Meteorology Panel (METP)

Working Group on Meteorological Operations Group (WG-MOG)

SADIS Work Stream

Fifteenth Meeting

(METP/WG-MOG/15-SADIS)

Virtual Meeting, 15 April 2021

Meeting Report

INTERNATIONAL CIVIL AVIATION ORGANIZATION

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1. **AGENDA ITEM 1:   OPENING OF THE MEETING**

1.1   The fifteenth meeting of the MET Operations Group (MOG/15) Work stream 1: SADIS/WIFS was held online via Teams on 15 April 2021.

1.2   The meeting was opened at 12.30 UTC by the new Working Group Rapporteur Mr. Jonathan Dutton, Head of Transport Business, United Kingdom Met Office, who chaired the meeting. Mr Dutton has taken over the MOG Rapporteur duties from Mr Colin Hord who has now retired.

1.3   Mr Dutton welcomed the participants, and the new ICAO Technical Officer, Mr. Jun Ryuzaki, and expressed his appreciation for their remote attendance. Mr Dutton also stressed the importance of the work programme and tasks of the group and its role in supporting the work of the METP. Mr Dutton was assisted by Ms. Karen Shorey, United Kingdom Met Office.

1.4   In lieu of oral introductions, all attendees were asked to provide their name, affiliation, and METP status (i.e., member, adviser, observer) in the chat window. In addition, advisors and observers were asked to provide their sponsoring METP member.

2. **AGENDA ITEM 2:   INTRODUCTION**

2.1   **Adoption of the Agenda**

2.1.1   The Agenda for the meeting, presented in MOG/15 IP/02, was adopted without change.

2.2   **Working Arrangements**

2.3   Referenced study notes (SN) and information papers (IP) are available on the ICAO METP MOG public website, under: https://www.icao.int/airnavigation/METP/Pages/MOG.aspx.

2.3.1   The meeting adopted appropriate working arrangements to work virtually via Teams.

2.3.2   The list of attendees is contained in **Appendix A**.

2.4   **Terms of Reference**

2.5   The meeting reviewed MOG/15 SN/01, regarding the METP MOG Terms of Reference to ensure they are fit for purpose. No changes related to SADIS are required, but a minor change relating to space weather was proposed.   The meeting formulated the following action:

> **Action Agreed 15/01 — Terms of Reference**
>
> That;
>
> a) the METP-WG/MOG meeting accepts the proposed updates to the Terms of Reference as shown in Appendix B; and
>
> b) the ICAO Secretariat make available the updated Terms of Reference document onto the ICAO   public   website   (https://www.icao.int/airnavigation/METP/Pages/Public-Documents.aspx), replacing the previous copy.
>
> c) the finalised Terms of Reference are presented as an information paper at METP/5

3.   **AGENDA ITEM 3: MATTERS RELATED TO SADIS**

3.1   **Agenda Item 3.1 - Status of outstanding WG-MOG (SADIS) Actions**

3.1.1   The meeting was presented with MOG/15 IP/03 which stated the actions and decisions that arose from the METP-WG/MOG13 and gave a progress update which is contained in Appendix C). The meeting was pleased to see the that all actions had been completed.

3.2   **Agenda Item 3.2 - SADIS Matters arising in relation to other METP groups (MIE, MISD, MRI)**

3.2.1   MOG/15 IP/04 – *Interaction with other METP Groups* described the activities within the MET Information Exchange (MIE) and Met Cost Recovery and Guidance Group (MCRGG) that were of relevance to the operation of SADIS and WIFS.

3.2.2   The MIE is developing guidance material that relates to SWIM (SWIM Plan, SWIM roadmap) and has been having discussions on SWIM governance and the requirements for a SWIM registry. This guidance material can be used by the WAFCs in the development of the next generations that replace SADIS and WIFS.

3.2.3   The MIE is also looking at IWXXM OPMET schema governance and protocols, which the SADIS manager is monitoring as it may impact on the OPMET API that is being developed to (eventually) replace the OPMET directories hosted on SADIS ftp.

3.2.4   The MIE was planning to propose an end date for TAC format OPMET of November 2026, however this is being delayed due to IATA's concerns. A new end date has not been proposed, but at the earliest would be with Amendment 82 to ICAO Annex 3 – Meteorological Service for Air Navigation in November 2029. Therefore plans for the next generation SADIS provision or the retirement of the SADIS ftp service may need to be adjusted.

3.2.5   The work of the MCRGG is of interest to the SADIS provider as the group is looking at cost recovery considerations in relation to SWIM and future data-centric services, ways of determining the cost basis for the provision of aeronautical meteorological information, and cost recovery mechanisms. The cost recovery mechanism for SADIS was introduced in 2000 and will need to be reviewed at some point in the future, especially as the next generation SADIS system will have an operating cost that is proportional to the number of downloads being made. A preliminary paper that considers the different options will be presented at the next SADIS Cost Recovery Administrative Group (SCRAG) meeting at the end of 2021. The SADIS provider State participates in the activities of the MCRGG.

3.3   **Agenda Item 3.3 - SADIS Operation during from March 2020 to February 2021**

SADIS Management Report

3.3.1   The SADIS Management Report was provided (as MOG/15 IP/05), by the SADIS Provider and the SADIS Gateway Provider, and showed that SADIS continues to provide an effective and reliable service to a large number of users across a many States within the AFI, ASIA, EUR, MID and NAT regions.

3.3.2   SADIS was migrated to use Amazon Web Services (AWS) infrastructure in November 2019, and it has shown a high level of resilience over the past year with only a single brief 45 minute partial outage caused by a connectivity problem within the AWS datacentre.

SADIS Changes made in November 2020

3.3.3   MOG/15 IP/06 describes upgrades made to SADIS in November 2020, in conjunction with the Amendment 79 to ICAO Annex 3 – *Meteorological Service for International Air Navigation.* On 5 November 2020 new 0.25 degree WAFS hazard (cumulonimbus, icing and turbulence) data sets were added to SADIS operationally, and the monitoring of the average daily download volume shows that SADIS users are taking this new data.

