

Thirteenth Meeting

of the Working Group of the Meteorology Panel

Meteorological Operations Group (METP WG-MOG/13)

Work Stream 1: SADIS/WIFS

*WebEx 25 March 2020*

**INTERNATIONAL CIVIL AVIATION ORGANIZATION**

**LIST OF METP WG-MOG/13– SADIS/WIFS ACTIONS**

(Plus one action carried forward from METP WG-MOG/06)

**Action Agreed 6/01 -** **Alignment of OPMET content from SADIS and WIFS**

That, in coordination with the European OPMET Data Management Group, the SADIS and the WIFS provider states be invited to:

a) continue efforts to align of the OPMET content of SADIS and WIFS for scheduled OPMET information (METAR and TAF) and non-scheduled OPMET information (such as AIRMET and Special AIREP);

b) report on progress in respect of a) above to the next WG-MOG Meeting.

**Action Agreed 13/01 — SADIS Report: reporting service outages**

That, information on the dates, times and duration of any SADIS system outages is provided in the SADIS management, as the old server uptime metric is no longer appropriate given the AWS technology now used for SADIS.

**Action Agreed 13/02 — AIRMET format issues**

That the AIRMET monitoring information contained in Appendix B to this report be:

a) forwarded to the relevant regional ICAO Regional Offices as advanced information about AIRMET format issues in view of the applicability date of Amendment 79 to Annex 3; and,

b) published as an Appendix to the METP-WG/MOG 13 report.

**Action Agreed 13/03 – OPMET Catalogue**

That,

a) the OPMET catalogue (using data from the February 2020 monitoring period) is created by the end of April 2020,

b) this catalogue is then published on SADIS, and <https://www.icao.int/airnavigation/METP/Pages/Public-Documents.aspx> (replacing the previous version)

c) the MOG members are notified of this publication via e-mail

**Action Agreed 13/04 — Annual statement of operational efficacy of SADIS 2019/2020**

That the Chair of the METP-WG/MOG be invited to inform the Chair of the SCRAG that the SADIS continued to meet the operational requirements during the period 2019/2020.

**Action Agreed 13/05 — 2020 SADIS Efficacy Survey**

That the web hosted SADIS Efficacy questionnaire, using the questions shown in Appendix C to this report, be used for the 2020 survey which will commence on 1 July 2020 and end on 31 December 2020.

*Note—Users will be notified of the survey via SADIS administrative messages, e-mail and letters from ICAO Regional Offices. The letters will include a copy of the questions shown in Appendix C*.

**Action Agreed 13/06— SADIS Agreement Annex I and II 2020-2021**

That, the *Rapporteur* of the METP-WG/MOG be invited to immediately forward the updated SADIS Agreement Annex I and II inventory, given in the Appendix D to this report, to the Chair of SCRAG to enable and extraordinary SCRAG meeting to take place in March 2020.

**Action Agreed 13/07— Status of Implementation of SADIS**

That the ICAO Secretariat be invited to make available the updated Status of Implementation of SADIS document, as shown in Appendix E to this report, in the ICAO public website (replacing the previous copy).

**Action Agreed 13/08 — Terms of Reference**

That;

a) the METP-WG/MOG meeting accepts the proposed updates to the Terms of Reference as shown in Appendix F to this report; and

b) the ICAO Secretariat make available the updated Terms of Reference document onto the ICAO public website (replacing the previous copy).

**Action Agreed 13/09 — Update of Job Card 008.03 update**

a) That the METP-WG/MOG meeting accepts the proposed updates to Job Card 008.03 as shown in Appendix G to this report; and

b) That the METP-WG/MOG recommend these changes to METP/5.

**Action Agreed 13/10 — METP-WG/MOG WAFS and SADIS linkages**

That, the MOG Rapporteur will liaise with the MOG (IAVW) to ensure relevant connections are included on the connectivity diagram, and once updated, will pass it to the ICAO Secretariat for publication on the ICAO website <https://portal.icao.int/METP/MOG/Pages/default.aspx>

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| **LIST OF METP WG-MOG/13– SADIS/WIFS DECISIONS**  **Decision 13/06 — SADIS User Guide**  That;  a) the proposed updates to the SADIS User Guide Part 1 and Part 2 are accepted; and,  b) a final edit of the guide is carried out prior to publication on the ICAO website in November 2020 to ensure that the changes related to the provision of high resolution hazard data sets and IWXXM format OPMET have been accurately documented. | |
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**1. Opening of the Meeting**

1.1 The thirteenth meeting of the MET Operations Group (MOG/10) Work stream 1: SADIS/WIFS was held online via WebEx on 25 March 2020.

1.2 The meeting was opened at 11.30 UTC by the Working Group Rapporteur Mr. Colin Hord, Policy Lead (MET & AIM), United Kingdom CAA, who chaired the meeting. Mr Hord welcomed the participants, expressed his appreciation for their remote attendance and stressed the importance of the work programme and tasks of the group and its role in supporting the work of the METP. Mr Hord was assisted by Ms. Karen Shorey, United Kingdom MET Office and Mr. Raul Romero, Technical Officer, Meteorology, ICAO Headquarters.

**2. Introduction**

**2.1 Adoption of the Agenda.**

2.1.1 The agenda as proposed in IP/02 was adopted.

**2.2 Working arrangements.**

2.2.1 The meeting adopted appropriate working arrangements to work via Webex.

**2.3 Attendance.**

2.3.1 The list of participants is provided in **Appendix A** to this report.

**3. Matters relating to SADIS**

**3.1. Status of outstanding WG-MOG (SADIS) actions.**

3.1.1 The meeting was provided, by the WAFC provider States, with a list of the follow up actions (See **Appendix B**) emanated from METP WG-MOG/10. Updated information was provided by Patrick Simon and Matt Wagner regarding the ongoing follow-up of Action Agreed 10/5. In this regard it was agreed to keep the referred action agreed open. The meeting was pleased to see the great amount of work completed.

**3.2. Operation of SADIS – for cost recovery purposes**

3.2.1 SADIS Operational activities and developments during the past year

3.2.1.1 IP03 informed the meeting of changes implemented on SADIS in November 2019, which moved the system from on-premise servers across to Amazon Web Services (AWS) Cloud infrastructure. This upgrade increased its operating and download speed, and resilience.

3.2.1.2 The SADIS Management Report was provided, by the SADIS Provider and the SADIS Gateway Provider, and covered the period 01 March 2019 to 28 February 2020. The meeting noted that SADIS service continues to provide a valuable and reliable service to a large number of users across a large number of States within the AFI, ASIA, EUR, MID and NAT regions, as evidenced by the user feedback in the annual SADIS Efficacy Report and in the monitoring statistics provided in the said report. Therefore the meeting expressed its compliments to the SADIS Provider State and SADIS Gateway providers for providing such complete and informative management report.

3.2.1.3 The move to AWS infrastructure means that reporting “server uptime” in the SADIS management report is no longer a useful metric, and in response the following action was agreed:

**Action Agreed 13/01 — SADIS Report: reporting service outages**

That, information on the dates, times and duration of any SADIS system outages is provided in the SADIS management, as the old server uptime metric is no longer appropriate given the AWS technology now used for SADIS.

3.2.1.4 The meeting reviewed SN/01, presented by the SADIS Provider State, which contained a progress report on AIRMET and GAMET matters related to SADIS (and WIFS) that arose from MOG/6 and METP/4. In this regard the meeting noted that Amendment 79 to Annex 3 — Meteorological Service for International Air Navigation, to be applicable in November 2020, will allow the inclusion of non-EUR Region AIRMET and GAMET on SADIS.

3.2.1.5 On a related issue the meeting noted that an annual sampling exercise, undertaken by the SADIS provider States, highlighted products that were assessed as non-compliant with Annex3, Appendix B refers. It was also noted that the issues as highlighted in Appendix B do not prevent them from being included on SADIS. It was considered necessary to make States for which AIRMET errors were identified aware of their errors and to enable them to improve the quality for their forecasts. Therefore the meeting agreed on the following action:

**Action Agreed 13/02 — AIRMET format issues**

That the AIRMET monitoring information contained in Appendix B to this report be:

a) forwarded to the relevant regional ICAO Regional Met Offices as advanced information about AIRMET format issues in view of the applicability date of Amendment 79 to Annex 3; and,

b) published as an Appendix to the METP-WG/MOG 13 report.

3.2.1.6 The meeting turned its attention to SN/02, presented by the SADIS Provider State, as requested at METP-WG/MOG10 to show the actions carried out at ROC London on behalf of the SADIS service and the ROC London Area of Responsibility (AoR). In this regard the meeting noted the difference of the two services responsibilities, the number of messages manually checked and repaired for each service, and the number of messages manually checked and dropped for each of the service. After review of the SN and its nine accompanying attachments the meeting congratulated the SADIS Provider State for the excellent information contained in the referred document.

