INTERNATIONAL CIVIL AVIATION ORGANIZATION

AFI OPMET DATA EXCHANGE (AODEX) HANDBOOK

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DRAFT AODEX

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RECORD OF AMENDMENTS AND CORRIGENDA

Amendment No	Dated	In force form	Entered by
1	15/03/2010	01/04/2010	RO/MET
2	01/07/2011	15/08/2011	METSG Secretariat
3	15/07/2013	15/10/2013	Core Team on AMBEX Scheme Secretariat
4	02/12/2015	02/12/2015	Secretariat
5	05/09/2025	20/03/2026	Secretariat CODEVMET Project Team on the Update of the AMBEX Scheme and Procedures
			States

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ABBREVIATIONS AND ACCRONYMS

AASPG	AFI Aviation Planning and Implementation Group
ACC	Area Control Center
ADMIN	Administrative
AFI	Africa Indian Ocean
AFS	Aeronautical Fixed Service
AFTN	Aeronautical Fixed Telecommunication Network
AIREP	Air Report
AIRMET	AIRman's METeorological Information
AIXM	Aeronautical Information Exchange Model
AMBEX	AFI Meteorological Bulletins Exchange
AMD	Amended
AMHS	Air Traffic Services Message Handling System
AMO	Aerodrome Meteorological Office
AMS	Aeronautical meteorological station
ANP	Air Navigation Plan
AODEX	AFI OPMET Data Exchange
AOP	Aerodrome Operations
AoR	Area of Responsibility
APAC	Asia and Pacific
APAC	ICAO Asia/Pacific Region
APIRG	AFI Planning and Implementation Regional Group
COM	Communications
DB	Databank
eANP	(Electronic) Air Navigation Plan
ESAF	Eastern and Southern African
EUR	Europe Region
FIR	Flight Information Region
FIXM	Flight Information Exchange Model
FTBP	File Transfer Body Part
GANP	Global Air Navigation Plan
GML	Geography Markup Language

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IAoR	Inter-regional Area of Responsibility
ICAO	International Civil Aviation Organization
ICD	Interface Control Document
IHE	IPM Heading Extension
IPM	Interpersonal Messaging (AMHS)
IROG	Inter-Regional OPMET Gateway
ISCS	International Satellite Communication System
iSTARS	integrated Safety Trend Analysis and Reporting System
IUT	Implementation Under Test
IWXXM	ICAO Meteorological Information Exchange Model
MET	Meteorology
METAR	Aerodrome routine meteorological report
METP	ICAO Meteorology Panel
MID	Middle East region of ICAO
MTA	Message Transfer Agent
MWO	Meteorological Watch Office
NAM	North American region of ICAO
NDR	Non-Delivery Report
NOC	National OPMET Centre
OGC	Open Geospatial Consortium
OID	Object Identifier
OPMET	Operational Meteorological Information
OU	Data Producer/ Originating Unit
P3	Message Submission and Delivery Protocol
ROC	Regional OPMET Centre
RODB	Regional OPMET Databank (International OPMET Databank)
RQM	Meteorological Databank Request in TAC-format
RQX	Meteorological Databank Request in IWXXM-format
SADIS	Secure Aviation Data Information Service
SAM	South American (Office)
SARP	Standards and Recommended Practices [ICAO]

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SIGMET	Information concerning en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations
SPECI	Aerodrome Special Meteorological Report
SWIM	System-Wide Information Management
SWXA	Space Weather Advisory
SWXC	Space Weather Advisory Centre
TAC	Traditional Alphanumeric Code Form
TAF	Aerodrome forecast
TCA	Tropical Cyclone Advisory
TCAC	Tropical Cyclone Advisory Centre
UA	User Agent
VAA	Volcanic Ash Advisory
VAAC	Volcanic Ash Advisory Centre
WACAF	Western and Central African (Office) of ICAO
WAFS	World Area Forecast System
WG-MIE	ICAO METP Working Group on Meteorological Information Exchange
WG-MOG	ICAO METP Meteorological Operations Working Group
WIFS	WAFS Internet File Service
WMO	World Meteorological organization
XML	Extensible Markup Langage

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DEFINITIONS AND SYMBOLS

Within the AODEX Scheme, the following definitions and symbols are used:

a) **AODEX:** AFI MET Bulletins Exchange (Scheme)

b) **AODEX Bulletin:** A collection of AODEX messages originating from MET offices within a collection area, always containing the same type of OPMET data and identified by an appropriate identifier. Bulletins should not exceed 1800 characters in length.

c) **OPMET:** The term OPMET (Operational Meteorological information) data is to be understood as being all meteorological data needed by airspace users to plan and conduct a safe and efficient flight. This data comprises e.g. METAR, TAF and SIGMET but also Significant Weather Charts and Wind-/Temperature-Charts for several flight levels.

- Under such circumstances, it will be necessary to provide additional information relating to the reason for the non-operational status.

d) **National OPMET center (NOC):** The role of the NOC is to gather and validate all internationally required OPMET messages, (refer to the Regional (electronic) Air Navigation Plans) generated by all originating units within a State, to compile national data into bulletins and to distribute them internationally according to the regional distribution schema.

e) **Regional OPMET center (ROC):** A ROC is responsible for collecting data from NOCs and validating all required data in its area of responsibility (AoR), according to the regional distribution schema. Each ROC is responsible for the collection of required OPMET data from the other ROCs in the Region, and for the dissemination to the other ROCs of the required data from its AoR.

f) **OPMET Inter-regional Gateway (IROG):** A designated centre charged with the responsibility of exchanging OPMET data between stations within the AFI Region and in adjacent regions, as prescribed in this Handbook. The plan of OPMET data exchange between regions through an IROG is based on pre-determined distributions responsibilities.

g) **Regional OPMET Data Bank (RODB):** A centre charged with task to collect required OPMET bulletins from AODEX centres, handle all types of OPMET bulletins, provide facilities for "request- reply" service to authorized users, maintain a catalogue of bulletins, quality control the incoming bulletins and inform AODEX centres on any deficiencies, monitor the OPMET traffic and report to the ICAO Regional Office on the results.

h) **Profile:** A profile A based on the exclusive use of the Extended Service should be used. As a result, the IHEs need to be used to carry the ATS priority, Filing time and Optional Heading Information. However, only some of the functional groups which are part of the Extended Service are needed for the profile, namely FTBP and IHE. More specifically, the profile does not require support of AMHS security.

i) **YPYX:** Fifth, sixth, seventh and eighth letter of an addressee indicator to be used:

- with the normal four-letter location indicators, to designate ROCs;

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- with indicators for pre-determined distribution within a ROC collection area.

j) Test and Exercise: There is no official definition of a test or exercise message. In some instances, the two words are used interchangeably. Since the use of Test or Exercise indicators would only be used in messages identified as non-operational, there are circumstances where one may be more appropriate than the other.

Note: More details and examples of test and exercise messages are provided in para 5.14.4 and 5.1.4.5.

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REFERENCES

- Annex 3: Meteorological Service for international Air Navigation
- Annex 10: Aeronautical Telecommunications
- AFI IWXXM Implementation Guideline (Edition1,2020)
- Doc8896: Manual of Aeronautical Meteorological Practice
- Doc8855: Guidelines on the use of the public Internet for aeronautical applications.
- Doc10157: Procedures for Air Navigation Services-Meteorology (PANS-MET)
- Doc10199: Information Management (IM)
- Doc9880: Manual on detailed technical specifications for ATN
- Doc9896: Manual on ATN using Internet Protocols Suites (IPS) standards and protocols
- Doc7910: Location indicators
- Doc8585: Designators for Aircraft Operating Agencies, Aeronautical Authorities and Services
- 10157Doc10003: Manual on the ICAO Meteorological Information Exchange Model (IWXXM)
- Doc10039: System Wide Information Management Manual
- Doc
- EUR Doc 021: ATS Messaging Management Manuel
- Global Air Navigation Plan (GANP)
- WMO No-306: Manual on Codes volume I.2 international code Part B
- WMO No-306: Manual on Codes volume I.3 international code Part D
- WMO No-386: Global Telecommunication System (GTS)
- SADIS API-User Guide.

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1. INTRODUCTION

1.1. Purpose

1.1.1. The AFI OPMET Data Exchange (AODEX) Scheme is a coordinated arrangement by the ICAO Africa-Indian Ocean (AFI) Region to facilitate the efficient and timely exchange of meteorological information (MET) necessary for the safety, regularity, and efficiency of international air navigation. The main purpose is to facilitate Regional and International MET Data Exchange to ensure that aeronautical meteorological bulletins (e.g. METARs, TAFs, SIGMETs) are distributed efficiently within the AFI Region and to other ICAO regions. The scheme ensures interoperability with ICAO Meteorological Information Exchange Model (IWXXM) standards and the World Meteorological Organization (WMO) data exchange principles (e.g. GTS – Global Telecommunication System).

1.1.2. The AODEX Handbook is the main guidance material providing detail on the procedures for OPMET data exchange under the AODEX scheme. The Handbook defines the responsibilities of the AODEX centres and the procedures to be followed. It also provides the content and format of the AODEX bulletins.

1.1.3. The procedures described in the AODEX Handbook are based to a significant degree on corresponding procedures in the Manual on the ICAO Meteorological Information Exchange Model (Doc 10003). Where some variations or adaptations of the basic principles appear more efficient, AODEX Provider States are strongly requested to submit to the AFI OPMET Management body (AFI-ROMG) any changes that are considered desirable for the enhancement of the efficiency of the scheme.

1.2. History

1.2.1. The AODEX (initially named AMBEX) scheme was established by the AFI Planning and Implementation Regional Group (APIRG) in 1986. The scheme became operational in 1986 and has since then been successfully serving the ICAO AFI Region in the exchange of the required OPMET information.