3.3.4   On 3 December 2020 IWXXM data was added to SADIS, with 1-minute, 5-minute and hourly files providing users with access to all types of IWXXM format data. At the MOG/13 meeting the meeting was informed that only IWXXM data with a schema version of 3.0 or later would be published, however it was later decided SADIS should publish <u>any</u> IWXXM data disseminated internationally. It is believed that SADIS is one of the first system to make international IWXXM data sets available to aviation industry users and a large number of national met services, and will help to encourage the adoption and use of this new data format. It is noted that the EUR Regional Opmet Data Banks (RODB) are making IWXXM data available.

3.3.5   It was noted that the development and delivery of these new data provisions on SADIS was a significant achievement, given the significant challenges presented by COVID-19 and the requirement for the development team to work remotely from each other.

3.3.6   A question was asked regarding the file naming conventions used on WIFS for the new 0.25 degree hazard data sets, which did not use the WMO style bulletin header naming convention applied to gridded data on WIFS. WAFC Washington reported that their files have recently been updated to contain the appropriate WMO style bulletin information to assist with data routing.

Provision of IWXXM Data on SADIS

3.3.7   SN/02 Rev-1- and the Management report both describe what IWXXM data is available on SADIS, as a full global data set is not yet available. IWXXM data is currently exchanged between ROC London (the SADIS gateway provider), ROC Toulouse and ROC Vienna with a "status" map provided to show which data was available at the time the report was written. Since then, some additional States data has been added within the EUR region and it was also noted that the three EUR ROC's all provide translation services. Connections outside of Europe still need to be established to all of the other regions and an EUR-AFI workshop has been held to try to resolve connectivity issues in the AFI region.

3.3.8   The AMHS Gateway interconnection between EUR and NAM is in place and has the required redundancy. ROC London is awaiting for the NAM region to identify a target date for the exchange of IWXXM data. Once a target date has been agreed the appropriate procedures can be put in place in the messaging domain, and data routed to SADIS.

3.3.9   The United Kingdom will present a working paper to highlight to the EUR AFS to SWIM transition task force (AST TF) the constraints and issues in the current AFS network for Interregional Gateways in respect to the exchange of IWXXM data between different regions via Extended AMHS utilising FTBP. This working paper is expected to start a new action to look into this Global issue.,

3.3.10 It was noted that the Met Information Exchange (MIE) working group are aware of the interregional IWXXM exchange issues and deficiencies and have an ongoing activity related to this. They will also be raising the matter to METP/5. It is also expected to be raised by the ICAO EUR AFS to SWIM transition task force (AST TF) to the ICAO EASPG so the issue is escalated in the ICAO messaging domain.

SADIS Efficacy Survey

3.3.11   The annual SADIS Efficacy survey was carried out between 1 July and 31 December 2020, and the results are described in SN/03. 96 responses were received from 71 different countries, and users expressed a high level of satisfaction with the SADIS service.

3.3.12   Based on the responses received and the summary presented in SN/03, the meeting reiterated its satisfaction with the quality of SADIS service. 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 2020/2021) and formulated the following action:

> **Action Agreed 15/02 - Annual statement of operational efficacy of SADIS 2020/2021**
>
> That the Rapporteur of the METP-WG/MOG be invited to inform the Secretary of the SCRAG (who will pass this on to the Chair of the SCRAG) that the SADIS continued to meet the operational requirements during the period 2020/2021.

3.3.13   As new 0.25 degree resolution WAFS data and IWXXM data has been added to SADIS, it is prudent to seek user feedback on them during the 2021 SADIS efficacy survey. Appendix D shows the questions reviewed and approved by the meeting. It was pointed out that some users have a requirement to keep a copy of their survey responses, and the SADIS manager agreed to investigate whether the survey software could provide this. The following action was formulated:

> **Action Agreed 15/03 — 2021 SADIS Efficacy Survey**
>
> That the web hosted SADIS Efficacy questionnaire, using the questions shown in Appendix D to this report, be used for the 2021 survey which will commence on 1 July 2021 and end on 31 December 2021.
>
> *Note 1—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.*
>
> *Note 2– the SADIS manager will investigate whether it is possible for respondents to access/download their responses once they have completed the survey, and if not, will add a note to the survey that advises that this isn't possible.*

Status of Implementation of SADIS

3.3.14   The meeting reviewed SN/04 regarding the Status of Implementation of SADIS, and it was noted that there has been an increase of 11 Users and 5 User States in the last year. The status of implementation table is included as Appendix E, and provides information on the active SADIS users and past users. The meeting agreed to formulate the following action:

> **Action Agreed 15/04 — Status of Implementation of SADIS**
>
> That the ICAO Secretariat be invited to publish the updated Status of Implementation of SADIS document, as shown in Appendix E to this report, on the ICAO website (https://www.icao.int/airnavigation/METP/Pages/Public-Documents.aspx), replacing the previous copy.

SADIS Gateway Activities

3.3.15   The meeting turned its attention to SN/05, presented by the SADIS Gateway Provider which details shows how the operational activities carried out for SADIS differ to their ROC London responsibilities. This information was originally requested at METP-WG/MOG10. The meeting was informed that ROC London responsibilities include carrying out quality compliance checks (and where appropriate interventions) for States which lie within the ROC London area of responsibility, whilst SADIS gateway responsibilities include quality compliance checks and interventions on data from all other States globally. The meeting expressed its satisfaction with endeavours of the SADIS Gateway provider in improving the quality of OPMET data on SADIS.

3.3.16   SN/06 further detailed the activities undertaken by the SADIS Gateway provider in order to ensure a reliable provision of OPMET data on SADIS by monitoring data from around 100 airports, validating and where possible repairing all METARs, TAFs, SIGMETs, and AIRMETs, and resolving issues with ICAO location indicators and missing data.

3.3.17   An ongoing activity, first agreed at METP WG-MOG/06, is to continue alignment activities so that a consistent OPMET data set can be provided on both SADIS and WIFS. IP/08 summarises the current differences that still need to be resolved. As such it was decided to continue with alignment activities during the next year and to add this activity to the SADIS job card.

> **Ongoing Action 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); and
>
> b) report on progress in respect of a) above to the next WG-MOG Meeting.

