



# **SECURE AVIATION DATA INFORMATION SERVICE (SADIS) USER GUIDE**

## **Part 1 – General and Administrative**

To be read in conjunction with Part 2 - Technical

**Sixth Edition — June 2016**

Endorsed by METP WG MOG/15

*Prepared by the ICAO Meteorological Panel Meteorological Operations Working Group  
(WG MOG)*

**INTERNATIONAL CIVIL AVIATION ORGANIZATION**



## RECORD OF AMENDMENTS AND CORRIGENDA

AMENDMENTS			CORRIGENDA		
No.	Date	Pages affected	No.	Date	Pages affected
1	7/7/2016	Original issue			
2.0	12/1/2017	SUG Annex 1 description (2.7.5; Annex 1) Update of webpage links (3.2.1) Removal of temporary references to new flight levels (now introduced) (Annex 4-3, 4-3) Reference to 1 hour delay each year by each WAFC to WAFC SIGWX data issued during WAFC Backup events (Annex 4-5; 4-7). Editorial corrections			
2.1	24/04/2018	Addition of Space Weather forecasts and minor adjustment to formatting.			
2.2	11/04/2019	Updated web links, 2.7.5 and 2.7.6 description. Reference added to workstation evaluation guide. New area of responsibility map. Layout of App E. Annex 1 wording to reference OPMET catalogue. Annex 5 updated to space weather section, and inclusion of low level area forecasts.			
2.3	05/11/2020	Addition of IWXXM format OPMET data sets, and higher resolution WAFS hazard data sets.			
2.4	20/04 2021	Appendices to the SUG restructured and consolidated.			



# TABLE OF CONTENTS

	<i>Page</i>
<b>Glossary .....</b>	iii
 <b>Chapter 1. Introduction to the Secure Aviation Data Information Service (SADIS)</b>	
1.1 Background .....	1
1.2 A brief description of the service .....	2
1.3 Management of SADIS .....	2
1.4 Authorized access to SADIS .....	3
1.5 SADIS cost allocation and recovery .....	3
 <b>Chapter 2. Products and data available on SADIS</b>	
2.1 Overview of products and data available on SADIS .....	4
2.2 Digital grid point (GRIB) data .....	4
2.3 Digital SIGWX in the BUFR code form .....	6
2.4 Digitally coded charts .....	6
2.5 OPMET information in alphanumeric format .....	8
2.6 OPMET information in IWXXM format .....	8
2.7 Administrative messages .....	9
2.8 Schedule of availability .....	9
2.9 The evolution of products and data on SADIS .....	9
 <b>Chapter 3. Recommended basic requirements for data processing systems</b>	
3.1 General requirements .....	10
3.2 Sources of information regarding potential suppliers of equipment to process/display products and data made available on the SADIS .....	10
 <b>Chapter 4. User support</b>	
4.1 Technical support by the SADIS Provider .....	11
4.2 24-hour helpline/faults desk .....	11
4.3 General contact facilities during office hours .....	11
4.4 System development contact facilities .....	11
4.5 Assistance for implementation .....	12
4.6 SADIS backup procedures .....	12

---

**APPENDICES**

Appendix A —Authorisation to use SADIS.....	A-1
Appendix B — Data available on SADIS.....	B-1
Appendix C —Data processing systems.....	C-1

# GLOSSARY

## ABBREVIATIONS AND TERMS

AFS	Aeronautical fixed service
AFTN	Aeronautical fixed telecommunication network
AIREP	Air-report
ANP	Air navigation plan
ATC	Air traffic control
BCC	Bulletin compiling centre
BUFR	Binary universal form for the representation of meteorological data
CB	Cumulonimbus cloud
EANPG	European Air Navigation Planning Group
FIR	Flight information region
FL	Flight level
FTP	File transfer protocol
GAMET	Area forecast for low-level flights
GRIB2	Gridded binary code (WMO) — Edition 2
GZIP	A file format used for file compression and decompression
IFR	Instrument flight rules
IP	Internet Protocol
IWXXM	ICAO Meteorological Information Exchange Model
LDC	Least developed countries
METAR	Aerodrome routine meteorological report
METP	Meteorological Panel (ICAO)
MHz	Megahertz
NATS	National Air Traffic Services
OPMET	Operational meteorological (information)
PNG	Portable network graphics
SADIS	Secure Aviation Data Information Service (formerly, until 1 August 2016, Satellite Distribution System for Information Relating to Air Navigation)
SADISOPSG	SADIS Operations Group (disbanded 2015, but reference retained for historical context)
SADIS Provider	United Kingdom Met Office
SADIS Provider State	United Kingdom, represented by the Head of the Meteorological Authority, United Kingdom Civil Aviation Authority
SARPs	Standards and Recommended Practices
SCRAG	SADIS Cost Recovery Administrative Group

SIGMET	Information concerning en-route weather phenomena which may affect the safety of aircraft operations
SIGWX	Significant weather (charts, forecasts)
SPECI	Aerodrome special meteorological report
SUG	SADIS User Guide
SVC	Switched virtual circuit
SWH	High-level SIGWX
SWM	Medium-level SIGWX
TAC	Traditional Alphanumeric code format
TAF	Aerodrome forecast
TCAC	Tropical cyclone advisory centre
TCP	Transmission control protocol
UPS	Uninterruptable power supply
UTC	Co-ordinated Universal Time
VAAC	Volcanic ash advisory centre
WAFC	World Area Forecast Centre (London and Washington)
WAFS	World area forecast system
WAFSOPSG	WAFS Operations Group (disbanded 2015, but retained for historical context)
WIFS	WAFS internet file service
WG-MOG	Meteorological Operations Group (reporting to METP)
WG-MIE	Meteorological Information Exchange (reporting to METP)
WG-MISD	Meteorological Information and Service Development (reporting to METP)
WG-MRI	Meteorological Requirements and Integration (reporting to METP)
WMO	World Meteorological Organization
WIFS Provider	United States National Weather Service Aviation Weather Center
WIFS Provider State	United States, represented by the Head of the Meteorological Authority, United States Federal Aviation Administration



## DOCUMENTS

- Doc 7910            *Location Indicators*
- Doc 9082           *Statements by the Council to Contracting States on Charges for Airports and Air Navigation Services*
- Doc 9855           *Guidelines on the Use of the Public Internet for Aeronautical Applications*

### **Air Navigation Plans**

- Doc 7754           *Air Navigation Plan — European Region*
- Doc 7474           *Air Navigation Plan — Africa-Indian Ocean Region*
- Doc 8733           *Air Navigation Plan — Caribbean and South American Regions*
- Doc 8755           *Air Navigation Plan — North Atlantic, North American and Pacific Regions*
- Doc 9634           *Air Navigation Plan — North Atlantic Region*
- Doc 9673           *Air Navigation Plan — Asia and Pacific Regions*
- Doc 9708           *Air Navigation Plan — Middle East Region*

### **Documents available from ICAO Regional Offices**

*AFI MET Bulletin Exchange (AMBEX) Handbook* (available from the ICAO WACAF and ESAF Offices)

*Regional OPMET Bulletin Exchange (ROBEX) Handbook* (available from the ICAO APAC Office)

*EUR OPMET Data Management Handbook* (available from the ICAO EUR/NAT Office)



# Chapter 1

## INTRODUCTION TO THE SECURE AVIATION DATA INFORMATION SERVICE (SADIS)

### 1.1 BACKGROUND

1.1.1 The purpose of this *SADIS User Guide* is to give an overview of the system and provide helpful information to potential users. It is intended to complement the technical manuals which will accompany the individual SADIS workstation and software provided by 3<sup>rd</sup> parties. The *SADIS User Guide* is made available on the ICAO METP website.

1.1.2 Additional system information is available from the Met Office SADIS website at URL: <https://www.metoffice.gov.uk/services/transport/aviation/regulated/sadis/index>

1.1.3 The objective of the world area forecast system (WAFS) is to supply meteorological authorities and other users with global meteorological en-route forecasts in digital form. This objective is to be achieved through a comprehensive, integrated worldwide, and, as far as is practicable, uniform system and in a cost-effective manner, taking full advantage of evolving technologies (Annex 3 — *Meteorological Service for International Air Navigation*<sup>1</sup>, 3.1 refers). The meteorological information to be provided comprises forecasts of global:

- a) upper wind;
- b) upper-air temperature;
- c) upper-air humidity;
- d) geopotential altitude of flight levels;
- e) direction, speed and flight level of maximum wind;
- f) flight level and temperature of tropopause;
- g) horizontal extent and flight levels of base and top of cumulonimbus clouds;
- h) icing;
- i) turbulence; and
- j) significant weather phenomena.

---

<sup>1</sup> “Annex 3” will be used to refer to ICAO Annex 3 — *Meteorological Service for International Air Navigation*, as opposed to Annex 3 of the SADIS User Guide which will be referred to as “SUG Annex 3”.

1.1.4 To facilitate computerized processing, the system provides the products under a) to i) in standardized digital format using gridded binary (WMO GRIB Edition 2 (GRIB2)) codes (WMO FM 92-IX Ext. GRIB refers). Product j) is made available in the binary universal form for the representation of meteorological data (BUFR) code (WMO FM 94-XII Ext. BUFR refers), and as “charts” in the portable network graphics (PNG) format (as a backup to the BUFR format). Note, Edition 3 of BUFR is used by the WAFCs. There are no plans to migrate to more recent editions of BUFR code forms and users should bear this in mind.

1.1.5 The foregoing products are made available globally by the two World Area Forecast Centres (WAFCs), London and Washington, via the Secure Aviation Data Information Service (SADIS) FTP and the WAFS Internet File Service (WIFS) systems, respectively. Note that the United Kingdom is both the SADIS Provider State and the WAFS Provider State. Similarly, the United States is the WAFS Provider State and the WAFS Washington Provider State. Both SADIS and WIFS use the public Internet as a method of making data available, as described in Annex 3, and host data from both WAFS London and WAFS Washington. WAFS products consist of aeronautical meteorological information of an operational nature. There is, therefore, an obligation for ICAO to ensure that all ICAO States have access to WAFS products via SADIS or WIFS.

