aviation Administration)	Helsinki-Vantaa Airport	X	X
68.	France	95	Corobor *	Paris		X
	France	96	Météo-France International (MFI)*	Toulouse		X
69.	Georgia	97	National Meteorological Service	Tbilisi Airport	X	X
70.	Germany	98	Lufthansa	Frankfurt Airport	X	X
	Germany	99	National Meteorological Service (Deutscher Wetterdienst)	Offenbach		X
71.	Greece	100	National Meteorological Service	Piraeus Airport, Elliniko	X	X
	Greece	101	National Meteorological Service and Civil Aviation Authority	New Athens Intl. Airport	X	
72.	Hungary	102	National Meteorological Service	Budapest		X
73.	Ireland	103	MET Eireann	Dublin		X
74.	Italy	104	Air traffic services	Milan Malpensa Airport	X	
	Italy	105	Air traffic services	Rome Fiumicino Airport	X	X
	Italy	106	Tecno Engineering	Comiso Airport	X	
	Italy	107	Air Traffic Services	Milan Linate Airport	X	

ICAO Contracting State		User		Location	Type	
No	Name	No	Name		2G	FTP
	<i>Kazakhstan</i>		<i>Kazaviamet</i>			
75	Latvia	108	Air Space Utilization and Air Traffic Organization	Riga	X	X
76..	Lithuania	109	Air Traffic Services (Oro Navigacija)	Vilnius Airport	X	X
77.	Malta	110	National Meteorological Service	Luqa Airport	X	X
78.	Netherlands	111	National Meteorological Service	De Bilt	X	X
	Netherlands	112	Televent Almos*	Culemborg		X
	Netherlands	113	Casses Ltd.	Amsterdam		X
79.	Poland	114	Lufthansa	Gdansk	X	X
	Poland	115	National Meteorological Service (IMGW)	Warsaw	X	X
	Poland	116	IBCOL Polska Sp. z o.o.	Warsaw		X
80.	Portugal	117	Air Force	Alfragide	X	X
	Portugal	118	National Meteorological Service	Lisbon Airport	X	X
81.	Republic of Moldova	119	Air traffic services	Chisinau Airport	X	X
82.	Romania	120	Air traffic services (ROMATSA)	Bucharest	X	X
83	Russian Federation	121	Institute of Radar Meteorology (IRAM)*	St. Petersburg		X
	Russian Federation	122	Map Makers Group *	Moscow	X	X
	Russian Federation	123	Roshydromet	St. Petersburg		X
84.	Serbia	124	National Meteorological Service	Belgrade	X	X
	Serbia	125	Air traffic services	Belgrade Airport		X
85.	Slovakia	126	IBL Software Engineering *	Bratislava	X	X
86.	Sweden	127	LFV Group – Airports and AN Services	Arlanda Airport	X	X
	Sweden	128	LFV Group – Airports and AN Services	Sundsvall Airport		X
	Sweden	129	Flygprestanda	Malmö	X	X
	Sweden	130	Carmenta	Göteborg		X
87.	Switzerland	131	National Meteorological Service	Zurich	X	X
	Switzerland	132	National Meteorological Service	Zurich	X	
88.	The former Yugoslav Republic of Macedonia	133	National Meteorological Service	Skopje	X	X
89.	Turkey	134	National Meteorological Service	Ankara Airport	X	X
90.	Ukraine	135	Air traffic services (UKSATSE)	Kyiv	X	X
	Ukraine	136	Aeronautical MET Centre (UAMC)	Boryspil Airport, Kyiv		X
91.	United Kingdom	137	UKMO	Exeter	X	X
	United Kingdom	138	Aviation Briefing	Bristol	X	X
	United Kingdom	139	Bytron	Kirmington	X	X
	United Kingdom	140	Paradigm Communications *	Alton, Hampshire	X	
	United Kingdom	141	Weathernews International	Aberdeen		X
	United Kingdom	142	Jeppesen	Crawley		X
	United Kingdom	143	Air Data	Crawley		X
92.	Uzbekistan	144	Uzaeronavigation	Tashkent	X	
MID REGION						
93	Afghanistan	145	National Meteorological Service	Kabul Airport		X
94.	Bahrain	146	Civil Aviation Authority	Bahrain International Airport	X	X

ICAO Contracting State		User		Location	Type	
No	Name	No	Name		2G	FTP
95.	Iran (Islamic Republic of)	147	National Meteorological Service	Teheran	X	X
96.	Iraq	148	National Meteorological Service	Baghdad Airport	X	
97.	Jordan	149	National Meteorological Service	Queen Alia Airport		X
98.	Kuwait	150	National Meteorological Service	Kuwait	X	X
99.	Oman	151	National Meteorological Service	Salalah Airport	X	X
	Oman	152	National Meteorological Service	Seeb Airport	X	
100.	Qatar	153	Civil Aviation Authority	Doha Airport	X	X
	Qatar	154	Qatar Met Department of CAA	Doha	X	
101.	Saudi Arabia	155	Saudi Airlines	Jeddah Airport		X
	Saudi Arabia	156	Presidency of Meteorology and Environment (PME)	Jeddah	X	X
	Saudi Arabia	157	Presidency of Meteorology and Environment (PME)	Jeddah Airport	X	X
		158	Presidency of Meteorology and Environment (PME)	Riyadh Airport	X	
102.	Syrian Arab Republic	159	National Meteorological Service	Damascus	X	
	Syrian Arab Republic	160	National Meteorological Service	Aleppo	X	
103.	United Arab Emirates	161	Air Force and Air Defence Meteorological Department	Abu Dhabi (Al-Dhafra Air Base)	X	
	United Arab Emirates	162	National Centre for Meteorology and Seismology (NCMS)	Abu Dhabi	X	
	United Arab Emirates	163	Civil Aviation Authority	Abu Dhabi Airport	X	X
	United Arab Emirates	164	Civil Aviation Authority	Dubai Airport	X	X
	United Arab Emirates	165	Civil Aviation Authority	Headquarters, Abu Dhabi		X
104.	Yemen	166	Civil Aviation and Meteorological Authority (CAMA)	Sana'a Airport	X	
	Yemen	167	National Meteorological Service (YMS/CAMA)	Sana'a	X	
NAT REGION						
105.	Iceland	168	CAA	Reykjavik		X
	Iceland	169	IMO	Reykjavik		X

APPENDIX E

STATES' WILLINGNESS TO PROVIDE OPMET INFORMATION FROM NON-AOP AERODROMES
(since 2011)

<i>State</i> (C = contacted in response to a SADISOPSG conclusion; N = non-solicited reply)	<i>Reported</i> <i>to the</i> <i>SADIS-</i> <i>OPSG</i>	<i>Number of non-AOP</i> <i>aerodromes:</i> «A» = added; «R» = removed «0» = refusal	<i>Other changes</i> Y=yes; N=no	<i>Requests for</i> <i>additional data</i> <i>from non-AOP</i> <i>aerodromes not</i> <i>before</i> ¹
Brazil (C)	16	0	N	2013
Chile (C)	16	0	Y	2013
Czech Republic (C)	16	4 A	N	—
Denmark (N)	16	1 R	Y	—
Germany (C)	16	0	Y	2013
India (C)	16	1 A	N	—
Johnston Atoll (N)	16	1 R	N	—
Lao People's Democratic Republic (N)	16	4 A	N	—
Norway (C)	16	1 R	N	2013
Republic of Korea (N)	16	3 R	N	—
Serbia (C)	16	2 A	N	—
Spain (C)	16	4 A	Y	—
Sweden (C)	16	1 A	N	—
Turkey (C)	16	9 A	Y	—
United Kingdom (C)	16	0	Y	2013
Venezuela (C)	16	0	N	2013
Viet Nam (N)	16	0	Y	—

¹ Only States that have been consulted are considered.

APPENDIX F

DRAFT AMENDMENT TO OPMET INFORMATION FROM NON-AOP AERODROMES

Note. – The nomenclature is based on the one provided by IATA; it does not reflect the official ICAO position in this regard.

NON-AOP AERODROMES TO BE DELETED

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
DATG	Y	Y	Y			Y		IN_GUEZZAM	Algeria	AFI
DIKO	Y	Y				Y		KORHOGO	Cote d'Ivoire	AFI
DIMN	Y	Y				Y		MAN	Cote d'Ivoire	AFI
DISP	Y	Y				Y		SAN_PEDRO	Cote d'Ivoire	AFI
FAAB	Y	Y				Y		ALEXANDER_BAY	South_Africa	AFI
FEFG	Y	Y				Y		BANGASSOU	Central_African_Republic	AFI
FOOD	Y	Y				Y		MOANDA	Gabon	AFI
FZAB	Y	Y		Y		Y		KINSHASHA/N'DOLO	Democratic_Republic_of_the_Congo	AFI
FZBN	Y	Y		Y		Y		MALEBO	Democratic_Republic_of_the_Congo	AFI
FZEA	Y	Y		Y		Y		MBANDAKA	Democratic_Republic_of_the_Congo	AFI
FZOA	Y	Y		Y		Y		KINDU	Democratic_Republic_of_the_Congo	AFI
FZOS	Y	Y		Y		Y		KASESE	Democratic_Republic_of_the_Congo	AFI
FZRF	Y	Y		Y		Y		KALEMIE	Democratic_Republic_of_the_Congo	AFI
FZSA	Y	Y		Y		Y		KAMINA	Democratic_Republic_of_the_Congo	AFI
GLMR	Y	Y		Y		Y		MONROVIA/SPRIGGS_PAYNE	Liberia	AFI
GQNK	Y	Y		Y		Y		KAEDI	Mauritania	AFI
GUFH	Y	Y		Y		Y		FARANAH	Guinea	AFI
GUOK	Y	Y		Y		Y		BOKE/BARALANDE	Guinea	AFI
HKML	Y	Y		Y		Y		MALINDI	Kenya	AFI
HKNW	Y	Y		Y		Y		NAIROBI/WILSON	Kenya	AFI
HSDN	Y	Y		Y		Y		DONGOLA	Sudan	AFI
HTMW	Y	Y		Y		Y		MWANZA	United_Republic_of_Tanzania	AFI
HTTG	Y	Y		Y		Y		TANGA	United_Republic_of_Tanzania	AFI
AYDU	Y	Y	Y			Y		DARU	Papua_New_Guinea	ASI
AYGA	Y	Y	Y			Y		GOROKA	Papua_New_Guinea	ASI

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
AYMD	Y	Y	Y			Y		MADANG	Papua_New_Guinea	ASI
OPPI	Y	Y		Y		Y		PASNI	Pakistan	ASI
OPQT	Y	Y		Y		Y		QUETTA	Pakistan	ASI
VCCC	Y	Y		Y		Y		COLOMBO/RATMALANA	Sri_Lanka	ASI
VCCJ	Y	Y		Y		Y		KANKESANTURAI/JAFFNA	Sri_Lanka	ASI
VEBS	Y	Y		Y		Y		BHUBANESWAR	India	ASI
VIPK	Y	Y		Y		Y		PATHANJOT	India	ASI
VVCR	Y	Y	Y			Y		CAM_RANH	Viet_Nam	ASI
VVDB	Y	Y	Y			Y		DIENBIEN	Viet_Nam	ASI
VVDL	Y	Y	Y			Y		DALAT_/LIENKHUONG	Viet_Nam	ASI
VYSW	Y	Y		Y		Y		SITTWE	Myanmar	ASI
WARJ	Y	Y		Y		Y		YOGYAKARTA/ADI_SUTJIPTO	Indonesia	ASI
WARQ	Y	Y		Y		Y		SOLO	Indonesia	ASI
WASS				Y		Y		SORONG	Indonesia	ASI
MYER	Y	Y		Y		Y		ROCK_SOUND	Bahamas	CAR
EHTW	Y	Y	Y			Y		ENSCHDEDE/TWENTHE	Netherlands	EUR
ENDI	Y	Y	Y			Y		GEILO/DAGALI	Norway	EUR
ENLI	Y	Y	Y			Y		LISTA	Norway	EUR
LFLD	Y	Y	Y			Y		BOURGES	France	EUR
LFLV	Y	Y	Y			Y		VICHY/CHARMEIL	France	EUR
LFMA	Y	Y				Y		AIX-LES_MILLES	France	EUR
LFMW	Y	Y	Y			Y		CASTELNAUDARY-VILLENEUVE	France	EUR
LFQB	Y	Y	Y			Y		TROYES/BARBEREY	France	EUR
LFRM	Y	Y		Y		Y		LE_MANS/ARNAGE	France	EUR
LHSY	Y	Y				Y		SZOMBATHELY	Hungary	EUR
LIMR	Y	Y	Y			Y		NOVI_LIGURE	Italy	EUR
LKHO	Y	Y				Y		HOLESOV	Czech_Republic	EUR
LSGL	Y	Y				Y		LAUSANNE-LA_BLECHERETTE	Switzerland	EUR
UACP	Y	Y	Y			Y		PETROPAVLOVSK	Kazakhstan	EUR
ULAM	Y	Y		Y		Y		NARYAN_MAR	Russian_Federation	EUR
UMMI	Y	Y	Y			Y		LIPKI	Belarus	EUR
UNIT	Y	Y		Y		Y		TURA	Russian_Federation	EUR
UUYP	Y	Y		Y		Y		PECHORA	Russian_Federation	EUR

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
LLBS	Y	Y	Y			Y		BEER_SHEBA-TEYMAN	Israel	MID
OOMA	Y	Y		Y		Y		MASIRAH	Oman	MID
CYCH	Y	Y		Y		Y		MIRAMICHI	Canada	NAM
CYCL	Y	Y		Y		Y		CHARLO	Canada	NAM
CYRI	Y	Y		Y		Y		RIVIERE-DU-LOUP	Canada	NAM
KCGX	Y	Y		Y		Y		CHICAGO/MERRILL_C.MEIGS	United_States	NAM
KPFN	Y	Y		Y		Y		PANAMA_CITY/BAY_COUNTY	United_States	NAM
KPLB	Y	Y		Y		Y		PLATTSBURG,CLINTON_CO	United_States	NAM
KUCA	Y	Y		Y		Y		UTICA_/ONEIDA_COUNTY	United_States	NAM
KYUM	Y	Y		Y		Y		YUMA_MCAS/YUMA_INTL	United_States	NAM