3.2.1.7 The alignment of OPMET data on SADIS and WIFS was discussed by the meeting, and as such it was decided to retain the ongoing activity from METP WG-MOG/06 to continue alignment activities. It was noted that due to the delay in compiling results from the EUR DMG February monitoring procedure it was not possible to create a new SADIS OPMET catalogue, and two appendices in the SADIS management report in time for the MOG meeting. As a result the following was agreed:

**Action Agreed 13/03 – OPMET Catalogue**

That,

a) the OPMET catalogue (using data from the February 2020 monitoring period) is created by the end of April 2020 at the latest,

b) this catalogue is then published on SADIS, and <https://www.icao.int/airnavigation/METP/Pages/Public-Documents.aspx> (replacing the previous version)

c) the MOG members are notified of this publication via e-mail

3.2.2 Operational efficacy of the SADIS – 2019/2020

3.2.2.1 Under this agenda item the meeting reviewed SN/04, presented by the SADIS Provider State, related to operational efficacy assessment 2019/2020, and proposal for 2020/2021 operational efficacy questionnaire. In this regard the meeting recalled that as a follow-up of METP-WG/MOG10 Decision 10/1 SADIS users were invited to participate in the SADIS efficacy survey in 2019 via letters from ICAO Regional Offices, e-mail and SADIS administrative messages. It was noted that at the close of the survey 86 responses were received from 67 different countries.

3.2.2.2 Based on the responses received and the summary presented in SN/04, the meeting reiterated its satisfaction with the quality of SADIS service, which was considered “good” by all users who responded to the survey. The group, including the International Air Transport Association (IATA), agreed that, in the light of comments received, the SADIS FTP service continued to meet the operational requirements during the period under review (namely 2019/2020) and formulated the following action:

**Action Agreed 13/04 - Annual statement of operational efficacy of SADIS 2019/2020**

That the Chair of the METP-WG/MOG be invited to inform the Chair of the SCRAG that the SADIS continued to meet the operational requirements during the period 2019/2020.

3.2.2.3 The meeting also noted that for the 2020 survey, the SADIS provider intends to use the same questionnaire again (as detailed in Appendix C). After review of the questions, the meeting formulated the following action:

**Action Agreed 13/05 — 2020 SADIS Efficacy Survey**

That the web hosted SADIS Efficacy questionnaire, using the questions shown in Appendix C to this report, be used for the 2020 survey which will commence on 1 July 2020 and end on 31 December 2020.

*Note—Users will be notified of the survey via SADIS administrative messages, e-mail and letters from ICAO Regional Offices. The letters will include a copy of the questions shown in Appendix C*.

3.2.3. SADIS Inventory – March 2020

3.2.3.1 The meeting reviewed SN/05 regarding changes and proposed updates to the SADIS Agreement Annexes I (SADIS Services) and II (SADIS Inventory) proposed by the SADIS Provider State for review and endorsement by the group. In this regard the meeting noted that the key changes and updates related to:

* there is no longer any equipment provided solely or principally for SADIS;
* the infrastructure now used to operate SADIS is a procured service – with a series of servers, AWS “buckets”, and other AWS functions being used;
* the addition of information to define the “fair use” and cyber security policy that will be applied
* a re-structuring of Met Office support roles and allocations
* the alignment of the NATS Roles and Responsibilities with the SCRAG documentation; and,
* various editorial changes to improve readability and to remove redundant references.

3.2.3.2 It was also noted that a draft of the proposed changes was presented to the twentieth SADIS Cost Recovery Meeting (SCRAG) in November 2019, which in order to expedite the update of the published SADIS agreement adopted SCRAG Conclusion 20/7 to hold an extraordinary SCRAG meeting after the MOG13 meeting had taken place.

3.2.3.3 Concluding the review the meeting agreed to formulate the following action:

**Action agreed13/06 — SADIS Agreement Annex I and II 2020-2021**

That, the Chair of the METP-WG/MOG be invited to immediately forward the updated SADIS Agreement Annex I and II inventory given in the Appendix D to this report to the Chair of SCRAG to enable and extraordinary SCRAG meeting to take place in March 2020.

3.2.4 SADIS Implementation – March 2020

3.2.4.1 The meeting noted IP/03, presented by the SADIS Provider State, which described the technology changes that were made to SADIS on 6 November 2019. In this regard it was noted that SADIS has received a significant technological upgrade, and has been migrated from on-premise servers located at the UK Met Office onto Amazon Web Services (AWS) cloud computing infrastructure. This successful migration, will enable the system to be fed with data from the next generation SADIS that is being developed for 2022.

3.2.4.2 The meeting reviewed S13/SN/06 Rev-1, Presented by the SADIS Provider State, regarding the status of implementation of SADIS. The status of implementation tables (Appendix E) provides information on the active SADIS users, and also shows past users as well as those who have an active SADIS account but have not used it in a period of at least two years. The meeting agreed to formulate the following action:

**Action Agreed 13/07 — Status of Implementation of SADIS**

That the ICAO Secretariat be invited to make available the updated Status of Implementation of SADIS document, as shown in Appendix E to this report, in the ICAO public website (replacing the previous copy).

3.2.4.3 The meeting reviewed SN/07, presented by the SADIS Provider State, to provide, at the request of SCRAG/19, the MOG SADIS with an overview of the functions carried out by the SADIS Gateway. The meeting noted the detailed information provided and thanked the Provider State.

3.2.5. Upcoming SADIS Development work

3.2.5.1 The meeting noted IP/05, presented by the SADIS Provider State, summarising all of the upcoming SADIS changes scheduled for November 2020. In this regard, the meeting noted that the two key additions to the data sets provided on SADIS will be the addition of higher resolution WAFS gridded hazard data sets and the addition of IWXXM data.

* Gridded data sets for cumulonimbus, icing and turbulence will be provided at 0.25 degree resolution, and will continue to be a blend of WAFC London and WAFC Washington data, and will have time-steps from T+6 to T+36 at 3-hourly intervals. Increasing the resolution to 0.25 degrees means that the provision of maximum and mean value will be unnecessary, therefore a single deterministic output will be provided.
* It becomes mandatory for States to issue their OPMET data in IWXXM format on 5 November 2020, and therefore all internationally published data IWXXM data in version 3.0 or later will be made available to SADIS users.

3.2.5.3 It was concluded that November 2020 will bring a significant increase in the amount of data available to users, and the upgrade onto AWS infrastructure with its fast download speeds ensures that SADIS users will be able to download this data quickly and efficiently.

3.2.5.2 The meeting also noted IP/06, presented by the SADIS Provider State, describing the plans for the next generation SADIS system that will become operational in November 2022. The new system will support the B1-AMET objectives, within the Global Air Navigation Plan (GANP) Aviation System Block Updates (ASBU) as well as data for trajectory-based operations (B1-TBO), free route operations (FRTO), continuous descent operations (B1-CDO), and improved air traffic flow management (B1-NOPS). It was noted that the SADIS provider has been engaging with a range of flight planning companies, software providers and Air Navigation Service Providers to define the requirements and scope for the next generation, SWIM compliant, SADIS system. The meeting notes that initial scoping work has been carried out while development work is expected to commence in late 2020. Finally it was noted that, as soon as an externally accessible demonstrator/test system is available software/workstation providers users will be invited to assist in testing the system.

3.2.5.2 IP/7, presented by the WAFS Internet File Service (WIFS) Provider State, described the plans for the next generation WIFS system that will become operational in November 2022 and November 2024. The capability proposed by the SADIS Provider State to support TBO is to provide users the ability to download a custom subset of data along a specific trajectory. However, due to the large number of airlines/flights in the United States, this functionality was not seen as not feasible, and it may be more efficient for an airline to simply download a larger subset of data for its area of operations, and then make multiple trajectories from it as needed. To this end the WIFS provider had been engaging with large airlines to determine which method they would prefer. All four of the large United States airlines said that they would rather create their own trajectory data rather than download each trajectory from WIFS.

3.2.6. Updates to SADIS related documentation

3.2.6.1 The meeting reviewed SN/08 and its Appendices A and B, presented by the SADIS Provider State, related to the updates required in the SADIS User Guides, Part 1 and Part 2, in the next year.

3.2.6.2 With regard to Part 1, the group noted that key changes of the guide were related to:

a) Moving to the start of the document of the “purpose of the SADIS user guide” and a link to SADIS information located on the Met Office Website;

b) References to icing potential ,turbulence potential, and the removal of the references to in-cloud turbulence. Addition of information on the new 0.25 degree hazard data sets (icing severity, turbulence severity and cumulonimbus extent/base/top);

c) Addition of an alert to users on the planned retirement of medium level SIGWX products in November 2022;

d) Addition of information on the provision of OPMET data sets in IWXXM format; and

e) updates of contact telephone numbers and web page addresses.

3.2.6.3 Key changes for Part 2 of the guide were related to the following:

a) Update of information on SADIS bandwidth provision and additional requirement to access multiple IP addresses;

b) Update of contact telephone numbers and web page addresses;

c) Removal of the restriction to host on SADIS only EUR region AIRMET and GAMET files;

d) Update of GRIB folder structure to accommodate 0.25 degree data sets; and

e) Addition of information on the new folder structure for IWXXM data sets provision.