## 1.2 A BRIEF DESCRIPTION OF THE SERVICE

1.2.1 SADIS FTP is an operational system dedicated primarily to aeronautical meteorological information in line with ICAO worldwide provisions. WAFS forecasts and OPMET information are made available via the public Internet.

1.2.2 SADIS FTP makes use of digital certificates and digital signatures to allow users to prove categorically that data downloaded from the SADIS Provider's servers did indeed come from the SADIS Provider, and has not been corrupted or tampered with in any way. This approach is consistent with the guidance provided in Doc 9855 — *Guidelines on the Use of the Public Internet for Aeronautical Applications*.

## 1.3 MANAGEMENT OF SADIS

1.3.1 As the SADIS is a multi-regional service provided by one State to serve multiple ICAO States, it is necessary to enable the user States to have an influence over the content and schedule of SADIS; and the medium and long-term management of the service to ensure that their requirements and those of the end-users are adequately met. Consequently, the ICAO Meteorological Panel (METP) – through its constituent Working Groups, oversees the SADIS to ensure that the information provided meets their requirements, and will act on behalf of users to address complaints and any difficulties which have not been resolved through normal day-to-day operational oversight by the SADIS Provider. It also integrates new requirements on the system and identifies operational adjustments to the service. The composition and terms of reference of the METP, and constituent Working Groups, are available from the METP website <https://www.icao.int/airnavigation/METP/Pages/Public-Documents.aspx>

1.3.2 The United Kingdom, as the SADIS Provider State, has been invited by ICAO to implement the SADIS in accordance with ICAO specifications for the system. Contractual agreements exist between the United Kingdom Met Office and commercial service providers for the operation and maintenance of the SADIS. As a consequence, the SADIS Provider manages the day-to-day operational control of the system in direct contact with the commercial service providers. The SADIS Provider ensures that the data required by all users are delivered via SADIS in accordance with ICAO provisions.

## 1.4 AUTHORIZED ACCESS TO SADIS

1.4.1 It is incumbent upon user States to arrange for authorized access to SADIS in order to obtain OPMET information and WAFS forecasts, and to arrange for their national distribution, in line with the provisions of Annex 3, Chapter 2, 2.1. In order for authorities in individual States to retain control over the national distribution, it is necessary to identify those users who are authorized to receive the SADIS directly. Appendix A provides information on the SADIS area of responsibility, in essence, the ICAO EUR, MID, AFI and western and central APAC regions.

1.4.2 Authorized access to the SADIS by an end user is subject to the direction in the appropriate ICAO Regional Air Navigation Plan and will only be granted after authorization by the ICAO State concerned. The authorization will be based upon advice from the meteorological authority of the State concerned as defined in Annex 3, Chapter 1, and Chapter 2, 2.1.4, and will be communicated to ICAO and also to the United Kingdom Met Office (as the SADIS Provider) by the authorizing State itself. Guidelines to assist States in authorizing access to SADIS are reproduced in Appendix A.

1.4.3 In order for a user to determine from which distribution service (SADIS or WIFS) they should obtain their data, the process is described in detail in Appendix A. In order to differentiate between operational use and backup use of SADIS (or WIFS), SADISOPSG Decision 17/18 defined thresholds of use to apply. The thresholds are provided in Appendix A.

## 1.5 SADIS COST ALLOCATION AND RECOVERY

A mechanism for the recovery of the costs incurred by the SADIS Provider State has been developed. The SADIS cost allocation and recovery scheme is based on mandatory participation by the SADIS user States and is administered by the ICAO SADIS Cost Recovery Administrative Group (SCRAG). States included in the United Nations list of Least Developed Countries (LDCs) are exempt from the cost recovery scheme. The participating States will contribute towards the scheme in proportion to the number of Available Tonne Kilometers (ATKs) performed in scheduled services (international and domestic) in the preceding calendar year by air carriers based in the territory of the State and recover these contributions from the airspace users through en-route charges. A copy of the agreement for sharing of costs for SADIS is available at: <http://www.icao.int/sustainability/Joint-Financing/Pages/SCRAG-Reports.aspx>, specifically and the linked agreement in the first paragraph of this webpage.

## Chapter 2

### PRODUCTS AND DATA AVAILABLE ON SADIS

#### 2.1 OVERVIEW OF PRODUCTS AND DATA AVAILABLE ON SADIS

2.1.1 The information made available on the SADIS comprises WAFS forecasts as defined in Annex 3 — *Meteorological Service for International Air Navigation*, Chapter 3 and Appendix 2, in digital format using the WMO GRIB2 and BUFR code forms, as well as OPMET information in alphanumeric format.

2.1.2 The set of information available on SADIS is as follows:

- a) WAFS upper-air forecasts in WMO GRIB Edition 2 code form (GRIB2);
- b) WAFS significant weather (SIGWX) forecasts in WMO BUFR code form bulletins and PNG chart format;
- c) volcanic ash advisory information and (where available) tropical cyclone advisory information in graphical format (PNG chart); and
- d) OPMET information in IWXXM and alphanumeric format.

#### 2.2 DIGITAL GRID POINT (GRIB) DATA

2.2.1 WAFCs London and Washington products consist of forecasts of global:

- a) upper wind;
- b) upper-air temperature;
- c) upper-air humidity;
- d) direction, speed and flight level of maximum wind;
- e) flight level and temperature of tropopause;
- f) geopotential altitude of flight levels;
- g) horizontal extent and flight levels of base and top of cumulonimbus clouds;
- h) icing potential<sup>1</sup>;
- i) icing severity
- j) clear-air turbulence potential<sup>1</sup>; and
- k) turbulence severity.

---

<sup>1</sup> Clear-air turbulence potential and icing potential will be discontinued in November 2022

2.2.2 Each WAFC provides a backup for the other so that if a failure occurs at one centre, routine products can be generated using the data from the other centre. The data are generated on an agreed grid and coded in a binary format using the GRIB2 code form (WMO FM 92-IX Ext. GRIB Edition 2) for efficient distribution. Users intending to use the data must therefore have a data processing system able to read the binary code, decode the information and manipulate the data for the user's specific purpose. To produce charts, visualization software is required.

2.2.3 The required levels for the different gridded parameters are shown in the table below:

Parameter	Resolution (degrees)	Available for the following flight levels:
Wind (u and v components), temperature, and geopotential altitude	1.25	050 (850 hPa), 080 (750hPa), 100 (700 hPa), 140 (600 hPa), 180 (500 hPa), 210 (450hPa), 240 (400 hPa), 270 (350 hPa), 300 (300 hPa), 320 (275 hPa), 340 (250 hPa), 360 (225 hPa), 390 (200 hPa), 410 (175 hPa), 450 (150 hPa), 480 (125hPa) and 530 (100 hPa)
Humidity	1.25	050 (850 hPa), 080 (750hPa) 100 (700 hPa), 140 (600 hPa) and 180 (500 hPa)
Icing potential <sup>1</sup> (mean and maximum)	1.25	provided for 100hPa layers centred on 60 (800 hPa), 100 (700 hPa), 140 (600 hPa), 180 (500 hPa), 240 (400 hPa) and 300 (300 hPa)
Icing severity <sup>2</sup>	0.25	provided for 100hPa layers centred on 60 (800 hPa), 100 (700 hPa), 140 (600 hPa), 180 (500 hPa), 240 (400 hPa) and 300 (300 hPa)
Clear-air turbulence potential <sup>1</sup> (mean and maximum)	1.25	provided for 50hPa layers centred on 240 (400 hPa), 270 (350 hPa), 300 (300 hPa), 340 (250 hPa), 390 (200 hPa) and 450 (150 hPa)
Turbulence severity <sup>2</sup>	0.25	provided for 50hPa layers centred on 100 (700 hPa), 140 (600 hPa), 180 (500 hPa), 240 (400 hPa), 270 (350 hPa), 300 (300 hPa), 340 (250 hPa), 390 (200 hPa) and 450 (150 hPa)
Tropopause temperature, Tropopause height, , maximum wind and height of maximum wind	1.25	These are not provided for specific levels
CB horizontal extent, CB base, and CB top	1.25 and 0.25	These are not provided for specific levels

2.2.4 The WAFS GRIB2 digital grid point data are based on a grid defined as a latitude/longitude *regular* grid, with data provided in either 1.25° x 1.25° resolution or 0.25° x 0.25°. Each individual GRIB2 bulletin covers the whole globe. To enable efficient distribution of the data, each GRIB2 bulletin is provided in compressed form using the JPEG2000 standard. Advice on decompression and decoding software is available from WAFC London to enable the information to be interpolated and presented on a regular latitude/longitude grid.

<sup>2</sup> Introduced 5 November 2020

2.2.5 The GRIB2 data set covers forecasts valid for 06, 09, 12, 15, 18, 21, 24, 27, 30, 33 and 36 hours after the time of the synoptic data on which they are based, and contain at each grid point data on all the parameters listed under 2.2.1 above. These forecast data sets are published on the SADIS every 6 hours based on the 0000, 0600, 1200 and 1800 UTC synoptic data with transmission (including harmonized cumulonimbus cloud, icing and turbulence data) normally completed by 0435, 1035, 1635 and 2235 UTC, respectively.

2.2.6 The WAFS gridded global forecasts have a number of applications for users, e.g. to calculate specific leg winds for detailed flight planning, or to create charts of selected map areas or routes using visualization software. The visualization software of the workstations should permit the flexible use of the data to the benefit of the user.

A tabulated representation of the WAFS gridded upper-air forecasts made available on SADIS is provided in Appendix B section 1 of this document.

### 2.3 DIGITAL SIGWX IN THE BUFR CODE FORM

2.3.1 The SADIS makes available forecasts of global SIGWX for high levels (i.e. between FL 250 and FL 630) issued by WAFCs London and Washington. Furthermore, SIGWX forecasts for medium levels (i.e. between FL 100 and FL 450<sup>3</sup>) are issued by the WAFCs for limited areas. Each centre provides a backup for the other so that if a production failure or communications outage occurs at one centre, routine products can be prepared and disseminated using the data from the other centre.