**PROPOSED AMENDMENTS TO OPMET INFORMATION
FROM NON-AOP AERODROMES
(red - deletion, blue - addition)**

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
DAAD	Y		Y			Y		BOU-SAADA	Algeria	AFI
DAAS	Y		Y			Y		SETIF	Algeria	AFI
DAAY	Y		Y			Y		MECHERIA_AIRFORCE_BASE	Algeria	AFI
DABT	Y		Y			Y		BATNA/MOSTEPHA_BEN_BOULAID	Algeria	AFI
DAFH	Y		Y			Y		HASSI_RMEL	Algeria	AFI
DAOF	Y		Y			Y		TINDOUF	Algeria	AFI
DAOI	Y			Y		Y		ECH_CHELIFF	Algeria	AFI
DAOL	Y					Y		ORAN/TAFARAOU	Algeria	AFI
DAOR	Y	Y	Y			Y		BECHAR	Algeria	AFI
DAOY			Y			Y		EL_BAYADH	Algeria	AFI
DATM	Y		Y			Y		BORDJ_MOKHTAR	Algeria	AFI
DAUE	Y		Y			Y		EL_GOLEA	Algeria	AFI
DAUL	Y		Y			Y		LAGHOUAT_AFB	Algeria	AFI
DGTK				Y		Y		TAKORADI	Ghana	AFI
DNGO				Y		Y		GOMBE	Nigeria	AFI
DNZA	Y					Y		ZARIA	Nigeria	AFI
DTNZ	Y			Y		Y		ENFIDHA/_ZINE_EL_ABIDINE_BEN	Tunisia	AFI
DTTL	Y					Y		KELIBIA	Tunisia	AFI
DTTR	Y		Y			Y		EL_BORMA	Tunisia	AFI
FAEL	Y		Y			Y		EAST_LONDON	South_Africa	AFI
FAGG	Y		Y			Y		GEORGE/P.O.BOTHA	South_Africa	AFI
FAHS			Y			Y		HOEDSPRUIT_AFB	South_Africa	AFI
FAKM			Y			Y		KIMBERLEY_(KIMBERLEY_AIRPORT)	South_Africa	AFI
FAKN	Y		Y			Y		KRUGER_MPUMALANGA_INT	South_Africa	AFI
FALM			Y			Y		MAKHADO	South_Africa	AFI
FAPN	Y		Y			Y		PILANESBERG	South_Africa	AFI
FAPP	Y		Y			Y		POLOKWANE_INTERNATIONAL	South_Africa	AFI
FAUT			Y			Y		UMTATA	South_Africa	AFI
FAWB			Y			Y		PRETORIA/WONDERBOOM	South_Africa	AFI
FAWK			Y			Y		WATERKLOOF	South_Africa	AFI
FBFT	Y		Y			Y		FRANCISTOWN	Botswana	AFI
FBKE	Y		Y			Y		KASANE	Botswana	AFI

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
FBMN	Y		Y			Y		MAUN	Botswana	AFI
FBSP	Y		Y			Y		SELEBI-PHIKWE	Botswana	AFI
FIMR	Y			Y		Y		RODRIGUES/PLAINE_CORAIL	Mauritius	AFI
FMCZ	Y		Y			Y		DZAOUDZI	Comoros	AFI
FMEP	Y		Y			Y		SAINT_PIERRE/PIERREFONDS	Reunion_(France)	AFI
FMMS	Y					Y		SAINT_MARIE	Madagascar	AFI
FMNA	Y			Y		Y		ANTSIRANANA	Madagascar	AFI
FMST				Y		Y		TOLIARA	Madagascar	AFI
FQCH				Y		Y		CHIMOIO	Mozambique	AFI
FQIN				Y		Y		INHAMBANE	Mozambique	AFI
FQLC				Y		Y		LICHINGA	Mozambique	AFI
FQPB				Y		Y		PEMBA	Mozambique	AFI
FQVL				Y		Y		VILANKULO	Mozambique	AFI
FVCZ			Y			Y		CHIREDDZI/BUFFALO_RANGE	Zimbabwe	AFI
FVKB			Y			Y		KARIBA	Zimbabwe	AFI
FVMV			Y			Y		MASVINGO	Zimbabwe	AFI
FVWN			Y			Y		HWANGE_NATIONAL_PARK	Zimbabwe	AFI
FYGF			Y			Y		GROOTFONTEIN	Namibia	AFI
FYOA			Y			Y		ONDANGWA	Namibia	AFI
FYWE			Y			Y		WINDHOEK/EROS	Namibia	AFI
GCGM	Y					Y		LA_GOMERA	Canary_Islands_(Spain)	AFI
GMMC	Y					Y		CASABLANCA/ANFA	Morocco	AFI
GMMH	Y					Y		DAKHLA	Morocco	AFI
GMLL	Y	Y	Y	Y		Y		LAAYOUNE/HASSAN_1ER	Morocco	AFI
GMTA	Y					Y		AL_HOCEIMA	Morocco	AFI
GOOK	Y					Y		KAOLACK	Senegal	AFI
GOTK	Y					Y		KEDOUGOU	Senegal	AFI
GVBA	Y			Y		Y		RABIL/BOA_VISTA_ISLAND	Cape_Verde	AFI
HEAR				Y		Y		EL-ARISH	Egypt	AFI
HEBA				Y		Y		ALEXANDRIA/BORG_EL_ARAB	Egypt	AFI
HEPS	Y			Y		Y		PORT_SAID	Egypt	AFI
HLGD				Y		Y		GARDABYA	Libyan_Arab_Jamahiriya	AFI
HLKF				Y		Y		KUFRA	Libyan_Arab_Jamahiriya	AFI
HLLM	Y			Y		Y		TRIPOLI/MITIGA	Libyan_Arab_Jamahiriya	AFI
HRZA	Y			Y		Y		KAMEMBE	Rwanda	AFI

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
NWWD				Y		Y		KONE	New_Caledonia_(France)	ASI
NWWL				Y		Y		LIFOU-OUANAHAM	New_Caledonia_(France)	ASI
NWWW				Y		Y		NOUMEA/MAGENTA	New_Caledonia_(France)	ASI
OPBW				Y		Y		BAHAWALPUR	Pakistan	ASI
OPDG				Y		Y		DERA_GHAZI_KHAN	Pakistan	ASI
OPRK				Y		Y		RAHIM_YAR_KHAN	Pakistan	ASI
OPSK	Y			Y		Y		SUKKUR	Pakistan	ASI
OPST	Y					Y		SIALKOT_INTERNATIONAL	Pakistan	ASI
RJAF	Y					Y		MATSUMOTO	Japan	ASI
RJAH	Y					Y		HYAKURI	Japan	ASI
RJAW	Y					Y		IWOJIMA	Japan	ASI
RJBD	Y					Y		NANKI_SHIRAHAMA	Japan	ASI
RJCB	Y					Y		OBIHIRO	Japan	ASI
RJCK	Y					Y		KUSHIRO	Japan	ASI
RJCM	Y					Y		MEMANBETSU	Japan	ASI
RJCN	Y					Y		NAKASHIBETSU	Japan	ASI
RJCW	Y					Y		WAKKANAI	Japan	ASI
RJDC	Y					Y		YAMAGUCHI-UBE	Japan	ASI
RJDT	Y					Y		TSUSHIMA	Japan	ASI
RJEB	Y					Y		MONBETSU	Japan	ASI
RJEC	Y					Y		ASAHIKAWA	Japan	ASI
RJFG	Y					Y		TANEGASHIMA	Japan	ASI
RJFM	Y					Y		MIYAZAKI	Japan	ASI
RJFR	Y					Y		KITAKYUSHU	Japan	ASI
RJKA	Y					Y		AMAMI	Japan	ASI
RJNK				Y		Y		KOMATSU	Japan	ASI
RJNT	Y			Y		Y		TOYAMA	Japan	ASI
RJOC	Y					Y		IZUMO	Japan	ASI
RJOI	Y					Y		IWAKUNI	Japan	ASI
RJOK	Y					Y		KOCHI	Japan	ASI
RJOM	Y					Y		MATSUYAMA	Japan	ASI
RJOR	Y					Y		TOTTORI	Japan	ASI
RJOY	Y					Y		YAO	Japan	ASI
RJSA	Y					Y		AOMORI	Japan	ASI

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
RJSC	Y					Y		YAMAGATA	Japan	ASI
RJSI	Y					Y		HANAMAKI	Japan	ASI
RJTF	Y					Y		CHOFU	Japan	ASI
RJTH	Y					Y		HACHIJOJIMA	Japan	ASI
RJTI	Y					Y		AKASAKA_PRESS_CENTER_HELIPORT	Japan	ASI
RJTO	Y					Y		OSHIMA	Japan	ASI
RJTY	Y					Y		YOKOTA	Japan	ASI
RODN	Y					Y		KADENA	Japan	ASI
RPVD	Y	Y		Y		Y		DUMAGUETE/SIBULAN,_NEGROS_ORIENTAL	Philippines	ASI
VLLB				Y		Y		LUANG_PRABANG	Lao_People's_Democratic_Republic	ASI
VLLN				Y		Y		LUANG_NAMTHA	Lao_People's_Democratic_Republic	ASI
VLPS				Y		Y		PAKSE	Lao_People's_Democratic_Republic	ASI
VLSK				Y		Y		SUVANNAKET	Lao_People's_Democratic_Republic	ASI
VTBO	Y					Y		TRAT/KHAO_SMING	Thailand	ASI
WARS	Y					Y		SEMARANG	Indonesia	ASI
WBGY	Y					Y		SIMANGGANG	Malaysia	ASI
WIPT	Y					Y		PADANG_PARIAMAN/MINANGKABAU	Indonesia	ASI
WMAU	Y					Y		MERSING	Malaysia	ASI
WMBA	Y					Y		SITIAWAN	Malaysia	ASI
WMKD	Y	Y		Y		Y		KUANTAN	Malaysia	ASI
WMKM	Y	Y		Y		Y		MALACCA	Malaysia	ASI
WPDL				Y		Y		DILI/INTL_PRESI_NICOLAU_LOBATO	East_Timor	ASI
YBHM	Y			Y		Y		HAMILTON_ISLAND	Australia	ASI
YBMA	Y			Y		Y		MOUNT_ISA	Australia	ASI
YBPN	Y	Y		Y		Y		PROSERPINE/WHITSUNDAY_COAST	Australia	ASI
YGEL	Y			Y		Y		GERALDTON	Australia	ASI
YPGV	Y			Y		Y		GOVE	Australia	ASI
YPJT	Y			Y		Y		PERTH/JANDAKOT	Australia	ASI
YPKU	Y			Y		Y		KUNUNURRA	Australia	ASI
YSTW	Y			Y		Y		TAMWORTH	Australia	ASI
ZBSJ	Y			Y		Y		SHIJIAZHUANG/ZHENGDDING	China	ASI
ZHCC	Y			Y		Y		ZHENGZHOU/XINZHENG	China	ASI
ZSNB	Y			Y		Y		NINGBO/LISHE	China	ASI

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
MDAB				Y		Y		SAMANA_ARROYO_BARRIL_INTL	Dominican_Republic	CAR
MDCY	Y			Y		Y		SAMANA_EL_CATEY_INTL	Dominican_Republic	CAR
MDJB	Y			Y		Y		SANTO_DOMINGO	Dominican_Republic	CAR
MGTK	Y			Y		Y		TIKAL/ANACLETO_M.CASTELLANOS	Guatemala	CAR
MMCT	Y					Y		CHICHEN_ITZA	Mexico	CAR
MUCF	Y					Y		CIENFUEGOS_JAIME_GONZALES	Cuba	CAR
MUGM	Y					Y		GUANTANAMO_US-NAVAL_AIR_BASE	Cuba	CAR
MUMZ	Y					Y		MANZANILLO/CUBA	Cuba	CAR
MUSC	Y					Y		SANTA_CLARA/ABEL_SANTAMARIA	Cuba	CAR
TDCF	Y					Y		CANEFIELD	Dominica	CAR
TJNR	Y					Y		ROOSEVELT_ROADS	Puerto_Rico_(United_States)	CAR
EDBC	Y		Y			Y		COCHSTEDT/SCHNEIDLINGEN	Germany	EUR
EFJY	Y	Y	Y	Y		Y		JYVASKYLA	Finland	EUR
EGBE	Y	Y	Y	Y		Y		COVENTRY	United_Kingdom	EUR
ENBL	Y					Y		FORDE/_BRINGELAND	Norway	EUR
ENBS	Y					Y		BATSFJORD	Norway	EUR
ENBV	Y	Y	Y			Y		BERLEVAG	Norway	EUR
ENDU	Y	Y	Y	Y		Y		BARDUFOSS	Norway	EUR
ENHK	Y					Y		HASVIK	Norway	EUR
ENHV	Y					Y		HONNINGSVAG/VALAN	Norway	EUR
ENLK	Y					Y		LEKNES	Norway	EUR
ENMH	Y					Y		MEHAMN	Norway	EUR
ENML	Y		Y			Y		MOLDE/ARO	Norway	EUR
ENMS	Y					Y		MOSJOEN/KJAERSTAD	Norway	EUR
ENNK	Y					Y		NARVIK/FRAMNES	Norway	EUR
ENNM	Y					Y		NAMSOS	Norway	EUR
ENNO	Y		Y			Y		NOTODDEN	Norway	EUR
ENOL	Y	Y	Y	Y		Y		OERLAND	Norway	EUR
ENOV	Y					Y		ORSTA-VOLDA/HOVDEN	Norway	EUR
ENRA	Y		Y			Y		MOI_RANA/ROSSVOLL	Norway	EUR
ENRS	Y					Y		ROST	Norway	EUR
ENSD	Y					Y		SANDANE,_ANDA	Norway	EUR
ENSG	Y					Y		SOGNDAL/HAUKASEN	Norway	EUR
ENSK	Y					Y		STOKMARKNES,SKAGEN	Norway	EUR

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
ENSN	Y		Y			Y		SKIEN/GEITERYGGEN	Norway	EUR
ENSO	Y		Y			Y		STORD_SORSTOKKEN	Norway	EUR
ENSR	Y					Y		SORKJØSEN	Norway	EUR
ENSS	Y					Y		VARDO/SVARTNES	Norway	EUR
ENST	Y					Y		SANDNESSJOEN/STOKKA	Norway	EUR
ENVD	Y		Y			Y		VADSO	Norway	EUR
ESCM			Y			Y		UPPSALA	Sweden	EUR
ESUD	Y					Y		STORUMAN	Sweden	EUR
ETUO	Y		Y			Y		GUTERSLOH	Germany	EUR
LBGO	Y	Y	Y	Y		Y		GORNA/ORYAHOVITSA	Bulgaria	EUR
LBPD	Y	Y	Y	Y		Y		PLOVDIV	Bulgaria	EUR
LCEN	Y			Y		Y		ERCAN	Cyprus	EUR
LCRA	Y			Y		Y		AKROTIRI	Cyprus	EUR
LEDA	Y		Y			Y		LLEIDA/ALGUARE	Spain	EUR
LEGT			Y			Y		MADRID/GETAFE	Spain	EUR
LEMO			Y			Y		MORON	Spain	EUR
LERT			Y			Y		ROTA	Spain	EUR
LFAQ	Y		Y			Y		ALBERT-BRAY	France	EUR
LFBC	Y		Y			Y		CAZAUX	France	EUR
LFBL	Y	Y	Y	Y		Y		LIMOGES/BELLEGARDE	France	EUR
LFBM	Y		Y			Y		MONT_DE_MARSAN	France	EUR
LFBU	Y		Y			Y		ANGOULEME/_BRIE_CHAMPNIERS	France	EUR
LFCR	Y	Y	Y	Y		Y		RODEZ/MARCILLAC	France	EUR
LFJL	Y	Y	Y	Y		Y		METZ/NANCY_LORRAINE	France	EUR
LFJR	Y		Y			Y		ANGERS/MARCE	France	EUR
LFKF	Y	Y	Y	Y		Y		FIGARI/SUD_CORSE	France	EUR
LFKS	Y		Y			Y		SOLENZARA	France	EUR
LFLN	Y		Y			Y		SAINT-YAN	France	EUR
LFLP	Y	Y	Y	Y		Y		ANNECY/MEYTHET	France	EUR
LFLX	Y			Y		Y		CHATEAUROUX/DEOLS	France	EUR
LFMC	Y					Y		LE_LUC-LE_CANNET	France	EUR
LFMI	Y	Y	Y	Y		Y		ISTRES/LE_TUBE	France	EUR
LFMK	Y	Y	Y	Y		Y		CARCASSONNE/SALVAZA	France	EUR
LFMO	Y		Y			Y		ORANGE	France	EUR
LFMU	Y	Y	Y	Y		Y		BEZIERS/VIAS	France	EUR