3.4   **Agenda Item 3.4 – SADIS (and WIFS) development activities**

3.4.1   Plans for the next generation WAFS data delivery systems (essentially the next generation SADIS) were presented in IP/07. In order to meet the SWIM objectives set out in the Global Air Navigation Plan (GANP) and to support the WAFC 10-year plan to provide enhanced gridded data sets the existing SADIS systems will need to be upgraded. A complete set of WAFS data is expected to increase from 50MB to 2200MB per model run in November 2023, with further increases in subsequent years when probabilistic data is added.

3.4.2   A core capability of the next generation SADIS will enable users to sub-set data using latitude/longitude bounding boxes and user defined polygons. Users will be able to "subscribe" to the same data set and get updated data with each new model run, but also make ad-hoc requests for data if they want to download different data sets on different occasions.

3.4.3   It will be possible to customise the OPMET downloads, with users able to request all data, on either a subscription or ad-hoc basis, located within a predefined area, according to its ICAO identifier, or perhaps any data of a particular type. The new IWXXM SIGWX forecasts will also be available.

3.4.4   The Next Generation SADIS System will be deployed in the Cloud, delivering SWIM Compliant Services to access the full set of enhanced WAFS Products. The system will be scalable making use of Cloud Based serverless technologies. It will consist of a set of loosely coupled Sub-systems, Components and Capabilities. It will in effect comprise of three separate different API[1] services (Gridded data, SIGWX and OPMET) which as a whole will form the next generation SADIS system. Access to the new system services will be controlled and managed with the use of API keys and tokens. Usage will be monitored.

3.4.5   The next generation WIFS will have similar capabilities, and each system will be the backup for the other, however the next generation SADIS may offer the ability to provide "corridors" of data that relate to specific flight trajectories. A question was raised about this last possibility, as this possibility may be seen as far from a global service linked to WAFC, is related to specific end users and the complementary aspects between SADIS / WIFS and the RODBs should be further determined and explored in this matter. It is anticipated that the new gridded data sets up to the 36-hour timestep will be available within 5 hours of the model run time (this is the current target). Availability times of data for the longer timesteps (out to 120-hours) may be later than this, and a new metric will be chosen once the data is operational.

3.4.6   An ongoing activity for the WAFC's is to harmonise the next generation capabilities where possible, and a further update will be presented at MOG next year.

3.5   **Agenda Item 3.5 – Updates to SADIS Documentation**

SADIS catalogue

3.5.1   An update to the SADIS Catalogue SADIS Catalogue, which details the information usually available on SADIS was presented in SN/13. It was noted that the catalogue has been extended from just listing the available TAC format METAR, SPECI and TAF data. The catalogue now includes the following data types in TAC format: AIRMET, GAMET, SIGMETS (all types), Tropical Cyclone Advisories, Space Weather Advisories, Volcanic Ash Advisories, Special AIREPs and administrative messages and also the following IWXXM data sets: METAR, SPECI, TAF, SIGMETS, AIRMETS, Tropical Cyclone Advisories, Space Weather Advisories, and Volcanic Ash Advisories.

> **Action Agreed 15/05 – SADIS OPMET Catalogue**
>
> That;
>
> a) the April 2021 update to the SADIS OPMET catalogue, once finalised is published on SADIS and https://www.icao.int/airnavigation/METP/Pages/Public-Documents.aspx (replacing the previous version).
>
> b) the catalogue is updated at least annually

SADIS User Guide

3.5.2   SN/07 presents an update to the SADIS User Guide part 1 and 2 (Attachments 1 and 2 to SN/07) for the meeting to review. The 13 different appendices/attachments to part one of the guide were given a significant overhaul and have been streamlined into three new, logically ordered appendices. The SADIS OPMET catalogue now contains detailed information which allows the two original appendices that were separate documents (called SUG Annex 2 and SUG Annex 3) to be retired. The remaining minor adjustments to the user guides relate to the new IWXXM data.

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[1] https://n.wikipedia.org/wiki/API

3.5.3   After consideration of the proposed revisions to the SADIS User Guide the meeting agreed to publish the updated guides and formulated the following action:

Action Agreed 15/06 — SADIS User Guide

That;

a) the proposed updates to the SADIS User Guide Part 1 and Part 2, as contained in SN07 Attachment 1 and 2, are accepted;

b) the two redundant appendices (SUG Annex 2 and SUG Annex 3) that are published as separate documents are removed from the ICAO website (https://www.icao.int/airnavigation/METP/Pages/Public-Documents.aspx); and,

c) once finalised, the new copy of the SADIS User Guide parts 1 and 2 is published on the ICAO website by the ICAO Secretariat.

SADIS workstation/software evaluations

3.5.4   SN/07 presented updates to two documents that relate to SADIS workstation evaluations; the SADIS software evaluation criteria (SN07/Attachment A), and the SADIS Workstation Software Evaluation guide (SN07/Attachment B). Both have been updated to take account of the new 0.25 degree resolution hazard data sets, and IWXXM data although compliance for IWXXM is treated as an optional requirement as the IWXXM data set is not yet complete enough to be used operationally.

3.5.5   After consideration of the proposed revisions to the SADIS Evaluation criteria and guide the meeting agreed to publish the updated guides and formulated the following decision:

Draft Action 15/07 – SADIS Software Evaluation Criteria and Workstation User Evaluation Guide

That;

a) the "Software Evaluation Criteria", as contained in SN/08 Attachment A, and the "SADIS Workstation User Evaluation Guide", as contained in SN/08 Attachment B is approved by the group

b) once finalised, both documents will be passed to the Secretary for publication on the ICAO website (https://www.icao.int/airnavigation/METP/Pages/Public-Documents.aspx);

c) the SADIS manager will arrange for them to be published on the Met Office Website and in the "documentation" section on SADIS.

SADIS Agreement Annex I and Annex II

3.5.6   The meeting reviewed SN/09 regarding changes and proposed updates to the SADIS Agreement Annexes I (SADIS Services) and II (SADIS Inventory). The changes all relate to the addition of IWXXM format data onto SADIS which took place in early December 2020. After consideration of the proposed revisions the following decision was formulated:

Draft Action 15/08 - SADIS Agreement Annex I and II 2021-2022

That, the Rapporteur of the METP-WG/MOG be invited to forward the updated SADIS Agreement Annex I and II inventory given in appendix F to the Secretary of SCRAG.