3.2.6.4 After consideration of the proposed revisions to the SADIS User Guide Part 1 and Part 2, and subject to a final editorial review immediately prior to publication, the meeting agreed to make available on the ICAO website the updated guide . Therefore; it formulated the following decision:

**Decision 13/01 — SADIS User Guide**

That;

a) the proposed updates to the SADIS User Guide Part 1 and Part 2 are accepted; and,

b) a final edit of the guide is carried out prior to publication on the ICAO website in November 2020, to ensure that the changes related to the provision of high resolution hazard data sets and IWXXM format OPMET have been accurately documented.

**3.3. Developments of the SADIS under METP and WGs**

3.3.1. Matters relating Amendment 80 of ICAO Annex 3

3.3.1.1 No papers were presented under this Agenda Item.

3.3.2. Review of MOG Terms of Reference in relation to SADIS

3.3.2.1 The meeting reviewed SN/10, presented by the SADIS and WIFS Provider States, regarding the METP MOG Terms of Reference with respect to SADIS and WIFS. In this regard, it was considered necessary to add a reference to the capability of the METP WG MOG to propose changes to the Job Card 008 and an editorial improvement. Therefore , the meeting formulated the following action:

**Action Agreed 13/08 — Terms of Reference**

That;

a) the METP-WG/MOG meeting accepts the proposed updates to the Terms of Reference as shown in Appendix F to this report; and

b) the ICAO Secretariat make available the updated Terms of Reference document onto the ICAO public website (replacing the previous copy).

3.3.3. SADIS Matters arising in relation to other METP groups (MIE, MISD, MRI)

3.3.1.1 No papers were presented under this Agenda Item.

**3.4. Long term planning of SADIS**

3.4.1. SADIS matters relating to Amendment 81 of ICAO Annex 3

3.4.1.1 No papers were presented under this Agenda Item.

3.4.2. Review of Job Cards related to SADIS

3.4.2.1 Under this agenda item the meeting reviewed SN/11, presented by the SADIS and WIFS Provider States, related to METP Job Card 008.03. In this regard, the meeting noted and agreed to introduce the following changes:

a) marked as completed the tasks related to the update the SADIS and WIFS user guides in relation Amendment 78 are;

b) update of dates relating to Amendment 79;

c) addition of a new task to update the SADIS and WIFS user guides in relation to Amendment 80 and the technology upgrades; and,

d) addition of a new task relating to the implementation of the next generation SADIS and WIFS technology in November 2022.

Accordingly, the group formulated the following action:

**Action Agreed 13/09 — Update of Job Card 008.03**

a) That the METP-WG/MOG meeting accepts the proposed updates to Job Card 8 as shown in Appendix G to this report; and

b) That the METP-WG/MOG recommend these changes to METP/5.

**3.5. AoB relating to SADIS**

3.5.1 Under this the meeting reviewed SN/11, presented by the Rapporteur, related to the MOG/SADIS and WAFS connectivity diagram. In this regard it was noted at the Met Panel Cross Working Group (CWGP) meeting in November 2019, it was agreed that each working group develop a document describing the links between the ICAO working groups, and external groups (e.g. World Meteorological Organisation). After review and incorporation of changes suggested at the METP-WG/WAFS12 (Appendix H) meeting the meeting formulated the following action:

**Action Agreed 13/10 – METP-WG/MOG WAFS and SADIS Connectivity diagram**

That, the MOG Rapporteur will liaise with the MOG (IAVW) to ensure relevant connections are included on the connectivity diagram, and once updated, will pass it to the ICAO Secretariat for publication on the ICAO website <https://portal.icao.int/METP/MOG/Pages/default.aspx>

**4. Timetable and future meetings of WG-MOG (SADIS)**

4.1 The meeting considered potential dated and venue for the next meeting and agreed, in principle, to held the METP WG/MOG/16 SADIS during the week commencing 12 April 2021 at the premises of the United Kingdom MET Office in Exeter.

**5. Any other business relating to WG-MOG**

5.1 No papers were presented under this Agenda Item.

**6. Meeting Close**

6.1 The meeting was closed by Mr. Colin Hord. He thanked all delegates for their contributions which had made this a successful online meeting. He also informed the meeting about his retirement at the end of April. In this regard Mr. Raul Romero expressed, on behalf of ICAO, the appreciation of the organization for the excellent work done by Mr. Hord during the last five years as Rapporteur of the METP WG MOG and previously as contributing expert to the Aeronautical MET Programme. The sentiments of ICAO were shared by the Members and Advisors participating at the meeting who also congratulated Mr. Hord for his fruitful work.

-END-

**APPENDIX A - List of participants**

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| **STATE/ORG.** | **NAME** | | **MEMBER/ADV.** | **E-MAIL ADDRESS** |
| Australia | Cameron | Lethlean | Advisor | [cameron.lethlean@bom.gov.au](mailto:cameron.lethlean@bom.gov.au) |
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| Matt | Strahan | Advisor | [Matt.Strahan@noaa.gov](mailto:Matt.Strahan@noaa.gov) |
| Pat | Murphy | Advisor | [Michael.Murphy@faa.gov](mailto:Michael.Murphy@faa.gov) |
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| Slawomir | Szalasny | Advisor | [slawomir.szalasny@lhsystems.com](mailto:slawomir.szalasny@lhsystems.com) |
| ICAO | Raul | Romero | Secretariat | [rromero@icao.int](mailto:rromero@icao.int) |

**APPENDIX B - AIRMETs with formatting errors identified by the SADIS manager during an assessment of the data**

*Note: the checking was carried out on a selection of data during the period 1200UTC on 26 January to 12:00 UTC on 27 January 2020.*

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| **AIRMET** | **Comment** |
| WAAB31 LATI 271154  LAAA AIRMET 10 VALID 271200/271500 LATI-  LAAA TIRANA FIR MOD ICE FCST ENTIRE FIR ABV FL060 STNR NC== | Two equals symbols at the end of the message |
| WAZA21 FAOR 270159  FACA AIRMET B01 VALID 270200/270600 FAOR-  FACA CAPE TOWN FIR SFC VIS 4000M BR OBS WI S3104 E02832 - S3114 E02850 - S3105 E02832 - S3104 E02832= | Missing movement vector and change in intensity at end of message. |
| FACA AIRMET I01 VALID 270600/271000 FAOR-  FACA CAPE TOWN FIR BKN CLD 800/6500FT FCST WI S3046 E02801 - S3108 E02839 - S3114 E02747 - S3049 E02732 - S3046 E02801 WKN= | Missing movement vector at end of message. |
| WAZA21 FAOR 270202  FAJA AIRMET B01 VALID 270200/270600 FAOR-  FAJA JOHANNESBURG FIR SFC VIS 4000M BR OBS WI S2502 E03150 - S2508 E03202 - S2600 E03205 - S2647 E03209 - S2650 E03253 - S2653 E03259 - S2831 E03213 - S3039 E03026 - S3135 E02930 - S3114 E02850 - S3104 E02832 - S3001 E02819 - S2916 E02936 - S2842 E02839 - S2637 E03027 - S2523 E03059= | Missing movement vector and change in intensity at end of message. |
| WAZA21 FAOR 270642  FAJA AIRMET L01 VALID 270600/271000 FAOR-  FAJA JOHANNESBURG FIR MT OBSC FCST WI S2349 E03102 - S2532 E03152 - S2543 E03109 - S2642 E03022 - S2540 E03047 - S2502 E03048 - S2409 E03029= | Missing movement vector and change in intensity at end of message. |
| WATU31 LTBA 270600  LTBB AIRMET 1 VALID 270600/271000 LTBA-  LTBB ISTANBUL FIR MOD ICE FCST MARMARA AND NORTH AEGEAN AND THRACE REGION BTN FL060/140 NC= | Forecast position descriptors not allowed. BTN not a permitted abbreviation. Missing movement vector at end of message. |
| WATS40 DTTA 270500  DTTC AIRMET 01 VALID 270500/270900 DTTA  DTTC TUNIS FIR ISOL CB FCST NORTH OF LINE N3630.TOP CB BLW FL320 MOV EAST NC.= | Missing hyphen after DTTA on row 2  Should be N not NORTH, and E not EAST. Extra full stops  CB after top not required |
| WANL31 EHDB 270543  EHAA AIRMET 2 VALID 270543/270643 EHDB-  EHAA AMSTERDAM FIR VIS 0500M OBS AT EHAK MOV NE 20 KT NC= | Should be FG after 0500M  The position can’t be specified as AT EHAK.  Extra Space between 20 and KT. |
| WAEG31 HECA 270715  HECC AIRMET 01 VALID 270700/271100 HECA-  HECC CAIRO FIR SFC VIS 2000M HZ OBS AND FCST OVER HELX NC= | Position can’t be specified as OVER HELX  Missing movement vector at end of message. |

**APPENDIX C - 2020/2021 SADIS efficacy survey questions**

1. What country are you located in?
2. What type of organisation do you work for?

Options: National Meteorological Service

National/Civil Aviation Authority

National Air Navigation Service Provider

Commercial aviation weather organisation

Airline

Airport

SADIS workstation vendor

Other

3. What is the name of your organisation/company?

4. Are you a primary SADIS user or do you only use SADIS for backup purposes

Options: Primary SADIS User

SADIS Backup User

5. How did you find the SADIS FTP service quality?

Options: No problems encountered

Problems encountered

6. If you experienced problems with SADIS FTP, please specify their nature\*

7. Is the SADIS FTP data download rate suitable for your operations?

Options Yes

No

1. If your answer to question 7 was 'No' please provide further details
2. How did you find the availability of WAFS upper-air gridded global forecasts in the WMO GRIB2 code form (including wind/temperature/humidity and CB cloud/icing/turbulence)?