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
LFMV	Y			Y		Y		AVIGNON/CAUMONT	France	EUR
LFOA	Y			Y		Y		AVORD	France	EUR
LFOC	Y		Y			Y		CHATEAUDUN	France	EUR
LFOJ	Y		Y			Y		ORLEANS/BRICY	France	EUR
LFOP	Y	Y	Y	Y		Y		ROUEN/VALLEE_DE_SEINE	France	EUR
LFPC	Y			Y		Y		CREIL	France	EUR
LFPV	Y			Y		Y		VILLACOUBLAY/VELIZY	France	EUR
LFQI	Y		Y			Y		CAMBRAI/EPINOY	France	EUR
LFRJ	Y		Y			Y		LANDIVISIAU	France	EUR
LFSD	Y	Y	Y	Y		Y		DIJON/LONGVIC	France	EUR
LFSF	Y		Y			Y		METZ/FRESCATY	France	EUR
LFSI	Y		Y			Y		SAINT-DIZIER/ROBINSON	France	EUR
LFSN	Y			Y		Y		NANCY/ESSEY	France	EUR
LFSO	Y		Y			Y		NANCY-OCHEY	France	EUR
LFSX	Y		Y			Y		LUXEUIL_ST.SAUVEUR	France	EUR
LFTH	Y			Y		Y		HYERES/LE_PALYVESTRE	France	EUR
LFVP	Y	Y	Y	Y		Y		SAINT_PIERRE	France	EUR
LGKZ	Y					Y		KOZANI	Greece	EUR
LGPA	Y					Y		PAROS	Greece	EUR
LGSO	Y					Y		SYROS	Greece	EUR
LGST			Y			Y		SITIA	Greece	EUR
LHKE	Y		Y			Y		KECSKEMET	Hungary	EUR
LHPA	Y		Y			Y		PAPA	Hungary	EUR
LHPP	Y	Y	Y			Y		PECS/POGANY	Hungary	EUR
LHPR	Y		Y			Y		GY=R-PER	Hungary	EUR
LHSM	Y		Y			Y		SARMELLEK/BALATON	Hungary	EUR
LHSN	Y		Y			Y		SZOLNOK	Hungary	EUR
LIBA			Y			Y		AMENDOLA	Italy	EUR
LIBN	Y		Y			Y		GALATINA/LECCE	Italy	EUR
LIBV	Y		Y			Y		GIOIA_DEL_COLLE	Italy	EUR
LICZ	Y		Y			Y		CATANIA/SIGONELLA	Italy	EUR
LIED	Y		Y			Y		DECIMOMANNU	Italy	EUR
LIMN	Y		Y			Y		CAMERI	Italy	EUR
LIPA	Y		Y			Y		AVIANO	Italy	EUR
LIPF	Y					Y		FERRARA	Italy	EUR

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
LIPI	Y		Y			Y		RIVOLTO_MIL	Italy	EUR
LIPL	Y		Y			Y		GHEDI_MIL	Italy	EUR
LIPS	Y		Y			Y		TREVISO/ISTRANA	Italy	EUR
LIRE	Y		Y			Y		PRATICA_DI_MARE	Italy	EUR
LIRT	Y					Y		TREVICO	Italy	EUR
LIVD	Y					Y		DOBBIACO	Italy	EUR
LIVF	Y					Y		FRONTONE	Italy	EUR
LIVM	Y					Y		MARINA_DI_RAVENNA	Italy	EUR
LOAN	Y	Y	Y	Y		Y		WIENER_NEUSTADT	Austria	EUR
LOXA			Y			Y		AIGEN_IM_ENNSTAL	Austria	EUR
LPBJ	Y			Y		Y		BEJA-AIR_BASE_NR._11	Portugal	EUR
LPHR	Y	Y	Y	Y		Y		HORTA	Portugal	EUR
LSMA	Y					Y		ALPNACH	Switzerland	EUR
LSMD	Y					Y		DUBENDORF/DUBENDORF	Switzerland	EUR
LSME	Y					Y		EMMEN	Switzerland	EUR
LSMP	Y					Y		PAYERNE_AFB	Switzerland	EUR
LSZL	Y	Y	Y			Y		LOCARNO	Switzerland	EUR
LTAG	Y			Y		Y		ADANA/INCIRLIK	Turkey	EUR
LTAR	Y		Y			Y		SIVAS	Turkey	EUR
LTAS	Y		Y			Y		ZONGULDAK/CAYCUMA	Turkey	EUR
LTAW	Y		Y			Y		TOKAT	Turkey	EUR
LTBO	Y		Y			Y		USAK	Turkey	EUR
LTCJ	Y	Y	Y	Y		Y		BATMAN	Turkey	EUR
LTCL	Y		Y			Y		SIIRT	Turkey	EUR
LTCM	Y		Y			Y		SINOP	Turkey	EUR
LTCN	Y		Y			Y		KAHRAMANMARAS	Turkey	EUR
LTCO	Y		Y			Y		AGRI	Turkey	EUR
LTCP	Y		Y			Y		ADIYAMAN	Turkey	EUR
LTCR	Y		Y			Y		MARDIN	Turkey	EUR
LTFD	Y		Y			Y		BALIKESIR/EDREMIT_K=RFEZ	Turkey	EUR
LTFG	Y		Y			Y		ALANYA/ANTALYA_GAZIPASA	Turkey	EUR
LYPG	Y			Y		Y		PODGORICA	Montenegro	EUR
UBBL	Y		Y			Y		LENKORAN	Azerbaijan	EUR
UBBY	Y		Y			Y		ZAGATALA	Azerbaijan	EUR
UESO	Y		Y			Y		CHOKURDAKH	Russian_Federation	EUR

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
UEST	Y	Y		Y		Y		TIKSI	Russian_Federation	EUR
UGSB	Y		Y			Y		BATUMI	Georgia	EUR
UHNN	Y	Y	Y	Y		Y		NIKOLAYEVSK-NA-AMURE	Russian_Federation	EUR
UHSH	Y		Y			Y		OKHA	Russian_Federation	EUR
ULDD	Y		Y			Y		AMDERMA	Russian_Federation	EUR
ULWW	Y		Y			Y		VOLOGDA	Russian_Federation	EUR
UNWW	Y		Y			Y		NOVOKUZNETSK	Russian_Federation	EUR
UOHH	Y			Y		Y		KHATANGA	Russian_Federation	EUR
UOII	Y		Y			Y		IGARKA	Russian_Federation	EUR
UOOO	Y			Y		Y		NORILSK_ALYKEL	Russian_Federation	EUR
URKM	Y					Y		MAYKOP/KANSKAYA	Russian_Federation	EUR
USMM	Y	Y	Y	Y		Y		NADYM	Russian_Federation	EUR
USMU	Y		Y			Y		NOVY_URENGOY	Russian_Federation	EUR
UTAM	Y		Y			Y		MARY	Turkmenistan	EUR
UTFA			Y			Y		ANDIZHAN	Tajikistan	EUR
UTFN	Y			Y		Y		NAMANGAN	Tajikistan	EUR
UTSA	Y			Y		Y		NAVOI	Uzbekistan	EUR
UTTP	Y			Y		Y		TASHKENT_VOSTOCHNY	Uzbekistan	EUR
UUMO	Y		Y			Y		MOSCOW_OSTAFYEVO	Russian_Federation	EUR
UUYH	Y		Y			Y		UKHTA	Russian_Federation	EUR
UUYS	Y		Y			Y		USINSK	Russian_Federation	EUR
UUYW	Y	Y	Y	Y		Y		VORKUTA	Russian_Federation	EUR
UWLL	Y			Y		Y		ULYANOVSK	Russian_Federation	EUR
UWPP	Y		Y			Y		PENZA	Russian_Federation	EUR
LLIB	Y					Y		ROSH-PINA/_MAHANAIM-I.BEN-YAA	Israel	MID
OAFZ				Y		Y		FAIZABAD	Afghanistan	MID
OAIX	Y			Y		Y		BAGRAM	Afghanistan	MID
OAMS				Y		Y		MAZAR-I-SHARIF	Afghanistan	MID
OAUZ				Y		Y		KUNDUZ	Afghanistan	MID
OEAH	Y			Y		Y		AL-AHSA	Saudi_Arabia	MID
OEDM	Y			Y		Y		PRINCE_SALMAN_BIN_ABDULAZIZ	Saudi_Arabia	MID
OEDR	Y			Y		Y		KING_ABDULAZIZ_AIR_BASE_DHARAN	Saudi_Arabia	MID
OEHL	Y			Y		Y		HAIL	Saudi_Arabia	MID
OEKJ	Y			Y		Y		PRINCE_SULTAN_AB	Saudi_Arabia	MID

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
OEKK	Y			Y		Y		KING_KHALED_MIL_CITY	Saudi_Arabia	MID
OEKM	Y			Y		Y		KHAMIS_MUSHAIT/KING_KHALED_AB	Saudi_Arabia	MID
OERY	Y			Y		Y		RIYADH_AIRBASE	Saudi_Arabia	MID
OETF	Y			Y		Y		TAIF	Saudi_Arabia	MID
OEYN	Y	Y	Y	Y		Y		YENBO	Saudi_Arabia	MID
OIAA	Y	Y	Y	Y		Y		ABADAN	Iran_(Islamic_Republic_of_)	MID
OIAG	Y					Y		AGHAJARI	Iran_(Islamic_Republic_of_)	MID
OIAH	Y					Y		GHACHSARAN	Iran_(Islamic_Republic_of_)	MID
OIAI	Y					Y		MASJED_SOLEIMAN	Iran_(Islamic_Republic_of_)	MID
OIAM	Y					Y		MAHSHAHR	Iran_(Islamic_Republic_of_)	MID
OIAW	Y			Y		Y		AHWAZ	Iran_(Islamic_Republic_of_)	MID
OIBA	Y					Y		ABUMUSA_ISLAND	Iran_(Islamic_Republic_of_)	MID
OIBB	Y		Y			Y		BUSHEHR	Iran_(Islamic_Republic_of_)	MID
OIBK	Y			Y		Y		KISH_ISLAND	Iran_(Islamic_Republic_of_)	MID
OIBL	Y					Y		BANDAR_LENGEH	Iran_(Islamic_Republic_of_)	MID
OIBS	Y					Y		SIRRI_ISLAND	Iran_(Islamic_Republic_of_)	MID
OICC	Y		Y			Y		KERMANSHAH	Iran_(Islamic_Republic_of_)	MID
OICI	Y					Y		ILAM	Iran_(Islamic_Republic_of_)	MID
OICK	Y					Y		KHORAM_ABAD	Iran_(Islamic_Republic_of_)	MID
OICS	Y					Y		SANANDAJ	Iran_(Islamic_Republic_of_)	MID
OIFK	Y					Y		KASHAN	Iran_(Islamic_Republic_of_)	MID
OIFS	Y					Y		SHAHRE_KORD	Iran_(Islamic_Republic_of_)	MID
OIGG	Y		Y			Y		RASHT	Iran_(Islamic_Republic_of_)	MID
OIHH	Y					Y		HAMADAN	Iran_(Islamic_Republic_of_)	MID
OIIP	Y		Y			Y		KARAJ-PAYAM	Iran_(Islamic_Republic_of_)	MID
OIKK	Y			Y		Y		KERMAN	Iran_(Islamic_Republic_of_)	MID
OIKQ	Y					Y		GHESHM_ISLAND	Iran_(Islamic_Republic_of_)	MID
OIMB	Y					Y		BIRJAND	Iran_(Islamic_Republic_of_)	MID
OIMC	Y					Y		SARAKHS	Iran_(Islamic_Republic_of_)	MID
OIMT	Y					Y		TABAS	Iran_(Islamic_Republic_of_)	MID
OING	Y					Y		GORGAN	Iran_(Islamic_Republic_of_)	MID
OINN	Y					Y		NOSHAHR	Iran_(Islamic_Republic_of_)	MID
OINR	Y					Y		RAMSAR	Iran_(Islamic_Republic_of_)	MID
OINZ			Y			Y		SARI/DASHT-E-NAZ	Iran_(Islamic_Republic_of_)	MID
OISF	Y					Y		FASA	Iran_(Islamic_Republic_of_)	MID

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
OISL	Y					Y		LAR	Iran_(Islamic_Republic_of_)	MID
OISY	Y					Y		YASOUJ	Iran_(Islamic_Republic_of_)	MID
OITL	Y		Y			Y		ARDABIL	Iran_(Islamic_Republic_of_)	MID
OITR	Y			Y		Y		UROMIYEH	Iran_(Islamic_Republic_of_)	MID
OIYY	Y		Y			Y		YAZD_/_SHAHID_SADOOGHI	Iran_(Islamic_Republic_of_)	MID
OIZB	Y					Y		ZABOL	Iran_(Islamic_Republic_of_)	MID
OIZC	Y			Y		Y		CHAH_BAHAR/KONARAK	Iran_(Islamic_Republic_of_)	MID
OIZI	Y					Y		IRAN_SHAHR	Iran_(Islamic_Republic_of_)	MID
OMAD	Y			Y		Y		ABU_DHABI_--_BATEEN	United_Arab_Emirates	MID
ORAA	Y			Y		Y		AL_ASAD_AB	Iraq	MID
ORBD	Y			Y		Y		BALAD_SOUTHEAST_AIRFIELD	Iraq	MID
ORBM	Y			Y		Y		MOSUL	Iraq	MID
ORKK	Y			Y		Y		KIRKUK	Iraq	MID
ORSH	Y			Y		Y		TIKRIT/AL_SAHRA_AAF	Iraq	MID
ORTL	Y			Y		Y		TALUL	Iraq	MID
OSDZ	Y					Y		DEIR_ZZOR	Syrian_Arab_Republic	MID
OSKL	Y					Y		KAMISHLY	Syrian_Arab_Republic	MID
OTBH	Y			Y		Y		AL_UDAID_AIR_BASE	Qatar	MID
OYAT	Y					Y		ATAQ	Yemen	MID
OYMB	Y					Y		MARIB	Yemen	MID
OYSQ	Y					Y		SOCOTRA/MOORI	Yemen	MID
OYSY	Y			Y		Y		SAYUN	Yemen	MID
CYAM	Y			Y		Y		SAULT_STE._MARIE	Canada	NAM
CYAY	Y			Y		Y		ST._ANTHONY	Canada	NAM
CYAZ	Y			Y		Y		TOFINO	Canada	NAM
CYCS	Y					Y		CHESTERFIELD_INLET	Canada	NAM
CYDL				Y		Y		DEASE_LAKE	Canada	NAM
CYFR	Y					Y		FORT_RESOLUTION	Canada	NAM
CYGH	Y			Y		Y		FORT_GOOD_HOPE	Canada	NAM
CYGK	Y			Y		Y		KINGSTON	Canada	NAM
CYKZ	Y			Y		Y		TORONTO_BUTTONVILLE_MUNI	Canada	NAM
CYLC	Y					Y		KIMMIRUT	Canada	NAM
CYLD	Y			Y		Y		CHAPLEAU	Canada	NAM
CYLU	Y					Y		KANGIQSUALUJJUAQ_GEORGES_RIVER	Canada	NAM