2.3.2 The SIGWX data is coded in a binary format using the BUFR code form (WMO FM 94-XII Ext. BUFR) for efficient distribution. Users intending to use the data must therefore have a data processing system able to read the binary code, decode the information and manipulate the data for the user's specific purpose. To produce charts, visualization software is required.

2.3.3 The user of WAFS forecasts can freely select the area of coverage using BUFR visualisation tools; however, as a minimum, it is recommended that a set of fixed areas of coverage as shown in Figures A8-1, A8-2 and A8-3 of Annex 3 (and reproduced Appendix B section 2 of this document.) can be readily produced using the decoding software and can be issued when required by users.

2.3.4 The WAFS SIGWX forecasts in the BUFR code form are presented as a series of bulletins. Each bulletin contains a single parameter (except the bulletin used for in-cloud medium-level icing and turbulence), as a continuous bit stream made of a sequence of bytes (1 byte = 8 bits) within a communications envelope, as follows:

---

<sup>3</sup> FL100 to FL450 exceeds the ICAO Annex 3 requirement, stated as FL100 to FL250.



**SIGWX for high levels**

- a) ISOL EMBD CB, OCNL EMBD CB, OCNL CB and FRQ CB;
- b) clear-air turbulence;
- c) flight level of tropopause;
- d) tropical cyclones, sandstorms, volcanic eruptions and the release of radioactive material into the atmosphere; and
- e) jet-streams.

**SIGWX for medium levels**

- a) ISOL EMBD CB, OCNL EMBD CB, OCNL CB and FRQ CB;
- b) clear-air turbulence;
- c) in-cloud turbulence and icing from non-CB cloud;
- d) flight level of tropopause;
- e) tropical cyclones, sandstorms, volcanic eruptions and the release of radioactive material into the atmosphere; and
- f) jet-streams.

*Note1.— Amendment 74 to Annex 3 removed the requirement for surface fronts and convergence zones on WAFS SIGWX forecasts. To minimize downstream impacts for users by withdrawing the related BUFR bulletins, the two WAFCs have continued to transmit high-level SIGWX (SWH) frontal system bulletins (JUFE00 EGRR/KKCI), but they are empty (i.e. they contain no data).*

*Note2.— Medium level SIGWX will be discontinued in November 2023 and replaced with a single SIGWX forecast that covers FL100 to FL600. At the same time, SIGWX production in IWXXM format will commence, with BUFR format due for retirement in November 2025.*

2.3.5 The BUFR data sets (high- and medium-level) cover forecasts valid for 0000, 0600, 1200 and 1800 UTC. This amounts to approximately 2 Mbytes of data per day. These forecast data are available on SADIS every 6 hours based on the 0000, 0600, 1200 and 1800 UTC synoptic data. Transmission of high-level and medium-level BUFR data sets is at 0700, 1300, 1900 and 0100 UTC, respectively (i.e. 17 hours ahead of validity). When operating in backup mode, the high-level and medium-level BUFR data set will be made available as early as possible but no later than 15 hours ahead of validity (i.e. 0900, 1500, 2100 and 0300 UTC for forecasts based on 0000, 0600, 1200 and 1800 UTC respectively).

2.3.6 The BUFR data is used to create charts of selected map areas or routes. Workstations should have visualization software which permits the conversion of BUFR bulletins into chart form. Software vendors should also make sure to include in their visualization software a feature which will depict the boundaries of the WAFS medium-level BUFR-coded SIGWX forecasts when reproduced in the chart form.

A tabulated representation of the WAFS SIGWX forecasts made available on SADIS in BUFR format is provided in Appendix B section 3 of this document.

## 2.4 DIGITALLY CODED CHARTS

Digitally coded WAFS SIGWX charts in PNG format are available on SADIS every 6 hours as a backup to the BUFR-coded SIGWX forecasts. They are transmitted at the same time as the SIGWX BUFR data (including a delay of up to 2 hours in the event of a backup event). Volcanic ash advisory information and (where available) tropical cyclone advisory information in graphical format (PNG image format) are available on SADIS when issued by a volcanic ash advisory centre or tropical cyclone advisory centre, respectively.

A tabulated representation of the WAFS SIGWX forecasts made available on SADIS in PNG format is provided in Appendix B section 3 of this document.

*Note.— Provision of WAFS SIGWX charts in PNG format will cease in November 2028, so please use the digital alternatives.*

## 2.5 OPMET INFORMATION IN ALPHANUMERIC FORMAT

2.5.1 OPMET information in alphanumeric format includes METAR, SPECI, TAF, SIGMET and AIRMET information, GAMET area forecasts, volcanic ash advisories, tropical cyclone advisories, space weather advisories, and special AIREP.

2.5.2 Aeronautical meteorological information is exchanged on the aeronautical fixed telecommunication network (AFTN) or ATS Message Handling System (AMHS) described in Annex 10 — *Aeronautical Telecommunications, Volume II — Communication Procedures including those with PANS status.*

2.5.3 When METAR, SPECI or TAF are intended for distribution in bulletin form, a WMO abbreviated heading is added in the first line of the text of the message to facilitate the compilation of the various METAR, SPECI and TAF messages into the appropriate bulletins. The WMO abbreviated heading is described in detail in document WMO-No. 386 — *Manual on the Global Telecommunication System*, and is explained briefly in Appendix B section 4 of this document.

## 2.6 OPMET INFORMATION IN IWXXM FORMAT

2.6.1 OPMET information in ICAO Meteorological Information Exchange Model (IWXXM) includes METAR, SPECI, TAF, SIGMET, AIRMET, volcanic ash advisories, tropical cyclone and in 2021 space weather advisories.

2.6.2 IWXXM OPMET is exchanged internationally via AMHS, and is described in detail in ICAO Doc 10003 — *Manual on the ICAO Meteorological Information Exchange Model*.

## 2.7 ADMINISTRATIVE MESSAGES

Information available on SADIS includes administrative messages disseminated in an alphanumeric format.

## 2.8 SCHEDULE OF AVAILABILITY

2.8.1 The information made available via the SADIS will be disseminated as soon as it becomes available. Therefore, the system will not operate to an absolute timetable. However, there will be a general schedule for the availability of the various products to ensure that the information is received when it is needed, and, in the case of forecasts, before the commencement of the period of validity.

2.8.2 Digital grid point data are available on SADIS four times per day, derived from the global model forecast runs based on 0000, 0600, 1200 and 1800 UTC synoptic data with transmission to be completed by 0420, 1020, 1620 and 2220 UTC, respectively for wind, temperature, geopotential height, humidity, maximum wind, height of maximum wind, tropopause temperature, and height of Tropopause. Data for harmonized cumulonimbus cloud, icing and turbulence is normally made available by 0435, 1035, 1635 and 2235 UTC respectively.

2.8.3 OPMET information in alphanumeric and IWXXM format will be made available as soon as the messages are received.

2.8.4 SIGMET and AIRMET information, space weather, volcanic ash and tropical cyclone advisories, and special AIREP are distributed without delay.

2.8.5 The "SADIS OPMET Catalogue" gives a more detailed listing of the TAC format data normally available on SADIS. The catalogue is available on <https://www.icao.int/airnavigation/METP/Pages/Public-Documents.aspx> (in the MOG-SADIS/WIFS Reference Documents section). The content of the catalogue is created comparing data from ROC London, SADIS, ICAO DOC 7910 and the eANP List of Aerodromes.

## 2.9 THE EVOLUTION OF PRODUCTS AND DATA ON SADIS

2.9.1 It is expected that the list of products available on SADIS will evolve with time to respond to new requirements of States and end users. This evolution of product availability is currently managed by the Working Groups tasked by the Meteorological Panel (METP) to oversee SADIS.

2.9.2 November 2020 saw the introduction of new 0.25 degree horizontal resolution turbulence, icing and cumulonimbus data sets onto SADIS, and also the provision of IWXXM format OPMET data sets.

## Chapter 3

# RECOMMENDED BASIC REQUIREMENTS FOR DATA PROCESSING SYSTEMS

### 3.1 GENERAL REQUIREMENTS

3.1.1 The data stored on the system should be made available to a user by visual reference on a screen display, and printed for permanent reference, e.g. as flight documentation, as necessary. All products either displayed or printed should include a clear reference to the date and time of access and the validity times of the data. Systems should be programmed to avoid data from a previous day being incorrectly used. It should be noted that there is an obligation for States to retain flight documentation for at least 30 days in case of an enquiry (Annex 3, 9.3.4). This storage requirement should be considered by users when making their choice of end-user system.

3.1.2 A number of the display packages enable users to manipulate the information presented to the workstation in BUFR format. This may be a useful feature for users who wish to use their workstation for the production of national products. However, it is important that users appreciate that any modification to the meteorological content of information available on SADIS invalidates that information as being a de facto WAFS forecast. In such a case, the forecast becomes a national product. It is imperative that such a change be clearly reflected in the legend that would be assigned to the forecast.

### 3.2 SOURCES OF INFORMATION REGARDING POTENTIAL SUPPLIERS OF EQUIPMENT TO PROCESS/DISPLAY PRODUCTS AND DATA MADE AVAILABLE ON THE SADIS

3.2.1 The names of suppliers and their websites are available from URL:

<https://www.metoffice.gov.uk/services/transport/aviation/regulated/sadis/software/suppliers>

*Note.— The inclusion of an individual supplier in these lists does not imply that their system has been evaluated or approved by ICAO or the SADIS Provider.*

Additional advice is provided in Appendix C to users considering purchasing a data processing system.

## Chapter 4

### USER SUPPORT

#### 4.1 TECHNICAL SUPPORT BY THE SADIS PROVIDER

End users of the SADIS are encouraged to contact the SADIS Provider in the event of problems. The SADIS Provider staff will assist where possible to resolve problems experienced by users if the fault lies within the SADIS. It may of course be the case that the fault is with the user's own SADIS equipment or internet connection. Under such circumstances, the supplier of the original hardware/software or the user's Internet service provider should be contacted.