> *Note: AFI Meteorological Advisory Group (AFMAG) was created by the LIM AFI (COM/MET/RAC) RAN Meeting in Lome April 1988 and established by APIRG/6 Meeting in November 1989.AFMAG was replaced by AFI Meteorology Sub Group (MET/SG) at APIRG/11 Nairobi 1998.*

1.2.2. The scheme was intended initially only for TAF exchanges. In later editions, AIREPs, METAR, SIGMET, Volcanic Ash Advisory (VAA) and Tropical Cyclone Advisory (TCA) were added. The operation of the AMBEX scheme included exchange of OPMET bulletins between the originating tributary offices and the bulletin compiling centres, which, according to their functions and responsibilities, were classified as METAR Collection Centres, TAF Collection Centres and AIREP Collection Centres. These centres served key roles in gathering, validating and transmitting their specific type of OPMET data. Over time, the AMBEX scheme has been developed to include AIRMET and Space Weather Advisory (SWA) and the functions of the separate collection centres have been consolidated into National OPMET Centres (NOC) which validate, compile bulletins and transmit to the Regional OPMET Databanks (RODBs). The operational exchange has been carried out

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according to agreed transmission schedules; the bulletin contents were specified in the AODEX Handbook.

1.2.3. Based on communications facilities of very limited capacity, at its initial stage, the AMBEX scheme was strictly planned to accommodate only those OPMET in TAC format exchanges considered vital for flight operations. Over the years, the communication facilities have been improving considerably and the AMBEX scheme has been developed accordingly.

1.2.4. Recently, it has been identified that significant changes in the scheme were needed in order to make it compatible with the existing communication environment and satisfy the evolving user requirements. In view of this, APIRG adopted conclusions that called for further development of the AMBEX scheme according to the new operational requirements. In response to this, the AMBEX scheme has transitioned from the product-based environment to the data-centric environment which supports integration into the system-wide information management (SWIM) environment, enhancing data quality and availability within the AFI region.

1.3. Amendments of the AODEX Handbook

1.3.1. The AODEX Handbook is dynamic in nature in that it is updated regularly to reflect current communications facilities and the requirements of users of OPMET data.

1.3.2. Any proposed amendment to the AODEX Manual that the States or relevant international organizations deem necessary due to changes in the operational requirements of the AODEX system or any other developments, shall be forwarded to the AFI-ROMG working group for consideration.

1.3.3. Major changes to the AODEX Manual must result in the publication of a new edition number and a minor change to this Manual must be called an “Amendment” or “Corrigenda” without a change to the edition number.

1.3.4. Major changes are any changes initiated through provisions in ICAO Annexes standards related to the AODEX scheme except editorial changes. Major changes should be approved through Decisions of AFI Aviation System Planning and Implementation Group (AASPG).

1.3.5. Amendment” or “Corrigenda” are minor editorials changes to be approved only by the AFI Infrastructure and Information Management Sub-Group (IIM/SG) meetings.

1.3.6. The AODEX manual is kept up to date by the ICAO ESAF and WACAF offices.

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2. AODEX SCHEME – GENERAL

2.1. Objective

2.1.1. The main purpose of the AFI OPMET Data Exchange (AODEX) Scheme is to ensure the:

- Optimal exchange of OPMET information within the AFI region and with other ICAO regions to meet the needs of OPMET data users; and
- Implementation of the Standards and Recommended Practices (SARPs) relating to OPMETs listed in Annex 3 and Annex 10 (Vol. II), as well as the relevant provisions of the AFI Area Air Navigation Plan (ANP), in a highly efficient and standardized manner.

2.1.2. The AODEX-schema handles OPMET data exchanged through the AFS (AFTN and/or AMHS). The OPMET data is available in both TAC (Traditional Alphanumeric Code) and IWXXM (ICAO Meteorological Information Exchange Model) format. An overview of the OPMET data types is provided in tables in 5.1.2 & 5.1.3. of Chapter 5.

2.2. Structure

2.2.1. The above objective is achieved by implementing seven Regional OPMET Centres (ROCs), two Inter-Regional OPMET Gateways (IROGs), two Regional OPMET Databanks (RODBs) and 52 National OPMET Centres (NOCs). At present, this structure is part of a larger global OPMET exchange, which should ensure seamless exchange of the required meteorological information to fulfil the needs of the aviation users. Similar schemas are implemented in other regions, e.g. the ROBEX in the APAC region or the RODEX (EUR Doc-18) in the EUR region.

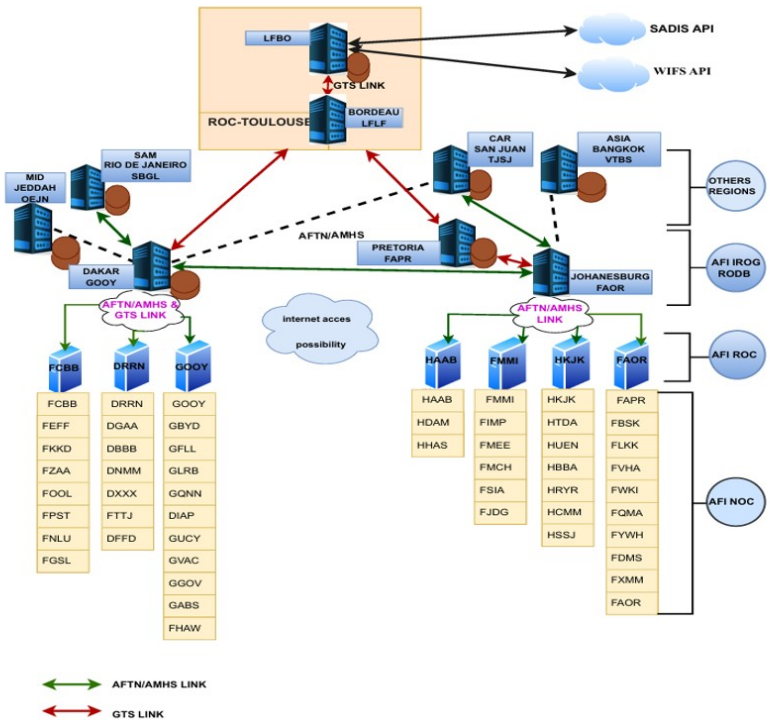

Figure 2.2.1: Schéma AODEX

2.2.2. Information about the ROCs AoR (which State belongs to which AoR) can be found in Appendix E (Distribution Determination for OPMET Data).

** Note: The AFI OPMET Regional Data Banks are located in Dakar, Senegal and Pretoria, South Africa.*

2.3. Products

2.3.1. The AODEX schema also provides guidelines on the production of OPMET data in predefined bulletins in order to ensure a flawless delivery to the aviation users. It handles all types of OPMET data in TAC and IWXXM format and provides facilities and services for scheduled and non-scheduled delivery of OPMET data.

2.4. IWXXM Data Exchange

2.4.1. ICAO Annex 3 Amendments *76*, *77* and *78* provide the first steps to the transition of Traditional Alphanumeric Code (TAC) formatted OPMET data towards XML formatted data in compliance with the ICAO Meteorological Information Exchange Model (IWXXM).

2.4.2. The development of new systems which provide and support digital OPMET requires initial investment but the use of enabling data exchange standards for other domains such as AIXM (Aeronautical Information Exchange Model) and FIXM (Flight Information Exchange Model) along with IWXXM will lead to cost reduction due to the implementation of widely used data modelling techniques including OGC (Open Geospatial Consortium) segments. This will enable users to create new products at lower cost, fusing all digital data available.

2.4.3. Amendment 76 (Applicable 14th November 2013) enabled the bilateral exchange of XML data for those States in a position to do so.

2.4.4. APIRG 20 (30th November – 2th December 2015) established the AFI Transition Plan to OPMET data in digital format (APIRG/20 Report, Appendix 2.6D).

2.4.5. Amendment 77 (Applicable 10th November 2016) enables the international exchange of XML-formatted METAR/SPECI, TAF, AIRMET and SIGMET, VAA and TCA.

2.4.6. Amendment 78 (Applicable 8th November 2018) requires the international exchange of XML-formatted METAR/SPECI, TAF, AIRMET and SIGMET, VAA and TCA to be raised to a standard, although the provisions relating specifically to IWXXM will not become applicable until 5 November 2020.

2.4.7. The phased transition of TAC OPMET data to IWXXM OPMET data is to be considered as a first step towards the ICAO System Wide Information Management (SWIM) concept.

2.4.8. With this new format also the terminology as well as the functionalities within the exchange systems changed. Details will be explained later in the document.

2.4.9. This edition of the Handbook focuses largely on the exchange of OPMET data in TAC format because all States currently have the ability to send and receive OPMET data in TAC format. Only a limited number of States have developed the capability to send and receive OPMET data in IWXXM. In addition, AMHS with FTBP has yet to be implemented in a number of AFI States. It should be noted that AFTN cannot be used to disseminate OPMET data in IWXXM format. However, some information on the exchange of OPMET in

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IWXXM is provided in this Handbook, but detailed information on IWXXM, and the transition from TAC to IWXXM, is provided in the document *Guidelines for The Implementation of OPMET Data Exchange using IWXXM in The AFI Region – First Edition, December 2020* available on the ICAO ESAF website in the MET section under ICAO ESAF e-Documents.

(https://www2023.icao.int/ESAF/Documents/AFI%20IWXXM%20Guideline%20Documents/AFI%20IWXXM%20Implementation%20Guideline%20Doc%20Ed.1_2020.pdf).

The progress of the IWXXM implementation in the AFI Region is provided through the following link (link to be completed).

2.5. OPMET Data provision and requirements

2.5.1. The determination of the OPMET data to be provided for international exchange by each State is a responsibility of the respective meteorological authority in consultation with the aviation users concerned. The user requirements should be as much as possible fulfilled by the provided OPMET data. The agreed requirements for AOP OPMET data are promulgated via the Africa-Indian Ocean (AFI) electronic Air Navigation Plan (e-ANP) in the following tables:

- AFI e-ANP Volume II Table MET II-1, Meteorological Watch Offices, Service to *be provided for FIR or CTA*, lists all MWOs in the AFI region. It defines the requirements for the provision of SIGMET (WS, WV, WC) and AIRMET (WA) messages for each FIR/UIR.
- AFI e-ANP Volume II Table MET II-2, Aerodrome Meteorological Offices, defines the requirements for the AOP airports (defined in e-ANP Volume I, AOP Table I-1) to provide OPMET data. The table includes *inter alia* the requirements for METAR/SPECI, TREND forecast, TAF period of validity and minimum and maximum temperatures.