Options Good

Average

Poor

GRIB2 data was not used

1. If your answer to question 9 was 'average' or 'poor' please specify the nature of the problem\*
2. How did you find the availability of WAFS SIGWX forecasts in the BUFR code form?

Options Good

Average

Poor

SIGWX BUFR data was not used

1. If your answer to question 11 was 'average' or 'poor' please specify the nature of the problem\*
2. How did you find the availability of OPMET messages (METAR, TAF, SIGMET etc.)?

Options Good

Average

Poor

OPMET data was not used

1. If your answer to question 13 was 'average' or 'poor' please specify the nature of the problem\*
2. How did you find the reliability of the SADIS FTP system overall?

Options Good

Average

Poor

1. If your answer to question 15 was 'average' or 'poor' please specify the nature of the problem below\*
2. During the last year, did you need to contact the Service Desk?

Options Yes

No

1. If your answer to question 17 was 'Yes'', was the technical support provided by the service desk satisfactory?

Options Yes

No

1. If your answer to question 18 was 'No' please explain the nature of the problem that was experienced\*
2. Were SADIS administrative messages sufficient to keep you advised of the status of SADIS services?

Options Yes

No

1. If your answer to question 20 was 'no' please explain the nature of the problem\*
2. If you have any additional comments or feedback on the current SADIS service please write them below. \*
3. If you have any suggestions about how to improve the SADIS service in future, please write them below. \*

*\* Survey participants were directed to e-mail the* [*SADISmanager@metoffice.gov.uk*](mailto:SADISmanager@metoffice.gov.uk) *with their feedback/issues if they wanted a direct response from the SADIS provider. Feedback submitted through the survey is anonymous.*

**APPENDIX D - Update to SADIS Agreement Annex I and II**

**ANNEX I**

**SADIS SERVICES**

*Note.— A glossary of abbreviations as used in this Annex is provided at the end of the Annex*.

**1. Internet based (FTP) service**

Products available on SADIS: .

a) distribution of WAFS upper-air forecasts in GRIB2 code form;

b) distribution of WAFS SIGWX forecasts in BUFR code form;

c) distribution of WAFS SIGWX forecasts in PNG chart form;

d) distribution of OPMET information in alphanumeric format (METARs, TAFs, SIGMET, special AIREPs, volcanic ash tropical cyclone and space weather advisories) from those regions whose OPMET information is needed to satisfy approved requirements in the regions served by SADIS;

e) distribution of meteorological information in graphical format (e.g. Volcanic Ash Graphics).

Note: Detailed descriptions are contained within the SADIS User Guide (Parts 1 and 2) of the service.

**2. Collection service**

a) collection of OPMET information by the SADIS Gateway from States in accordance with approved requirements stated by PIRGs and actioned by Meteorological Operations Working Group (WG-MOG/SADIS);

b) monitoring, validation and repair of data received at the SADIS Gateway to the required standards, for the provision of real-time scheduled reports and for off-line quality control analysis.

**3. Back-up service**

The recognised back-up to failure if the SADIS FTP service is via the USA administered, WAFS Information File Service (WIFS). SADIS FTP users are encouraged to arrange back-up accounts with the WIFS provider via <https://aviationweather.gov/wifs/> .

*Note 1: - Usage restrictions apply. Further information is provided in the SADIS User Guide Part 1 (Administrative)*

*Note 2: - It is the responsibility of the SADIS FTP user to arrange and test back-up accounts with WIFS.*

**4. User support service**

a) 24-hour help line/faults desk;

b) dissemination of administrative messages, including amendments to bulletin headers given in the SADIS User Guide (Parts 1 and 2).

**5. File transfer protocol service**

Provision of facilities dedicated to establishing and receiving an FTP connection, using password protected access, to the SADIS FTP server that enables the transfer of WAFS upper-air forecasts in GRIB code, WAFS SIGWX forecasts in BUFR code, WAFS SIGWX forecasts in PNG chart form and OPMET data over the Public Internet. The FTP service implements Digital Signatures and Digital Certificates to confirm data integrity and authenticity of the data.

**6.  Fair Use of SADIS Products**

a) The use of SADIS is continually monitored to ensure the volume of data being downloaded is not excessive and does not impede the operation of the SADIS FTP Servers;

b) A user who is responsible for >10% of the total volume of data being downloaded from SADIS FTP Server in a single week will be considered as excessive usage.

c) If users are deemed to be excessively downloading data then the SADIS Manager will contact the user with a request to the use to reduce the volume data being downloaded.  The SADIS Manager may at their discretion, limit or terminate access to the SADIS FTP server without recourse to the user if the excessive use continues.

**7. Security**

a) The SADIS FTP server will be continually monitored for lawful security purposes.

b) Users are not permitted to share passwords and are responsible for keeping passwords secure.

c) The SADIS Manager reserves the right to suspend or terminate a user’s access to the SADIS FTP Server if the users use of the system or the user has failed to observe the obligations of 7 b) has resulted or is likely to result in an increased risk to security of the SADIS FTP Server.

d) The SADIS Manager reserves the right to restrict access to the SADIS FTP Server in the event of a security threat and users acknowledge that access to the SADIS FTP Server may be restricted or unavailable until such time the security threat has been resolved.

**Glossary of abbreviations**

*AIREP* Air report

*BUFR* Binary Universal Form for the Representation of meteorological data (code)

*FTP* File Transfer Protocol (Internet based)

*GRIB2* Gridded binary edition 2 (code)

*METAR* Routine aviation weather report in code form

*METP* Meteorology Panel

*OPMET* Operational meteorological (information or data)

*PIRG* ICAO planning and implementation regional group

*PNG* Portable Network Graphics (image format)

*SADIS* Secure Aviation Data Information Service

*SADIS FTP* Internet based provision of SADIS

*SADIS Gateway* The United Kingdom message-handling system which receives data from the Aeronautical Fixed Service for transmission on SADIS

*SADISOPSG* SADIS Operations Group was tasked with the oversight of SADIS until its dissolution in 2015. Superseded by Meteorological Operations Working Group (WG-MOG) under the Meteorology Panel (METP).

*SIGMET* Information of specified en-route weather phenomena which may affect the safety of aircraft operations

*SIGWX* Significant weather

*TAF* Aerodrome forecast in code form

*WAFS* World area forecast system

*WG-MOG* The oversight of the SADIS service is undertaken by the Meteorological Panel (METP) which has tasked Met Operations Group (WG-MOG/SADIS) to carry out this responsibility, each year they meet to ensure the service is meeting the users needs.

**ANNEX II**

**SADIS INVENTORY**

**(2019-2020)**

The inventory items identified below cover the equipment and staffing required to provide, operate and maintain the Secure Aviation Data Information Service (SADIS). The inventory includes: communications circuits, communications back-up system, procured services, and staff. It should be noted that some equipment items form part of a wider infrastructure. Costs of some 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 SADIS FTP infrastructure and communications circuits**

SADIS infrastructure consists of the following:

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

NIL

*Note: In November 2019 SADIS FTP was migrated to use Amazon Web Services infrastructure (see Section 2A) which is a procured service.*

ii)  **Not procured principally for SADIS**

a) Met Office Message switch (MetSwitch): Total investment £328K[[1]](#footnote-1) of which 1.23 per cent is attributable to the SADIS FTP service usage: switching data to operational FTP service;

b) NATS SADIS gateway function software (developed specifically for the gateway as part of the NATS CoreMet system)

c) Met Office operational monitoring software:

*Note. ─ This enables the operational monitoring of the SADIS FTP service and ensures problems can be identified and resolved in a timely manner.*

d) Met Office Service Desk equipment

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

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

The recognised back-up for SADIS FTP in the event of a failure is via the USA administered, WAFS Information File Service (WIFS). SADIS FTP users are encouraged to arrange back-up accounts with the WIFS provider via <https://aviationweather.gov/wifs/> .