#### 4.2 24-HOUR HELPLINE/FAULTS DESK

Tel.: +44 (0) 330 135 4444

E-mail: [servicedesk@metoffice.gov.uk](mailto:servicedesk@metoffice.gov.uk)

#### 4.3 GENERAL CONTACT FACILITIES DURING OFFICE HOURS (UK time)

The SADIS Manager  
International Services, WAFC London,  
Met Office, Fitzroy Road  
Exeter, Devon  
United Kingdom EX1 3PB

E-mail: [SADISmanager@metoffice.gov.uk](mailto:SADISmanager@metoffice.gov.uk)

#### 4.4 SYSTEM DEVELOPMENT CONTACT FACILITIES

4.4.1 Sample data for each of the products available via SADIS can be provided by the SADIS Provider if required. Prior to the introduction of any new data sets they will be made available on a ftp server for individual system development and trials. This data may be on the SADIS server (and will be clearly marked as test data) or one of the SADIS provider's other public facing ftp servers.

4.4.2 WAFC London can also provide advice and guidance on GRIB, IWXXM and BUFR code form data and applications.

## 4.6 ASSISTANCE FOR IMPLEMENTATION

4.6.1 Seminars and workshops on the implementation of the WAFS and SADIS may be organized periodically in close coordination between ICAO, WMO and WAFC London when significant changes to the WAFS data sets or SADIS systems take place. The *SADIS User Guide (Parts 1 and 2)* forms part of the material to accompany these events.

4.6.2 Technical assistance may be obtained in various forms. It is recommended that requests for technical assistance from ICAO be included in the framework of existing ICAO technical co-operation projects.

4.6.3 Information is available concerning the GRIB2 code and decompression, and about the way in which features encoded in BUFR should be displayed from <https://www.icao.int/airnavigation/METP/Pages/Public-Documents.aspx> (within the MOG-WAFS Reference Document section). Guidelines for representing WAFS SIGWX data in BUFR available from the same link.

4.6.4 In 2019 the SADIS Workstation Evaluation Guide was published to enable users to check that their software or workstation is functioning to the required standard, and if deficiencies are detected to report the issue to the software provider. The guide was updated in April 2021 and can be downloaded from <https://www.icao.int/airnavigation/METP/Pages/Public-Documents.aspx>.

## 4.7 SADIS BACKUP PROCEDURES

4.7.1 In the unlikely event of a failure of the Secure SADIS FTP service, the WIFS can be used as an operationally available backup. Authorized SADIS users can be granted access to the WIFS by the WIFS Provider State in order to enable access to the OPMET information and WAFS forecasts using the WIFS over the public Internet. Authorized SADIS users wishing to access the WIFS as a backup to SADIS, but who do not yet have account access, should contact the WIFS Provider via <https://www.aviationweather.gov/wifs/> to initiate an account. The WIFS Provider monitors WIFS to ensure that authorized SADIS users only make use of the service during times of backup contingency.

---

# Appendix A

## AUTHORISATION TO USE SADIS

### 1. SADIS Area of Responsibility

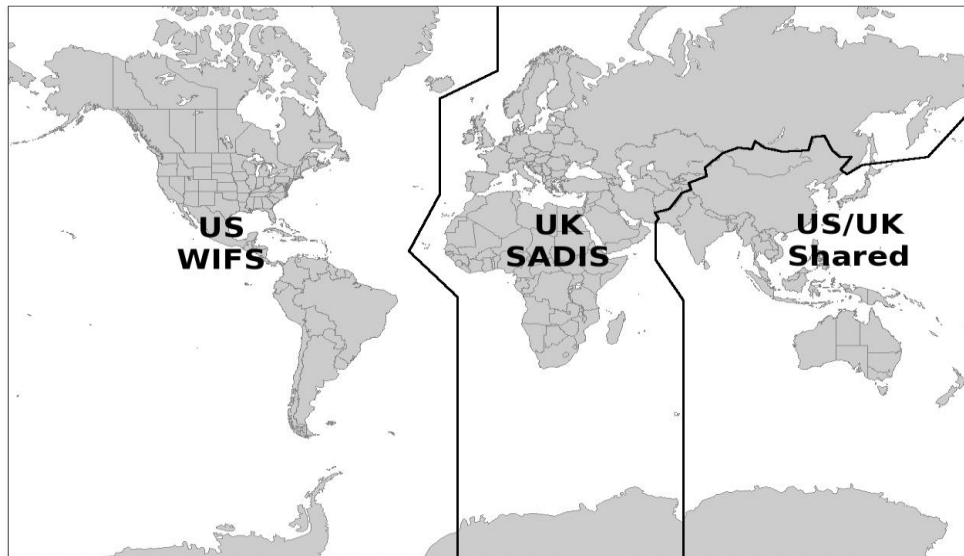
1.1. States may wish to meet their obligation under Article 28 of the Convention on International Civil Aviation regarding the supply to users of meteorological information for the provision of meteorological service for international air navigation by using SADIS.

1.2. In particular, Section 2.1 of ICAO Annex 3, Appendix 2 notes:

2.1.1 Aerodrome meteorological offices shall use forecasts issued by the WAFCs in the preparation of flight documentation, whenever these forecasts cover the intended flight path in respect of time, altitude and geographical extent, unless otherwise agreed between the meteorological authority and the operator concerned.

2.1.2 In order to ensure uniformity and standardization of flight documentation, the WAFS GRIB and BUFR data received shall be decoded into standard WAFS charts in accordance with relevant provisions in this Annex, and the meteorological content and identification of the originator of the WAFS forecasts shall not be amended.

1.3. As described in the Regional Air Navigation Plans, SADIS provides WAFS and OPMET data to the Africa, Europe, and Middle East ICAO Regions; and to west and central parts of the ICAO Asia and Pacific Region. WIFS (administered by the USA) is provided to the Americas; and to east and central parts of the ICAO Asia and Pacific Region. The map below shows the different areas of responsibility.



1.4. For those States required by the ICAO Regional Air Navigation Plans to use SADIS as their primary source from which to obtain WAFS forecasts, the following procedure applies:

- a) SADIS accounts will be provided (following normal authorization processes) on request to the SADIS Provider State; and,
- b) participation in the SADIS cost recovery scheme will be required (except for LDCs as defined by United Nations).

1.5. For those States located in the shared region, if SADIS is chosen to be the primary operational supplier of WAFS forecasts, or if there is a requirement to obtain data from both WIFS and SADIS then the procedures shown in 1.4 will apply.

1.6. For those States required by the ICAO Regional Air Navigation Plans to use WIFS as their primary source from which to obtain WAFS forecasts, the following procedure applies:

- a) WIFS accounts will be provided (following normal authorization processes) on request to the WIFS Provider State; and
- b) SADIS accounts will be provided to authorized WIFS users by the SADIS Provider State for backup purposes on condition that:

## **2. Backup accounts**

2.1. WIFS accounts will be provided to authorized SADIS users by the WIFS Provider State for backup purposes on condition that:

- a SADIS account has been authorized and provided;
- there are no outstanding balances in respect of the SADIS cost recovery scheme; and
- use is restricted to backup purposes and periodic testing.

2.2. SADIS accounts will be provided to authorized WIFS users by the SADIS Provider State for backup purposes on condition that:

- a WIFS account has been authorized and provided; and
- use is restricted to backup purposes and periodic testing

2.3. SADISOPSG Decision 17/18 defined the policy to be applied with regard to determining "operational use". The policy is necessary to prevent those users who have been granted access to SADIS or WIFS as a backup to their normal service misusing the backup account by continuously accessing the backup service. The policy allows users to implement regular testing (up to one day in seven), but denies continuous 24/7 access to the service. The following criteria were endorsed by the SADISOPSG with regard to determining whether SADIS and/or WIFS are being used for operational purposes by States/users:

- a) when a SADIS or WIFS backup account has been provided the State/user should not access the contingent WIFS service more frequently than one day in every seven;

*Note: This will allow users to test the backup account on a schedule of at least once every week. As long as the "no more than one day in seven" criteria is not exceeded, the specific days/times States/users wish to test their accounts is at the State/user's discretion, and they may do so less frequently (monthly, for example) if they so wish.*



- b) in the extremely unlikely event of the SADIS or WIFS services failing, temporary unlimited access will be permitted to the contingent service until full resumption of service.

*Note: Backup accounts will be maintained in a "live" status in order that immediate access is available in the event of a genuine need to access the alternative Provider's service for backup purposes.*

2.4. The SADIS and WIFS Providers will monitor their services to determine access behaviour.

2.5. It remains the sole responsibility of the State/user to determine if they require a backup account from the alternative Provider, and if so, to arrange for that account.

### **3. State level Authorisation of SADIS use**

3.1. It is the prerogative of each State to determine the distribution of the OPMET information and WAFS forecasts to users, in the State concerned, as well as means, links and information flow to be used for this purpose. In view of this, it is for each State to determine the users in the State concerned to be provided with the authorized access to the SADIS.

3.2. Where the meteorological service for international air navigation is provided by or through arrangements made by the meteorological authority in compliance with Annex 3 — *Meteorological Service for International Air Navigation*, 2.1.4, the meteorological authorities, WAFCs, and aerodrome and other meteorological offices should fully enjoy the benefits of the SADIS FTP to receive OPMET information and WAFS forecasts. Furthermore, it is at the discretion of each State to determine, on advice from its meteorological authority, whether any of the following users will be provided with authorized access to the SADIS FTP: operators; air traffic services units; search and rescue services units; aeronautical information services units; VAACs; and other aeronautical users.

3.3. Each State will notify ICAO and, for the purpose of efficiency, also the SADIS Provider, regarding the users in that State it has authorized to access the SADIS.

3.4. Recovery by States of associated costs through charges on international civil aviation should be based on the principles contained in Article 15 of the Convention and the *Statements by the Council to Contracting States on Charges for Airports and Air Navigation Services* (Doc 9082).

## Appendix B

### DATA AVAILABLE ON SADIS

#### 1. World Area Forecast System (WAFS) Gridded data

1.1. WAFS upper-air temperature, wind, geopotential height, humidity, Tropopause, icing, turbulence, extent of cumulonimbus, flight level of cumulonimbus base and flight level of cumulonimbus top are made available in GRIB2 code form.

1.2. WAFS London WAFS forecasts in GRIB2 format use the WMO AHL T<sub>1</sub>T<sub>2</sub>A<sub>1</sub>A<sub>2</sub>ii identifiers below (CCCC = EGRR). WAFS Washington WAFS forecasts (CCCC = KWBC) are also made available on SADIS FTP.