GRIB2 reference documentation

3.5.7   SN/11 provided an update to a WAFS GRIB quick reference table (SN/11 Attachment 1) that is available on the ICAO website to take account of the retirement of the 1.25 degree in-cloud turbulence field at the end of March 2020. The WAFS GRIB2 Specification document (SN/11 Attachment 2) also needed to be update to remove the in-cloud turbulence and to add the 0.25 degree hazard data sets.

3.5.8   Having considered the updated documents the group formulated the following action:

> **Draft Action 15/09 — WAFS GRIB2 Specification**
>
> That the ICAO Secretariat be invited to publish the GRIB documents once finalised (as contained in SN11 Attachment 1 and 2), on https://www.icao.int/airnavigation/METP/Pages/Public-Documents.aspx , replacing the previous versions.

Job Card

3.5.9   At the MOG/13 Meeting, an action was agreed to present the agreed updates to Job Card 8 to the METP/5 meeting. Due to the COVID-19 pandemic the dates of the METP meeting was pushed back to June 2021, which means that many of the activities listed on the job card have now been completed. Therefore, an additional review was completed, and presented to the meeting in SN/14. The ICAO secretariat advised that completed tasks should be given a "completed" status instead of being scored out, and the revised Job card is available in Appendix G.

3.5.10   Key changes proposed for the job card include:

- Marking the tasks relating to updating the SADIS and WIFS users guide in relation to Amendment 78 and Amendment 79 as complete.

- Changing the text relating to action 1716 to make it more understandable.

- Adding a new action to reflect the continual activity to align the OPMET content hosted on SADIS and WIFS. This particularly relates to METAR and TAF data.

- Adding new tasks to update the SADIS and WIFS user guides in relation to Annex 3 Amendment 81 and the new PANS-MET, and the upcoming technology upgrades.

3.5.11   Having considered the proposed changes to the job card the following action was agreed:

> **Action Agreed 13/10 — 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.

4.   **Agenda Item 4 - AoB**

4.1   No papers were presented under this Agenda Item.

5.   **Agenda Item 5 - Timetable and future meetings of WG-MOG (SADIS)**

5.1   The meeting considered potential date and venue for the next meeting and agreed, in principle, to held the next meeting during the week commencing 25April 2022 at the premises of the United Kingdom MET Office in Exeter should travel and working regulations permit.

6.   **Meeting Close**

6.1   The meeting was closed by Mr. Dutton who thanked all delegates for their contributions which had made this another successful online meeting, and hoped that it would be possible to conduct the meeting next year in person.

-END-

APPENDIX A - List of participants

STATE/ORG.	NAME		
Australia	Cameron	Lethlean	
Canada	Karine	Dumas	
	William	Maynard	
China	Zou	Juan	
France	Patrick	Simon	
Germany	Clemens	Weidemann	
South Africa	Gaborekwe	Khambule	
United Kingdom	Jonathan	Dutton	Rapporteur
	Karen	Shorey	Workstream lead
	Matt	Wagner	
United States	Pat	Murphy	
	Matt	Strahan	
	Larry	Burch	
	Brian	Pettegrew	
	Alfred	Moosakhanian	
ASECNA	Diori	Saley	
IATA	Oleh	Shulimov	
	Slawomir	Szalasny	
ICAO	Jun	Ryuzaki	Secretariat
IFALPA	Klaus	Sievers	

APPENDIX B – 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. Note - Space weather is expected to be added to this working group following the METP/5 meeting.

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 set of actions

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

APPENDIX C- Status of SADIS actions/decisions from MOG/13

Item	Status
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.	Ongoing. An update will be given at MOG15.
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.	Complete. This information is included within the SADIS management report.
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.	Complete
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	Complete
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.	Completed in December 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.*	Complete. SN03 reports back on the survey responses.
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.	Complete
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).	Complete
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).	Complete
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.	METP-5 meeting delayed until July 2021. Additional updates to the Job Card are proposed in SN12.
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	Complete
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.	Complete. Published in Nov 2020.

APPENDIX D - 2020/2021 SADIS efficacy survey questions

New question being used in the 2020-2021 Survey are shown in blue highlighted text.

2019/2020 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
8. If your answer to question 7 was 'No' please provide further details
9. 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
10. If your answer to question 9 was 'average' or 'poor' please specify the nature of the problem*
11. Are you downloading the new higher resolution (0.25 degree) cumulonimbus, turbulence and icing data sets?

    Options   Yes

    No

    I don't know

12. If your answer to question 11 was 'no' please explain when you plan to start downloading the higher resolution data sets or any issues that may causing a delay in using this new data.*

13. 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

14. If your answer to question 1113 was 'average' or 'poor' please specify the nature of the problem*

15. How did you find the availability of OPMET messages (METAR, TAF, SIGMET etc.)?

    Options   Good

                  Average

                  Poor

                  OPMET data was not used

16. If your answer to question 1315 was 'average' or 'poor' please specify the nature of the problem*

17. Are you downloading the new IWXXM format OPMET data sets?

    Options   Yes

                  No

                  I don't know

18. Please explain any plans you have in relation to downloading and using IWXXM OPMET data sets*

    Note: At present not all ROC's are exchanging IWXXM format data, so SADIS is only able to provide a limited selection of data.

19. How did you find the reliability of the SADIS FTP system overall?

    Options   Good

                  Average

                  Poor

20. If your answer to question 1519 was 'average' or 'poor' please specify the nature of the problem below*

21. During the last year, did you need to contact the Service Desk?

    Options   Yes

                  No

22. If your answer to question 1721 was 'Yes", was the technical support provided by the service desk satisfactory?

    Options   Yes

                  No

23. If your answer to question 1822 was 'No' please explain the nature of the problem that was experienced*

24. Were SADIS administrative messages sufficient to keep you advised of the status of SADIS services?

    Options   Yes

                  No

25. If your answer to question 2024 was 'no' please explain the nature of the problem*

26. If you have any additional comments or feedback on the current SADIS service please write them below. *

27. If you have any suggestions about how to improve the SADIS service in future, please write them below. *

Survey participants are directed to e-mail the SADISmanager@metoffice.gov.uk with their feedback/issues if they want a direct response from the SADIS provider. Feedback submitted through the survey is anonymous.