*Note 1: - Usage restrictions apply. Further information is provided in the SADIS User Guide Part 1 (Administrative)*

*Note 2: - It is the responsibility of the SADIS FTP user to arrange and test back-up accounts with WIFS.*

**2. PROCURED SERVICES**

A. Amazon Web Services (AWS) elements used by the Met Office in the operation of SADIS FTP:

|  |  |  |  |
| --- | --- | --- | --- |
| **AWS Service** | **Specification** | **Quantity** | **What the service is used for:** |
| EC2 | t3.medium  2\* vCPU *(Intel Xeon Platinum 8000 series)*  4 GiB Memory  Network Bandwidth: ≤5Gbps;  EBS Bandwidth ≤1.50 Gbps) | 3 | 2\* FTP Server and 1 Apps Server |
| S3 | N/A | 6 | Data Storage : Ingestion;  FTP Content;  AuthN;  Logs & Alerts. |
| Route53 | N/A | 1 | DNS |
| Lambda | N/A | N/A | Various Serverless Functions including housekeeping, Log formatting, Alerting Management etc |
| Cloudwatch | N/A | N/A | Log Aggregation |
| NAT Gateway | N/A | 1 | Access |
| VPC | N/A | 1 |
| Kinesis Data Stream | N/A | 1 | Log Entry Routing |
| Kinesis Firehose | N/A | 2 |
| DynamoDB | N/A |  | Alert Management |
| Athena | N/A |  |

B. NATS Gateway function:

i) Communication circuits between Met Office and NATS infrastructure site; and

ii) System maintenance.

**3**. **ANNUAL STAFF REQUIREMENTS**

**A. Met Office**

**i) First Line Support**

*Help Desk*  S*kill*

1. Service desk (first point of contact) Incident Management and customer enquiries

*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*

**ii) Second Line Support**

*24-hour IT Operations support*S*kill*

1. Shift Leader (ITCS) Technical Supervisor, incident handling

2. Networks Incident Manager (NIM) Service Continuity, system monitoring

**iii) Third and Fourth Line Support**

*Normal working hours support and “best endeavors” Skill*

1. Message Switching Manager Incident handling, server adjustments

2. Message Switching Staff Incident handling and account changes

3. AWS Technical Support AWS expertise, support and guidance

**iv) Additional support**

*Day support Resource*

1. Administrator 144 staff-days of senior stakeholder relationship manager (SADIS manager)

2. International aviation management 14staff-days of aviation business head

3. Contract procurement and management 4 staff-days of senior procurement

manager

4. Invoice Administration 20 staff-days of finance assistant and

15 staff-days of senior finance manager

**B. NATS infrastructure site – Data Services (OPMET Gateway function)**

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

*Note 2. — The resource demand to provide the SADIS Gateway service is the required staff days needed to provide the SADIS service. It comprises 6 watches providing the H24 element of the service and support administrative staff. The cost recovery NATS submits to the SCRAG will represent actual staff-days required to provide the service*

*Role and Responsibilities Resource*

1. Operational Staff 521 staff-days per annum

- Operational Staff relates to the H24

function in ROC LONDON. Monitor, validate, record &

report on issues raised through the SADIS Gateway operation.

2. Engineering Staff 20 staff-days per annum

- Engineering Staff includes the

duties carried out by the Engineering Day support team

and an H24 engineers for the support of SADIS.

**C. Bought-in services**

Additional support and maintenance agreements with third parties are in place to provide additional third line AWS support of the SADIS FTP services.

**APPENDIX E - Status of Implementation of SADIS**

**STATUS OF IMPLEMENTATION OF SADIS FTP (LISTED BY ICAO REGIONS)**

**(as at 29 February 2020)**

*Note. ─ Non-operational approved users, and those who no longer take the service (for whatever reason) are indicated in italics*

*Key:*

|  |  |
| --- | --- |
|  |  |
| *SADIS FTP =* | *operational user (‘X’) of SADIS FTP service* |
| *\* =* | *approved SADIS hardware and/or software supplier* |