#### GRIB2 Bulletins on SADIS FTP.

Bulletins will contain a global field of data for each element;

(1.25-degree resolution)	
YUX (C-M) (85/75/70/60/50/45/40/35/30/27/25/23/20/18/15/13/10)	U-component of the wind
YVX (C-M) (85/75/70/60/50/45/40/35/30/27/25/23/20/18/15/13/10)	V-component of the wind
YTX (C-M) (85/75/70/60/50/45/40/35/30/27/25/23/20/18/15/13/10)	Temperature
YRX (C-M) (85/75/70/60/50)	Relative humidity
YHX (C-M) (97)	Flight level of tropopause
YTX (C-M) (97)	Temperature of tropopause
YUX (C-M) (96)	U-component of the max wind
YVX (C-M) (96)	V-component of the max wind
YHX (C-M) (96)	Flight level of the max wind
YHX (C-M) (85/75/70/60/50/45/40/35/30/27/25/23/20/18/15/13/10)	Geopotential altitude of flight levels
Y LX (C-M) (40/35/30/25/20/15)	Mean turbulence potential (CAT)
Y LX (C-M) (41/36/31/26/21/16)	Max turbulence potential (CAT)
YIX (C-M) (80/70/60/50/40/30)	Mean icing potential
YIX (C-M) (81/71/61/51/41/31)	Max icing potential
YBX (C-M) (01)	Horizontal extent of CB
YHX (C-M) (02)	ICAO height at CB base
YHX (C-M) (03)	ICAO height at CB top

<b>(0.25-degree resolution)</b>	
YLY (C-M) (70/60/50/40/35/30/25/20/15)	Turbulence severity
YIY (C-M) (80/70/60/50/40/30)	Icing severity
YBY (C-M) (01)	Horizontal extent of CB
YHY (C-M) (02)	ICAO height at CB base
YHY (C-M) (03)	ICAO height at CB top

1.3. The availability times for the wind/temperature/tropopause/geopotential height/relative humidity data sets are:

0330-0420 UTC for data based on 0000 UTC  
0930-1020 UTC for data based on 0600 UTC  
1530-1620 UTC for data based on 1200 UTC  
2130-2220 UTC for data based on 1800 UTC

1.4. The availability times for the cumulonimbus cloud, icing and turbulence data sets are:

0415-0450 UTC for data based on 0000 UTC  
1015-1050 UTC for data based on 0600 UTC  
1615-1650 UTC for data based on 1200 UTC  
2215-2250 UTC for data based on 1800 UTC

1.5. The total number of bulletins issued by each WAFC per data set is shown in the table below:

	<b>Number of bulletins</b>	<b>Size of a complete EGRR model run</b>
1.25 degree wind (U&V), temperature, humidity, geopotential height, tropopause height, tropopause temperature, maximum wind (U&V), and maximum wind height	858	22MB
1.25 degree icing, turbulence and cumulonimbus	297	6MB
0.25 degree icing, turbulence and cumulonimbus	198	23MB

*Note — Very rarely, if corruption to the originally issued files is identified, corrections (not amendments) to the above forecasts will be identified by appending of the appropriate correction indicator (CCA, CCB etc) to the WMO AHL.*

## 2. SIGWX forecasts in the BUFR code form

2.1. Global BUFR-encoded SWH forecasts are produced by WAFC London and WAFC Washington.

SWH or SWM	BUFR FEATURES	COMMON NAME	WMO HEADER used by WAFC London	WMO HEADER used by WAFC Washington
SWH	Jet-streams	JETS	JUWE96_EGRR	JUWE96_KKCI
	Clear Air Turbulence (CAT)	CAT	JUCE00_EGRR	JUCE00_KKCI
	Embedded Cumulonimbus	CLOUD	JUBE99_EGRR	JUBE99_KKCI
	Tropopause height	TROP	JUTE97_EGRR	JUTE97_KKCI
	Frontal Systems	FRONTS	JUFE00_EGRR	JUFE00_KKCI
SWH and SWM	Tropical Cyclone, Sandstorms & Volcanoes	V_T_S or Other_Parameters	JUVE00_EGRR	JUVE00_KKCI
SWM	SWM Tropopause height	M-TROP	JUOE00_EGRR	JUOE00_KKCI
	SWM jet-streams	M-JETS	JUTE00_EGRR	JUTE00_KKCI
	SWM fronts	M-FRONTS	JUJE00_EGRR	JUJE00_KKCI
	SWM cloud, in-cloud icing and turbulence	M-CLOUD	JUNE00_EGRR	JUNE00_KKCI
	SWM Clear Air Turbulence (C.A.T.)	M-CAT	JUME00_EGRR	JUME00_KKCI

The above table can be related to the folder structure within **Secure SADIS FTP**, thus:

H_CAT	Clear Air Turbulence (SWH)
H_EMBEDDED_CB	Embedded cumulonimbus cloud (SWH)
H_FRONTS	Frontal systems (SWH) <sup>5</sup>
H_JETS	Jetstream information (SWH)
H_TROP	Tropopause information (SWH)
M_CAT	Clear Air Turbulence (SWM)
M_CLOUD	Embedded cumulonimbus cloud (SWM)
M_FRONTS	Frontal systems (SWM) <sup>5</sup>
M_JETS	Jetstream information (SWM)
M_TROP	Tropopause information (SWM)
OTHER_PARAMETERS	Volcano, Tropical Cyclone, Radioactive release (SWM and SWH)

2.2. In both the EGRR and KKCI folders, the SWH datasets are global in nature. However, the SWM datasets are different, with the EGRR subfolder containing data for SWM areas EURO, MEA and ASIA SOUTH whilst the KKCI subfolder contains data for the single SWM area NAT.

<sup>5</sup> The need to depict fronts was removed from SIGWX charts in accordance with Amendment 74 to ICAO Annex 3 (2007). However, the essentially empty bulletins are provided by default for legacy compatibility reasons.

2.3. The following availability times for SWH and SWM BUFR SIGWX files currently applies:

- SWH and SWM BUFR SIGWX data based on 0000 UTC model run –  
T+24 issued at 0700 UTC (No later than 0900 UTC when operating in backup mode)
- SWH and SWM BUFR SIGWX data based on 0600 UTC model run –  
T+24 issued at 1300 UTC (No later than 1500 UTC when operating in backup mode)
- SWH and SWM BUFR SIGWX data based on 1200 UTC model run –  
T+24 issued at 1900 UTC (No later than 2100 UTC when operating in backup mode)
- SWH and SWM BUFR SIGWX data based on 1800 UTC model run –  
T+24 issued at 0100 UTC (No later than 0300 UTC when operating in backup mode)

*Note. — As indicated above, under conditions of the pre-planned quarterly WAFS SIGWX backup tests, SIGWX forecasts will be issued to the normal schedule excepting that, each WAFC will purposefully delay the issuance of such data by one hour for one such test each year (WG-MOG/3 Decision 1). Under conditions of real WAFS backup events, issuance of the SIGWX forecasts may be up to two hours later than the normal issuance time (i.e. under real backup conditions SIGWX forecasts will be issued no later than 0900, 1500, 2100 and 0300 UTC).*

### 3. SIGWX forecasts in the PNG (Portable Network Graphics) chart form

3.1. These charts are provided as a back-up to the BUFR- coded products

3.2. High Level SIGWX Forecasts (SWH):

Directory	Containing PNG file	Number of issues per day	ICAO equivalent name	Chart projection
AREA_A	PGEE05 KKCI hhmm	4	AMERICAS	Mercator
AREA_B	PGSE05 EGRR hhmm	4	EURSAM	Mercator
AREA_B1	PGIE05 KKCI hhmm	4	AREA B1	Mercator
AREA_C	PGRE05 EGRR hhmm	4	EURAFI	Mercator
AREA_D	PGZE05 EGRR hhmm	4	ASIA	Mercator
AREA_E	PGGE05 EGRR hhmm	4	INDOC	Mercator
AREA_F	PGGE05 KKCI hhmm	4	S PACIFIC	Mercator
AREA_G	PGCE05_EGRR_hhmm	4	MID	Polar Stereographic
AREA_H	PGAE05_EGRR_hhmm and PGAE05 KKCI hhmm	Both 4	NAT	Polar Stereographic
AREA_I	PGBE05_KKCI_hhmm	4	N PACIFIC	Polar Stereographic
AREA_J	PGJE05_KKCI_hhmm	4	S POLAR	Polar Stereographic
AREA_K	PGKE05_EGRR_hhmm	4	SIO	Polar Stereographic
AREA_M	PGDE29 KKCI hhmm	4	N PACIFIC	Mercator

3.3. Medium Level SIGWX forecasts (SWM):

Directory	Containing PNG file	Number of issues per day	ICAO equivalent name	Chart projection
AREA_ASIA_SOUTH	PGZE14 EGRR hhmm	4	ASIA SOUTH	Mercator
AREA_EURO	PGDE14 EGRR hhmm	4	EURO	Polar Stereographic
AREA_MID	PGCE14 EGRR hhmm	4	MID (or MEA)	Mercator
AREA_NAT	PGNE14 KKCI hhmm	4	NAT	Polar Stereographic

3.4. Currently, the following issue times for SWH and SWM PNG SIGWX applies:

- SWH and SWM PNG SIGWX charts based on 0000 UTC model run – T+24 issued at 0700 UTC (No later than 0900 UTC when operating in backup mode)
- SWH and SWM PNG SIGWX charts based on 0600 UTC model run – T+24 issued at 1300 UTC (No later than 1500 UTC when operating in backup mode)
- SWH and SWM PNG SIGWX charts based on 1200 UTC model run – T+24 issued at 1900 UTC (No later than 2100 UTC when operating in backup mode)
- SWH and SWM PNG SIGWX charts based on 1800 UTC model run – T+24 issued at 0100 UTC (No later than 0300 UTC when operating in backup mode)