2.5.2. Additional requirements can be found in the ICAO Doc 9766, Handbook on the International Airways Volcano Watch (IAVW), which describes the areas of responsibility of Volcanic Ash Advisory Centres (VAAC) and in the AFI SIGMET Guide.

2.6. Management

2.6.1. Monitoring of the OPMET exchange under the AODEX Scheme, planning for improvements and preparation of proposals for any changes that may be necessary, are carried by the AASPG. In order to achieve these tasks, the AODEX implementation status and planning is part of the agenda of the ICAO Regional Offices.

2.6.2. It is necessary to establish an AODEX System Management Group in the AFI Region, responsible for the management of OPMET data within the AFI Region, based on existing needs. The mandate is as follows:

- coordinate and facilitate, under the biannual rotating leadership of the BRDOs of

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Dakar and Pretoria, the proper functioning of the exchange of OPMETs in the AFI Region and report on it to the WACAF and ESAF Offices of ICAO;

- review existing and any new AFI Region requirements and assess the feasibility of meeting these requirements, taking into account data availability;
- reorganize, if necessary, the bulletins by modifying existing bulletins or adding new bulletins, based on validated requirements;
- ensure management of the transition to data exchange in IWXXM format;
- follow the trials by NOCs, ROCs and BRDOs of the exchange of IWXXM information across the SFA, using AMHS networks with FTBP and the AMHS profile for IWXXM formatted data, as outlined in the guidance provided in Appendices A and B to this document;
- ensure the delivery of all OPMETs to the BRDOs in Dakar and Pretoria.
- inform States one month in advance of changes to the program by notification of the ICAO WACAF and ESAF Offices.

2.6.3. The terms of reference of the OPMET management group of the AFI region (AFI-ROMG) are specified in Annex M.

2.7. Requests and Reply of OPMET Data

2.7.1. The RODBs provide a request and reply facility to allow users to request and receive OPMET data on a non-regular or occasional basis through the AFS. This is not intended for routine requests, which should be arranged through the implementation of a predetermined regular OPMET exchange.

2.7.2. Guidelines on query procedures to access the RODBs of the AFI region in order to request OPMETs are provided in Annex K.

2.8. Documentation

2.8.1. The AODEX manual is the main guidance document relating to the operation of the AODEX system.

2.8.2. The AFI OPMET Data Banks Interface Control Document (ICD) is a supplementary document which provides users with guidance on the interrogation procedures and the content of the RODBs.

3. TELECOMMUNICATIONS

3.1. General

3.1.1. According to Annex 3, 11.2, «Telecommunications facilities used for the exchange of operational meteorological information should be the aeronautical fixed service». The AFS is the central pillar for OPMET exchange:

- between the national OPMET centers (NOC) and their respective regional OPMET centers (ROC) of affiliation;

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- between ROCs of the AFI region and other ICAO regions;
- between interregional OPMET Gateway (IROGs) as part of global exchanges.
- however, in light of recent developments, dissemination via SADIS API/WIFS API, SWIM), as well as access via secure internet, are becoming complementary components of the AODEX architecture.

3.1.2. For the exchange of non-time-critical OPMET, the public internet may be used, subject to availability, satisfactory performance, and a bilateral/multilateral and/or regional air navigation agreement.

3.2. AMHS/ AFTN

3.2.1. In the AODEX Scheme, AFTN/AMHS circuits are used for regional and inter-regional OPMET data (in TAC and IWXXM format).

3.2.2. The access to the regional OPMET data banks (request-reply service provided by the RODBs) is also provided through the AFTN/AMHS.

3.2.3. Transmission of OPMET data in TAC and IWXXM format:

- OPMET messages in TAC format are transmitted via AFTN or AMHS in IA5 text.
- Given the size and character set limitations of IWXXM messages, they cannot be transmitted via AFTN. Instead, the IWXXM message file should be compressed and attached as a File Transfer Body Part (FTBP) to the AMHS message, in accordance with ICAO Doc 9880 Part II-B and further detailed in AFI IWXXM Implementation Guideline Doc Ed.1_2020, to enable the international exchange of IWXXM data through the AFS.

3.2.4. Message encapsulation

- All OPMET bulletins transmitted should be encapsulated in the text part of the AFTN/AMHS message (TAC in IA5) or via FTBP (for IWXXM). The transmitted data should comply with the syntactic and semantic constraints of the TAC / IWXXM formats.

3.2.5. Transit times

- The transit times of OPMET messages via AFTN/AMHS should comply with the requirements of PANS-MET (Doc 10157), Chapter 10. The AMHS should at a minimum achieve the performance of the AFTN to ensure operational continuity.

3.2.6. Priority indicators

3.2.6.1. OPMET bulletins transmitted via AFTN should use the following priority indicators:

- FF: SIGMET, AIREP SPECIAL, VAA, TCA, and amended TAF.
- GG: TAF, METAR, SPECI.

3.2.6.2. OPMET bulletins transmitted via AMHS should use the following priority indicators:

- Normal: SIGMET, AIREP SPECIAL, VAA, TCA and amended TAF.

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- Non-urgent: TAF, METAR, SPECI.

3.2.6.3. Validation and quality

3.2.6.3.1. OPMET data should be validated (syntax, consistency) according to the TAC model before transmission. Any anomalies should trigger alerts or corrections before dissemination. ROCs should monitor data quality and report any gap.

3.3. SADIS API/ WIFS API

3.3.1. SADIS API as a new pillar

3.3.1.1. The SADIS API is gradually replacing SADIS FTP as the OPMET / WAFS broadcast channel. It is a SWIM-compliant service, using REST/HTTP interfaces, allowing targeted requests of OPMET data sets (TAC, IWXXM) for specific geographical areas.

3.3.1.2. The SADIS API supports custom requests, OPMET bulletin deliveries in JSON, zip, or via direct HTTP links, and access restrictions via OAuth2 authentication.

3.3.1.3. The SADIS FTP will be gradually phased out (target 2028); until that date, it will remain an alternative, but no new users will be added to SADIS FTP. States should plan their migration to SADIS API well before this date.

3.3.1.4. The SADIS API ensures the provision of OPMET bulletins (METAR, SPECI, TAF, SIGMET, VAA, etc.) in TAC and IWXXM formats, as well as WAFS GRID data.

3.3.1.5. Redundancy via WIFS API

a) In the event of a critical failure of the SADIS API, the WIFS API operated by WAFC Washington can serve as a backup solution. The SADIS/WIFS API system has been harmonized to facilitate this redundancy.

b) ROCs should ensure that they are subscribed to both services or at least registered to access the WIFS API as a backup.

3.4. Using of internet

3.4.1. *Terms of Use*: According to ICAO Doc 9855, the use of the Internet for aeronautical operational purposes should be limited to the exchange of non-time-critical messages, information or data. Non-time-critical means that what is being communicated has no immediate effect on an active flight.

3.4.2. *Eligible data types*: The following meteorological information is considered non-time-critical and can be provided via the Internet:

a) meteorological information concerning forecasts, e.g. TAF, area and route forecasts, and concerning observations such as aerodrome routine meteorological report (METAR) and aerodrome special meteorological report (SPECI);

b) meteorological information provided by the world area forecast centres (WAFCs), e.g. significant weather charts, and wind, temperature and relative humidity charts;

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c) volcanic ash advisories in graphical format (VAG) provided by the volcanic ash advisory centres;

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d) GAMET area forecasts; and

e) Route forecasts (ROFOR).

3.4.2.1. *Web access to RODBs*: The RODBs provide secure Internet access for the retrieval of OPMET data by authorized users.

3.5. Contingency Plan

3.5.1. Contingency objectives

3.5.1.1. The Contingency objectives are to ensure that the OPMET exchange (TAC and IWXXM) remains operational even in the event of a failure of a main AFS or API link.

Main connection	Possible emergency connections	Recommended actions
AFTN/AMHS	Internet	Letter of Agreement
SADIS API	WIFS API	Have a subscription/prior access to the WIFS API; regularly test the failover
SADIS FTP	Internet	Migrate to SADIS API
Multiple breakdown		Centers can locally store validated temporary OPMET bulletins and then relay them when connections are restored.

Table 3.5.1.1: Contingency actions

3.5.2. Implementation recommendations

a) Each ROC and NOC should have a documented operational continuity plan, with regular switchover tests;

b) Performance and availability of channels (AFS, API, FTP) should be monitored using monitoring tools, and switchovers should be triggered automatically;

c) Priority should be assigned in the contingency plan to critical bulletins (SIGMET, TCA, VAA) to ensure their prioritized dissemination;

d) Intra-Regional/ ROC coordination is essential to ensure that backup plans are compatible.

4. COMPONENTS AND FUNCTIONS OF AODEX SCHEME

4.1. Components of the AODEX Scheme

4.1.1.1. The AODEX scheme consists of several components, using the regional Air Navigation System as the medium for OPMET data exchange. These components provide one or more functions within the AODEX system. The various components and functions required for

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the regional and interregional exchange of regular and non-regular OPMET data are listed and explained below.

4.1.2. Data Producer/ Originating Unit

4.1.2.1. The Data Producer/ Originating Unit is an operational unit were OPMET data is produced and disseminated. The units can be:

a) Aeronautical Meteorological Station (AMS);
b) Aerodrome Meteorological Office (AMO);
c) Meteorological Watch Office (MWO);
d) Tropical Cyclone Advisory Centre (TCAC);
e) Volcanic Ash Advisory Centre (VAAC);
f) Space Weather Centre (SWXC);
g) World Area Forecast Centre (WAFC).