| *ICAO Contracting State* | | | *User* | | | | *Location* | | *SADIS FTP* | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *No* | | *Name* | *No* | | *Name* | | *Name* | |
| **AFI REGION** | | | | | | | | | | |
|  | | Angola |  | | INAMET | | Luanda Airport | | X | |
|  | | Benin |  | | National Meteorological Service (ASECNA) | | Cotonou International  Airport | | X | |
|  | | Botswana |  | | National Meteorological Service | | Gaborone Airport | | X | |
|  | | Burkina Faso |  | | National Meteorological Service (ASECNA) | | Ouagadougou Airport | | X | |
|  | | Burundi |  | | Institute Geographique | | Bujumbura | | X | |
|  | | Cabo Verde |  | | National Meteorological Service (INMG) | | Espargos | | X | |
|  | | Cameroon |  | | National Meteorological Service (ASECNA) | | Douala Airport | | X | |
|  | | Central African  Republic |  | | National Meteorological Service (ASECNA) | | Bangui | | X | |
|  | | Chad |  | | National Meteorological Service (ASECNA) | | N’Djamena Airport | | X | |
|  | | Comoros |  | | National Meteorological Service (ASECNA) | | Moroni Airport | | X | |
|  | | Congo |  | | National Meteorological Service (ASECNA) | | Brazzaville Airport | | X | |
|  | | Côte d'Ivoire |  | | National Meteorological Service (ASECNA) | | Abidjan Airport | | X | |
|  | | Democratic Republic of the Congo |  | | METTELSAT | | Kinshasa Airport | | X | |
|  | | Djibouti |  | | Service Météorologique | | Djibouti Airport | | X | |
|  | | Equatorial Guinea |  | | National Meteorological Service (ASECNA) | | Malabo Airport | | X | |
|  | | *Eritrea* |  | | *Civil Aviation Authority* | | *Asmara International Airport* | |  | |
|  | | Ethiopia |  | | National Meteorological Agency | | Addis Ababa Airport | | X | |
|  | | *Ethiopia* |  | | *Ethiopian Airlines* | | *Addis Ababa Airport* | |  | |
|  | | Gabon |  | | National Meteorological Service (ASECNA) | | Libreville Airport | | X | |
|  | | Gambia |  | | Department of Water resources | | Banjul Airport | | X | |
|  | | Ghana |  | | National Meteorological Agency | | Accra Airport | | X | |
|  | | Guinea |  | | National Meteorological Service | | Conakry Airport | | X | |
|  | | Guinea-Bissau |  | | Administration Météorologique | | Bissau Intl. Airport | | X | |
|  | | | Kenya |  | | National Meteorological Service | | Eldoret Airport | | X | | |
|  | | | Kenya |  | | National Meteorological Service | | Mombasa Airport | | X | | |
|  | | | Kenya |  | | National Meteorological Service | | Nairobi Airport | | X | | |
|  | | | Lesotho |  | | National Meteorological Service | | Moshoeshoe Airport | | X | | |
|  | | | Liberia (Republic of) |  | | Roberts Flight Information Region | | Monrovia | | X | | |
|  | | | Madagascar |  | | National Meteorological Service (ASECNA) | | Antananarivo/Ivato | | X | | |
|  | | | Madagascar |  | | Meteo Madagascar | | Antananarivo | | X | | |
|  | | | Malawi |  | | Department of Climate Change and Meteorology | | Lilongwe | | X | | |
|  | | | Mali |  | | National Meteorological Service (ASECNA) | | Bamoko Airport | | X | | |
|  | | | *Mauritania* |  | | *Office National de la Météorologie* | | *Nouakchott Airport* | |  | | |
|  | | | Mauritania |  | | National Meteorological Service (ASECNA) | | Nouadhibou Airport | | X | | |
|  | | | Mauritius |  | | National Meteorological Service | | Vacoas | | X | | |
|  | | | Mozambique |  | | Instituto Nacional de Meteorologia | | Maputo | | X | | |
|  | | | Namibia |  | | National Meteorological Service | | Windhoek | | X | | |
|  | | | Niger |  | | National Meteorological Service (ASECNA) | | Niamey Airport | | X | | |
|  | | | Niger |  | | National Meteorological Service  (ASECNA) | | EAMAC Training School | | X | | |
|  | | | Nigeria |  | | NIMET | | Lagos Airport | | X | | |
|  | | | Nigeria |  | | NIMET | | Mallam Aminu Kano Airport | | X | | |
|  | | | Nigeria |  | | NIMET | | Abuja Airport | | X | | |
|  | | | Nigeria |  | | NIMET | | Port Harcourt Airport | | X | | |
|  | | | Nigeria |  | | NIMET | | Sam Mbakwe Airport, Owerri | | X | | |
|  | | | Nigeria |  | | NIMET | | Maiduguri Airport | | X | | |
|  | | | Nigeria |  | | NIMET | | Sokoto Airport | | X | | |
|  | | | Nigeria |  | | NIMET | | Ilorin Airport | | X | | |
|  | | | Nigeria |  | | NIMET | | Akanu Ibiam Airport, Enugu | | X | | |
|  | | | Nigeria |  | | NIMET | | Umuaru Musa Yardua Airport, Kasina | | X | | |
|  | | | *Rebuplic of South Sudan* |  | | *South Sudan Meteorological Service* | | *Juba Airport* | |  | | |
|  | | | Rwanda |  | | Civil Aviation Authority | | Kigali Airport | | X | | |
|  | | | St Helena (UK OT) |  | | St Helena Airport Project | | St Helena | | X | | |
|  | | | Sao Tome and Principe |  | | Instituto Nacional de Meteorologia | | Sao Tome Airport | | X | | |
|  | | | Senegal |  | | National Meteorological Service (ASECNA) | | Dakar Airport | | X | | |
|  | | | Senegal |  | | ASECNA – DTI Maintenance 1 | | Headquarters, Dakar | | X | | |
|  | | | Senegal |  | | ASECNA | | Blaise Diagne Int Airport, Dakar | | X | | |
|  | | | Seychelles |  | | Seychelles Meteorological Authority | | Victoria, Mahá | | X | | |
|  | | | *Sierra Leone* |  | | *National Meteorological Service* | |  | |  | | |
|  | | | Somalia |  | | Flight Information Services for Somalia | | United Nations, Nairobi | | X | | |
|  | | | South Africa |  | | South Africa Weather Services (SAWS) | | Pretoria | | X | | |
|  | | | South Africa |  | | Netsys٭ | | Pretoria | | X | | |
|  | | | South Africa |  | | Platsoft\* | | Sandton | | X | | |
|  | | | Swaziland |  | | National Meteorological Service | | Mbabane | | X | | |
|  | | | Togo |  | | National Meteorological Service (ASECNA) | | Lomé | | X | | |
|  | | | Uganda |  | | National Meteorological Authority | | Entebbe Airport | | X | | |
|  | | | Uganda |  | | National Met Authority | | Soroti Aerodrome | | X | | |
|  | | | United Republic of Tanzania |  | | National Meteorological Agency | | Dar Es Salaam | | X | | |
|  | | | Zambia |  | | Zambia Meteorological Department | | Lusaka International Airport | | X | | |
|  | | | Zambia |  | | Zambia Meteorological Department | | Livingstone | | X | | |
|  | | | Zimbabwe |  | | Meteorological Services Department | | Harare International Airport | | X | | |
| **ASIA REGION** | | | | | | | | | | | | |
|  | | *Afghanistan* | | |  | | *National Meteorological Service* | | *Kabul Airport* | |  | |
|  | | Australia | | |  | | Bureau of Meteorology | | Melbourne | | X | |
|  | | Australia | | |  | | WeatherZone | | North Sydney | | X | |
|  | | Australia | | |  | | Air Services Australia | | Canberra | | X | |
|  | | Bangladesh | | |  | | National Meteorological Service | | Dhaka Airport | | X | |
|  | | Cambodia | | |  | | State Secretariat of Civil Aviation (SSCA) | | Phnom Penh International Airport | | X | |
|  | | China | | |  | | Civil Aviation Administration of China (CAAC) | | Aviation Meteorological Center | | X | |
|  | | China | | |  | | Civil Aviation Administration of China (CAAC) | | Beijing Airport | | X | |
|  | | China | | |  | | Civil Aviation Administration of China (CAAC) | | Guangzhou Airport | | X | |
|  | | China | | |  | | Hong Kong Observatory | | Hong Kong Intl. Airport | | X | |
|  | | China | | |  | | Civil Aviation Authority | | Macau Airport | | X | |
|  | | China | | |  | | Meteorological and Geophysical Bureau | | Macau | | X | |
|  | | *Democratic People’s*  *Republic of Korea* | | |  | | *Civil Aviation Authority* | | *Pyongyang Airport* | |  | |
|  | | India | | |  | | India Meteorological Department | | New Delhi | | X | |
|  | | India | | |  | | Sheory Digital Systems | | Mumbai | | X | |
|  | | Indonesia | | |  | | Badan Meteorologi Klimatologi dan Geofisika (BMKG) | | Sultan Hasanuddin International Airport, Makassar | | X | |
|  | | Lao People’s Democratic Republic | | |  | | Ministry of Natural Resource and Environment | | Vientiane International Airport | | X | |
|  | | Maldives | | |  | | National Meteorological Service | | Male Airport | | X | |
|  | | *Mongolia* | | |  | | *Civil Aviation Authority* | | *Ulan Bator Airport* | |  | |
|  | | *Myanmar* | | |  | | *DMH* | | *Yangon* | |  | |
|  | | *Nepal* | | |  | | *National Meteorological Service* | | *Kathmandu Airport* | |  | |
|  | | Pakistan | | |  | | Meteorological Department | | Karachi | | X | |
|  | | *Sri Lanka* | | |  | | *GHP Dharamaratna* | | *Colombo* | |  | |
|  | | Thailand | | |  | | Thai Meteorological Department | | Suvarnabhumi Airport | | X | |
|  | | Thailand | | |  | | Thai Meteorological Department | | Don Mueang Airport | | X | |
|  | | Viet Nam | | |  | | Civil Aviation Authority | | Hanoi | | X | |
|  | | Viet Nam | | |  | | Southern Airports Corporation | | Tan Son Nhat Airport,  Ho Chi Min City | | X | |
|  | | Viet Nam | | |  | | Northern Airports Corporation | | Noi Bai Int. Airport | | X | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **EUR REGION** | | | | | |
|  | Albania |  | National Air Traffic Agency | Tirana Airport | X |
|  | Algeria |  | Meteo Algerie | Dar El Beida | X |
|  | Algeria |  | National Meteorological Service | Essidikia Oran | X |