*Note.— As indicated, under conditions of the pre-planned quarterly WAFS SIGWX backup tests, SIGWX forecasts will be issued to the normal schedule excepting that, each WAFS will purposefully delay the issuance of such data by one hour for one such test each year (WG-MOG/3 Decision 1). Under conditions of real WAFS backup events, issuance of the SIGWX forecasts may be up to two hours later than the normal issuance time (i.e. under real backup conditions SIGWX forecasts will be issued no later than 0900, 1500, 2100 and 0300 UTC).*

3.5. List of WAFS SIGWX PNG charts, including common name, ICAO area, flight levels, and WMO AHL:

Regional Areas	Area of coverage code (ANP)	Flight levels	WMO AHL (T <sub>1</sub> T <sub>2</sub> A <sub>1</sub> A <sub>2</sub> ii CCCC)
AMERICAS	A	FL250-FL630	PGEE05 KKCI
EURSAM	B	FL250-FL630	PGSE05 EGRR
AMERICAS-AFI	B1	FL250-FL630	PGIE05 KKCI
EURAFI	C	FL250-FL630	PGRE05 EGRR
EURASIA	D	FL250-FL630	PGZE05 EGRR
INDOC	E	FL250-FL630	PGGE05 EGRR
PACIFIC (North Pacific)	F	FL250-FL630	PGGE05 KKCI

Regional Areas	Area of coverage code (ANP)	Flight levels	WMO AHL (T <sub>1</sub> T <sub>2</sub> A <sub>1</sub> A <sub>2</sub> ii CCCC)
MID (SWH)	G	FL250-FL630	PGCE05 EGRR
NAT (SWH)	H	FL250-FL630	PGAE05 EGRR
NAT (SWH)	H	FL250-FL630	PGAE05 KKCI
PACIFIC (North Pacific)	I	FL250-FL630	PGBE05 KKCI
SOUTH POLAR	J	FL250-FL630	PGJE05 KKCI
SIO	K	FL250-FL630	PGKE05 EGRR
NORTH PACIFIC	M	FL250-FL630	PGDE29 KKCI
NAT (SWM)	NAT	FL100-FL450	PGNE14 KKCI
EURO	EURO	FL100-FL450	PGDE14 EGRR
MID (SWM)	MEA	FL100-FL450	PGCE14 EGRR
ASIA SOUTH	ASIA SOUTH	FL100-FL450	PGZE14 EGRR

Note 1 — NAT (SWH) and NAT (SWM) cover different geographical areas; MID (SWH) and MID (SWM) cover different geographical areas.

Note 2 – Corrections (not amendments) to the above forecasts will be identified by appending of the appropriate correction indicator (CCA, CCB etc) to the WMO AHL.

3.6. The fixed area of coverage of the WAFS forecasts in chart form is shown in the following diagrams:

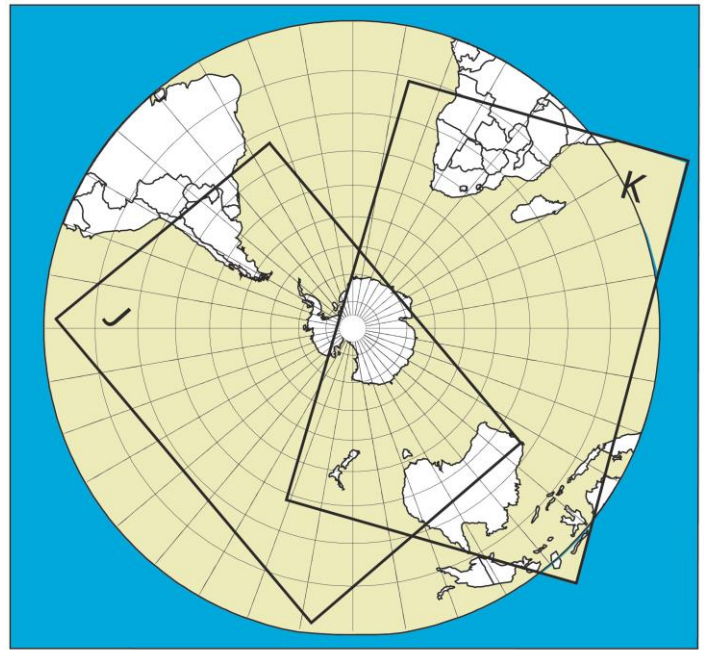
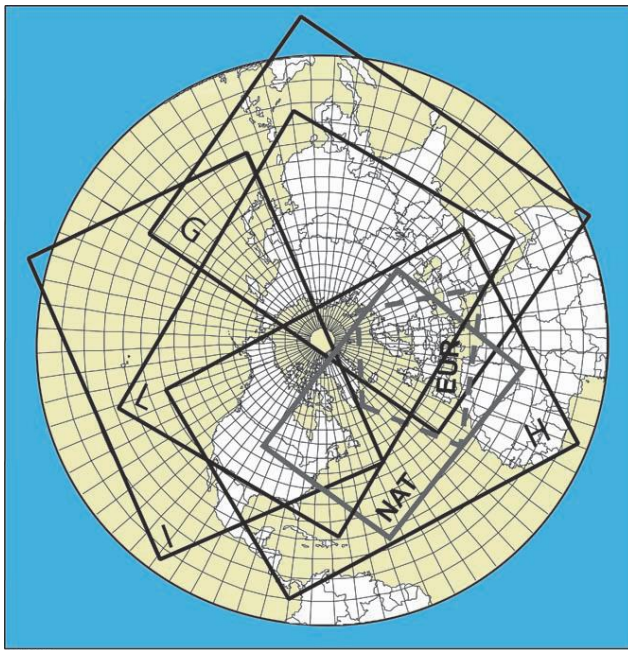
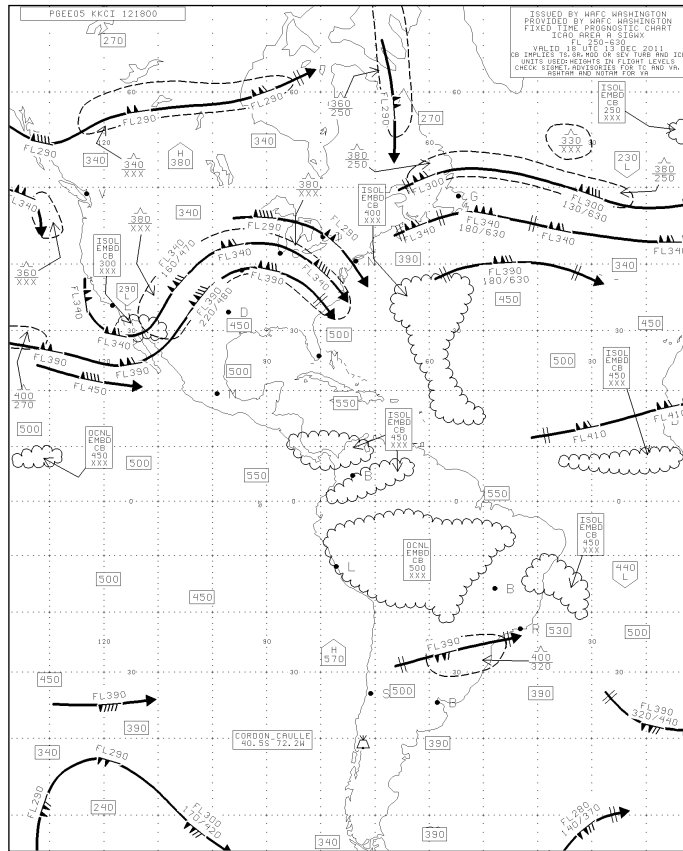


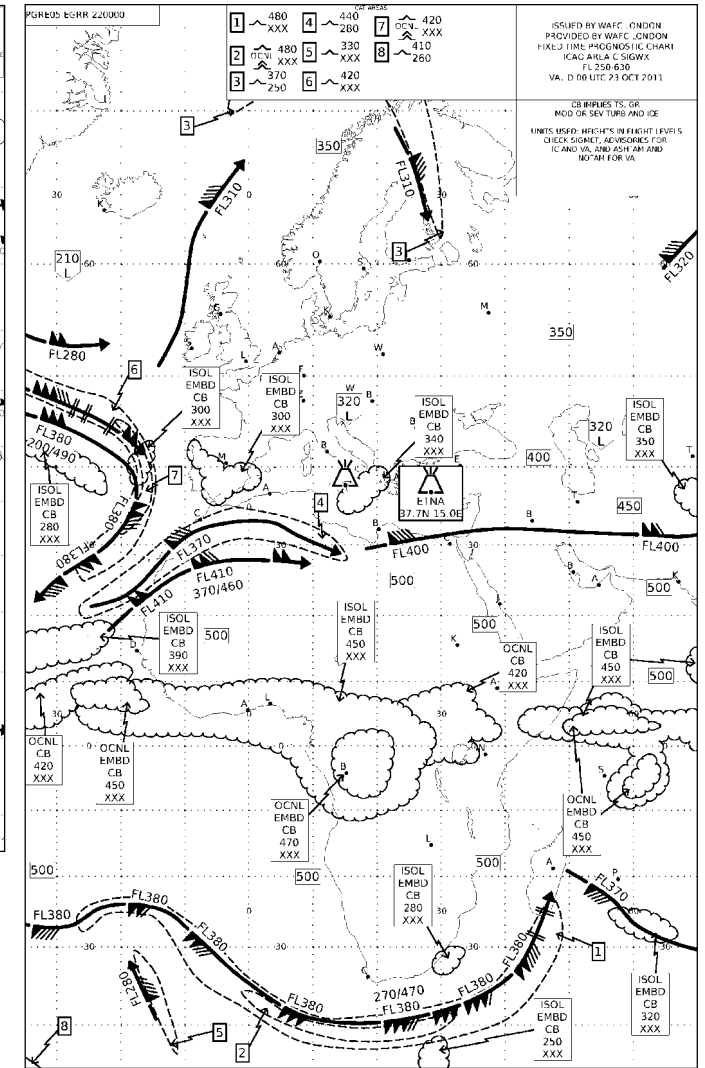
CHART	LATITUDE	LONGITUDE	CHART	LATITUDE	LONGITUDE	CHART	LATITUDE	LONGITUDE
EUR	N4633	W05634	I	N1912	E11130	J	S0318	W17812
EUR	N5842	E06824	I	N3330	W06012	J	N0037	W10032
EUR	N2621	E03325	I	N0126	W12327	J	S2000	W03400
EUR	N2123	W02136	I	S0647	E16601	J	S2806	E10717
G	N3552	W02822	L	N1205	E11449	K	N1255	E05549
G	N1341	E15711	L	N1518	E04500	K	N0642	E12905
G	S0916	E10651	L	N2020	W06900	K	S2744	W16841
G	S0048	E03447	L	N1413	W14338	K	S1105	E00317
H	N3127	W14836	NAT	N4439	W10143			
H	N2411	E05645	NAT	N5042	E06017			
H	S0127	W00651	NAT	N1938	E00957			
H	N0133	W07902	NAT	N1711	W05406			