4.1.2.2. The AODEX components for the exchange of OPMET data are the following:

- National OPMET Centre (NOC);
- Regional OPMET Centre (ROC);
- Regional OPMET Databank (RODB);
- Inter-Regional OPMET Gateway (IROG).

4.1.3. In the AFI Region, the AODEX scheme is composed of 48 NOCs, seven (7) ROCs, and two (2) RODB/IROGs.

4.1.3.1. A NOC manages the national exchange of ICAO OPMET data within a State. NOCs must collect and validate all required national OPMET messages – required AOPs and agreed non-AOP exchanged messages (see Regional (Electronic) Air Navigation Plans for AOPs) – generated by the State's transmitting units, compile the national collective bulletins, and disseminate them according to the regional distribution scheme on the SFA. A NOC must operate in close cooperation with the State's national AFTN/AMHS Telecommunications Center/Switch (COM) to meet the ICAO SFA requirement for the international exchange of OPMET data. The choice between a direct AFTN/AMHS connection and a proprietary solution is the responsibility of the State and is not addressed in this document.

4.2. Functions of the AODEX Components

4.2.1. Data Producer/ Originating Unit

4.2.1.1. For an IWXXM Producer, the following requirement should be met:

- The Producer output should conform to the IWXXM Schema;
- The Producer output should pass IWXXM Schematron/business rules; and
- The Producer should apply appropriate (defined) metadata following agreed ICAO rules and regulations.

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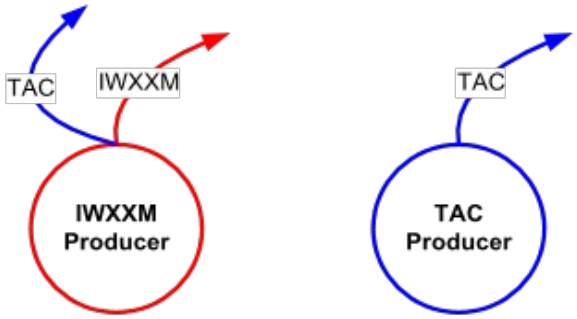

Figure 4.2.1: Comparison of IWXXM and TAC Producers

4.2.1.2. The Data Producer provides meteorological information. Since November 2020 OPMET data are to be produced in both TAC and IWXXM format.

4.2.1.3. *TAC Producer:* The TAC Producer produces meteorological information in TAC format only.

4.2.1.4. *IWXXM Producer:* IWXXM Producer: The IWXXM producer produces meteorological information in IWXXM format. It may also provide information in TAC format until this is no longer required under ICAO Annex 3.

4.2.1.5. An Originating Unit is providing the following functions:

- Data Producer (Refer to section 4.1.2);
- Data translator (Refer to section 4.2.1.11).

4.2.1.6. Currently, Data Producers are producing OPMET data in both TAC and IWXXM format. Eventually data Producers are expected to install systems capable of generating OPMET data in IWXXM directly without translation from TAC format.

4.2.2. National OPMET Centre

4.2.2.1. A NOC manages the national exchange of OPMET data within a state. NOCs should collect and validate at least all required international OPMET messages generated by the State`s originating units, compile national collective bulletins and make them available according to the regional distribution scheme over the AFS.

4.2.2.2. Each State should establish one dedicated NOC, being responsible to provide the following function:

- Data Aggregator (see 4.2.6).

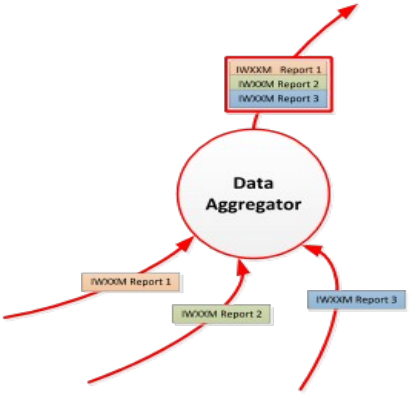

Figure 4.2.1.7: Data Aggregator

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4.2.3. Regional OPMET Centre (ROC)

4.2.3.1. A ROC manages the regional exchange of OPMET data. It collects, validates and disseminates OPMET messages received from the NOCs in its Area of Responsibility (AoR) according to the AODEX scheme. The ROCs as well as their respective AoR are listed in the Distribution Determination for OPMET Data" (Appendix E).

4.2.3.2. Normally, a ROC also acts as the NOC for the State it is situated.

4.2.3.3. A ROC should use the AFS for the exchange of OPMET data.

4.2.3.4. A ROC should provide the following functions:

- Data Aggregator (see 4.2.6);
- Data Translator (see 4.2.7).

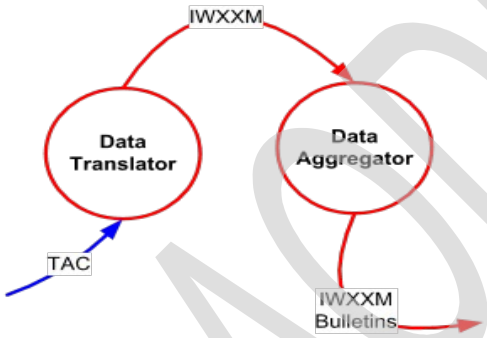

Figure 4.2.3.4: Data Translator generating IWXXM from TAC

4.2.3.5. Furthermore, a ROC is responsible for the quality control of the bulletins from within the AoR (see 12.2.3 and Appendix H, for details) on 24 hours / 7 days a week basis. This is necessary to ensure that messages can be routed correctly and without delay within the AODEX scheme.

4.2.3.6. In order to avoid duplication of the OPMET data traffic, all regional OPMET exchange should be directed through the ROCs. Direct addressing of OPMET data from the originator or NOC to recipients in the regions should be avoided, except in case of bilaterally agreed data exchange of non-AOP data.

4.2.3.7. A ROC should minimize the duplication of OPMET data from within the AoR.

4.2.3.8. A ROC should monitor the reception of OPMET data for national and international dissemination. To fulfil this task, ROCs should participate to the scheduled AFI ROMG OPMET monitoring exercises. Details on this exercise can be found in the AFI RODBs Monitoring Procedure (Appendix. H).

4.2.4. Regional OPMET Databank (RODB)

4.2.4.1. RODB provides the functionality to store OPMET data in a database and make it available for users through AFTN or AMHS. It also provides the capability for users to request OPMET data in TAC and IWXXM formats through the AFS.

Note: The designated RODB and their responsibilities are described in Appendix E.

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4.2.4.2. The main responsibilities of the RODBs are as follows:

- Collect and store all TAC and IWXXM OPMET data received from the responsible ROCs, based on requirements defined in the regional eANPs Volume II Table MET II-2;
- Maximizing the amount of available OPMET data by using the AFI ICAO mechanism for requesting additional data (AFI OPMET Data Update Procedure (Appendix D-2, Chapter 7).
- Provide request/reply facilities for authorized users to obtain TAC and/or IWXXM data according to the procedure defined in the ICD (Appendix K).
- Ad hoc monitor user request activities to detect possible misuse or abuse of the OPMET databanks.

4.2.4.3. There are two Regional OPMET databanks in the AFI Region, provided by Dakar AIBD (GOBD) and Pretoria (FAPR). According to the AFI eANP, Volume II, Part V, 2.8 the ROCs in the AFI-region are taking care to disseminate all OPMET-data to the RODBs. Data originator and/or NOCs should not send their OPMET data directly to the RODBs.

4.2.4.4. The RODBs should store at the least the OPMET data as required in Table MET II-2 and the agreed non-AOP OPMET data exchanged via the AODEX scheme.

4.2.4.5. RODBs should not undertake any translation of OPMET Data from TAC to IWXXM formats.

4.2.4.6. For an IWXXM OPMET Databank, the following requirement should be met:

- The Databank output should conform to the IWXXM Schema;
- The Databank output should pass IWXXM Schematron/business rules;
- The Databank has an AMHS interface supporting FTBP;
- The Databank should only send the response back to the originator;
- The Databank should aggregate the reply reports according to the same rules used by the Data Aggregators;
- The Databank should apply a correct filename to its output;
- The Databank correctly compresses data applying an appropriate suffix; and.
- The Databank should respond correctly to the standard interrogations.

4.2.4.7. Figure 4.2.4.7 below illustrates a possible implementation of an OPMET Databank with combined TAC and IWXXM functionalities.

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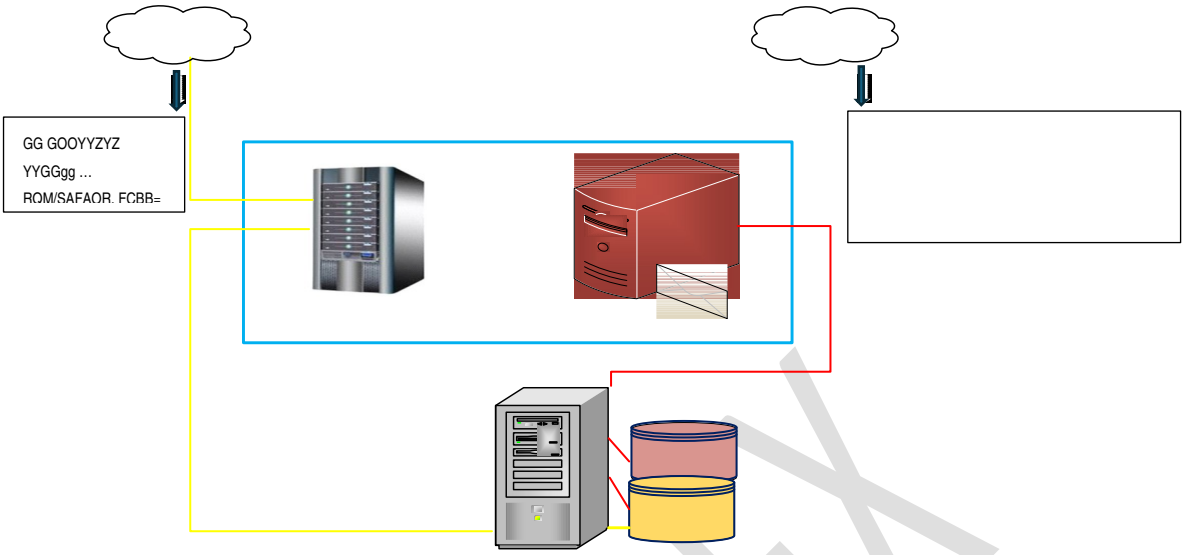

Figure 4.2.4.7: The implementation of a combined TAC & IWXXM Databank

4.2.5. Inter-Regional OPMET Gateway (IROG)

4.2.5.1. An IROG manages the inter-regional exchange of OPMET data with IROGs of other ICAO regions. The amount of data to be sent will be agreed upon between the IROGs.