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
CYMU	Y					Y		UMIUJAQ	Canada	NAM
CYNC	Y					Y		WEMINDJI	Canada	NAM
CYOY	Y			Y		Y		VALCARTIER	Canada	NAM
CYQD	Y			Y		Y		THE_PAS	Canada	NAM
CYQF	Y			Y		Y		RED_DEER_REGIONAL	Canada	NAM
CYQH	Y			Y		Y		WATSON_LAKE	Canada	NAM
CYQI	Y			Y		Y		YARMOUTH	Canada	NAM
CYQR	Y			Y		Y		REGINA_INTL_SK	Canada	NAM
CYQV	Y			Y		Y		YORKTON_MUNI	Canada	NAM
CYQZ				Y		Y		QUESNEL	Canada	NAM
CYRB	Y			Y		Y		RESOLUTE_BAY	Canada	NAM
CYRJ	Y			Y		Y		ROBERVAL	Canada	NAM
CYRL	Y			Y		Y		RED_LAKE	Canada	NAM
CYRT	Y			Y		Y		RANKIN_INLET	Canada	NAM
CYSB	Y			Y		Y		SUDBURY	Canada	NAM
CYSC				Y		Y		SHERBROOKE	Canada	NAM
CYSF				Y		Y		STONY_RAPIDS	Canada	NAM
CYSL	Y					Y		ST._LEONARD	Canada	NAM
CYSN	Y			Y		Y		ST._CATHARINES	Canada	NAM
CYSP	Y			Y		Y		MARATHON	Canada	NAM
CYSY	Y			Y		Y		SACHS_HARBOUR	Canada	NAM
CYTH	Y			Y		Y		THOMPSON	Canada	NAM
CYTQ	Y			Y		Y		TASIUJAQ	Canada	NAM
CYTR	Y			Y		Y		TRENTON	Canada	NAM
CYTS	Y			Y		Y		TIMMINS	Canada	NAM
CYTZ				Y		Y		TORONTO_CITY_CENTRE	Canada	NAM
CYUA	Y					Y		SHINGLE_POINT	Canada	NAM
CYUB	Y			Y		Y		TUKTOYAKTUK	Canada	NAM
CYUS	Y					Y		SHEPHERD_BAY	Canada	NAM
CYUT	Y			Y		Y		REPULSE_BAY	Canada	NAM
CYUY	Y			Y		Y		ROUYN-NORANDA	Canada	NAM
CYVV	Y			Y		Y		WIARTON	Canada	NAM
CYWA	Y			Y		Y		PETAWAWA	Canada	NAM
CYWL	Y			Y		Y		WILLIAMS_LAKE	Canada	NAM
CYWY	Y					Y		WRIGLEY	Canada	NAM

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
CYXL	Y			Y		Y		SIOUX_LOOKOUT	Canada	NAM
CYXN	Y					Y		WHALE_COVE	Canada	NAM
CYXP	Y			Y		Y		PANGNIRTUNG_NWT	Canada	NAM
CYXR	Y			Y		Y		EARLTON/TIMISKAMING_REGIONAL	Canada	NAM
CYXT	Y			Y		Y		TERRACE	Canada	NAM
CYXZ	Y			Y		Y		WAWA	Canada	NAM
CYYD	Y			Y		Y		SMITHERS	Canada	NAM
CYYH	Y			Y		Y		TALOYOAK	Canada	NAM
CYYN	Y			Y		Y		SWIFT_CURRENT	Canada	NAM
CYZH	Y			Y		Y		SLAVE_LAKE	Canada	NAM
CYZP				Y		Y		SANDSPIT	Canada	NAM
CYZR				Y		Y		SARNIA/CHRIS_HADFIELD	Canada	NAM
CYZU	Y			Y		Y		WHITECOURT	Canada	NAM
CZBF	Y			Y		Y		BATHURST	Canada	NAM
CZEM	Y					Y		EASTMAIN_RIVER	Canada	NAM
CZPC	Y					Y		PINCHER_CREEK	Canada	NAM
CZUM	Y			Y		Y		CHURCHILL_FALLS	Canada	NAM
KAAA	Y					Y		LINCOLN	United_States	NAM
KALS				Y		Y		SAN_LUIS_VALLEY_RGNL-BERGMAN_F	United_States	NAM
KANW	Y					Y		AINSWORTH	United_States	NAM
KAPA				Y		Y		DENVER/ARAPAHOE/CENTENNIAL	United_States	NAM
KARA				Y		Y		NEW_IBERIA/ACADIANA_RGNL	United_States	NAM
KAST				Y		Y		ASTORIA	United_States	NAM
KAUG				Y		Y		AUGUSTA_STATE	United_States	NAM
KAUW				Y		Y		WAUSAU_DOWNTOWN	United_States	NAM
KAYS	Y					Y		WAYCROSS_WARE_CO	United_States	NAM
KBED	Y	Y		Y		Y		BEDFORD/LAURENCE_G.HANSCOM_FLD	United_States	NAM
KBIE	Y					Y		BEATRICE	United_States	NAM
KBIH				Y		Y		BISHOP	United_States	NAM
KBJI				Y		Y		BEMIDJI_BELTRAMI_CO_AIRPORT	United_States	NAM
KBLF				Y		Y		BLUEFIELD	United_States	NAM
KBLH				Y		Y		BLYTHE	United_States	NAM
KBMI				Y		Y		BLOOMINGTON/CENTRAL_IL_RGNL	United_States	NAM
KBNO				Y		Y		BURNS	United_States	NAM

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
KBPI				Y		Y		BIG_PINEY	United_States	NAM
KBRD				Y		Y		BRAINERD_LAKES_RGNL	United_States	NAM
KBVI				Y		Y		BEAVER_CO	United_States	NAM
KBWG				Y		Y		BOWLING_GREEN	United_States	NAM
KCDR				Y		Y		CHADRON_MUNI_AIRPORT	United_States	NAM
KCDS				Y		Y		CHILDRESS	United_States	NAM
KCID	Y			Y		Y		CEDAR_RAPIDS/THE_EASTERN_IOWA	United_States	NAM
KCLT	Y			Y		Y		CHARLOTTE/DOUGLAS_INTL	United_States	NAM
KCNU				Y		Y		CHANUTE	United_States	NAM
KCOD				Y		Y		CODY/YELLOWSTONE_REGIONAL	United_States	NAM
KCOE				Y		Y		COEUR_D_ALENE_AIR_TERMINAL	United_States	NAM
KCON				Y		Y		CONCORD	United_States	NAM
KCRE				Y		Y		NORTH_MYRTLE_BEACH	United_States	NAM
KCRQ	Y			Y		Y		CARLSBAD/MC_CLELLAN_PALOMAR	United_States	NAM
KCSM				Y		Y		CLINTON-SHERMAN	United_States	NAM
KCTZ	Y					Y		CLINTON/SAMPSON	United_States	NAM
KCWA				Y		Y		CENTRAL_WISCONSIN	United_States	NAM
KDAG				Y		Y		BARSTOW_DAGGETT	United_States	NAM
KDBQ				Y		Y		DUBUQUE_RGNL	United_States	NAM
KDHT				Y		Y		DALHART_MUNI	United_States	NAM
KDIK				Y		Y		DICKINSON	United_States	NAM
KDKB	Y					Y		DE_KALB	United_States	NAM
KDLS				Y		Y		COLUMBIA_GORGE_RGNL/DALLES_MUN	United_States	NAM
KDNV	Y					Y		DANVILLE	United_States	NAM
KDPA				Y		Y		CHICAGO_-_DUPAGE	United_States	NAM
KDRA				Y		Y		MERCURY_DESERT_ROCK	United_States	NAM
KDRT	Y			Y		Y		DEL_RIO_INTL	United_States	NAM
KDUG	Y			Y		Y		DOUGLAS/BISBEE-DOUGLAS	United_States	NAM
KDVL	Y					Y		DEVILS_LAKE	United_States	NAM
KEAR	Y					Y		KEARNEY	United_States	NAM
KEAT				Y		Y		WENATCHEE_PANGBORN_MEM	United_States	NAM
KEED				Y		Y		NEEDLES	United_States	NAM
KEHA	Y					Y		ELKHART	United_States	NAM
KELY				Y		Y		ELY	United_States	NAM

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
KENL	Y					Y		CENTRALIA_MUNI	United_States	NAM
KENV				Y		Y		WENDOVER	United_States	NAM
KFDK	Y					Y		FREDERICK_MUNI	United_States	NAM
KFDY				Y		Y		FINDLAY	United_States	NAM
KFEP	Y					Y		FREEPORT_ALBERTUS	United_States	NAM
KFKL				Y		Y		FRANKLIN_VENANGO_REGIONAL	United_States	NAM
KFMH				Y		Y		FALMOUTH/OTIS_AFB	United_States	NAM
KFMN				Y		Y		FOUR_CORNERS_RGNL/FARMINGTON	United_States	NAM
KFMY				Y		Y		FT_MYERS_PAGE_FLD	United_States	NAM
KFOA	Y					Y		FLORA_MUNI	United_States	NAM
KFOD				Y		Y		FORT_DODGE_RGNL	United_States	NAM
KFOE	Y			Y		Y		TOPEKA_FORBES	United_States	NAM
KFPR	Y					Y		FT_PIERCE_ST_LUCIE_CO_INTL	United_States	NAM
KFWC	Y					Y		FAIRFIELD_MUNI	United_States	NAM
KFXE	Y			Y		Y		FT_LAUDERDALE_EXECUTIVE	United_States	NAM
KFYV				Y		Y		FAYETTEVILLE_DRAKE_FLD	United_States	NAM
KGCC				Y		Y		GILLETTE-CAMPBELL_CO	United_States	NAM
KGDV	Y			Y		Y		GLENDIVE_DAWSON_COMMUNITY	United_States	NAM
KGLD				Y		Y		GOODLAND_RENNER_FLD_(GOD.MUNI)	United_States	NAM
KGLE	Y					Y		GAINESVILLE_MUNI	United_States	NAM
KGLH				Y		Y		GREENVILLE_MID_DELTA_REG.	United_States	NAM
KGMU				Y		Y		GREENVILLE_DOWNTOWN	United_States	NAM
KGON	Y	Y		Y		Y		GROTON/NEW_LONDON	United_States	NAM
KGPI				Y		Y		KALISPELL/GLACIER_PARK_INTL	United_States	NAM
KGPZ	Y					Y		GRAND_RAPIDS/ITASCA_CO_NEWSTRO	United_States	NAM
KHBR				Y		Y		HOBART	United_States	NAM
KHIO				Y		Y		PORTLAND/HILLSBORO	United_States	NAM
KHLG				Y		Y		WHEELING_OHIO_CO	United_States	NAM
KHOB				Y		Y		HOBBS_LEA_CO_REGIONAL	United_States	NAM
KHSA				Y		Y		BAY_ST_LOUIS_/STENNIS	United_States	NAM
KHSB	Y					Y		HARRISBURG-RALEIGH	United_States	NAM
KHUL	Y			Y		Y		HOULTON	United_States	NAM
KHVR	Y			Y		Y		HAVRE_CITY-CO	United_States	NAM
KHYS				Y		Y		HAYS_REGIONAL	United_States	NAM

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
KIGQ	Y					Y		LANSING_MUNI_CHICAGO	United_States	NAM
KIJX	Y					Y		JACKSONVILLE_MUNI	United_States	NAM
KILN	Y			Y		Y		WILMINGTON_AIRBORNE_PARK	United_States	NAM
KINW				Y		Y		WINSLOW	United_States	NAM
KIPJ	Y					Y		LINCOLTON_CO_REGIONAL	United_States	NAM
KIPL	Y			Y		Y		IMPERIAL_CO	United_States	NAM
KISM				Y		Y		KISSIMMEE_GATEWAY_A/P_ORLANDO	United_States	NAM
KISN	Y			Y		Y		WILLISTON_SLOULIN_FIELD_INTL	United_States	NAM
KITH				Y		Y		ITHACA_TOMPKINS_REGIONAL	United_States	NAM
KJCT				Y		Y		JUNCTION_KIMBLE_CO	United_States	NAM
KJHW				Y		Y		JAMESTOWN_CHAUTAUQUA_CO	United_States	NAM
KJKL				Y		Y		JACKSON_JULIAN_CARROLL	United_States	NAM
KJOT	Y					Y		JOLIET_REGIONAL	United_States	NAM
KLAF				Y		Y		LAFAYETTE/PURDUE_UNIV	United_States	NAM
KLFC				Y		Y		LUFKIN_ANGELINA_CO	United_States	NAM
KLGC	Y					Y		LA_GRANGE-CALLAWAY	United_States	NAM
KLGU				Y		Y		LOGAN-CACHE	United_States	NAM
KLND				Y		Y		LANDER	United_States	NAM
KLOT	Y					Y		CHICAGO/ROMEOVILLE_LEWIS_UNI.	United_States	NAM
KLSV				Y		Y		LAS_VEGAS/NELLIS_AFB	United_States	NAM
KLVS				Y		Y		LAS_VEGAS_MUNI	United_States	NAM
KLWB				Y		Y		LEWISBURG/GREENBRIER_VALLEY	United_States	NAM
KLWS				Y		Y		LEWISTON_NEZ_PERCE	United_States	NAM
KLWT				Y		Y		LEWISTOWN_MUNI	United_States	NAM
KMBG				Y		Y		MOBRIDGE_MUNI	United_States	NAM
KMCB				Y		Y		MC_COMB-PIKE_CO-JOHN_E_LEWIS	United_States	NAM
KMCE				Y		Y		MERCED_MUNI/MACREADY_FLD	United_States	NAM
KMCK				Y		Y		MC_COOK_MUNI	United_States	NAM
KMCW				Y		Y		MASON_CITY_MUNI	United_States	NAM
KMPV				Y		Y		EDWARD_F_KNAPP_STATE/BARRE	United_States	NAM
KMQB	Y					Y		MACOMB_MUNI	United_States	NAM
KMQY	Y					Y		SMYRNA	United_States	NAM
KMTJ				Y		Y		MONTROSE_REGIONAL	United_States	NAM
KMWA	Y					Y		MARION_WILLIAMSON_CO_REGIONAL	United_States	NAM
KMWH	Y			Y		Y		MOSES_LAKE/GRANT_COUNTY_INTL	United_States	NAM