|  | Algeria |  | National Meteorological Service | Eastern Regional Meteo Office | X |
|  | *Algeria* |  | *Forces Aériennes Algériennes* | *Forces Aériennes Algériennes* |  |
|  | Armenia |  | Armenian Aero-Meteorological Centre | Zvartnots Airport, Yerevan | X |
|  | Austria |  | Austro Control | Vienna | X |
|  | Azerbaijan |  | Azeraeronavigation | Heydar Aliyev International Airport | X |
|  | Belgium |  | Skeyes (formerly Belgocontrol) | Brussels Airport | X |
|  | Belgium |  | Eurocontrol | Brussels | X |
|  | Bosnia and Herzegovina |  | Bosnia and Herzegovina Air Navigation Services Agency (BHANSA) | Banja Luka | X |
|  | Bulgaria |  | Bulgaria Air Traffic Services | Sofia Airport | X |
|  | Croatia |  | Croatia Control Ltd. | Zagreb Airport | X |
|  | Cyprus |  | Department of Civil Aviation Cyprus | Nicosia | X |
|  | Czech Republic |  | Czech HydroMet Institute | Praha/Komorany | X |
|  | Czech Republic |  | Air Navigation Services | Praha/Jenec | X |
|  | Czech Republic |  | NAV Flight Services, s.r.o. | Praha | X |
|  | Denmark |  | Danish Meteorological Institute | Copenhagen | X |
|  | Denmark |  | SAS Airline | Copenhagen | X |
|  | Denmark |  | Air Support A/S | Billund | X |
|  | Denmark |  | AviationCloud A/S | Odense | X |
|  | Denmark |  | Naviair | Kastrup | X |
|  | Estonia |  | Air Navigation Service (EANS) | Rae küla | X |
|  | Estonia |  | Estonian Environment Agency (ESTEA) | Tallinn | X |
|  | Finland |  | Air Navigation Services Finland  (Civil Aviation Administration) | Helsinki-Vantaa Airport | X |
|  | Finland |  | Finnish Meteorological Institute | Helsinki | X |
|  | France |  | Météo-France | Toulouse | X |
|  | France |  | Météo-France International (MFI)٭ | Toulouse | X |
|  | France |  | Corobor٭ | Paris | X |
|  | Georgia |  | National Meteorological Service | Tbilisi Airport | X |
|  | Germany |  | Deutscher Wetterdienst | Offenbach | X |
|  | Germany |  | European Union Aviation Safety Agency (EASA) | Cologne | X |
|  | Germany |  | Lufthansa Systems | Frankfurt Airport | X |
|  | Germany |  | *JMB Data Service* | *Nuremberg* |  |
|  | Germany |  | FSS-GMB | Cologne | X |
|  | Greece |  | Hellenic National Meteorological Service (HNMS) | Athens | X |
|  | Greece |  | SSA S.A | Athens International Airport | X |
|  | Hungary |  | Hungarian Meteorological Service | Budapest | X |
|  | Hungary |  | HungaroControl | Budapest Airport | X |
|  | Ireland |  | MET Eireann | Dublin | X |
|  | Israel |  | Israel Meteorological Service | Bet-Dagan | X |
|  | Italy |  | ENAV | Milan Forecasting Unit | X |
|  | Italy |  | ENAV | Rome Forecasting Unit | X |
|  | Italy |  | ENAV | AIS Milan | X |
|  | Italy |  | ENAV | AIS Rome | X |
|  | Italy |  | Air Force National Centre for Meteorology and Climatology (CNMCA) | Rome | X |
|  | Kazakhstan |  | Kazaeronavigatsia | Almaty | X |
|  | Latvia |  | Latvijas Gaisa Satiksme (LGS) | Riga | X |
|  | Latvia |  | Latvijas Vides, Geologijas un Meteorologijas Centre | Riga | X |
|  | Lithuania |  | Air Traffic Services (Oro Navigacija) | Vilnius Airport | X |
|  | Malta |  | Malta International Airport | Luqa Airport | X |
|  | Montenegro |  | Serbia and Montenegro Air Traffic Services | Belgrade Airport | X |
|  | Morocco |  | Maroc Meteo | Casablanca | X |
|  | Netherlands |  | KNMI | De Bilt | X |
|  | Netherlands |  | Telvent Almos٭ | Culemborg | X |
|  | Netherlands |  | Smart4Aviation. | Amsterdam | X |
|  | Netherlands |  | Navindigo | Nieuwegein | X |
|  | *Netherlands* |  | *Flight Operations in Control* | *The Hague* |  |
|  | Netherlands |  | MeteoGroup | Wageningen | X |
|  | Netherlands |  | PocketFMS | Lelystad Airport | X |
|  | Norway |  | Avinor Flysikring | Bergen Airport | X |
|  | North Macedonia |  | Macedonian Air Navigation Service Provider (M-NAV) | Skopje | X |
|  | Poland |  | Institute of Meteorology and Water Management (IMGW) | Warsaw | X |
|  | Poland |  | Lufthansa | Gdansk | X |
|  | Poland |  | Port Lotniczy Bydgoszcz S.A | Port Lotniczy airport | X |
|  | Poland |  | Radom Meteo Sp. z o.o. | Radom Airport | X |
|  | Poland |  | Warmia i Mazury | Olsztyn-Mazury | X |
|  | Portugal |  | Instituto Português do Mar e da Atmosfera | Lisbon Airport | X |
|  | *Portugal* |  | *Força Aérea Portuguesa* | *Alfragide* |  |
|  | Republic of Moldova |  | MoldATSA | Chisinau Airport | X |
|  | Romania |  | ROMATSA | Bucharest | X |
|  | Russian Federation |  | Aviamettelekom of Roshydromet | St. Petersburg | X |
|  | Russian Federation |  | Institute of Radar Meteorology (IRAM)٭ | St. Petersburg | X |
|  | Russian Federation |  | Map Makers Group ٭ | Moscow | X |
|  | Russian Federation |  | Aviamettelekom of Roshydromet (ATM) | Moscow | X |
|  | Serbia |  | National Meteorological Service | Belgrade | X |
|  | Serbia |  | Serbia and Montenegro Air Traffic Services | Belgrade Airport | X |
|  | Slovakia |  | Slovak Hydrometeorological Institute | Bratislava | X |
|  | Slovakia |  | MicroStep MIS | Bratislava | X |
|  | Slovakia |  | IBL Software Engineering ٭ | Bratislava | X |
|  | Slovenia |  | Slovenia Environment Agency | Ljubljana | X |
|  | Spain |  | La Agencia Estatal de Meteorología (AEMET) | Madrid | X |
|  | Sweden |  | LFV | Arlanda Airport | X |
|  | Sweden |  | LFV | Sundsvall Airport | X |
|  | Sweden |  | Flygprestanda | Malmö | X |
|  | Sweden |  | Carmenta \* | Göteborg | X |
|  | *Sweden* |  | *Navigraph* | *Stockholm* |  |
|  | Sweden |  | Swedish Meteorological and Hydrological Institute (SMHI) | Norrköping | X |
|  | Sweden |  | Swedish Meteorological and Hydrological Institute (SMHI) | Stockholm | X |
|  | Switzerland |  | MeteoSwiss | Zurich | X |
|  | Tunisia |  | National Institute of Meteorology | Tunis | X |
|  | Turkey |  | Turkish State Meteorological Service | Ankara Airport | X |
|  | Ukraine |  | Air traffic services (UKSATSE) | Kyiv | X |
|  | Ukraine |  | Aeronautical MET Centre (UAMC) | Boryspil Airport, Kyiv | X |
|  | United Kingdom |  | Met Office | Exeter | X |
|  | United Kingdom |  | NATS | Swanwick | X |
|  | United Kingdom |  | Aviation Briefing | Bristol | X |
|  | United Kingdom |  | Bytron | Kirmington | X |
|  | United Kingdom |  | Air Data | Crawley | X |
|  | United Kingdom |  | The Weather Company (IBM) | Birmingham | X |
|  | *United Kingdom* |  | *Stratajet* | *London* |  |
|  | *United Kingdom* |  | *Lufthansa* | *Welwyn Garden City* |  |
|  | *United Kingdom* |  | *Flight Efficiency Ltd* | *London* |  |
|  | United Kingdom |  | Rocket Route | Farnborough | X |
|  | *Uzbekistan* |  | *Uzaeronavigation* | *Tashkent* |  |
| **MID REGION** | | | | | |
|  | Bahrain |  | Ministry of Transportation Civil Aviation Affairs | Bahrain International Airport | X |
|  | Egypt |  | Meteorological Authority | Cairo Airport | X |
|  | Egypt |  | Egyptian Ministry of Defence | Cairo | X |
|  | *Iran (Islamic Republic of)* |  | *National Meteorological Service* | *Teheran* |  |
|  | Iraq |  | Iraq Meteorological Organization and Seismology | Baghdad Airport | X |
|  | Jordan |  | Meteorological Department | Queen Alia Airport | X |
|  | Kuwait |  | Meteorological Department | Kuwait | X |
|  | Libya |  | National Meteorological Centre | NMC - Eswani | X |
|  |  |  | National Meteorological Centre | Tripoli Int. Airport | X |
|  |  |  | National Meteorological Centre | Binena Int. Airport | X |
|  | Oman |  | Public Authority for Civil Aviation/ Meteorological Department | Salalah Airport | X |
|  | Oman |  | Public Authority for Civil Aviation/ Meteorological Department | Seeb Airport | X |
|  | Qatar |  | Civil Aviation Authority - Meteorology Department | Doha Airport | X |
|  | Qatar |  | Civil Aviation Authority - Meteorology Department | Doha | X |
|  | Saudi Arabia |  | General Authority of Meteorology and Environmental Protection (GAMEP) | Jeddah | X |
|  | Saudi Arabia |  | General Authority of Meteorology and Environmental Protection (GAMEP) | Jeddah Airport | X |
|  | Saudi Arabia |  | General Authority of Meteorology and Environmental Protection (GAMEP) | Riyadh Airport | X |
|  | *Saudi Arabia* |  | *Saudi Airlines* | *Jeddah Airport* |  |
|  | Sudan |  | Sudan Meteorological Authority | Headquarter, Khartoum | X |
|  | *Syrian Arab Republic* |  | *National Meteorological Service* | *Damascus* |  |
|  | *Syrian Arab Republic* |  | *National Meteorological Service* | *Aleppo* |  |
|  | United Arab Emirates |  | National Centre for Meteorology and Seismology (NCMS) | Dubai International Airport | X |
|  | United Arab Emirates |  | National Centre for Meteorology and Seismology (NCMS) | Dubai International Airport | X |
|  | United Arab Emirates |  | National Centre for Meteorology and Seismology (NCMS) | Dubai International Airport | X |
|  | *United Arab Emirates* |  | *Civil Aviation Authority* | *Headquarters, Abu Dhabi* |  |
|  | *United Arab Emirates* |  | *Air Force and Air Defence Meteorological Department* | *Abu Dhabi (Al-Dhafra Air Base)* |  |
|  | Yemen |  | Civil Aviation and Meteorological Authority (CAMA) | Sana’a Airport | X |
|  | Yemen |  | National Meteorological Service (YMS/CAMA) | Sana’a | X |
| **NAT REGION** | | | | | |
|  | Iceland |  | IMO | Reykjavik | X |