4.2.5.2. An IROG is responsible:

- for providing Data Switching services (see 4.2.8).
- for the collection of OPMET messages from other ICAO regions and for the distribution of this data to the ROCs in the AFI region.
- for maintaining close co-ordination with other IROGs.

4.2.5.3. The following principles are applied for the Inter-Regional OPMET exchange:

- An IROG should be connected to a COM-centre capable of handling efficiency the anticipated volume of traffic.
- An IROG should be capable of handling all OPMET data types.
- The OPMET data exchange between the IROGs should be carried out through the AFS.

4.2.5.4. In order to avoid duplication of the OPMET data traffic, all inter-regional OPMET data exchange should be directed through the IROGs. Direct addressing of OPMET data from the originator or NOC or ROC to recipients in the other ICAO regions should be avoided.

Note: The regional operational requirements can be found in the regional e-ANPs, Volume II, MET Table II-2.

4.2.6. Data Aggregator

4.2.6.1. The function of the Data Aggregator is to take individual reports, perform limited data validation and aggregate them into bulletins. Bulletins consist of one or more reports of the same type (e.g. METAR).

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4.2.6.2. The 'Feature Collection Model' (Collect) is currently used to represent a collection of one or more GML feature instances of the same type of meteorological information. The intent is to allow XML encoded meteorological information to be packaged in a way that emulates the existing data distribution practices used within AFS. Figure 4.2.6.3 depicts the data aggregation process.

4.2.6.3. For an IWXXM Aggregator, the following requirement should be met:

- The Aggregator output will conform to the IWXXM Schema;
- The Aggregator output will pass IWXXM Schematron/business rules;
- The Aggregator will apply a correct filename to its output;
- The Aggregator correctly compresses data applying an appropriate suffix; and;
- The Aggregator will apply appropriate (defined) metadata following agreed ICAO rules e.g. for monitoring and validation issues.

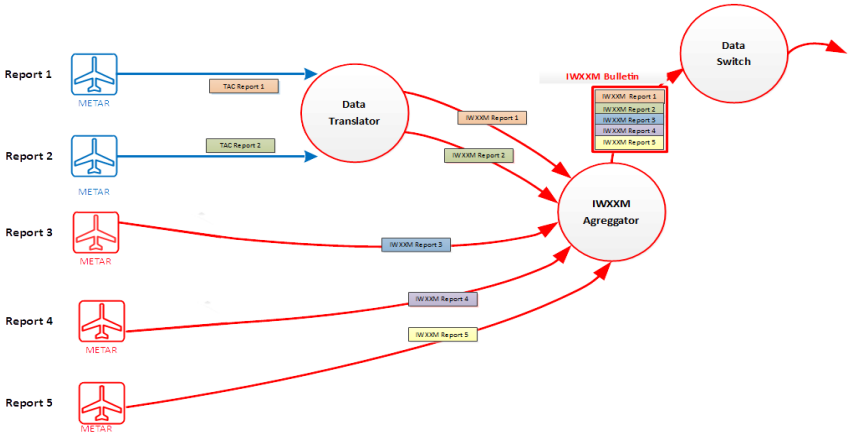


Figure 4.2.6.3: Aggregation of TAC and IWXXM data

4.2.7. Data Translation centre

4.2.7.1. A data translator converts TAC data into IWXXM on behalf of their State (i.e: when the data producer is unable to do so). A bi-lateral or regional agreement should be defined for such circumstances. To do so, it should be able to parse incoming TACs and apply the data to IWXXM schema. It is expected that this will be carried out on a bulletin basis so that the translator will always be associated with a Data Aggregator function.

4.2.7.2. When generating the IWXXM message, the translator should include IWXXM fields which define where and when the translation has been carried out in order to provide traceability. This should be achieved by introducing agreed metadata elements (centre identifier and time stamp) that is part of IWXXM.

4.2.7.3. It is highly likely that not all incoming TAC messages will be translatable due to non-conformance with TAC standards. There will be a need to develop and implement procedures to address any non-compliant data, which may involve further translation where

predefined arrangements have been made. Refer to section 4.2.3 for more details. Figure 4.2.3.4 depicts the Data Translator generating IWXXM messages from TAC.

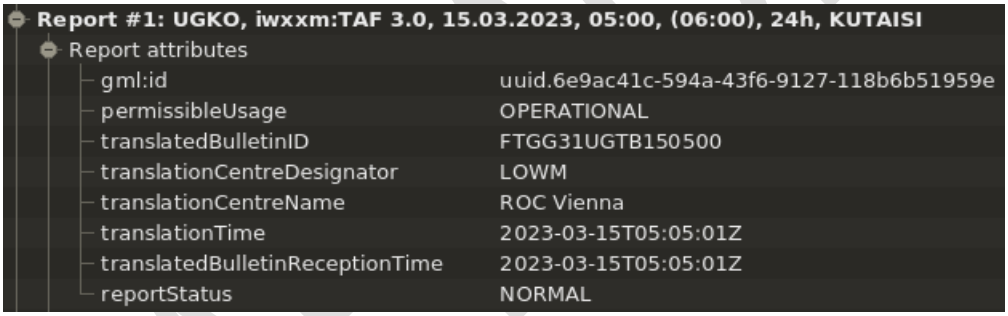
Note: *A Translation centre should also perform Aggregator functions. Whilst the IWXXM Schema may be extended for national translation purposes, an emphasis on maintaining the purity of the schema should be maintained. Where extensions to the schema are proposed to be disseminated internationally, these should follow the WMO extension mechanism for extending the schema and the extensions should be standardised where possible with other States, so that the benefits of the extensions use can be realised by all ICAO members.*

4.2.7.4. The Data Translation function includes that the translated IWXXM data is validated against the latest schema and schematron rules before dissemination.

4.2.7.5. A Data Translator should be able to parse incoming TAC-data and apply the IWXXM-schema to the data. This function can be associated with an Originating Unit, performing the translation on report level, or a Data Aggregator, if the translation is done on bulletin level.

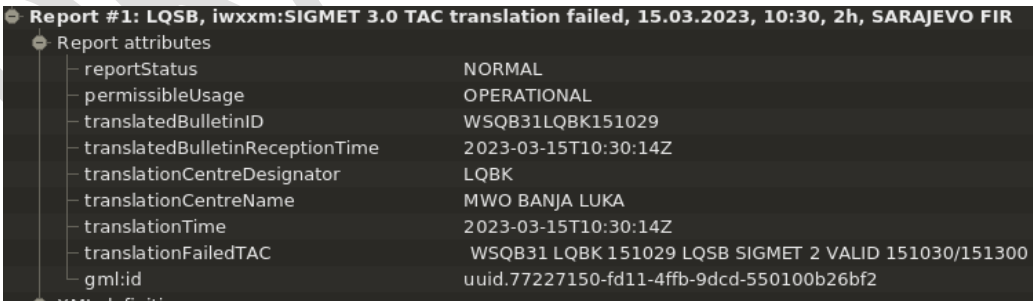
4.2.7.6. TAC data should be translated only once. Multiple translation of the same TAC-data by different Data Translators is prohibited.

4.2.7.7. In case of TAC being translated into IWXXM, this should be reflected in the “Report Attributes” of the IWXXM-message, as can be seen in the example below:



Report #1: UGKO, iwxxm:TAF 3.0, 15.03.2023, 05:00, (06:00), 24h, KUTAISI	
Report attributes	
gml:id	uuid.6e9ac41c-594a-43f6-9127-118b6b51959e
permissibleUsage	OPERATIONAL
translatedBulletinID	FTGG31UGTB150500
translationCentreDesignator	LOWM
translationCentreName	ROC Vienna
translationTime	2023-03-15T05:05:01Z
translatedBulletinReceptionTime	2023-03-15T05:05:01Z
reportStatus	NORMAL

4.2.7.8. If a TAC message cannot be translated into IWXXM, this must be reflected in the "Report Attributes" in addition to the information concerning the translated bulletin, as shown below:



Report #1: LQSB, iwxxm:SIGMET 3.0 TAC translation failed, 15.03.2023, 10:30, 2h, SARAJEVO FIR	
Report attributes	
reportStatus	NORMAL
permissibleUsage	OPERATIONAL
translatedBulletinID	WSQB31LQBK151029
translatedBulletinReceptionTime	2023-03-15T10:30:14Z
translationCentreDesignator	LQBK
translationCentreName	MWO BANJA LUKA
translationTime	2023-03-15T10:30:14Z
translationFailedTAC	WSQB31 LQBK 151029 LQSB SIGMET 2 VALID 151030/151300
gml:id	uuid.77227150-fd11-4ffb-9dcd-550100b26bf2

4.2.8. Data switch

4.2.8.1. A Data Switch routes the data according to the World Meteorological Organization (WMO) abbreviated header structure, $T_1T_2A_1A_2$ii CCCC, of the bulletin. The bulletin header fulfils the regulations described in WMO Doc No 386, Manual on the Global Telecommunication System.