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
KMYL				Y		Y		MC_CALL_MUNICIPAL	United_States	NAM
KOAJ				Y		Y		ALBERT_J_ELLIS_AIRPORT	United_States	NAM
KOFK				Y		Y		NORFOLK_KARL_STEFAN_MEMORIAL	United_States	NAM
KOLF	Y			Y		Y		WOLF_POINT_L_M_CLAYTON	United_States	NAM
KOLS	Y			Y		Y		NOGALES_INTL	United_States	NAM
KOLY	Y					Y		OLNEY-NOBLE	United_States	NAM
KONL	Y					Y		ONEILL_MUNI-JOHN_L_BAKER_FLD	United_States	NAM
KOPF	Y			Y		Y		OPA_LOCKA	United_States	NAM
KPBF				Y		Y		PINE_BLUFF_-_GRIDER_FLD	United_States	NAM
KPBG				Y		Y		PLATTSBURG_INTL_AIRPORT	United_States	NAM
KPDK	Y	Y		Y		Y		ATLANTA/DE_KALB-PEACHTREE	United_States	NAM
KPDT				Y		Y		PENDLETON_-_EASTERN_OREGON_REG	United_States	NAM
KPGA				Y		Y		PAGE_MUNI	United_States	NAM
KPHN	Y					Y		PORT_HURON_-_ST_CLAIRE_CO_INTL	United_States	NAM
KPNC				Y		Y		PONCA_CITY_RGNL	United_States	NAM
KPNE				Y		Y		NORTHEAST_PHILADELPHIA	United_States	NAM
KPNT	Y					Y		PONTIAC_MUNI	United_States	NAM
KPPQ	Y					Y		PITTSFIELD_PENSTONE_MUNI	United_States	NAM
KPRG	Y					Y		PARIS_-_EDGAR_COUNTY	United_States	NAM
KPSC				Y		Y		PASCO/TRI-CITIES	United_States	NAM
KPUW				Y		Y		PULLMAN/MOSCOW_RGNL	United_States	NAM
KPVU				Y		Y		PROVO_MUNI	United_States	NAM
KRDM	Y	Y		Y		Y		REDMOND/ROBERTS_FIELD	United_States	NAM
KRHI				Y		Y		RHINELANDER-ONEIDA_COUNTY	United_States	NAM
KRIL				Y		Y		GARFIELD_COUNTY_RGNL	United_States	NAM
KRIW				Y		Y		RIVERTON	United_States	NAM
KRME				Y		Y		GRIFFISS_AFLD	United_States	NAM
KRSL				Y		Y		RUSSELL_MUNI	United_States	NAM
KRVS				Y		Y		TULSA_-_RICHARD_LLOYD_JONES_JR	United_States	NAM
KRWF				Y		Y		REDWOOD_FALLS_MUNI	United_States	NAM
KRWL				Y		Y		RAWLINS	United_States	NAM
KSAF				Y		Y		SANTA_FE	United_States	NAM
KSAR	Y					Y		SPARTA_COMMUNITY_-_HUNTER_FLD	United_States	NAM
KSDY				Y		Y		SIDNEY-RICHLAND	United_States	NAM

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
KSGU				Y		Y		ST_GEORGE_MUNI	United_States	NAM
KSLE				Y		Y		SALEM_-_MCNARY_FIELD	United_States	NAM
KSLO	Y					Y		SALEM-LECKRONE_AIRPORT	United_States	NAM
KSMN				Y		Y		SALMON_-_LEMHI_COUNTY	United_States	NAM
KSNY				Y		Y		SIDNEY_MUNI/LLOYD_W._CARR_FLD	United_States	NAM
KSOW	Y					Y		SHOW_LOW_REGIONAL_AIRPORT	United_States	NAM
KSPS				Y		Y		WICHITA_FALLS/SHEPPARD_AFB	United_States	NAM
KSTS				Y		Y		SANTA_ROSA_/ _SONOMA_COUNTY	United_States	NAM
KSUN				Y		Y		HAILEY_-_FRIEDMAN_MEMORIAL	United_States	NAM
KTAZ	Y					Y		TAYLORVILLE_MUNI	United_States	NAM
KTIP	Y					Y		RANTOUL_AVN_CTR_FRANK_E._FIELD	United_States	NAM
KTMB	Y			Y		Y		MIAMI/TAMIAMI	United_States	NAM
KTOP				Y		Y		TOPEKA_-_PHILIP_BILLARD_MUNI	United_States	NAM
KTPH				Y		Y		TONOPAH	United_States	NAM
KTRK	Y			Y		Y		TRUCKEE-TAHOE	United_States	NAM
KTRM				Y		Y		DESERT_RESORTS_REGL,PALM_SPRGS	United_States	NAM
KTTD				Y		Y		PORTLAND/TROUTDALE	United_States	NAM
KTTS				Y		Y		TITUSVILLE/NASA_SHUTTLE_LDGFAC	United_States	NAM
KUDG	Y					Y		DARLINGTON_COUNTY_JETPORT	United_States	NAM
KUNV				Y		Y		UNIVERSITY_PARK/STATE_COLLEGE	United_States	NAM
KVEL				Y		Y		VERNAL	United_States	NAM
KVGT				Y		Y		NORTH_LAS_VEGAS	United_States	NAM
KVNY				Y		Y		VAN_NUYS_AIRPORT	United_States	NAM
KVTN				Y		Y		VALENTINE_/ _MILLER_FIELD	United_States	NAM
KVUJ	Y					Y		ALBEMARLE_/ _STANLEY_COUNTY	United_States	NAM
KVYS	Y					Y		PERU,_WALTER_A_DUNCAN_FLD	United_States	NAM
KWDR	Y					Y		WINDER-BARROW_AIRPORT	United_States	NAM
KWJF				Y		Y		LANCASTER,_GEN_WMJ_FOX_AIRFLD	United_States	NAM
KWMC				Y		Y		WINNEMUCCA	United_States	NAM
KXNA				Y		Y		FAYETTEVILLE_(SPRINGDALE)_AR	United_States	NAM
PAGS				Y		Y		GUSTAVUS	United_States	PAC
PAPG	Y			Y		Y		JOHNSON_PETERSBURG	United_States	PAC
PASY	Y					Y		SHEMYA/EARECKSON_AFS	United_States	PAC

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
PAWG	Y			Y		Y		WRANGELL	United_States	PAC
PFYU	Y					Y		FORT_YUKON	United_States	PAC
PHJR	Y			Y		Y		KAPOLEI/KALAELOA/JOHN_ROGERS	United_States	PAC
SBAA	Y					Y		CONCEICAO_DO_ARAGUAIA	Brazil	SAM
SBAF	Y					Y		RIO_DE_JANEIRO/AFONSOS	Brazil	SAM
SBAN	Y					Y		ANAPOLIS/BASE_AEREA	Brazil	SAM
SBAR	Y			Y		Y		ARACAJU/SANTA_MARIA	Brazil	SAM
SBAT	Y					Y		ALTA_FLORESTA	Brazil	SAM
SBBG	Y			Y		Y		BAGE_INTL/GUSTAVO_KRAEMER	Brazil	SAM
SBBH	Y					Y		BELO_HORIZONTE/PAMPULHA	Brazil	SAM
SBBI	Y					Y		CURITIBA/BACACHERI_PR	Brazil	SAM
SBBQ	Y					Y		BARBACENA	Brazil	SAM
SBBU	Y					Y		BAURU	Brazil	SAM
SBBW	Y					Y		BARRO_DO_GARCAS	Brazil	SAM
SBCB	Y			Y		Y		CABO_FRIO	Brazil	SAM
SBCC	Y					Y		NOVO_PROGRESSO/CACHIMBO	Brazil	SAM
SBCJ	Y			Y		Y		PARAUPEBAS/CARAJAS	Brazil	SAM
SBCO	Y					Y		PORTO_ALEGRE/CANOAS	Brazil	SAM
SBCP				Y		Y		CAMPOS_DOS_GOITACAZES/BART.LIS	Brazil	SAM
SBDN	Y					Y		PRESIDENTE_PRUDENTE	Brazil	SAM
SBEK	Y					Y		JACAREACANGA	Brazil	SAM
SBES	Y					Y		SAO_PEDRO_DA_ALDEIA	Brazil	SAM
SBFN	Y			Y		Y		FERNANDO_DE_NORONHA	Brazil	SAM
SBGO	Y			Y		Y		GOIANIA/SANTA_GENOVEVA	Brazil	SAM
SBGW	Y					Y		GUARATINGUETA	Brazil	SAM
SBHT	Y					Y		ALTAMIRA	Brazil	SAM
SBIH	Y					Y		ITAITUBA	Brazil	SAM
SBIL	Y					Y		ILHEUS	Brazil	SAM
SBIZ	Y					Y		IMPERATRIZ	Brazil	SAM
SBJF	Y					Y		JUIZ_DE_FORA/FRANCISC_DE_ASSIS	Brazil	SAM
SBJP	Y			Y		Y		JOAO_PESSOA/PRES_CASTRO_PINTO	Brazil	SAM
SBJR	Y					Y		RIO_DE_JANEIRO/JACAREPAGUA	Brazil	SAM
SBKG	Y					Y		CAMPINA_GRANDE/JOAO_SUASSUNA	Brazil	SAM
SBLO	Y			Y		Y		LONDRINA	Brazil	SAM

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
SBLP	Y					Y		BOM_JESU_DA_LAPA	Brazil	SAM
SBMA	Y			Y		Y		MARABA	Brazil	SAM
SBME	Y					Y		MACAE	Brazil	SAM
SBMK	Y					Y		MONTES_CLAROS/MARIO_RIBEIRO	Brazil	SAM
SBMN	Y			Y		Y		MANAUS/PONTA_PELADA	Brazil	SAM
SBMS	Y					Y		MOSSORO/DIX_SEPT_ROSADO	Brazil	SAM
SBMT	Y					Y		SAO_PAULO/MARTE	Brazil	SAM
SBNF				Y		Y		NAVEGANTES/MINIS_VICTOR_KONDER	Brazil	SAM
SBOI	Y			Y		Y		OIAPOQUE	Brazil	SAM
SBPB	Y			Y		Y		PARNAIBA	Brazil	SAM
SBPC	Y					Y		POCOS_DE_CALDAS	Brazil	SAM
SBPJ	Y					Y		PALMAS/TOCANTINS	Brazil	SAM
SBPK	Y			Y		Y		PELOTAS	Brazil	SAM
SBPL	Y			Y		Y		SENADOR_NILO_COELHO	Brazil	SAM
SBPN	Y					Y		PORTO_NATIONAL	Brazil	SAM
SBPS				Y		Y		PORTO_SEGURO	Brazil	SAM
SBPV	Y			Y		Y		PORTO_VELHO_INTL/GOV_J.T.DE_O.	Brazil	SAM
SBQV	Y					Y		VITORIA_DA_CONQUISTA	Brazil	SAM
SBRB	Y			Y		Y		RIO_BRANCO/PRESID_MEDICI_INTL	Brazil	SAM
SBRJ	Y			Y		Y		RIO_DE_JANEIRO/SANTOS_DUMONT	Brazil	SAM
SBRP	Y			Y		Y		RIBEIRAO_PRETO/LEITE_LOPES	Brazil	SAM
SBSC	Y					Y		RIO_DE_JANEIRO/SANTA_CRUZ	Brazil	SAM
SBSJ	Y			Y		Y		SAO_JOSE_DOS_CAMPOS	Brazil	SAM
SBSM	Y					Y		SANTA_MARIA	Brazil	SAM
SBSP	Y			Y		Y		SAO_PAULO/CONGONHAS	Brazil	SAM
SBST	Y					Y		GUARUJA/BASE_AEREA	Brazil	SAM
SBTE	Y			Y		Y		TERESINA/SENADOR_PETRONIO_PORT	Brazil	SAM
SBTF	Y			Y		Y		TEFE	Brazil	SAM
SBTK	Y					Y		TARAUACA	Brazil	SAM
SBTU	Y					Y		TUCURUI	Brazil	SAM
SBUF	Y					Y		PAULO_ALFONSO	Brazil	SAM
SBUL	Y					Y		UBERLANDIA	Brazil	SAM
SBUR	Y					Y		UBERABA	Brazil	SAM
SBVH	Y					Y		VILHENA	Brazil	SAM
SBVT	Y			Y		Y		VITORIA/GOIABEIRAS	Brazil	SAM

ICAO Location	SA	SP	FC	FT	FX	SUG	AOP	Name	State	Region
SBYS	Y					Y		PIRACUNUNGA/CAMPO_FONTENELLE	Brazil	SAM
SCAS	Y					Y		PUERTO_AYSEN/CABO1_JUAN_ROMAN	Chile	SAM
SCCH	Y					Y		CHILLAN/BERNARDO_OHIGGINS	Chile	SAM
SCGE	Y					Y		LOS_ANGELES/MARIA_DOLORES	Chile	SAM
SCGZ	Y					Y		PUERTO_WILLIAMS/GUARD.ZANARTU	Chile	SAM
SCTB	Y					Y		SANTIAGO/EULOGIO_SANCHEZ-TOBA.	Chile	SAM
SCVD	Y					Y		VALDIVIA/PICHOY	Chile	SAM
SKRH				Y		Y		RIOHACHA/ALMIRANTE_PADILLA	Colombia	SAM
SVAC	Y					Y		ACARIGUA	Venezuela	SAM
SVBI	Y					Y		BARINAS	Venezuela	SAM
SVBM	Y			Y		Y		BARQUISIMETO	Venezuela	SAM
SVBS	Y					Y		MARACAY/MARISCAL_SUCRE	Venezuela	SAM
SVCB	Y					Y		CIUDAD_BOLIVAR	Venezuela	SAM
SVCL	Y					Y		CALABOZO	Venezuela	SAM
SVCR	Y					Y		CORO	Venezuela	SAM
SVCS	Y					Y		CHARALLAVE	Venezuela	SAM
SVCU	Y					Y		CUMANA	Venezuela	SAM
SVGU	Y					Y		GUANARE	Venezuela	SAM
SVJM	Y					Y		SAN_JUAN_DE_LOS_MORROS	Venezuela	SAM
SVLF	Y					Y		LA_FRIA	Venezuela	SAM
SVMD	Y					Y		MERIDA	Venezuela	SAM
SVPA	Y					Y		PUERTO_AYACUCHO	Venezuela	SAM
SVPC	Y					Y		PUERTO_CABELLO	Venezuela	SAM
SVPR	Y					Y		GUAYANA/MANUEL_CARLOS_PIAR	Venezuela	SAM
SVSP	Y					Y		SAN_FELIPE	Venezuela	SAM
SVSR	Y					Y		SAN_FERNANDO_DE_APURE	Venezuela	SAM
SVSZ	Y					Y		SANTA_BARBARA	Venezuela	SAM
SVVG	Y					Y		EL_VIGIA/J.P.PEREZ_ALFONZO	Venezuela	SAM
SVVL	Y					Y		VALERA	Venezuela	SAM
SVVP	Y					Y		VALLE_DE_LA_PASCUA	Venezuela	SAM

APPENDIX G**AD HOC TEAM ON THE FUTURE OF THE SADIS SATELLITE
BROADCAST BEYOND 2015**

1. The following three options are to be considered by the ad hoc team for the service to be provided after 2015:
 - a) status quo (i.e. continuation of both the SADIS 2G satellite broadcast and Secure SADIS FTP service);
 - b) Secure SADIS FTP service only (i.e. discontinuation of the SADIS 2G satellite broadcast); and
 - c) alternative satellite or other solutions.
2. All the options are to be assessed by the ad hoc team; the assessment should include the associated:
 - a) implementation and delivery costs;
 - b) technical issues (e.g. reliability, timeliness, security);
 - c) need for the development of guidance material; and
 - d) roadmap with milestones covering the 5-year period May 2012- May 2017.
3. The deliverables of the ad hoc team are as follows (timelines in brackets):
 - a) study of the ad hoc working group (1 June 2011-31 January 2012);
 - b) initial assessment of the ad hoc group (28 February 2012); and
 - c) completion of the SADISOPSG/17 working paper (15 March 2012).