APPENDIX E – Update to the Status of Implementation of SADIS

- New text is in highlighted text.
- Deleted text is shown with red ~~strikeout~~

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

(28 February 2021)

Note.⎯ Non-operational approved users, and those who no longer take the service (for whatever reason) or who have not used SADIS for a period of at least two years 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					
1.	Angola	1.	INAMET	Luanda Airport	X
2.	Benin	2.	National Meteorological Service (ASECNA)	Cotonou International Airport	X
3.	Botswana	3.	National Meteorological Service	Gaborone Airport	X
4.	Burkina Faso	4.	National Meteorological Service (ASECNA)	Ouagadougou Airport	X
5.	Burundi	5.	Institute Geographique	Bujumbura	X
6.	Cabo Verde	6.	National Meteorological Service (INMG)	Espargos	X
7.	Cameroon	7.	National Meteorological Service (ASECNA)	Douala Airport	X
8.	Central African Republic	8.	National Meteorological Service (ASECNA)	Bangui	X
9.	Chad	9.	National Meteorological Service (ASECNA)	N'Djamena Airport	X
10.	Comoros	10.	National Meteorological Service (ASECNA)	Moroni Airport	X
11.	Congo	11.	National Meteorological Service (ASECNA)	Brazzaville Airport	X
12.	Côte d'Ivoire	12.	National Meteorological Service (ASECNA)	Abidjan Airport	X
13.	Democratic Republic of the Congo	13.	METTELSAT	Kinshasa Airport	X
14.	Djibouti	14.	Service Météorologique	Djibouti Airport	X
15.	Equatorial Guinea	15.	National Meteorological Service (ASECNA)	Malabo Airport	X
	Eritrea		*Civil Aviation Authority*	*Asmara International Airport*	
16.	Ethiopia	16.	National Meteorological Agency	Addis Ababa Airport	X
	Ethiopia		*Ethiopian Airlines*	*Addis Ababa Airport*	
17.	Gabon	17.	National Meteorological Service (ASECNA)	Libreville Airport	X
18.	Gambia	18.	Department of Water resources	Banjul Airport	X
19.	Ghana	19.	National Meteorological Agency	Accra Airport	X

ICAO Contracting State		User		Location	SADIS FTP
No	Name	No	Name	Name	
20.	Guinea	20.	National Meteorological Service	Conakry Airport	X
21.	Guinea-Bissau	21.	Administration Météorologique	Bissau Intl. Airport	X
22.	Kenya	22.	National Meteorological Service	Eldoret Airport	X
	Kenya	23.	National Meteorological Service	Mombasa Airport	X
	Kenya	24.	National Meteorological Service	Nairobi Airport	X
23.	Lesotho	25.	National Meteorological Service	Moshoeshoe Airport	X
24.	Liberia (Republic of)	26.	Roberts Flight Information Region	Monrovia	X
25.	Madagascar	27.	National Meteorological Service (ASECNA)	Antananarivo/Ivato	X
	Madagascar	28.	Meteo Madagascar	Antananarivo	X
26.	Malawi	29.	Department of Climate Change and Meteorology	Lilongwe	X
27.	Mali	30.	National Meteorological Service (ASECNA)	Bamoko Airport	X
28.	*Mauritania*		*Office National de la Météorologie*	*Nouakchott Airport*	
	Mauritania	31.	National Meteorological Service (ASECNA)	Nouadhibou Airport	X
29.	Mauritius	32.	National Meteorological Service	Vacoas	X
30.	Mozambique	33.	Instituto Nacional de Meteorologia	Maputo	X
31.	Namibia	34.	National Meteorological Service	Windhoek	X
32.	Niger	35.	National Meteorological Service (ASECNA)	Niamey Airport	X
	Niger	36.	National Meteorological Service (ASECNA)	EAMAC Training School	X
33.	Nigeria	37.	NIMET	Lagos Airport	X
	Nigeria	38.	NIMET	Mallam Aminu Kano Airport	X
	Nigeria	39.	NIMET	Abuja Airport	X
	Nigeria	40.	NIMET	Port Harcourt Airport	X
	Nigeria	41.	NIMET	Sam Mbakwe Airport, Owerri	X
	Nigeria	42.	NIMET	Maiduguri Airport	X
	Nigeria	43.	NIMET	Sokoto Airport	X
	Nigeria	44.	NIMET	Ilorin Airport	X
	Nigeria	45.	NIMET	Akanu Ibiam Airport, Enugu	X
	Nigeria	46.	NIMET	Umuaru Musa Yardua Airport, Kasina	X
	Rebuplic of South Sudan		*South Sudan Meteorological Service*	*Juba Airport*	
34.	Rwanda	47.	Civil Aviation Authority	Kigali Airport	X
35.	St Helena (UK OT)	48.	St Helena Airport Project	St Helena	X
36.	Sao Tome and Principe	49.	Instituto Nacional de Meteorologia	Sao Tome Airport	X
37.	Senegal	50.	National Meteorological Service (ASECNA)	Dakar Airport	X
	Senegal	51.	ASECNA – DTI Maintenance 1	Headquarters, Dakar	X
	Senegal	52.	ASECNA	Blaise Diagne Int Airport, Dakar	X
38.	Seychelles	53.	Seychelles Meteorological Authority	Victoria, Mahá	X
	Sierra Leone		*National Meteorological Service*		
39.	Somalia	54.	Flight Information Services for Somalia	United Nations, Nairobi	X
40.	South Africa	55.	South Africa Weather Services (SAWS)	Pretoria	X
	South Africa	56.	Netsys*	Pretoria	X
	South Africa	57.	Platsoft*	Sandton	X