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4.2.8.2. Whilst it is anticipated that IWXXM would be disseminated to the same recipients as TAC, during the earlier years of IWXXM implementation, only a subset of recipients may be capable of receiving IWXXM due to a lack of AMHS with FTBP. As a result, the distribution addresses of TAC and IWXXM will likely initially differ and will need to be updated to align with the capabilities of the intended recipient lists.

4.2.8.3. The routing table will associate this $T_1T_2A_1A_2$ii CCCC data identifier with the AMHS addresses where the data should be sent to. The compressed file will be named with the suffix appropriate to the compression and sent onto AMHS.

4.2.8.4. The following principles are applied for the regional OPMET data exchange:

- a ROC should be connected to a COM-centre capable of handling efficiently the volume of anticipated traffic;
- a ROC should be capable of handling all OPMET data types.

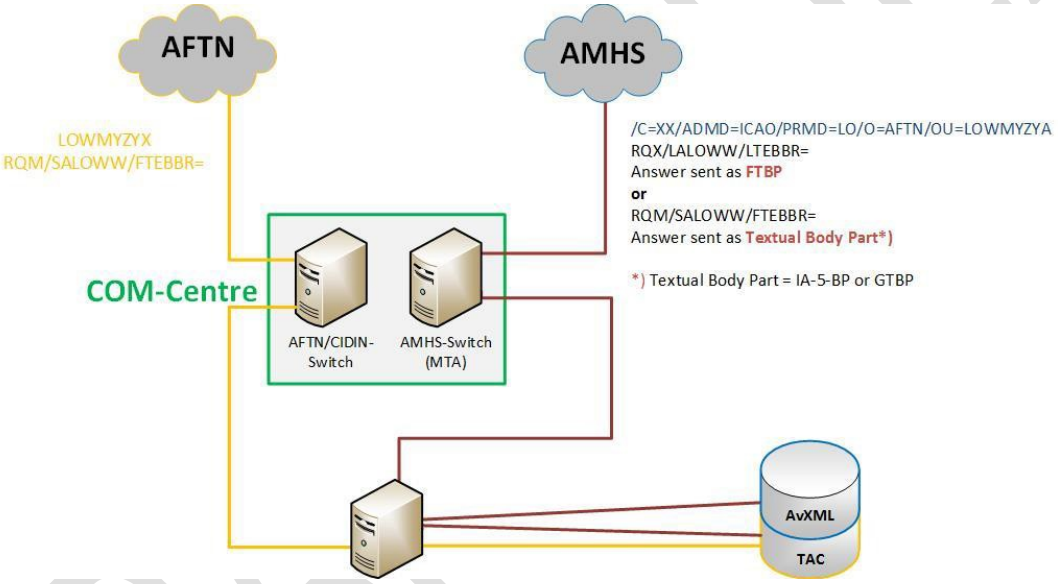

Figure 4.2.8.4: The implementation of a combined TAC & IWXXM Databank

4.2.8.5. Interfaces

- the Databank has an AMHS P3 connection to the AMHS Message Transfer Agent (MTA) of a COM centre; and
- in case the COM Centre still serves AFTN users, the Databank may have a separate AFTN connection to the COM Centres AFTN switch or alternatively, the COM Centre will take care of the AFTN-AMHS conversion.

4.2.8.6. Databank tables: data in IWXXM and data in TAC are stored in separate sets of tables.

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5. OPMET INFORMATION AND OPMET EXCHANGE

5.1. OPMET Data Types

5.1.1. As described under section 5.1, the TAC and IWXXM OPMET data exchange is handled by the AODEX schema. The supported data types listed in the table 5.1.2 below. It contains the WMO data type designator (T_1T_2) for TAC as well as for the IWXXM formatted OPMET data type equivalents (as far as defined):

5.1.2. OPMET Data in TAC format

- T_1: Data type
  - S – Surface data
  - F – Forecasts
  - U – Upper-air data
  - W – Warnings
  - N – Notices

Data type	Abbreviated name	Data type designator (TAC format) T_1T_2	Code form name
Aerodrome meteorological reports	METAR SPECI	SA SP	FM 15 (METAR) FM 16 (SPECI)
Terminal Aerodrome forecasts	TAF (Short): less than 12h TAF (Long):12 up to 30h	FC FT	FM 51 (TAF) FM 51 (TAF)
Tropical Cyclone Advisories	TCA	FK	ICAO (Tropical Cyclone Advisory)
Space Weather Advisory	SWXA	FN	ICAO (Space weather Advisories)
Volcanic Ash Advisories	VAA	FV	ICAO (Volcanic Ash Advisory)
Special aircraft reports	ARS and ARS for Volcanic Ash	UA	ICAO (AIREP)
Volcano Observatory Notice for Aviation (VONA)	VONA	WM	ICAO (VONA)
AIRMET Information	AIRMET	WA	ICAO (AIRMET)
Aviation area/GAMET/advisories	GAMET	FA	FM 53 (ARFOR/[TEXT]
SIGMET Information	SIGMET for WS SIGMET for TC SIGMET for VA	WS WC WV	ICAO (SIGMET)
Administrative	METNO	NO	[TEXT]

Table 5.1.2.: OPMET Data in TAC format

Note: TAC messages (Original text from Tables A and B1, Attachment II-5, WMO-No.386)

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5.1.3. OPMET Data in IWXXM format

- T_1: Data type
  - L – Aviation information in XML

Data type	Abbreviated name	Data type designator (IWXXM format) T_1T_2	Code form (XML element)
Aerodrome meteorological reports	METAR	LA	FM 205 (iwxxm:METAR)
	SPECI	LP	FM 205 (iwxxm:SPECI)
Aerodrome forecasts	TAF (Short): less than 12h	LC	FM 205 (iwxxm:TAF)
	TAF (Long):12 up to 30h	LT	FM 205 (iwxxm:TAF)
Tropical Cyclone Advisories	TCA	LK	FM 205 (iwxxm:Tropical Cyclone Advisory)
Space Weather Advisories	SWXA	LN	FM 205 (iwxxm:SpaceWeather Advisory)
Volcanic Ash Advisories	VAA	LU	FM 205 (iwxxm:Volcanic Ash Advisory)
Volcano Observatory Notice for Aviation (VONA)	VONA	LM	FM 205 (iwxxm:Volcano Observatory Notice for Aviation)
AIRMET Information	AIRMET	LW	FM 205 (iwxxm:AIRMET)
SIGMET Information	SIGMET for WS	LS	FM 205 (iwxxm:SIGMET)
	SIGMET for TC	LY	FM 205 (iwxxm:Tropical Cyclone SIGMET)
	SIGMET for VA	LV	FM 205 (iwxxm:VolcanicGO Ash SIGMET)

Table 5.1.3.: OPMET Data in IWXXM format

Note: IWXXM messages (Original text from Tables A and B7, Attachment II-5, WMO-N0.386)

5.1.3.1. IWXXM includes representations for most of the reports in International Civil Aviation Organization (ICAO) Annex 3, such as METAR/SPECI, TAF, SIGMET, AIRMET, Tropical Cyclone Advisory, Volcanic Ash Advisory, Space Weather Advisory and VONA.

5.1.3.2. Under this paragraph some basic principles, explanations and guidance will be outlined for the production of OPMET data in IWXXM-format. Further details on the IWXXM-schemas and schematrons can be found on the WMO-website:

https://community.wmo.int/en/activity-areas/wis/iwxxm

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5.1.3.3. The IWXXM format is not intended to be read in its raw form by humans. It is intended as a structured, 'machine-to-machine' message that is then subsequently processed for human interpretation/interaction.

5.1.3.4. An important requirement when producing IWXXM messages is, that UUIDs are used.

5.1.3.5. An IWXXM message should furthermore contain certain metadata to provide some general information on the report in the IWXXM message such as:

- report status
- whether it is an automated station
- the permissible usage
- information in case of a translated bulletin

5.1.3.6. Report Status Indicator

This indicator can be set to the following values:

- NORMAL
- AMENDMENT (for TAF)
- CANCELLATION (for TAF, SIGMET, AIRMET)
- CORRECTION (for METAR, SPECI, TAF)
- MISSING (for METAR, TAF in case of NIL-messages)

5.1.3.7. Automated Station Indicator

This indicator is only useable for METAR and SPECI to indicate whether it is an automated station (set to TRUE) or a human observation (set to FALSE).

5.1.4. Permissible Usage

5.1.4.1. This indicator is used to define whether a message is “OPERATIONAL” or “NON-OPERATIONAL”.

5.1.4.2. *Operational message*:

- An operational message is one that is intended to be used as the basis for operational decision making. As such, the content of the message may result in decisions that may affect any or all phases of a flight by any authorised and competent stakeholder (i.e. air navigation service providers, airport authorities, pilots, flight dispatchers etc). Recipients of such messages (either automatic or human) would therefore expect that the information is sourced from a competent entity, that originating equipment (sensors etc.) is serviceable and that any human involvement is carried out by qualified, competent personnel.
- Every IWXXM message that is issued for operational purposes should set the IWXXM element name 'permissibleUsage' to Operational.
- Under such circumstances no other information relating to the operational status should be included.

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5.1.4.3. *Non-operational message*:

- A non -operational message is one that is not intended to be used for operational decision making, even though it may contain realistic data (particularly during an exercise). Recipients of such messages should ignore the content of the message with regard to decision making. Non-operational messages may be further classified as either being related to TEST or EXERCISE.
- Every IWXXM message that is issued for non-operational purposes should set the IWXXM element name 'permissibleUsage' to non-operational.
- Under such circumstances, it will be necessary to provide additional information relating to the reason for the non-operational status.

5.1.4.4. TEST messages may be issued for the following reasons:

- as an ad-hoc message to test distribution of a particular message, such as SIGMET when, for example, a new system is installed at an originating centre.
- as part of a more organised test of message routing for non-scheduled messages such as SIGMET.
- An organised regional SIGMET test may likewise include «AFI SIGMET TEST» conducted annually.
- For an entity initially issuing IWXXM data as it enters the final phase of transition to IWXXM, production may include «TEST IWXXM Data PRE-OPERATIONAL» or similar.
- In the above cases the messages may contain either realistic data or no data.