APPENDIX H

SADIS LONG-TERM PLAN FOR THE YEARS 2012-2016

<p><i>SADIS MILESTONES</i></p> <p><i>Note - Service(s) affected in brackets</i></p>	<p><i>SCOPE</i></p> <p><i>Major</i> <i>Minor</i></p>	<p><i>NATURE</i></p> <p><i>Hardware</i> <i>Software;</i> <i>P=SADIS provider</i> <i>U=SADIS user</i> <i>V=vendor</i></p>	<p><i>SADISOPSG</i> <i>meeting schedule</i></p> <p><i>(WAFSOPSG</i> <i>meeting schedule)</i></p>	<p><i>Applicability dates of</i> <i>ICAO Annex 3</i> <i>amendments</i></p>
<p>2012 to November 2013:</p> <p>SADIS user workstations upgraded to accept WAFS forecasts in the compressed GRIB2 code form (including processing and visualisation)</p> <p>{SADIS 2G and Secure SADIS FTP}</p>	Major	Hardware and software U		
<p>July 2012:</p> <p>WAFS forecasts in the GRIB2 code form prioritized over those in the GRIB1 code form;</p> <p>Provide a questionnaire to SADIS users seeking views on future requirements for SADIS services.</p> <p>{SADIS 2G and Secure SADIS FTP}</p>	Major	P, U	<p>May 2012: SADISOPSG/17</p> <p>September 2012: WAFSOPSG/7</p>	
<p>November 2012</p> <p>Cessation of the prevailing SADIS FTP Service.</p>	Major	Software U, V		
<p>May 2013:</p> <p>Determine future SADIS bandwidth and/or data transfer rate requirements based on expected future requirements, .i.e. changes in data volumes (reductions due to proposed cessation of transmission of WAFS forecasts in the GRIB1 code form; and increases due to OPMET data coded in XML, expected to be introduced as of 2016).</p> <p>{SADIS 2G}</p>	Major	Hardware and software P	May 2013: SADISOPSG/18	
<p>May 2013</p> <p>Based on results of the questionnaire on future requirements for SADIS services, establish a road map (with a timescale) concerning the change of the SADIS Service</p> <p>{SADIS 2G and SADIS FTP}</p>	Major	U		
<p>November 2013:</p> <p>Cessation of the transmission of WAFS upper-air forecasts in the GRIB 1 code form.</p>	Major	Software P,U		November 2013: Amendment 76

<p><i>SADIS MILESTONES</i></p> <p><i>Note - Service(s) affected in brackets</i></p>	<p><i>SCOPE</i></p> <p><i>Major</i> <i>Minor</i></p>	<p><i>NATURE</i></p> <p><i>Hardware</i> <i>Software;</i> <i>P=SADIS provider</i> <i>U=SADIS user</i> <i>V=vendor</i></p>	<p><i>SADISOPSG</i> <i>meeting schedule</i></p> <p><i>(WAFSOPSG</i> <i>meeting schedule)</i></p>	<p><i>Applicability dates of</i> <i>ICAO Annex 3</i> <i>amendments</i></p>
{SADIS 2G and SADIS FTP}				
<p>2014</p> <p>(None foreseen at this stage).</p>			<p>February 2014: WAFSOPSG/8</p> <p>May 2014: SADISOPSG/19</p>	<p>June 2014: Endorsement of Amendment 77 by the MET/AIM Divisional Meeting</p>
<p>2015</p> <p>Implementation of revisions to the SADIS service, including possible cessation of provision of data over SADIS 2G (in accordance with the road map established in May 2013).</p> <p>{SADIS 2G and SADIS FTP}</p>	Major	Hardware, software, P, V, U	<p>May 2015: SADISOPSG/20</p> <p>September 2015: WAFSOPSG/9</p>	
<p>2016</p> <p>(None foreseen at this stage).</p>	—	—	<p>May 2016: SADISOPSG/21</p>	<p>November 2016: Amendment 77</p>

BACKGROUND INFORMATION RELATED TO SADIS MILESTONES (2012-2016)

To assist workstation vendors and users alike to better understand the proposals outlined in this long-term plan, additional background information has been prepared by the SADIS Provider State:

1. Initially, the WAFS upper air forecasts (including those of icing, turbulence and CB clouds) in the GRIB2 code form were disseminated on the SADIS FTP service only. At the SADISOPSG/15 Meeting, it was agreed that forecasts in the GRIB2 code form will be provided in parallel with those in the GRIB1 code form on the SADIS 2G satellite broadcast (except for those related to icing, turbulence and CB clouds).
2. SADIS workstation vendors and flight planning systems will be afforded over 4 years of availability of GRIB2 data, in parallel with GRIB1 data, to develop systems that are capable of accepting, processing and visualizing WAFS forecasts in the GRIB2 code form. End-user systems would be expected to be upgraded to handle forecasts in the GRIB2 code form, before forecasts in the GRIB1 code form are withdrawn from all SADIS services.
3. Following endorsement by the SADISOPSG/14 Meeting, the SADIS Provider State has commenced development of a Secure SADIS FTP service that will benefit from dual server capability and enhanced security features. This new service will necessitate a re-configuration or upgrade of end user workstations, since pre-existing login credentials are not expected to work on the new server. The Secure SADIS FTP service was implemented in November 2010. Users will be afforded a parallel running period of the pre-existing and secure SADIS FTP services, to allow them to update their systems. Subject to endorsement by the SADISOPSG/16 Meeting, the legacy service will be withdrawn in November 2011 in view of the operational implementation of the Secure SADIS FTP service, including migration of users.
4. WAFSOPSG/5 Meeting (September 2009) resulted in requirement for continued development of the gridded forecasts for CB clouds, icing and turbulence before they could be considered operationally acceptable, and both WAFCs continue to progress this work. As a consequence, but also from the user's stated preferences, there was an ongoing requirement for SIGWX data to provided in a format similar to that provided currently, i.e. a simple two-dimensional schematic illustrating in an easy to digest form the SIGWX features to be encountered en route. As such, the proposed cessation of the format of the SIGWX BUFR/PNG formats is to be determined by the WAFSOPSG; pending this decision it has been deleted from the long term plan.

APPENDIX I

DELIVERABLES, EXECUTIVE SUMMARIES AND TASK TEAMS OF THE SADISOPSG
(Endorsed by the SADISOPSG/16 Meeting (2011))

<i>Task number</i>	<i>Short-Name</i>	<i>Description</i>	<i>Source of task</i>
SADISOPSG-01	01-SADIS management report	Issuance of satellite distribution system for information relating to air navigation (SADIS) management report, every 12 months, 10 weeks before each SADISOPSG meeting	SADISOPSG 2/3 b)
SADISOPSG-02	02-operational efficacy statement	Issuance of an operational efficacy statement at every SADISOPSG meeting	SADISOPSG 1/4
SADISOPSG-03	03-updated SADIS inventory	Update of the SADIS inventory at every SADISOPSG meeting	SADISOPSG 1/8
SADISOPSG-04	04-updated SADIS broadcast content, schedule and priorities	Update of SADIS broadcast content, schedule and priorities, as necessary, contained in Annexes 1 and 4 to the <i>SADIS User Guide</i>	143-5; 149/18 (TOR)
SADISOPSG-05	05-impact of the introduction of OPMET data in table-driven codes	assessment of the potential impact of the introduction of METAR/SPECI and TAF in table-driven codes on the SADIS gateway operations	SADISOPSG 9/13
SADISOPSG-06	06-technological developments having an impact on the SADIS	preparation of a report on technological developments having an impact on the SADIS to be presented at every SADISOPSG meeting	SADISOPSG 3/13
SADISOPSG-07	07-updated SADIS long-term plan	update to the SADIS 5-year long-term plan at every SADISOPSG meeting	APANPIRG 16/40; SADISOPSG 11/22
SADISOPSG-08	08-up-to-date SADIS User Guide	updates to the <i>SADIS User Guide</i> , as necessary, to ensure its compatibility with the evolving SADIS	EANPG 37/20

SADISOPSG EXECUTIVE SUMMARIES OF RECURRENT TASKS

SADISOPSG Deliverables No. 1, 2, 3 and 7: Implementation and operation of SADIS

Task: Routine issuance of annual management report, operational clearance and update of SADIS inventory for submission to SCRAG.

Source: SCRAG

Coordination: SCRAG, WAFC London

Output: Annual management report by the Provider State
Annual statement of SADIS operational efficacy by the SADISOPSG Operational Efficacy Assessment Team
Annual amendment to the SADIS Inventory by the SADIS Provider State
Annual amendment to the long-term plan

Progress: 1995/1996 operational clearance and inventory issued by SADISOPSG/1
1996/1997 operational clearance and updated inventory issued by SADISOPSG/2
1997/1998 operational clearance and inventory issued by SADISOPSG/3
1998/1999 operational clearance and inventory issued by SADISOPSG/4
1999/2000 operational clearance and inventory issued by SADISOPSG/5
2000/2001 operational clearance and inventory issued by SADISOPSG/6
2001/2002 operational clearance and inventory issued by SADISOPSG/7
2002/2003 operational clearance and inventory issued by SADISOPSG/8
2003/2004 operational clearance and inventory issued by SADISOPSG/9
2004/2005 operational clearance and inventory issued by SADISOPSG/10
2005/2006 operational clearance and inventory issued by SADISOPSG/11
2006/2007 operational clearance and inventory issued by SADISOPSG/12
2007/2008 operational clearance and inventory issued by SADISOPSG/13
2008/2009 operational clearance and inventory issued by SADISOPSG/14
2009/2010 operational clearance and inventory issued by SADISOPSG/15
2010/2011 operational clearance and inventory issued by SADISOPSG/16

References: SADISOPSG/1 Conclusions 1/6 and 1/8
SADISOPSG/2 Conclusions 2/2, 2/3 and 2/5
SADISOPSG/3 Conclusion 3/7
SADISOPSG/4 Conclusions 4/5 and 4/6
SADISOPSG/5 Conclusions 5/5 and 5/7
SADISOPSG/6 Conclusions 6/5 and 6/6
SADISOPSG/7 Conclusions 7/4 and 7/5
SADISOPSG/8 Conclusions 8/4 and 8/5
SADISOPSG/9 Conclusions 9/6 and 9/7
SADISOPSG/10 Conclusions 10/6 and 10/7
SADISOPSG/11 Conclusions 11/5 and 11/6
SADISOPSG/12 Conclusions 12/4 and 12/5
SADISOPSG/13 Conclusions 13/4, 13/5 and Decision 13/21
SADISOPSG/14 Conclusions 14/4, 14/5, 14/7, 14/8 and Decisions 14/6, 14/20
SADISOPSG/15 Conclusions 15/4, 15/5, 15/21, 15/22 and Decisions 15/3, 15/20
SADISOPSG/16 Conclusions 16/4 and 16/5, and Decisions 16/3 and 16/17

Group responsible: SADISOPSG Operational Efficacy Assessment Team
Rapporteur: Chris Tyson

SADISOPSG Deliverables No. 4 and 5: Development, maintenance and monitoring of the SADIS broadcast content, schedule and priorities

- Task:** The content of the SADIS broadcast has to be developed, maintained, and monitored, in line with operational requirements developed by the ICAO planning and implementation regional groups. The broadcast has to be backed-up, as necessary, by the SADIS Provider State. The flow of OPMET traffic must be organized to ensure smooth and reliable transit through the SADIS gateway to the SADIS node for uplink on the broadcast. Assess the potential impact of the introduction of table-driven codes on the SADIS gateway operations.
- Source:** SADISOPSG terms of reference; SADIS Gateway High-Level Technical Requirements (paragraph 3.4)
- Coordination:** MET and CNS/MET sub-groups of APANPIRG, APIRG, EANPG and MIDANPIRG; EUR OPMET DMG; WAFCS London and Washington; WAFSOPSG and IAVWOPSG, as necessary
- Output:** Up-to-date annexes to the *SADIS User Guide* placed on the ICAO SADISOPSG website; Technical requirements kept up-to-date in the *SADIS Gateway Operations Handbook*
- Progress:** OPMET information and WAFS forecasts to be included on the SADIS broadcast incorporated in Annexes 1 and 4 of the *SADIS User Guide*, respectively. The actual content of broadcast is indicated in Annexes 2 and 3 (based on the input from the EUR OPMET DMG).
- References:** SADISOPSG/1 paragraphs 9.1 to 9.14
SADISOPSG/3 paragraph 5.4, Conclusion 3/15
SADISOPSG/4 paragraphs 3.1 to 3.6, Conclusion 4/8
SADISOPSG/5 paragraphs 3.7 to 3.9, Conclusion 5/9
SADISOPSG/6 paragraphs 3.2 to 3.13, Conclusions 6/8 and 6/9
SADISOPSG/7 paragraphs 3.1 to 3.11, Conclusions 7/6, 7/8 and 7/9
SADISOPSG/8 Conclusions 8/6, 8/7, 8/8 and 8/9
SADISOPSG/9 Conclusions 9/8, 9/9, 9/10 and Decision 9/11
SADISOPSG/10 Conclusions 10/8, 10/9, 10/10 and Decision 10/11
SADISOPSG/11 Conclusions 11/8, 11/9, 11/10, 11/12 and Decision 11/11
SADISOPSG/12 Conclusions 12/7, 12/8 and Decisions 12/6, 12/9 and 12/10
SADISOPSG/13 Conclusions 13/6, 13/7, 13/9, 13/10 and Decisions 13/8 and 13/11
SADISOPSG/14 Conclusions 14/10, 14/11, 14/12 and Decision 14/13
SADISOPSG/15 Conclusions 15/6, 15/7, 15/8 and 15/9
SADISOPSG/16 Conclusions 16/7 and 16/9, and Decisions 16/6 and 16/8