Example WAFS Charts in PNG format are provided below:

**ICAO REGION A — AMERICAS (PGEE05 KKCI)**

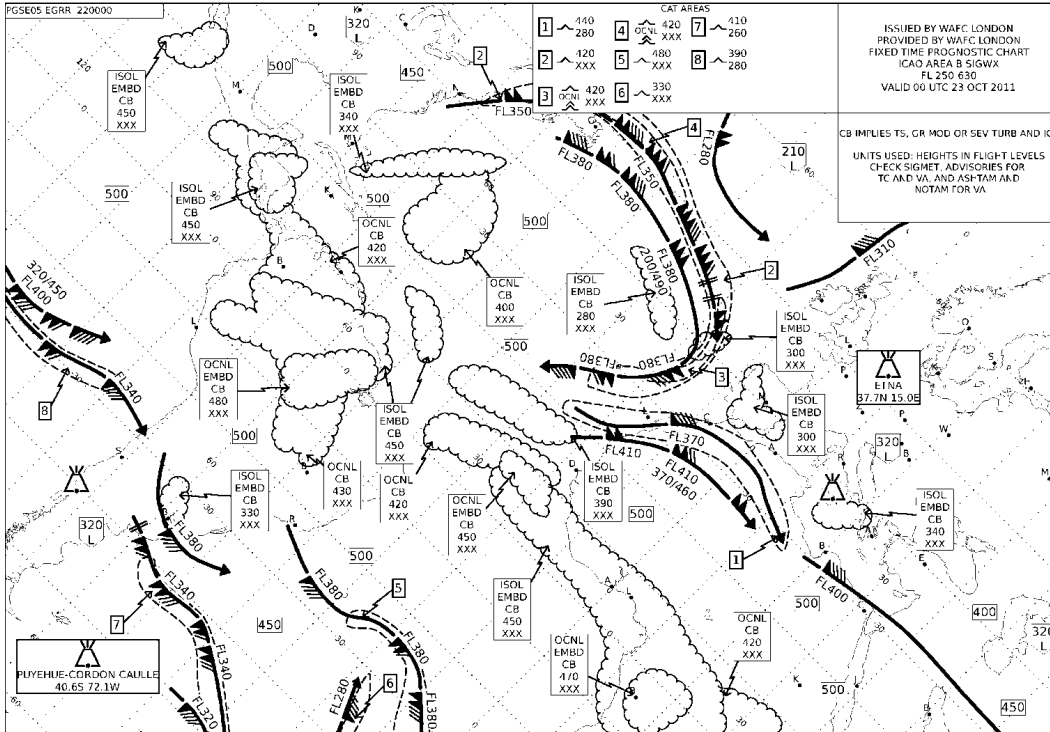


**ICAO REGION C — EURAFI (PGRE05 EGRR)**

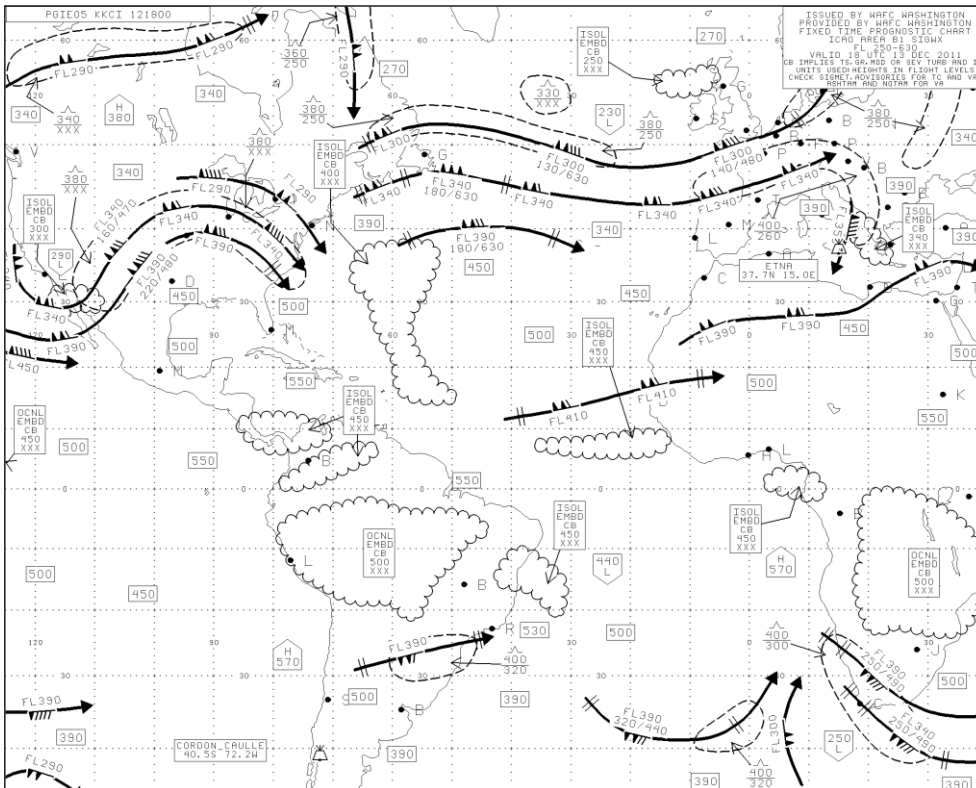




ICAO REGION B — EURSAM (PGSE05 EGRR).



ICAO REGION B1 AMERICAS AFI (PGIE05 KKCI)



## 4. OPMET information

4.1. Whilst SADIS is only mandated to contain OPMET information for aerodromes listed in the AOP tables of the regional Air Navigation Plans (eANP), many other aerodromes are routinely used as flight destinations and therefore their data is also included on SADIS if it is made available on international bulletins.

4.2. OPMET data sets are compiled from data sent to ROC London, and are published on SADIS using their WMO abbreviated heading. OPMET messages in TAC format are stripped of their AFTN envelope before they are made available on SADIS FTP. OPMET messages in IWXXM format are published as individual bulletins.

**TTAAii CCCC YYGGgg (BBB)** where:

TT	=	data designator, e.g. SA for METAR, FC and FT for TAF and WS for SIGMET
AA	=	geographical designator, e.g. GH for Ghana, HU for Hungary <sup>1</sup>
ii	=	number used to differentiate bulletins with the same types of data from the same geographical area
CCCC	=	International four-letter location indicator for station originating or compiling the bulletin (ICAO Doc 7910 — <i>Location Indicators</i> )
YY	=	the day of the month
GGgg	=	time in hours and minutes for the time of observation in the case of METARs, and in the case of TAFs the full hour preceding the transmission time
BBB	=	optional group to indicate whether the message is an amendment, a correction or a delayed message (WMO GTS Manual, A-11.4)

### EXAMPLE<sup>6</sup>

FTEA31 HKNA 080400 CCA

FT TAF with validity more than 12 hours  
EA East Africa  
31 TAF Bulletin No.31  
HKNA message originated by Nairobi  
08 transmitted on the 8th day of the month  
0400 full hour preceding the transmission was 0400 UTC  
CCA first correction of this TAF

---

<sup>6</sup> See Annex 10, Volume II, Chapter 4 for teletypewriter operating procedures.

4.3. The following types of data are published on SADIS:

WMO data type designator (TT)	
<b>TAC Format</b>	
FA	GAMET
FC	TAF (less than 12 hours)
FK	Tropical Cyclone Advisory
FN	Space Weather Advisory
FT	TAF (up to 30 hours)
FV	Volcanic Ash Advisory
NO	Administrative messages
SA	METAR
SP	SPECI
UA	Special AIREP
WA	AIRMET
WC	SIGMET for Tropical Cyclone
WS	SIGMET
WV	SIGMET for Volcanic Ash
<b>IWXXM Format</b>	
LA	METAR
LC	TAF (less than 12 hours)
LK	Tropical Cyclone Advisory
LN	Space Weather Advisories
LP	SPECI
LS	SIGMET
LT	TAF (up to 30 hours)
LU	Volcanic Ash Advisory
LV	SIGMET for volcanic ash
LW	AIRMET
LY	SIGMET for Tropical Cyclone

4.4. Further information on IWXXM format data can be found in ICAO Doc 10003 – Manual on the Digital Exchange of Aeronautical Meteorological Information

4.5. The “SADIS OPMET Catalogue” gives a more detailed listing of the TAC format data normally available on SADIS. The catalogue is available on <https://www.icao.int/airnavigation/METP/Pages/Public-Documents.aspx> (in the MOG-SADIS/WIFS Reference Documents section). The content of the catalogue is created comparing data from ROC London, SADIS, ICAO DOC 7910 and the eANP List of Aerodromes.