5.1.4.5. EXERCISE messages may be issued for the following reasons:

- as a national or regional (or more rarely 'global') organised event intended to permit stakeholders to become familiar with the data content of messages. An example would be for Regional Volcanic Ash Exercises where stakeholders wish to provide training and 'desk top' scenarios for rare events.
- under exercise scenarios, the messages may contain realistic data (though not necessarily valid data). For instance, volcanic ash exercises sometimes use volcanic ash data based on historical wind patterns to ensure that the requisite training is provided (i.e. to ensure the volcanic ash data impacts particular FIRs).
- the 'permissibleUsageReason' field should be set to either Test or Exercise.
- the ' permissibleUsageSupplementary' field should contain a short description to provide further information. This is a free text field and is intended to contain the reason for the test or exercise.

For example;

A volcanic Ash Exercise message may include the name of the exercise in this field AFI VOLCEX' conducted bi-annually.

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- Whilst the 'permissibleUsageReason' field may be left empty, this is not considered to be good practice. Where possible, the field should contain some description of the reason for the Test or Exercise.
- The examples below are provided for reference:
    - <u>Example 1: Operational IWXXM data</u>
      <IWXXM: CLASSNAME ... permissibleUsage "OPERATIONAL">...</IWXXM: CLASSNAME>
    - <u>Example 2: 'Test' IWXXM data</u>
      <IWXXM: CLASSNAME ... permissibleUsage ="NON-OPERATIONAL" permissibleUsageReason ="TEST" permissibleUsageSupplementary ="AFI SIGMET TEST 17/09/2018">...</IWXXM: CLASSNAME>
    - <u>Example 3: 'Exercise' IWXXM data</u>
      <IWXXM : CLASSNAME ... permissibleUsage ="NON-OPERATIONAL" permissibleUsageReason ="EXERCISE" permissibleUsageSupplementary ="EUR VOLCEX 12/03/2018">...</IWXXM : CLASSNAME>

5.1.4.6. Notwithstanding the explicit inclusion of Test and Exercise indicators in all IWXXM messages, it is best practice to always forewarn stakeholders of Test events, and in particular Exercise events, whenever possible. The message originator, and/or the Exercise Coordinator, where applicable, should consider the most appropriate method for notifying stakeholders. A non-exhaustive list of methods would include: State Letter, Exercise Directives, administrative messages and emails.

5.1.4.7. It should be noted that, independently of the status of the data, the distribution of data should remain the same (whether the permissibleUsage is Operational or Non-Operational).

5.1.4.8. Information in case of translations

a) In cases where a TAC-bulletin is translated into the IWXXM-version, the report should contain several attributes to provide further details. This is important also in regard to possible quality monitoring of IWXXM-data:

- translatedBulletinID (The TAC bulletin ID that was translated, of the form '$T_1T_2A_1A_2$iiCCCYYGGgg').
- translatedBulletinReceptionTime (The time at which the translated TAC bulletin was received by the translation centre).
- translationCentreDesignator (The ICAO designator of the centre which performed translation from TAC to XML).
- translationCentreName (The name of the translation centre which performed translation from TAC to XML).
- translationTime (The time at which translation was performed from TAC to XML).
- translationFailedTAC (Only used when a TAC message could not be translated to include the original TAC-message).

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b) In case the translation failed, the IWXXM-report should at least, for a METAR, SPECI or TAF contain the meta-data of the airport (CCCC, name), the bulletin header time, report time and validity period (for TAF). In case of SIGMET or AIRMET it should include meta-data of the FIR, the bulletin header time as well as the validity period of the original message. Additionally, the attribute "translationFailedTAC", listed above, should be included.

5.1.4.9. Guidance on IWXXM Version

a) MET-Providers should implement new IWXXM-versions based on the applicability date as defined in ICAO Annex 3. An overview of the released IWXXM-versions can be found in the table below, which is only updated on a yearly basis. Please, check the WMO-website for any amended versions: https://community.wmo.int/en/activity-areas/wis/iwxxm/.

5.1.4.10. File naming convention with abbreviated heading (Original text from Section 4, *Attachment II-15, WMO-No.386).*

a) Aggregated IWXXM-messages should use the WMO Naming Convention to create a filename. This is mandatory to enable Data Switches to route IWXXM-messages, as the routing is, as for TAC-data, based on the abbreviated header line (AHL).

b) For IWXXM report(s) exchanged as an attachment to an AMHS message over AFS, the file name format should be as follows:

pflag_productidentifier_**oflag**_originator_yyyyMMddhhmmss[_freeformat]. **type [. compression]**

Where the elements in black and bold are fixed elements and:

a) The elements in **black and bold** are fixed elements where:

- the **pflag** is "**A**", indicating that the "product identifier" field will be decoded as the standard ABH including BBB as appropriate.
- the **oflag** is "**C**", indicating that the "originator" field will be decoded as a standard CCCC site id.
- Horodatage (aaaaMMjjhhmmss): Date aaaaMMj and time hhmmss of creation of the file by the originator.
- Date and time stamp (yyyyMMddhhmmss): Date yyyyMMdd and time hhmmss of creation of the file by the originator.
- Free format text (ffffff): (Optional) Six alphanumeric characters containing further identifiers as required by a given originator. In the AFI region, this free format test will be omitted.
- the type is "**xml**"
- the compression is "**gz**"

b) Compression: (Optional) Specifies the compression technique, which if applied should be gz (Unix Gzip) as recommended by ICAO.

Note: *gzip is used in the MET domain. The ideal situation is to define the same compression technique for all types of ICAO data. If different compression*

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techniques were to be required, they will need to be coordinated and globally agreed upon.

A_$T_1T_2A_1A_2$iiCCCCYYGGgg[BBB]_**C**_CCCC_yyyyMMddhhmmss.**xml.gz**

- $T_1T_2A_1A_2$iiCCCCYYGGgg is the WMO header with the date time group.
- *BBB* is ***optional***, used in case of retards (RRx), amendements (AAx) or corrections (CCx)
- CCCC is the repeated CCCC part from $T_1T_2A_1A_2$iiCCCC.
- YYYYMMddhhmmss is the date/time group of file generation

5.1.4.11. FTBP name examples with METAR from FAPR

A_LAZA31FAPR171500_C_FAPR_20151117150010.xml.gz

1st retarded bulletin:

A_LAZA31FAPR171500RRA_C_FAPR_20151117150105.xml.gz

1st corrected bulletin:

A_LAZA31FAPR171500CCA_C_FAPR_20151117150425.xml.gz

5.1.4.12. The routing table will associate this $T_1T_2A_1A_2$iiCCCC data identifier with the AMHS addresses where the data should be sent to. The compressed file will be named with the suffix appropriate to the compression and sent onto AMHS.

5.1.4.13. Details of IWXXM implementation developments are given in (See link 2.4.9).

5.2. OPMET Bulletins

5.2.1. The exchange of OPMET data is carried out through bulletins containing one or more meteorological report(s) (METAR, SPECI, TAF, SIGMET …).

5.2.2. The format of OPMET bulletins is determined by:

- ***ICAO Annex 10***, *Aeronautical telecommunications* - AFTN envelope of the bulletin;
- ***WMO-No.386***, *Manual on the Global telecommunication System* -WMO abbreviated heading of the bulletin;
- ***ICAO Annex*** *3 and* ***WMO-No.306***, *Manual on Codes* - format and coding of the information included in the bulletin.

The routing of bulletins is based on the WMO abbreviated header

5.2.3. Details regarding the message header are illustrated in Appendix D.

5.2.4. The meteorological message is encapsulated in an AFTN-envelope (only TAC) or an AMHS-envelope (TAC and/or IWXXM).

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Data type	TAC-format	IWXXM-format
METAR	SACG31 FCBB 211000	LACG31 FCBB 211000
TAF	FTNR31 DRRN 151500	LTNR31 DRRN 151500
SIGMET	WSSG31 GOBD 301455	LSSG31 GOBD 301455
VAA	FVFR01 LFPW 030954	LUFR01 LFPW 030954

Table 5.2.4.: Meteorological message encapsulated in an AFTN-envelope or an AMHS-envelope

5.2.5. Several ICAO as well as WMO documents are available, providing further details. A list of documents related to data exchange can be found under references.

5.2.6. The following is an example of the format to be applied in preparing a METAR bulletin:

Parts of Message	AODEX SA Bulletin
AFTN header	
Priority Indicator and Address Date and time of filing and Originator	GG HKNAYPYX 271304 HKJKYPYX
WMO Abbreviated Heading	SAKN32 HKNA 271300
METAR messages	METAR HKJK 271300Z ..…… = METAR H 271300Z …….=
AFTN Normal Ending	NNNN

Table 5.2.6: Example for AFTN header of AODEX SA Bulletin

Note: The inclusion of the code name METAR in front of each message in the METAR bulletin is mandatory.

5.2.7. For METARs, which are not available at the time of compilation of the bulletin, the word NIL should be inserted following the date/time group indicating the time of the observation.

Example : METAR GQNO 271200Z NIL=

5.3. Type of OPMET Exchange

5.3.1. Regional exchange – AODEX Schema

5.3.1.1. The AODEX scheme covers the exchange of OPMET information within the APAC region and to and from adjacent ICAO regions. It includes several types of exchanges as described below:

a) *Regular exchange* is a scheduled exchange that encompasses the collection of messages from the originating stations, compiling of bulletins and their dissemination according to predetermined distribution schemes. The collection and distribution are carried out at fixed times, and the bulletin content is defined in this Handbook.

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b) *Non-regular exchange:* The RODBs store OPMET data and make this available on request. The procedure for requesting OPMET is provided in Appendix K.