ICAO Contracting State		User		Location	SADIS FTP
No	Name	No	Name	Name	
41.	Swaziland	58.	National Meteorological Service	Mbabane	X
42.	Togo	59.	National Meteorological Service (ASECNA)	Lomé	X
43.	Uganda	60.	National Meteorological Authority	Entebbe Airport	X
	Uganda	61.	National Met Authority	Soroti Aerodrome	X
44.	United Republic of Tanzania	62.	National Meteorological Agency	Dar Es Salaam	X
45.	Zambia	63.	Zambia Meteorological Department	Lusaka International Airport	X
	Zambia	64.	Zambia Meteorological Department	Livingstone	X
46.	Zimbabwe	65.	Meteorological Services Department	Harare International Airport	X
ASIA REGION					
47.	Afghanistan	66.	PACTEC International	Kabul	X
	Afghanistan		*National Meteorological Service*	*Kabul Airport*	
48.	Australia	67.	Bureau of Meteorology	Melbourne	X
	Australia	68.	WeatherZone	North Sydney	X
	Australia	69.	Air Services Australia	Canberra	X
49.	Bangladesh	70.	National Meteorological Service	Dhaka Airport	X
50.	Cambodia	71.	State Secretariat of Civil Aviation (SSCA)	Phnom Penh International Airport	X
51.	China	72.	Civil Aviation Administration of China (CAAC)	Aviation Meteorological Center	X
	China	73.	Civil Aviation Administration of China (CAAC)	Beijing Airport	X
	China	74.	Civil Aviation Administration of China (CAAC)	Guangzhou Airport	X
	China	75.	Hong Kong Observatory	Hong Kong Intl. Airport	X
	China	76.	Civil Aviation Authority	Macau Airport	X
	China	77.	Meteorological and Geophysical Bureau	Macau	X
	Democratic People's Republic of Korea		*Civil Aviation Authority*	*Pyongyang Airport*	
52.	India	78.	India Meteorological Department	New Delhi	X
	India	79.	Sheory Digital Systems	Mumbai	X
53.	Indonesia	80.	Badan Meteorologi Klimatologi dan Geofisika (BMKG)	Sultan Hasanuddin International Airport, Makassar	X
54.	Lao People's Democratic Republic	81.	Ministry of Natural Resource and Environment	Vientiane International Airport	X
55.	Maldives	82.	National Meteorological Service	Male Airport	X
	Mongolia		*Civil Aviation Authority*	*Ulan Bator Airport*	
	Myanmar		*DMH*	*Yangon*	
56.	Nepal	83.	National Meteorological Service	Kathmandu Airport	X
57.	Pakistan	84.	Meteorological Department	Karachi	X
	Sri Lanka		*GHP Dharamaratna*	*Colombo*	
58.	Thailand	85.	Thai Meteorological Department	Suvarnabhumi Airport	X
	Thailand	86.	Thai Meteorological Department	Don Mueang Airport	X
59.	Viet Nam	87.	Civil Aviation Authority	Hanoi	X
	Viet Nam	88.	Southern Airports Corporation	Tan Son Nhat Airport, Ho Chi Min City	X
	Viet Nam	89.	Northern Airports Corporation	Noi Bai Int. Airport	X

					EUR REGION		
60.	Albania	90.	National Air Traffic Agency	Tirana Airport	X
61.	Algeria	91.	Meteo Algerie	Dar El Beida	X
	Algeria	92.	National Meteorological Service	Essidikia Oran	X
	Algeria	93.	National Meteorological Service	Eastern Regional Meteo Office	X
	Algeria		*Forces Aériennes Algériennes*	*Forces Aériennes Algériennes*	
62.	Armenia	94.	Armenian Aero-Meteorological Centre	Zvartnots Airport, Yerevan	X
63.	Austria	95.	Austro Control	Vienna	X
64.	Azerbaijan	96.	Azeraeronavigation	Heydar Aliyev International Airport	X
65.	Belarus	97.	Belhydromet	Minsk	X
66.	Belgium	98.	Skeyes (formerly Belgocontrol)	Brussels Airport	X
	Belgium	99.	Eurocontrol	Brussels	X
67.	Bosnia and Herzegovina	100.	Bosnia and Herzegovina Air Navigation Services Agency (BHANSA)	Banja Luka	X
68.	Bulgaria	101.	Bulgaria Air Traffic Services	Sofia Airport	X
69.	Croatia	102.	Croatia Control Ltd.	Zagreb Airport	X
70.	Cyprus	103.	Department of Civil Aviation Cyprus	Nicosia	X
71.	Czech Republic	104.	Czech HydroMet Institute	Praha/Komorany	X
	Czech Republic	105.	Air Navigation Services	Praha/Jenec	X
	Czech Republic	106.	NAV Flight Services, s.r.o.	Praha	X
72.	Denmark	107.	Danish Meteorological Institute	Copenhagen	X
	Denmark	108.	SAS Airline	Copenhagen	X
	Denmark	109.	Air Support A/S	Billund	X
	Denmark	110.	AviationCloud A/S	Odense	X
	Denmark	111.	Naviair	Kastrup	X
73.	Estonia	112.	Air Navigation Service (EANS)	Rae küla	X
	Estonia	113.	Estonian Environment Agency (ESTEA)	Tallinn	X
74.	Finland	114.	Air Navigation Services Finland (Civil Aviation Administration)	Helsinki-Vantaa Airport	X
	Finland	115.	Finnish Meteorological Institute	Helsinki	X
75.	France	116.	Dassault Falcon	Saint Cloud (Paris)	X
	France	117.	Météo-France	Toulouse	X
	France	118.	Météo-France International (MFI)*	Toulouse	X
	France	119.	Corobor*	Paris	X
76.	Georgia	120.	National Meteorological Service	Tbilisi Airport	X
77.	Germany	121.	Deutscher Wetterdienst	Offenbach	X
	Germany	122.	European Union Aviation Safety Agency (EASA)	Cologne	X
	Germany	123.	Lufthansa Systems	Frankfurt Airport	X
	Germany		*JMB Data Service*	*Nuremberg*	
	Germany	124.	FSS-GMB	Cologne	X
78.	Greece	125.	Hellenic National Meteorological Service (HNMS)	Athens	X
	Greece	126.	SSA S.A	Athens International Airport	X
79.	Hungary	127.	Hungarian Meteorological Service	Budapest	X
	Hungary	128.	HungaroControl	Budapest Airport	X
80.	Ireland	129.	MET Eireann	Dublin	X
81.	Israel	130.	Israel Meteorological Service	Bet-Dagan	X
82.	Italy	131.	ENAV	Milan Forecasting Unit	X