SADISOPSG Deliverable No. 6: Technological Developments

- Task:** Monitor, report on and propose action on technological developments having an impact on the SADIS.
- Source:** SADISOPSG terms of reference
- Coordination:** SCRAG
- Output:** Annual reports to SADISOPSG
- Progress:** SADISOPSG/4: Study of possible TPC/IP output part on SADIS VSATs;
SADISOPSG/7: Assessment of the SADIS second-generation broadcast (SADIS 2G) using a combination of a new-type modulation and new receiving equipment;
SADISOPSG/8: Development of the operational concept for the second-generation SADIS two-way system based on approved VSAT technology studied; however, implementation not pursued due to the lack of a clear operational requirement.
- References:** SADISOPSG/3 Decision 3/14 and Appendix I
SADISOPSG/4 Decision 4/12 and Appendix J; Conclusion 4/13
SADISOPSG/5 paragraph 4.3
SADISOPSG/6 paragraph 4.18
SADISOPSG/7 paragraphs 4.23 and 4.24, Conclusion 7/14
SADISOPSG/8 paragraphs 4.11.5 to 4.11.11, Decision 8/14
SADISOPSG/9 paragraphs 5.4.1 to 5.4.5, Conclusion 9/15
SADISOPSG/10 paragraph 5.3.1
SADISOPSG/11 paragraphs 6.3.1 to 6.3.3
SADISOPSG/12 paragraphs 6.3.1 to 6.3.3
SADISOPSG/13 paragraphs 6.3.1 to 6.3.7; Conclusions 13/16 and 13/17
SADISOPSG/14 paragraphs 6.3.1 to 6.3.9; Conclusions 14/16 and 14/17
SADISOPSG/15 paragraphs 6.3.1 to 6.3.14; Conclusions 15/12, 15/13, 15/14 and Decisions 15/15 and 15/16
SADISOPSG/16 paragraphs 6.3.1 to 6.3.7; Conclusions 16/12 and 16/13
- Group responsible:** SADISOPSG Technological Developments Team
Rapporteur: Bernd Richter

SADISOPSG Deliverable No. 8: SADIS User Guide

- Task:** Maintain, update and extend, as necessary, *SADIS User Guide*.
- Source:** EANPG Conclusion 37/20; METG/5 paragraph 5.27
- Coordination:** NIL
- Output:** *SADIS User Guide* and amendments thereto, as necessary
- Progress:** Guide available from the SADISOPSG website only; the second, third and fourth editions issued in 2001, 2004 and 2008, respectively.
- References:**
- SADISOPSG/1 Decision 1/11
 - SADISOPSG/2 Decision 2/15.
 - SADISOPSG/3 Decision 3/15
 - SADISOPSG/4 Decision 4/1, Conclusions 4/2 and 4/17 and Appendix E
 - SADISOPSG/5 paragraphs 5.1 to 5.3
 - SADISOPSG/6 paragraphs 5.1 to 5.5
 - SADISOPSG/7 paragraphs 5.1 to 5.5
 - SADISOPSG/8 Conclusions 8/6, 8/9 and 8/18
 - SADISOPSG/9 Conclusion 9/22
 - SADISOPSG/10 Conclusion 10/20
 - SADISOPSG/11 paragraphs 7.1.1 to 7.1.3
 - SADISOPSG/12 Conclusion 12/23
 - SADISOPSG/13 Decision 13/22
 - SADISOPSG/14 Decision 14/21
 - SADISOPSG/15, Decision 15/23
 - SADISOPSG/16, Decision 16/18

SADISOPSG TASK TEAMS**SADISOPSG TECHNICAL DEVELOPMENTS TEAM****COMPOSITION**

Germany, Netherlands, Switzerland, United Kingdom, United States, ASECNA and IATA

TASKS

- evaluate options for technological development in respect of the technical and financial impacts;
- coordinate any funded study/evaluation, if approved by SCRAG; and
- report on its activities to the SADISOPSG on an annual basis.

Rapporteur: Bernd Richter

SADISOPSG OPERATIONAL EFFICACY ASSESSMENT TEAM

COMPOSITION

Chairman of the SADISOPSG, *ex-officio* Member from the EUR OPMET DMG and United Kingdom

TASKS

- analyse the completed questionnaires returned by States related to the operational efficacy of the SADIS broadcast; and
- report back to the SADISOPSG on an annual basis

Rapporteur: Chris Tyson

APPENDIX J

**PROPOSED UPDATE OF THE SADIS WORKSTATION SOFTWARE EVALUATION
CRITERIA (ROUND 4, 2011/2012)**

SADIS Workstation Software Evaluation (4th Round, 2011/2012)

Workstation provider: ...
 Software application: ...
 Software Version No. (Release date): ...
 Evaluation date: ...
 Evaluation location: ...
 Evaluator: ...

Software Functionality	Available and Compliant?			Comments
	SADIS 2G ✓/✗	SADIS FTP ✓/✗	SADIS FTP ✓/✗	
1. Display of OPMET data and other data types in text format				
2. WAFS GRIB1 decoder and compliant display package				
3. WAFS GRIB2 decoder and compliant display package				
4. WAFS SWH and SWM BUFR decoder and compliant display package				
5. Display and ability to prompt users of the arrival of BUFR SIGWX or PNG SIGWX chart corrections				
6. Display and ability to prompt users of the arrival of SADIS administrative messages				
7. Display of tropical cyclone advisory statements				

Software Functionality	Available and Compliant?			Comments
	SADIS 2G √/X	SADIS FTP √/X	SADIS FTP √/X	
8. Display of tropical cyclone advisory graphics				
9. Display of volcanic ash advisory statements				
10. Display of volcanic ash graphics				
11. Display bulletin contents from the WMO header				
12. Display of special AIREPS				
13. Display of WAFS SIGWX charts in the PNG (portable network graphics) chart format.				
14. Processes Digital Signature and Digital Certificate to check authenticity and integrity of Secure SADIS FTP data.	N/A	N/A		

Note. – Please refer to the accompanying notes that detail the requirements and whether the functionality was **COMPLIANT** or **NON-COMPLIANT** at time of evaluation. **Requirements**

The numbers of the notes below correspond to the numbers of the 14 items listed in the table above. For a software package to receive a **√** or **COMPLIANT** as opposed to **X** or **NON-COMPLIANT** in the Available and compliant column on the table, all of the functions detailed below need to be satisfied for each functionality item.

For every workstation provider agrees for their software to be tested under these criteria, our intention is to make the information available to all existing and prospective SADIS users via the SADIS web page at URL: <http://www.metoffice.gov.uk/aviation/sadis/software>.

Ability for the data to be sourced from SADIS 2G and Secure SADIS FTP

1. i) The ability to receive and display OPMET data and other data types in text format (including TAFs, METARs, SPECIs, SIGMETs, EUR region AIRMETs and GAMETs, and ASHTAMs and NOTAMs related to volcanic ash);

Objective 1: Demonstrate retrieval of all TAFs from each of the following regions; CARSAM, NACC, EUR/NAT, MID, APAC; using SADIS User Guide Annex 1 for ICAO Location IDs. Retrieval of 20 random TAFs from each of the regions above as directed by the SADIS Manager during the evaluation will also be required. [COMPLIANT/NON-COMPLIANT]

Objective 2: Demonstrate retrieval of all METARs from each of the following regions; CARSAM, NACC, EUR/NAT, MID, APAC; using SADIS User Guide Annex 1 for ICAO Location IDs. Retrieval of 20 random METARs from each of the regions above as directed by the SADIS Manager during the evaluation will also be required. [COMPLIANT/NON-COMPLIANT]

Objective 3: Demonstrate retrieval of SPECIs from each of the following regions; CARSAM, NACC, EUR/NAT, MID, APAC. [COMPLIANT/NON-COMPLIANT]

Objective 4: Demonstrate retrieval of valid SIGMETs from each of the following regions; CARSAM, NACC, EUR/NAT, MID, APAC. [COMPLIANT/NON-COMPLIANT]

Objective 5: Demonstrate retrieval of valid AIRMETs from EUR region. [COMPLIANT/NON-COMPLIANT]

Objective 6: Demonstrate retrieval of valid GAMETs from EUR region. [COMPLIANT/NON-COMPLIANT]

Objective 7: Demonstrate retrieval of valid ASHTAM and NOTAMS relating to volcanic ash.¹ [COMPLIANT/NON-COMPLIANT]

- ii) Prompt users of the arrival of a SIGMET, SPECI, ASHTAM and NOTAM related to volcanic ash.

Objective 1: Demonstrate alerts of received SIGMETs. [COMPLIANT/NON-COMPLIANT]

Objective 2: Demonstrate alerts of received SPECIs. [COMPLIANT/NON-COMPLIANT]

Objective 3: Demonstrate alerts of received ASHTAM and NOTAMS relating to volcanic ash.² [COMPLIANT/NON-COMPLIANT]

¹ It is acknowledged that there may be no available bulletins in which to demonstrate this. Self certification is acceptable.

² It is acknowledged that there may be no available bulletins in which to demonstrate this. Self certification is acceptable.

2. i) The functionality to enable a user to produce a wind-temperature chart from the GRIB1 data over a configurable user-specified area. Global coverage is required. The ability to produce charts spanning the International Date Line and including all of the standard ICAO areas³ is required.

Objective 1: Demonstrate display of wind/temperature chart from WAFC London GRIB1 data. Display examples of for a sample of different levels (at least 5) and different timesteps (at least 3).

[COMPLIANT/NON-COMPLIANT]

Objective 2: Indicate to user if wind data is thinned to 5 degrees, 2.5 degrees, or is 1.25 degrees.

[COMPLIANT/NON-COMPLIANT]

- ii) A “zooming facility” for GRIB1 chart areas.

Objective 1: Indicate to user if wind data is thinned to 5 degrees, 2.5 degrees, or is 1.25 degrees.

[COMPLIANT/NON-COMPLIANT]

Objective 2: Document at what zoom settings 2.5 degree and 1.25 degree data will be displayed.

[COMPLIANT/NON-COMPLIANT]

(objectives 1 and 2 are intended to inform user that more, relevant wind datas may be revealed at higher levels of zoom)

- iii) The ability to produce a wind-temperature chart from GRIB1 encoded data that is largely identical as far as layout is concerned to the wind and temperature example chart contained in Appendix 1 of Amendment 75 to ICAO Annex 3. The product must clearly display whether the chart is derived from the WAFC London or WAFC Washington GRIB1 encoded data and additionally include the provider of the GRIB encoded data⁴.

Objective 1: Dependent upon level of zoom, screen/print quality, higher resolution than the 5 degree spacing as indicated in Annex 3 is permissible/encouraged. Indicate to user if wind data is thinned to 5 degrees, 2.5 degrees, or is 1.25 degrees. [COMPLIANT/NON-COMPLIANT]

Objective 2: Demonstrate that the product identifies whether the chart is derived from the WAFC London or WAFC Washington GRIB1 encoded data. [COMPLIANT/NON-COMPLIANT]

3. i) The functionality to enable a user to produce a wind-temperature chart from the GRIB2 data over a configurable user-specified area. Global coverage is required. The ability to produce charts spanning the International Date Line and including all of the standard ICAO areas⁵ is required.

Objective 1: Demonstrate display of wind/temperature chart from WAFC London GRIB2 data. Display examples of for a sample of different levels (at least 5) and different timesteps (at least 3).

³ A, B, B1, C, D, E, F, G, H, I, J, K, M, NAT, EUR, MID, SOUTH ASIA

⁴ Provider is a requirement of Amendment 75.

⁵ A, B, B1, C, D, E, F, G, H, I, J, K, M, NAT, EUR, MID, SOUTH ASIA

[COMPLIANT] ~~NON-COMPLIANT~~

Objective 2: Indicate to user if wind data is thinned to 5 degrees, 2.5 degrees, or is 1.25 degrees.

[COMPLIANT] ~~NON-COMPLIANT~~

ii) A “zooming facility” for GRIB2 chart areas.

Objective 1: Indicate to user if wind data is thinned to 5 degrees, 2.5 degrees, or is 1.25 degrees.

[COMPLIANT] ~~NON-COMPLIANT~~

Objective 2: Document at what zoom settings 2.5 degree and 1.25 degree data will be displayed.

[COMPLIANT] ~~NON-COMPLIANT~~

(objectives 1 and 2 are intended to inform user that more, relevant wind datas may be revealed at higher levels of zoom)

iii) The ability to produce a wind-temperature chart from GRIB2 encoded data that is largely identical as far as layout is concerned to the wind and temperature example chart contained in Appendix 1 of Amendment 75 to ICAO Annex 3. The product must clearly display whether the chart is derived from the WAFC London or WAFC Washington GRIB2 encoded data and additionally include the provider of the GRIB2 encoded data⁶.

Objective 1: Dependent upon level of zoom, screen/print quality, higher resolution than the 5 degree spacing as indicated in Annex 3 is permissible/encouraged. Indicate to user if wind data is thinned to 5 degrees, 2.5 degrees, or is 1.25 degrees. [COMPLIANT] ~~NON-COMPLIANT~~

Objective 2: Demonstrate that the product identifies whether the chart is derived from the WAFC London or WAFC Washington GRIB encoded data. [COMPLIANT] ~~NON-COMPLIANT~~

iv) The functionality to enable a user to produce a wind-temperature chart from the GRIB2 data over a configurable user-specified area. Global coverage is required. The ability to produce charts spanning the International Date Line and including all of the standard ICAO areas⁷ is required.

Objective 1: Demonstrate display of wind/temperature chart from WAFC London GRIB2 data. Display examples of for a sample of different levels (at least 5) and different timesteps (at least 3).

[COMPLIANT] ~~NON-COMPLIANT~~

Objective 2: Indicate to user if wind data is thinned to 5 degrees, 2.5 degrees, or is 1.25 degrees.

[COMPLIANT] ~~NON-COMPLIANT~~

⁶ Provider is a requirement of Amendment 75.

⁷ A, B, B1, C, D, E, F, G, H, I, J, K, M, NAT, EUR, MID, SOUTH ASIA

4. i) The functionality to enable a user to produce a SWH and a SWM SIGWX chart from BUFR data over a configurable user-specified area. Global coverage for the SWH data is required. The ability to produce charts spanning the International Date Line and covering all of the standard ICAO areas⁸ is required for the SWH data.

Objective 1: Demonstrate display of WAFC London SIGWX BUFR data over 3 previously defined, custom areas. Areas are at discretion of Software provider, but should demonstrate the extremes of useable zoom settings, and one should cross the international dateline. **COMPLIANT/NON-COMPLIANT**

Objective 2: Demonstrate display of WAFC Washington SIGWX BUFR data over 3 previously defined, custom areas. Areas are at discretion of Software provider, but should demonstrate the extremes of useable zoom settings, and one should cross the international dateline. **COMPLIANT/NON-COMPLIANT**

Objective 3: Demonstrate how areas of the globe not covered by SWM SIGWX BUFR forecast data are indicated to the user (i.e. how does the user know there is no information?). **COMPLIANT/NON-COMPLIANT**

Objective 4: Demonstrate how user configurable areas are created. **COMPLIANT/NON-COMPLIANT**

Objective 5: Demonstrate and provide hard copies of all SIGWX Charts for all ICAO Areas (excepting Area L). **COMPLIANT/NON-COMPLIANT**

- ii) A “zooming facility” for BUFR chart areas.