**APPENDIX F - MOG Terms of Reference**

* New text is shaded in grey
* Deleted text is shown with ~~red strikeout~~

**METP Meteorological Operations Group (MOG)** **Terms of Reference**

The aim of the MET Operations Group is to ensure that the following systems meet the agreed user requirements:

* WAFS
* SADIS / WIFS
* IAVW

~~In the longer term it is considered that Space Weather and Regional Hazardous Weather Centres will be added to the remit of the working group.~~ It is expected that Space Weather will be added to the remit of the working group in the short term, whilst Regional Hazardous Weather Centres will be added in the medium term.

The MET Operations group should:

* Establish Key Performance Indicators for the provision of services based on the performance requirements in coordination with other METP WGs and final agreement by the METP
* Define the continuity / availability of services based on the performance requirements, in coordination with the other METP WGs and final agreement by the METP.
* Arrange for the reporting of KPIs from each provider State (e.g. verification and timeliness metrics)
* Receive reports from each provider State on the management of their system(s)
* Set out, review and maintain the back-up arrangements and include relevant details in management reports
* Ensure that coordination and harmonisation takes place between WAFCs, VAACs, and SADIS / WIFS providers
* Monitor, assess and provide advice on potential scientific and technological developments to meet the current, future and evolving performance requirements to the METP in coordination with WMO.
* Assess the financial and technical implications of proposed developments to services and their implementation.
* Ensure that developments have measurable success criteria for implementation
* Establish the times scales, pre-operational tests and implementation of services
* Maintain and, when required, create guidance material on the implementation and provision of services.
* Identify any weaknesses in the current service provision and coordinate updates to the requirements with other Working Groups of the METP
* Ensure that the necessary remedial actions are in place when necessary to overcome identified deficiencies.
* Where necessary assist the Secretariat in the coordination of the arrangements between the various international organizations
* Propose changes to the job cards when required
* Maintain an up to date ~~task list~~ set of actions

Following each meeting provide a report and make it available on the METP website

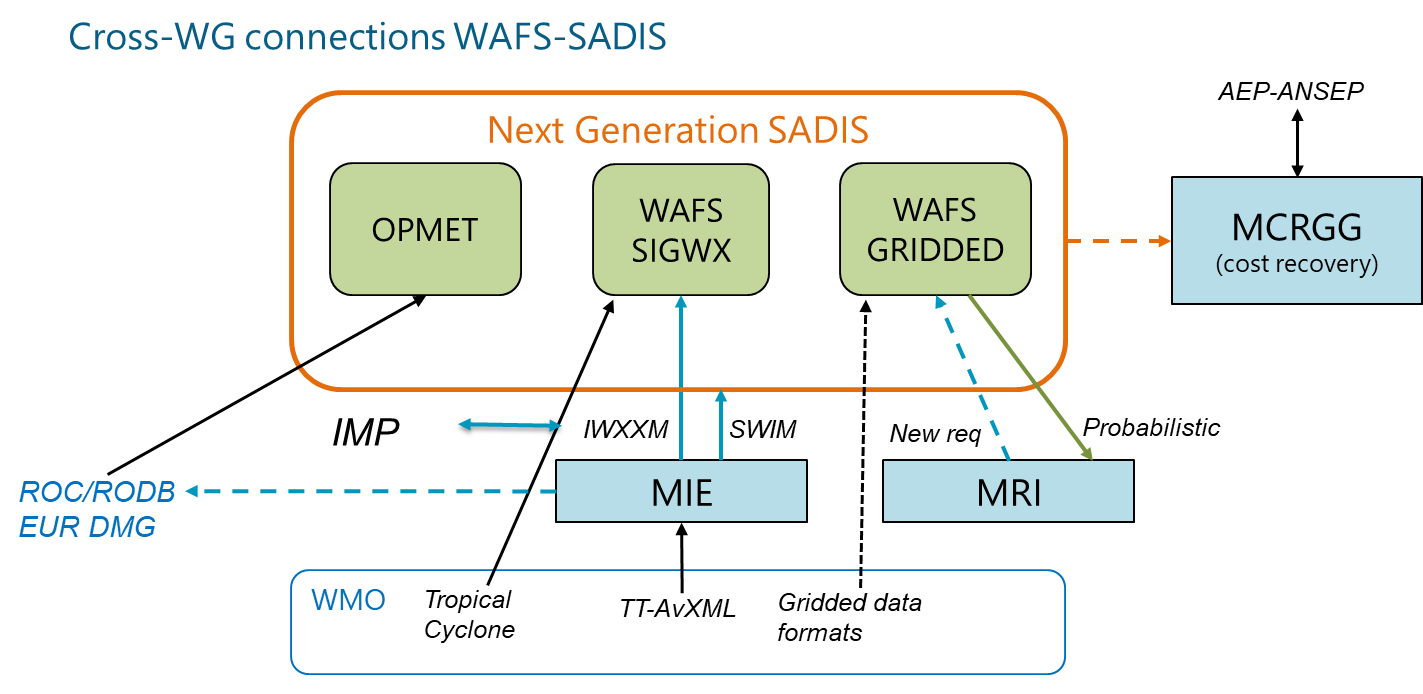
**APPENDIX G – Job Card METP.008.03 update**

Additions are shown in highlighted text, whilst deletions are shown with ~~strikethrough.~~

|  |  |
| --- | --- |
| METP.008.03 | Further development of the Secure Aviation Data Information Service (SADIS) and WAFS Internet File Service (WIFS). |
| Source | MET Divisional Meeting 2014 (Recommendations 2/2 and 2/3 a) and b)), METP/~~2~~4 |
| Problem Statement | The Secure Aviation Data Information Service (SADIS) and WAFS Internet File Service (WIFS) providing meteorological information for air navigation needs to be managed to ensure that it meets the requirements of States and users for the provision of global OPMET and WAFS information. These systems must be developed to meet the objectives of the Aviation System Block Upgrades (ASBU) within the Fifth Edition of the Global Air Navigation Plan 2016-2030 (Doc 9750). |
| Specific Details | SADIS and WIFS provide global OPMET and WAFS information to States and users via a secure FTP system.  It was recommended by the MET Divisional Meeting (Recommendation 2/2) that an appropriate ICAO expert group be tasked to ensure that the SADIS and the WIFS continue to meet user expectations and further develop in a manner consistent with the Global Air Navigation Plan (Doc 9750). The Met Panel will work on the future improvements to deliver data in a way that is suitable for the system-wide information management (SWIM) environment. Planned activities are detailed below |
| Expected Benefits | Provision of global OPMET and WAFS information as specified in Annex 3 through an Internet-based system via a SWIM compliant Application Processing Interface (API) based delivery system that can deliver higher resolution WAFS data sets to the aviation community. |
| Reference Documents | SADIS User Guide, WIFS User Guide, ICAO Annex 3 |
| Deliverable Expert Group | Meteorology Panel (METP) |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ID** | **Document Affected** | **Description of Amendment proposal or Action** | | **Supporting**  **Expert Group** | | **Status** | **Expected Dates** | | |
| **Delivery Date** | **Effective** | **Applicability** |
| 1716 | Action | Assist ICAO in the coordination of the arrangements by the SADIS Provider State in ensuring that the global requirements for the dissemination of global OPMET and WAFS information are met. | |  | | Re-scheduled |  |  | Nov 2020 |
| 10093 | Actions | Delivery of IWXXM format OPMET data on SADIS and WIFS | |  | | On Schedule | Q4 2020 |  | Nov 2020 |
| ~~1701~~ | ~~SADIS User Guide~~ | ~~Update SADIS guidance material in line with Annex 3 Amendment 78, when Space Weather advisories become available, and when IWXXM OPMET data becomes available~~ | | ~~IMP~~ | | ~~On-schedule~~ | ~~Q3 2020~~ | ~~Nov 2020~~ | ~~Nov 2020~~ |
| ~~10090~~ | ~~WIFS User Guide~~ | ~~Update WIFS guidance material in line with Annex3 Amendment 78.~~ | | ~~IMP~~ | | ~~On-schedule~~ | ~~Q3 2020~~ | ~~Nov 2020~~ | ~~Nov 2020~~ |
| 10094 | Actions | Update of SADIS and WIFS systems to deliver OPMET data in IWXXM format and WAFS data in a SWIM compliant manner | |  | | On-schedule | Q4 2022 |  | Nov 2022 |
| 10091 | SADIS User Guide | Update SADIS guidance material in line with Annex 3 Amendment 79. | | IMP | | On-schedule | Q3 2020 | Nov ~~2022~~ 2020 | Nov ~~2022~~ 2020 |
| 10092 | WIFS User Guide | Update SADIS guidance material in line with Annex 3 Amendment 79. | | IMP | | On-schedule | Q3 2020 | Nov ~~2022~~ 2020 | Nov ~~2022~~ 2020 |
|  | SADIS User Guide | Update SADIS guidance material in line with Annex 3 Amendment 80, and next generation SADIS technology changes | | IMP | | In planning | Q3 2022 | Nov 2022 | Nov 2022 |
|  | WIFS User Guide | Update SADIS guidance material in line with Annex 3 Amendment 80, and next generation WIFS technology changes | | IMP | | In planning | Q3 2020 | Nov 2022 | Nov 2022 |
|  | Action | Development of SWIM compliant, API enabled, systems to replace SADIS and WIFS. | |  | | In planning |  | Nov 2022 | Nov 2022 |
| Status: | | Priority: | Initial Issue Date: | Date Approved by ANC: | | | | Session / Meeting: | |
| Approved | |  | 17 Jun 2015 | | 12 March 2019 | | | 210-8 | |

**APPENDIX H - SADIS connectivity diagram**



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1. budgeted cost for providing MetSwitch service during the fiscal year 2018/2019. [↑](#footnote-ref-1)