	Italy	132.	ENAV	Rome Forecasting Unit	X
	Italy	133.	ENAV	AIS Milan	X
	Italy	134.	ENAV	AIS Rome	X
	Italy	135.	Air Force National Centre for Meteorology and Climatology (CNMCA)	Rome	X
83.	Kazakhstan	136.	Kazaeronavigatsia	Almaty	X
84.	Kyrgyzstan	137.	Kyrgyzaeronavigatsia	Manas Airport	X
85.	Latvia	138.	Latvijas Gaisa Satiksme (LGS)	Riga	X
	Latvia	139.	Latvijas Vides, Geologijas un Meteorologijas Centre	Riga	X
86.	Lithuania	140.	Air Traffic Services (Oro Navigacija)	Vilnius Airport	X
87.	Luxembourg	141.	Administration de la navigation aérienne, Département météorologique (MeteoLux)	Findel	X
88.	Malta	142.	Malta International Airport	Luqa Airport	X
89.	Montenegro	143.	Serbia and Montenegro Air Traffic Services	Belgrade Airport	X
90.	Morocco	144.	Maroc Meteo	Casablanca	X
91.	Netherlands	145.	KNMI	De Bilt	X
	Netherlands	146.	Telvent Almos*	Culemborg	X
	Netherlands	147.	Smart4Aviation.	Amsterdam	X
	Netherlands	148.	Navindigo	Nieuwegein	X
	Netherlands	149.	*Flight Operations in Control*	*The Hague*	
	Netherlands	150.	MeteoGroup	Wageningen	X
	Netherlands	151.	PocketFMS	Lelystad Airport	X
	Netherlands	152.	Weathernews Benelux	Soest	X
92.	Norway	153.	Avinor Flysikring	Bergen Airport	X
93.	North Macedonia	154.	Macedonian Air Navigation Service Provider (M-NAV)	Skopje	X
94.	Poland	155.	Institute of Meteorology and Water Management (IMGW)	Warsaw	X
	Poland	156.	Lufthansa	Gdansk	X
	Poland	157.	Port Lotniczy Bydgoszcz S.A	Port Lotniczy airport	X
	Poland	158.	Radom Meteo Sp. z o.o.	Radom Airport	X
	Poland	159.	Warmia i Mazury	Olsztyn-Mazury	X
95.	Portugal	160.	Instituto Português do Mar e da Atmosfera	Lisbon Airport	X
	Portugal		*Força Aérea Portuguesa*	*Alfragide*	
96.	Republic of Moldova	161.	MoldATSA	Chisinau Airport	X
97.	Republic of Tajikistan	162.	Tajikairnavigation	Dushanbe	X
98.	Romania	163.	ROMATSA	Bucharest	X
99.	Russian Federation	164.	Aviamettelekom of Roshydromet	St. Petersburg	X
	Russian Federation	165.	Institute of Radar Meteorology (IRAM)*	St. Petersburg	X
	Russian Federation	166.	Map Makers Group *	Moscow	X
	Russian Federation	167.	Aviamettelekom of Roshydromet (ATM)	Moscow	X
100.	Serbia	168.	National Meteorological Service	Belgrade	X
	Serbia	169.	Serbia and Montenegro Air Traffic Services	Belgrade Airport	X
101.	Slovakia	170.	Slovak Hydrometeorological Institute	Bratislava	X
	Slovakia	171.	MicroStep MIS	Bratislava	X
	Slovakia	172.	IBL Software Engineering *	Bratislava	X
102.	Slovenia	173.	Slovenia Environment Agency	Ljubljana	X

103.	Spain	174.	La Agencia Estatal de Meteorología (AEMET)	Madrid	X
104.	Sweden	175.	AVTECH	Kista, Stockholm	X
	Sweden	176.	LFV	Arlanda Airport	X
	Sweden	177.	LFV	Sundsvall Airport	X
	Sweden	178.	Flygprestanda	Malmö	X
	Sweden	179.	Carmenta *	Göteborg	X
	Sweden		*Navigraph*	*Stockholm*	
	Sweden	180.	Swedish Meteorological and Hydrological Institute (SMHI)	Norrköping	X
	Sweden	181.	Swedish Meteorological and Hydrological Institute (SMHI)	Stockholm	X
105.	Switzerland	182.	MeteoSwiss	Zurich	X
106.	Tunisia	183.	National Institute of Meteorology	Tunis	X
107.	Turkey	184.	Turkish State Meteorological Service	Ankara Airport	X
108.	Ukraine	185.	Air traffic services (UKSATSE)	Kyiv	X
	Ukraine	186.	Aeronautical MET Centre (UAMC)	Boryspil Airport, Kyiv	X
109.	United Kingdom	187.	Met Office	Exeter	X
	United Kingdom	188.	NATS	Swanwick	X
	United Kingdom	189.	Aviation Briefing	Bristol	X
	United Kingdom	190.	Bytron	Kirmington	X
	United Kingdom	191.	Air Data	Crawley	X
	United Kingdom	192.	The Weather Company (IBM)	Birmingham	X
	United Kingdom		*Stratajet*	*London*	
	United Kingdom		*Lufthansa*	*Welwyn Garden City*	
	United Kingdom		*Flight Efficiency Ltd*	*London*	
	United Kingdom	193.	Rocket Route	Farnborough	X
	United Kingdom	194.	AVBLOX	London	X
	Uzbekistan		*Uzaeronavigation*	*Tashkent*	
MID REGION					
110.	Bahrain	195.	Ministry of Transportation Civil Aviation Affairs	Bahrain International Airport	X
111.	Egypt	196.	Meteorological Authority	Cairo Airport	X
	Egypt	197.	Egyptian Ministry of Defence	Cairo	X
	Iran (Islamic Republic of)		*National Meteorological Service*	*Teheran*	
112.	*Iraq*	198.	*Iraq Meteorological Organization and Seismology*	*Baghdad Airport*	X
113.	Jordan	199.	Meteorological Department	Queen Alia Airport	X
114.	Kuwait	200.	Meteorological Department	Kuwait	X
115.	Libya	201.	National Meteorological Centre	NMC - Eswani	X
		202.	National Meteorological Centre	Tripoli Int. Airport	X
		203.	National Meteorological Centre	Binena Int. Airport	X
116.	Oman	204.	Public Authority for Civil Aviation/ Meteorological Department	Salalah Airport	X
	Oman	205.	Public Authority for Civil Aviation/ Meteorological Department	Seeb Airport	X
117.	Qatar	206.	Civil Aviation Authority - Meteorology Department	Doha Airport	X
	Qatar	207.	Civil Aviation Authority - Meteorology Department	Doha	X
118.	Saudi Arabia	208.	General Authority of Meteorology and Environmental Protection (GAMEP)	Jeddah	X