Objective 1: Demonstrate the limits of zoom for SIGWX charts generated from SIGWX BUFR. **COMPLIANT/NON-COMPLIANT**

- iii) The ability to produce a SIGWX chart from BUFR encoded data that is *identical* as far as the meteorological content is concerned (including depiction of non-CB cloud areas and jetstream depth notation), *identical* as far as the chart legend⁹ box text, and *largely identical* as far as other features are concerned (e.g. the position of text boxes), to a standard portable network graphics (PNG) SIGWX chart for the same area and meets the latest ICAO Annex 3 requirements. The product must clearly display whether the chart is derived from WAFC London or WAFC Washington BUFR encoded data, and the provider¹⁰ of the data. If the software allows the user to modify any of the plotted meteorological parameters, reference to either WAFC *must* be automatically removed if such modification is carried out by the end user.

Objective 1: Provide for close scrutiny and comparison with equivalent WAFC generated PNG forecasts, the system’s own ICAO Chart areas as generated from WAFC SIGWX BUFR. All ICAO areas must be provided, selecting from 2 validity times. To be compliant, the system’s own SIGWX

⁸ A, B, B1, C, D, E, F, G, H, I, J, K, M, NAT, EUR, MID, SOUTH ASIA

⁹ Note requirement to include ‘Provider’ information as per Amendment 75

¹⁰ Required in Amendment 75

charts must be identical in meteorological content to that of the WAFCs PNG charts.

[COMPLIANT/NON-COMPLIANT]

Objective 2: Text box/arrow head placement must lead to an unambiguous indication to users (including dispatchers and aircrew) of the meteorological situation¹¹. [COMPLIANT/NON-COMPLIANT]

Objective 3: The product must clearly display whether the chart is derived from WAFC London or WAFC Washington BUFR encoded data, and the 'Provider' of the data. [COMPLIANT/NON-COMPLIANT]

Objective 4: Demonstrate that if the software allows the user to modify any of the plotted meteorological parameters, reference to either WAFC *must* be automatically removed if such modification is carried out by the end user. [COMPLIANT/NON-COMPLIANT]

iv) The ability to handle BUFR bulletins that contain no data – i.e. bulletins that are empty apart from message header information. In particular, this applies to the BUFR bulletins associated with surface fronts, namely:

JUFE00 EGRR, JUFE00 KKCI, JUJE00 EGRR; and JUJE00 KKCI.

Objective 1: Demonstrate that BUFR bulletins that contain no data do not cause a failure of the display of SIGWX. [COMPLIANT/NON-COMPLIANT]

5. i) The ability to receive, prompt users and display the arrival of WAFS SIGWX corrections. These corrections are text messages issued with the following WMO header: FXUK65 EGRR for BUFR-code and/or PNG SIGWX chart corrections¹².

Objective 1: Demonstrate that the user is alerted to FXUK65 EGRR and FXUS65 EGRR messages. (WAFC London can transmit 'TEST' FXUK65 EGRR messages to assist demonstration of this objective). [COMPLIANT/NON-COMPLIANT]

6. i) The ability to receive, display and prompt users of the arrival of SADIS administrative messages. These are text messages issued with the following WMO headers:

NOUK10¹³ EGRR; NOUK11 EGRR; NOUK12 EGRR; NOUK13 EGRR; NOUK31 EGGY; and NOBX99 EBBR

¹¹ It is essential that dispatchers and aircrew can quickly and unambiguously understand the meteorological situation from the charts.

¹² It is possible to arrange for a 'TEST' FXUK65 EGRR message to be transmitted during the real-time evaluation. Additionally, any screenshot or other evidence of the system receiving, notifying and displaying such messages will be useful.

Objective 1: Demonstrate that the user is alerted to NOUK10 EGRR messages. (WAFc London can transmit 'TEST' NOUK10 EGRR messages to assist demonstration of this objective).

[COMPLIANT/NON-COMPLIANT]

7. 1) The ability to receive, display and prompt users of the arrival of tropical cyclone advisory statements. These bulletins are in text format and are of the form FK**** CCCC.¹⁴

Objective 1: Demonstrate that the user is alerted to FK**** CCCC messages. [COMPLIANT/NON-COMPLIANT]

8. 2) The ability to receive, display and prompt users of the arrival of tropical cyclone advisory graphics. These bulletins are in PNG format and are of the form T₁T₂A₁A₂ii¹⁵ CCCC.¹⁶

Objective 1: Demonstrate that the user is alerted to T₁T₂A₁A₂ii CCCC messages relating to tropical cyclone advisory graphics. [COMPLIANT/NON-COMPLIANT]

9. i) The ability to receive, display and prompt users of the arrival of volcanic ash advisory statements. These bulletins are in text format, and the WMO headers of those currently available for dissemination of SADIS are listed below. These bulletin headers are of the form FV**** CCCC¹⁷.

FVAK(20-25) PAWU; FVXX(01-03) EGRR; FVXX05 EGRR; FVXX(20-27) KNES;
FVXX(01-05) LFPW; FVFE01 RJTD; FVCN(01-04) CWAO; FVAU(01-10) ADRM;
FVAG01 SBAM; and FVPS01 NZKL.

Objective 1: Demonstrate that the user is alerted to the above messages. (WAFc London can transmit 'TEST' FVXX05 EGRR messages to assist demonstration of this objective). [COMPLIANT/NON-COMPLIANT]

10. i) The ability to receive and display volcanic ash graphics (VAG). These graphical charts are in standard T4 format or PNG chart format (as available). The products that may be available for dissemination on SADIS have the following WMO headers:

PFXB00 CWAO; PFXD00 CWAO; PFXG00 CWAO; PFXI00 CWAO; PHBE10 KWBC; and

¹³ It is possible to arrange for a 'TEST' NOUK10 message to be transmitted during the real-time evaluation. Additionally, any screenshot or other evidence of the system receiving, notifying and displaying NOUK10s and other messages listed will be useful.

¹⁴ Prior to Evaluation, as much evidence of receipt, notification and display (screenshots, or other evidence) should be collected to demonstrate such messages are dealt with appropriately

¹⁵ Currently, there is only one known TCAC issuing Tropical Cyclone Advisories in graphical form. La Reunion uses PZXD0(1-4) FMEE.

¹⁶ Prior to Evaluation, as much evidence of receipt, notification and display (screenshots, or other evidence) should be collected to demonstrate such messages are dealt with appropriately

¹⁷ Prior to Evaluation, as much evidence of receipt, notification and display (screenshots, or other evidence) should be collected to demonstrate such messages are dealt with appropriately

PHBI10 KWBC¹⁸.

PFXD(01-10) ADRM; PFXD(01-03) EGRR; PFXD05 EGRR; PFXD(20-27) KNES;
PFXD(05-09) LFPW.

Objective 1: Demonstrate that the user is alerted to the above messages. (W AFC London can transmit 'TEST' PFXD(01-03) EGRR messages to assist demonstration of this objective).

[COMPLIANT/NON-COMPLIANT]

11. i) The functionality to enable a user to display the contents of a single bulletin (including all types of bulletins except GRIB and BUFR encoded bulletins) by typing in the WMO header of the bulletin.

Objective 1: Demonstrate retrieval of at least 20 bulletins covering a range of bulletin types.

[COMPLIANT/NON-COMPLIANT]

12. i) The ability to receive, display and prompt users of the arrival of special AIREPS. These bulletins are in text format, and the WMO headers of the bulletins currently available for dissemination on SADIS are listed below. The bulletins are of the form UA**** XXXX.¹⁹

UANT90 EGRR and UAU90 EGRR

Objective 1: Demonstrate that the user is alerted to the above messages. (W AFC London can transmit 'TEST' UAU90 EGRR messages to assist demonstration of this objective).

[COMPLIANT/NON-COMPLIANT]

13. i) The ability to receive WAFS SIGWX charts in the PNG (portable network graphics) chart format and display them using standard visualisation software, e.g. web browser.

Objective 1: Demonstrate the display and provision in hard copy form of the PNG format SIGWX Charts. Demonstrate for at least 5 ICAO Areas (including at least 2 SWM), for at least 2 different validity times. [COMPLIANT/NON-COMPLIANT]

14. i) To correctly process files and Digital Certificate/Digital Signatures in order to check authenticity and integrity of data downloaded from Secure SADIS FTP.

Objective 1: Demonstrate that the Digital Certificate is checked, and relevant details are available for authenticity checks. [COMPLIANT/NON-COMPLIANT]

Objective 2: Demonstrate that the system can deal with a change of Digital Certificate.

¹⁸ Prior to Evaluation, as much evidence of receipt, notification and display (screenshots, or other evidence) should be collected to demonstrate such messages are dealt with appropriately

¹⁹ Prior to Evaluation, as much evidence of receipt, notification and display (screenshots, or other evidence) should be collected to demonstrate such messages are dealt with appropriately

[COMPLIANT/NON-COMPLIANT]

Objective 3: Demonstrate how a user is alerted to a failure of processing the Digital Certificate, and the options available to the user with regard to continuing to accept data. [COMPLIANT/NON-COMPLIANT]

Objective 4: Demonstrate how user responses to Objective 3 are logged and stored. [COMPLIANT/NON-COMPLIANT]

Objective 5: Demonstrate that the Digital Signature is appropriately handled/processed with the relevant file to prove that there has been no corruption/tampering. [COMPLIANT/NON-COMPLIANT]

Objective 6: Demonstrate how a user is alerted to a failure to confirm that a file has not been corrupted/tampered with, and the options available to the user with regard to continuing to accept data. [COMPLIANT/NON-COMPLIANT]

Objective 7: Demonstrate how user responses to Objective 6 are logged and stored. [COMPLIANT/NON-COMPLIANT]

Objective 8: Explain the 're-try/re-poll' policy, should initial attempts at re-loading Digital Certificates/Digital Signatures produce fails²⁰. [COMPLIANT/NON-COMPLIANT]

²⁰ This is required to deal with rare occasions where there may be a small delay in the availability of the Digital Signatures after the relevant and equivalent data file has been delivered.

APPENDIX K

PROPOSED AGREEMENT BETWEEN SADIS PROVIDER AND SADIS WORKSTATION SOFTWARE PROVIDERS, RELATING TO THE EVALUATION OF SADIS WORKSTATION SOFTWARE

Evaluation Options:

1) Provision (by the SADIS workstation software provider) of a laptop (to be returned of course) pre-loaded with the software to be evaluated, and sample data installed.

This will allow the SADIS Provider to use the software to evaluate what the system can do.

The laptop might be couriered, or if preferred a staff representative (of the workstation vendor) could attend to demonstrate the system. (note, it is regretted that the SADIS Provider's IT Security Restrictions would prevent connection of non Met Office laptop to any of our systems or the internet that would provide access to live SADIS data).

2) Completion by the SADIS workstation software provider of a self-evaluation/self-certification form, supported by the evidence of screenshots and hard copy printouts of charts/logs demonstrating compliance.

To do this, a date and time period will be agreed from which the workstation software supplier should demonstrate the necessary functions by provision of screenshots, logs, hard copy, and sufficient explanatory text to show that their systems meet the evaluation requirements. The SADIS Provider will review against equivalent data in order to cross reference the workstation provider's screenshots/logs/hard copy with the original data provided.

3) The SADIS Manager can attend the offices of the SADIS workstation software provider and evaluate the system in realtime.

This would allow for the most realistic demonstration of the system in real time, and without some of the restrictions above.

For 'cost' purposes:

- The SADIS Provider would provide up to 16 hours of time 'cost free', to evaluate at a high level (see scope of evaluations below) the SADIS workstation software against the most recent SADIS evaluation criteria, as endorsed by SADISOPSG. Whilst substantial changes cannot be made without endorsement by SADISOPSG, some minor adjustments may be permissible dependent upon any changes endorsed by other official (particularly ICAO) groups/authorities.
- Should the evaluation extend beyond 16 hours, or if the SADIS Manager's involvement extends into more detailed 'consultancy' work then a charge of the SADIS Manager's time will be raised (the charge rates will be advised before entering into any commitment).
- The evaluation would have to be conducted in English for all verbal and written correspondence. Any requirement for translation facilities would need to be arranged by and met by the SADIS workstation software provider.

In the event of option 1), then courier costs and insurance for the laptop both to and from the Met Office at Exeter would need to be met by the SADIS workstation software provider. If a member of the SADIS workstation software provider staff accompanied the laptop to demonstrate the system then of course their travel/subsistence costs and hotel accommodation would need to be arranged/met by the SADIS workstation software provider.

In the event of option 2), then all costs for the generating and posting of evidence would be met by the SADIS workstation software provider. Email would be acceptable (~7MB limit on emails for UK Met Office), and it would be acceptable to send CDs/DVDs rather than large volumes of paper. Downloading from an ftp site (provided by the SADIS workstation software provider) would be acceptable. Costs of the SADIS workstation software provider's staff time in generating the material would of course be met by the SADIS workstation software provider.

In the event of option 3), then the SADIS Manager's travel, subsistence and (if necessary) hotel accommodation costs would need to be met by the SADIS workstation software provider.

Scope of Evaluations:

It should be noted that the evaluations are 'high level' evaluations of functionality, and not detailed technical certifications of compliance. Note that:

a) The software evaluation process does not certify or endorse any single software application; neither does it recommend one application over another. The software evaluations are the results of software reviews that the Met Office has carried out on behalf of the ICAO SADISOPSG. The purpose of these reviews is to verify whether the applications can deliver certain minimum functions which the SADISOPSG considers are essential for the correct use of the WAFS and OPMET data; and

b) It remains the responsibility of the user to ensure that procured software meets their full requirements. It is not intended that the software evaluations fulfil this task. The results from the software evaluations may be used as one additional source of information to aid any procurement process but should not be viewed in isolation of other important procurement requirements.

Additional:

The SADIS Provider will not publish the result of the SADIS workstation software evaluations on the SADIS Provider's web pages without prior agreement of the SADIS workstation software provider. However, the SADIS Provider will provide, and the SADIS workstation software supplier agrees to said provision, to the SADISOPSG with a copy of the full report - regardless of overall compliance of the software - and such reports will be available from the relevant SADISOPSG meeting documentation. As such, any SADIS workstation software evaluations should be considered to be available in the public domain.

Disputes:

Final decision upon compliance or otherwise against a particular criteria rests solely upon the SADIS Manager. There is no appeal or alternative evaluation option. Whilst the SADIS Manager and the SADIS Provider is willing to enter into some correspondence and will consider the opinions of those representing the workstation software providers, the SADIS Provider reserves the right to determine a final report based upon the evaluation exercise within a reasonable period (and in any case no more than 30 days) after the evaluation. Workstation software providers may supply additional data post evaluation to demonstrate that items identified as being non compliant have been addressed. The decision regarding subsequent compliance again rests solely with the SADIS Manager.

— END —