4.6. The SADIS OPMET Catalogue details the exact data usually available on SADIS. A quick summary is provided below:

	<b>WMO headers (T<sub>1</sub>T<sub>2</sub>A<sub>1</sub>A<sub>2</sub>i i CCCC)</b>	
METAR	SA//// //// SP//// ////	All METARs and SPECIs routed internationally
TAF	FC//// //// FT//// ////	All TAFS routed internationally
SIGMET	WS//// ////	All SIGMETs other than for tropical cyclones and volcanic ash
	WC//// ////	All tropical cyclone SIGMETs
	WV//// ////	All volcanic ash SIGMETs
AIRMET	WA//// ////	All AIRMET bulletins that are routed to the SADIS gateway.
GAMET	FA//// ////	All AIRMET bulletins that are routed to the SADIS gateway.
Special AIREP	UA//6/ ////	All Special AIREP other than for volcanic ash
	UA//7/ ////	Volcanic Ash Special AIREP
Volcanic Ash Advisory (VAA)	FVAK (21-25) PAWU	Anchorage VAAC
	FVAG (01-05) SABM	Buenos Aires VAAC
	FVAU (01-10) ADRM	Darwin VAAC
	FVXX (01-03,05) EGRR	London VAAC
	FVCN (01-04) CWAO	Montreal VAAC
	FVFE01 RJTD	Tokyo VAAC
	FVXX (01-05) LFPW	Toulouse VAAC
	FVXX (20-27) KNES	Washington VAAC
	FVPS (01-05) NZKL	Wellington VAAC
Tropical Cyclone Advisory (TCA)	FKAU (01-06) ADRM	TCAC Darwin
	FKIN (20-21) VIDP	TCAC New Delhi
	FKIO20 FMEE	TCAC La Réunion
	FKNT (21-25) KNHC	TCAC Miami
	FKPZ (21-25) KNHC	TCAC Miami
	FKPA (21-25) PHFO	TCAC Honolulu
	FKPQ (30-33) RJTD	TCAC Tokyo
	FKPS 01 NFFN	TCAC Nadi
Space Weather Advisory	FNXX (01-04) KWNP	SWX Washington, United States
	FNXX (01-04) EFKL	PECASUS Consortium (Austria, Belgium, Cyprus, Finland, Germany, Italy, Poland, Netherlands and the United Kingdom)
	FNXX (01-04) LFPW and FNXX (01-04) YMMC	ACFJ Consortium (Australia, Canada, France and Japan)
	NOXX39 CCCC	Will be used for SADIS administrative messages

Where “/” represents any character at the appropriate position (wildcard routing).

Note 1: A new space weather centre comprising of the Peoples Republic of China and the Russian Federation is expected to commence in 2021. It will use FNXX(01-04) ZBBB and UUAG.

Note 2: In the event that the PECASUS consortium bulletins have to be sent by the United Kingdom due to back up procedures being implemented the headers FNXX(01-04) EGRR will be used

4.7. NOTAMS relating to Volcanic Ash (VA NOTAMs), and ASHTAMs are made available on the SADIS in accordance with 4.3a of Doc 9766 — Handbook on the International Airways Volcano Watch (IAVW) and 5.3.4 of Annex 15 - Aeronautical Information Services. VA NOTAMs and ASHTAMs are distributed over SADIS using NWXX01 EGRR WMO AHLs

4.8. A selection of graphical format advisories are provided on SADIS

	<b>WMO headers (T<sub>1</sub>T<sub>2</sub>A<sub>1</sub>A<sub>2</sub>i i CCCC)</b>		
Volcanic Ash Advisory graphics (VAG)	PFXD (21-25) PAWU	Anchorage VAAC	
	PFXD (01-05) SABM	Buenos Aires VAAC	
	PFXD (01-10) ADRM	Darwin VAAC	
	PFXD (01-03,05) EGRR	London VAAC	
	PFXD (01-04) CWAO	Montreal VAAC	
	PFXD 01 RJTD	Tokyo VAAC	
	PFXD (09) LFPW	Toulouse VAAC	
	PFXD (20-27) KNES	Washington VAAC	
	PFXD (01-05) NZKL	Wellington VAAC	
Tropical Cyclone Advisory graphic (TCG)	PZXD (01-05) FMEE	TCAC La Réunion	
Low Level Area Forecast Charts	QGDB49, QGDC49	Austria and Switzerland	
	QGXB98	Belgium	
	QGRH90	Croatia	
	QGFC96, QGFD96, QGFE96, QGFF96, QGFG96, QGFH96	France	
	QGDB40, QGDC40	Germany	
	QGXD70	Ireland	
	QGIS55	Israel	
	QGAE15, QGAG15, QGAI15, QGAK15	Morocco	
	QGRB55	Romania	
	QGDC57	Serbia and Montenegro	
	QGLJ50	Slovenia	
	QGUK54	United Kingdom	
	Supplementary Volcanic Ash Graphics	PFD[A-D][09,24,46]	London VAAC
		PFN[A-D][09,24,46]	

*Note.1— Volcanic Ash Advisory graphics and Tropical Cyclone advisory graphics are only available on SADIS FTP when they are forwarded to the WAFC London messages switch by the TCAC concerned and following notification of the WMO AHL by the originator. Currently only one of the seven TCACs provide tropical cyclone advisories in graphical format for distribution via SADIS as necessary.*

*Note.2— METP-WG/MOG Action 4/SADIS9 introduced low level area forecast charts to SADIS as part of an ongoing trial. Only charts belonging to those States or ANSP's who have chosen to participate are included. As this is a trial, the charts are provided on a best endeavors basis. Should your State or ANSP wish to participate, please contact the SADIS manager ([SADISmanager@metoffice.gov.uk](mailto:SADISmanager@metoffice.gov.uk)) for information.*

4.9. The following types of administrative message are published on SADIS

<b>WMO headers</b> (T <sub>1</sub> T <sub>2</sub> A <sub>1</sub> A <sub>2</sub> i <sub>i</sub> CCCC)	<b>Intended use</b>
NOUK10 EGRR	Messages used to advise on model or product delays/difficulties, or service outages. This message is also used to advise of forthcoming product changes that may require actions by users. This is the preferred bulletin header for messages that have an impact on the service itself.
NOUK11 EGRR	For messages that provide useful information to users but do not have an immediate impact on the service. An example would be the notification of SADIS or WAFS documentation updates (with the exception of SADIS User Guide updates, for which a NOUK13 EGRR will be used).
NOUK12 EGRR	This provides a text message directing users how to decode GRIB values. It is mainly used by workstation suppliers.
NOUK13 EGRR	SADIS User Guide updates (ICAO can only authorize these messages).
NOUK31 EGGY	NATS advisory messages
NOUK32 EGGY	NATS advisory messages, Automatic SADIS Monitor Messages (see below)
NOUK33 EGGY	NATS advisory messages, Manually generated by SADIS Gateway Operators for data providers and communications centres requesting information on missing data.
NOUK34 EGGY	NATS advisory messages, Manually generated by SADIS Gateway Operators for SADIS users informing them of the nature of a problem
NOBX99 EBBR	DMG METNOs describing changes to bulletins promulgated in the EUR Region.

4.10. If data from an aerodrome listed in the catalogue goes missing, or if you would like us to investigate whether any additional aerodromes can be added, please e-mail [SADISmanager@metoffice.gov.uk](mailto:SADISmanager@metoffice.gov.uk) .

## Appendix C

### DATA PROCESSING SYSTEMS

Guidance material has been developed by the SADIS provider to enable users to assess the capability and functionality of software in using the WAFS data sets, and OPMET data sets appropriately. The “SADIS Workstation Evaluation Guide” is published here: <https://www.icao.int/airnavigation/METP/Pages/Public-Documents.aspx>

#### 1. SPECIFIC REQUIREMENTS FOR DIGITAL GRID POINT (GRIB) DATA AND DIGITALLY CODED SIGWX DATA

The system should:

- a) display wind and temperature information generated from the GRIB data, and SIGWX information from the BUFR data on a map background in the appropriate Annex 3 format;
- b) select the map area for a selected route;
- c) be able to zoom in on a selected area;
- d) display all the grid point data along a route;
- e) print the screen display;
- f) display valid data with the correct date and time group at all times;
- g) ensure that the standard ICAO areas are available on the system as map area defaults;
- h) be able to produce wind and temperature charts from GRIB data, and SIGWX charts from BUFR data that are largely identical to the equivalent PNG chart-format products;
- i) be able to produce charts that span the international date line, and cover all of the standard ICAO areas; and
- j) have the capability to automatically generate Annex 3 compliant charts from the GRIB and BUFR code forms.

## **2. SPECIFIC REQUIREMENTS FOR DIGITALLY CODED CHARTS**

The system should:

- a) display WAFS SIGWX in PNG chart format;
- b) display charts with the correct orientation and map projection;
- c) be able to zoom into part of a chart if required with a valid date and time displayed at all times; and
- d) print whole charts on A4 paper.

## **3. SPECIFIC REQUIREMENTS FOR OPMET INFORMATION IN ALPHANUMERIC FORMAT**

The system should:

- a) display all OPMET information in alphanumeric format (METAR – SA; TAF – FC and FT; SIGMET - WS, WV and WC; special AIREP – UA; tropical cyclone and volcanic ash advisories - FK, FV; GAMET – FA; AIRMET – WA; and Space weather advisories – FN ).
- b) display only valid OPMET information by FIR, bulletin, country or route;
- c) include an option to select all data;
- d) be able to build a user's own route list which can be saved for future use;
- e) display SIGMET at all times and in particular when linked by requests for TAF and METAR information by FIR, country or selected route; and
- f) print out OPMET information.

Note: IWXXM data sets were added to SADIS on 5 November 2020. Ideally software should be able to process and visualize this new data in the same ways that the alphanumeric data is handled.



#### **4. GENERAL INFORMATION AND ADVICE WHEN IMPLEMENTING A DATA PROCESSING SYSTEM**

- a) Establish how the hardware/software will be supported.
- b) Does the hardware/software carry sufficient extended warranty? Is it worth the extra cost?
- c) Does the supplier provide a 'hot-line' for customer support, what is its availability, is it in your own language?
- d) Identify the cost of additional copies of the application software and operating software.
- e) Identify, as much as possible, the volume of data and the type of products that are required to be processed, through WAFC London, and ensure that your system will be able to cope and meet future requirements cheaply and effectively.
- f) Identify the cost of software upgrades and enhancements that will be required when the WAFS product suite changes.
- g) Review the SADIS hardware and software procurement guidelines available from the SADIS website at URL: <https://www.metoffice.gov.uk/services/transport/aviation/regulated/sadis>.

#### **5. SADIS WORKSTATION AND SOFTWARE PROVIDERS**

Information on SADIS workstation and software providers is available at this link:

<https://www.metoffice.gov.uk/aviation/sadis/manufacturers-full>

---