	Saudi Arabia	209.	General Authority of Meteorology and Environmental Protection (GAMEP)	Jeddah Airport	X
	Saudi Arabia	210.	General Authority of Meteorology and Environmental Protection (GAMEP)	Riyadh Airport	X
	Saudi Arabia		*Saudi Airlines*	*Jeddah Airport*	
119.	Sudan	211.	Sudan Meteorological Authority	Headquarter, Khartoum	X
	Syrian Arab Republic		*National Meteorological Service*	*Damascus*	
	Syrian Arab Republic		*National Meteorological Service*	*Aleppo*	
120.	United Arab Emirates	212.	National Centre for Meteorology and Seismology (NCMS)	Dubai International Airport	X
	United Arab Emirates	213.	National Centre for Meteorology and Seismology (NCMS)	Dubai International Airport	X
	United Arab Emirates	214.	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)*	
121.	Yemen	215.	Civil Aviation and Meteorological Authority (CAMA)	Sana'a Airport	X
	Yemen	216.	National Meteorological Service (YMS/CAMA)	Sana'a	X
NAT REGION					
122.	Iceland	217.	Air Atlanta Icelandic	Kopavogur	X
	Iceland	218.	IMO	Reykjavik	X

APPENDIX F – Update to the SADIS Agreement Annex I and II.

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

ANNEX I

SADIS SERVICES

(~~2019-2020~~ 2021-2022)

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 advisories, tropical cyclone advisories 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 OPMET information in IWXXM format (METARs, TAFs, SIGMET, AIRMET, volcanic ash advisories, tropical cyclone advisories and space weather advisories) from those States who are distributing their data internationally via the Regional Opmet Centres;

   ~~e~~f) 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)
IWXXM	The ICAO Meteorological Information Exchange Model is a data format for reporting aviation weather information in XML/GML format
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. Tasked with the oversight of SADIS until its dissolution in 2015. Superseded by Meteorological Operations Working Group (WG-MOG) under the Meteorology Panel (METP). Reference retained for historical purposes.
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~~ 2021-2022)

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[2] 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.

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[2] budgeted cost for providing MetSwitch service during the fiscal year 2018/2019.

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~~12	Data Storage : Ingestion; FTP Content; IWXXM; AuthN; Logs & Alerts.
DynamoDB	1x Table Primary partition key: report_id Read/write capacity mode: On-Demand	1	Stores incoming IWXXM reports from AV OPMET Data Services
Route53	N/A	1	DNS
Lambda	N/A	N/A	Various Serverless Functions including housekeeping, Log formatting, Alerting Management, packaging IWXXM data, 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	*Skill*
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	*Skill*
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	14 staff-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 Services provide 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 standard required staff days needed to provide the SADIS service. It comprises 6 watches providing the H24 element of the service and day 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 - Operational Staff relates to the H24 function in ROC LONDON. Monitor, validate, record & report on issues raised through the SADIS Gateway operation.	521 staff-days per annum
2. Engineering Staff - Engineering Staff includes the duties carried out by the Engineering Day support team and an H24 engineers for the support of SADIS.	20 staff-days per annum
3. Administration Staff - The Administration Office carries out the documentation creation and amendments, adaptation changes, investigations and meeting attendance of the SADIS Gateway operation.	63 staff-days per annum

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 G – Update to Job Card 8

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/~~24~~
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 provides global OPMET and WAFS information to States and users; via a secure FTP system for SADIS, and via a secure webservice for WIFS. 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 – *Meteorological Service for International Air Navigation*, Doc … Procedures for Air Navigation Services – Meteorology
Deliverable Expert Group	Meteorology Panel (METP)

ID	Document Affected	Description of Amendment proposal or Action	Supporting Expert Group	Status	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~~ On-going			~~Nov 2020~~ Nov 2023
10093	Action~~s~~	Delivery of IWXXM format OPMET data on SADIS and WIFS		~~On-schedule~~ Complete	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~~ Complete	Q3 2020	Nov 2020	Nov 2020
10090	WIFS User Guide	Update WIFS guidance material in line with Annex3 Amendment 78.	IMP	~~On-schedule~~ Complete	Q3 2020	Nov 2020	Nov 2020
10094	Action~~s~~	Update of SADIS and WIFS technology ~~systems~~ to deliver OPMET data in ~~IWXXM format~~ and WAFS data to users in a SWIM compliant manner using API's and web coverage or web feature services.		~~On-schedule~~ In development	Q4 2022		~~Nov 2022~~ Nov 2023
10091	SADIS User Guide	Update SADIS guidance material in line with Annex 3 Amendment 79.	IMP	~~On-schedule~~ Complete	Q3 2020	Nov 2022	Nov 2022
10092	WIFS User Guide	Update SADIS guidance material in line with Annex 3 Amendment 79.	IMP	~~On-schedule~~ Complete	Q3 2020	Nov 2022	Nov 2022
	Actions	Alignment of the OPMET data sets provided on SADIS and WIFS so that the published METARs and TAF data sets are consistent.		On going	Q3 2023	Nov 2023	Nov 2023
	SADIS User Guide	Update SADIS guidance material in line with Annex 3 Amendment 81 and the associated PANS-MET, and develop guidance/training material that reflects the next generation SADIS technology changes		In planning	Q3 2023	Nov 2023	Nov 2023
	WIFS User Guide	Update WIFS guidance material in line with Annex 3 Amendment 81 and the associated PANS-MET, and develop guidance/training material that reflects the next generation WIFS technology changes		In planning	Q3 2020	Nov 2023	Nov 2023

Status:	Priority:	Initial Issue Date:	Date Approved by ANC:	Session / Meeting:
Approved		17 Jun 2015	12 March 2019	210-8

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