5.3.2. Inter-regional OPMET exchange

5.3.2.1. Exchange of OPMET data between the AFI region and the other ICAO regions is carried out via designated centres, which serve as Inter-regional OPMET Gateways (IROG). An IROG is set up for sending and receiving specified OPMET data between the AFI region and other ICAO regions.

5.3.2.2. Inter-regional OPMET exchange via IROGs the ground segment of the AFS

5.3.3. Exchange of OPMET information through the Internet.

5.3.3.1. All AFI OPMET data handled by the AODEX scheme is relayed to the SADIS and WIFS Service Providers, allowing users to retrieve the data via SADIS and WIFS.

5.3.4. Other OPMET exchanges

5.3.4.1. Where OPMET exchanges described in the above paragraphs are not sufficient, direct AFTN/AMHS addressing can be utilized by the originating centres or NOCs.

5.4. Compliance testing

5.4.1. IWXXM compliance testing platforms or software are provided by some software providers of messages switching systems. Beyong that, States find information, through the links below including exemples about IWXXM.

a) https://github.com/wmo-im/iwxxm

b) https://github.com/NCAR/crux.

5.4.2. States/NOCs might also contact their responsible ROC in order to co-ordinate test exchange of IWXXM-data in order to get feedback on the correctness of the produced IWXXM-messages.

6. METAR/SPECI EXCHANGE

6.1. METAR General

6.1.1. METAR reports are issued for AOP-aerodromes as required in the ICAO eANP, Volume II, MET Table II-2. These METARs should be included in the regular AODEX schema.

6.1.2. Additional METARs for non-AOP aerodromes issued on discretion by a State and/or required by users may also be included in the regular AODEX schema, if agreed by the States concerned «agreed non-AOP aerodromes».

Notes:

- *The ICAO eANP* Volume II *Table MET II-2 includes the aviation user*

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requirements for OPMET data (METAR and TAF) from AOP aerodromes. For the domestic airports not included in the ICAO eANP Volume II *Table MET II-2 States are consulted on their agreement for providing these additional aerodromes. Once agreed, the States should provide the required OPMET information on a continuous basis.*

- *SADIS User Guide (SUG) Annex 1 presents the requirements for OPMET data (METAR and TAF) by aviation users. When OPMET data from domestic airports (so called non-AOP airports) is required by users, the corresponding State is consulted on its agreement for providing this additional information. If the information is available and the State agrees to include it in the exchange, the additional airports are included in SUG Annex 1 and the State should provide the additional OPMET information on a continuous basis.*

6.1.3. Description of the AFI METAR bulletins included in the regular AODEX exchange, containing the responsible compiling AODEX centre, WMO bulletin identification, and the list of aerodromes included in the bulletin, is given in Appendices A-1 and A-2.

6.1.4. All METAR/SPECI should be available on request from the RODBs.

6.1.5. NOCs should compile eANP required METARs for international distribution in dedicated bulletins. METARs not in the eANP (agreed non-AOP aerodromes or aerodromes exchanged only nationally or bilaterally) should be compiled in different bulletins. Those bulletins are to be differentiated by using different «ii-bulletin numbers» in the abbreviated header ($T_1T_2A_1A_2$ii CCCC).

6.1.6. SPECI-report dissemination via AODEX schema should be identical to METAR-report dissemination.

6.1.7. A SPECI bulletin should contain only one SPECI report. Only the compilation of METAR reports is permitted.

6.1.8. During the transition period from TAC towards IWXXM, Originating Units should continue producing and distributing TAC OPMET data and the equivalent IWXXM OPMET data in parallel.

6.1.9. Description of the AFI METAR Bulletins included in the regular AODEX exchange, containing the responsible compiling AODEX centre, WMO bulletin identification, and the list of aerodromes included in the bulletin, is given in Appendices A-1 and A-2.

6.1.10. The official hour of observation to be included in the METAR bulletin heading is indicated in the table in Appendix A-1.

6.1.11. All METAR bulletins should be sent to both RODBs Dakar and Pretoria by the ROCs. AODEX centres should exchange METAR bulletins according to the distribution lists given in Appendix A-2.

6.1.12. SPECI reports should be disseminated in the same way as the METAR reports originated by the same aerodrome.

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6.1.13. Exchange of METAR/SPECI messages outside AODEX schema, if necessary, should be carried out by direct AFTN/AMHS addressed messages.

6.1.14. An Originating Unit can delegate the translation of the TAC into IWXXM METAR/SPECI to its NOC. The NOC can delegate the translation of METAR data from TAC to IWXXM to the assigned ROC or a Data Translation Centre if not (yet) capable to produce IWXXM formatted METAR data.

6.1.15. The IWXXM METAR Producer is responsible for the validation of the data against the most recent AODEX schema & schematron before international distribution.

6.2. Responsibilities of Aerodrome meteorological station (AMS)

6.2.1. Routine METAR reports should be prepared for the international aerodromes listed in the *ANP, Volume I, Table AOP I-1*, and in *Volume II, Table MET II- 2*. METAR should be issued hourly or half-hourly throughout the 24 hours of each day as determined by regional air navigation agreement or by agreement by individual States (refer to *6.1.2*).

6.2.2. Regarding approved non-AOP aerodromes, the inclusion in the Bulletin compilation will take into account the opening and closing times of the aerodromes concerned.

6.2.3. SPECI reports are included in separate bulletins and should be disseminated in the same way as the METAR reports originated by the same aerodromes. It should be noted that METAR and SPECI reports are not to be included together in a bulletin.

> *<u>Note</u>: SADIS User Guide (SUG) Annex 1 presents the requirements for OPMET data (METAR and TAF) by aviation users. When OPMET data from domestic airports (so called non-AOP airports) is required by users, the corresponding State is consulted on its agreement for providing this additional information. If the information is available and the State agrees to include it in the exchange, the additional airports are included in SUG Annex 1 and the State should provide the additional OPMET information on a continuous basis.*

6.2.4. The AMS prepares METAR/SPECI observations and sends them to the responsible NOC.

6.2.5.

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6.3. Responsibilities of National OPMET Centres (NOCs)

6.3.1. The NOC compiles the collected METAR observations in one or more collective bulletins and sends those via the AFS to the responsible ROC. The NOC is responsible for the WMO No. 306 and ICAO Annex 3 code format compliance of METAR/SPECI observations and bulletins from its State.

> *Note: When OPMET data from non-AOP aerodromes is required by users, the corresponding State is consulted on its agreement to provide the additional information.*

6.3.2. Regarding non-AOP aerodromes, the inclusion in the Bulletin compilation will take into account the opening and closing times of the aerodromes concerned.

6.3.3. A description of the AFI METAR bulletins provided in the regular AODEX exchange, including the responsible compiling ROC, WMO bulletin identification, list of aerodromes, observation times and AFTN distribution, is given in Appendices A-1 and A-2.

6.3.4. SPECI should be prepared between the regular observation times, following the requirements set in Annex 3 and sent with no delay to the responsible AODEX centre.

6.3.5. METAR messages should be sent to the responsible ROC before the cut-off time specified by the ROC to allow for timely compilation of the METAR bulletin. If, for some reason, a METAR message has not been sent before the cut-off time, the originating station/NOC should send it as soon as possible after that, as a delayed message. The originating stations/NOCs should follow strictly the schedules specified for METAR messages and keep to a minimum the number of delayed messages.

6.3.6. Where two or more separate METAR/SPECI bulletins are issued with the same 'A1A2' group (e.g. "AM") different “ii” values (e.g., AM"31" and AM"32”) should be used in the WMO heading to differentiate the bulletins.

6.3.7. METAR and SPECI messages should be quality controlled by the originating stations/NOCs and, when necessary, a corrected message should be sent immediately after an error in an already transmitted message had been identified.

> *Note: Procedures applying to the corrected and delayed messages are given in Appendix D-1, Section 2.4.*

6.4. Responsibilities of Regional OPMET Centes (ROCs)

6.4.1. ROCs collect all TAC and IWXXM METAR/SPECI bulletins from the NOCs in their AoR via the AFS. When needed, for compliance with the ICAO AFI format standards for distribution, a ROC re-compiles METAR/SPECI bulletins.

6.4.2. A ROC can act as a Data Translation Centre on behalf of the NOCs within its AoR.

6.4.3. 6.4.3. A ROC distributes, via the SFA, all TAC and IWXXM bulletins of METAR/SPECI of its area of responsibility to other ROCs, to the IROG and to the BRDO of attachment.

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6.4.4. ROCs should provide TAC and IWXXM METAR/SPECI bulletins to the NOCs in their area of responsibility, as agreed between the ROC and the NOC. The possibility to provide IWXXM METAR/SPECI bulletins depends on the capabilities of a NOC to use extended AMHS.

6.4.5. At scheduled transmission times, ROCs should transmit the compiled METAR bulletins to other ROCs and RODBs according to the distribution lists specified for each METAR bulletin in Appendix A-2. METAR bulletins should be filed for transmission, not later than 5 minutes after the observation time.

6.4.6. ROCs should transmit the METAR bulletins compiled by them, as well as bulletins received from other ROCs, as necessary, to the NOCs and/or other offices in the States in their area of responsibility, as agreed between the ROC and the meteorological authorities of the States concerned.

6.4.7. A SPECI, when received by a ROC, should be sent as a SPECI bulletin to the same addresses to which METAR from the issuing aerodrome are sent. Normally, a SPECI bulletin should contain a single SPECI and must not be included in any METAR bulletin.

Note: The WMO heading of a SPECI bulletin should be constructed in the same way as the WMO heading of the METAR bulletin, which contains the aerodrome, for which the SPECI is issued, by using SP data type designator instead of SA.

6.4.8. A METAR message received by the ROC after the scheduled issuance of the corresponding bulletin is a delayed METAR. The ROC must transmit a delayed bulletin upon receipt of one or more delayed messages or at specified intervals after the scheduled time of bulletin broadcast. (Example: the first delayed bulletin (RRA) issued after the compilation time; the second delayed bulletin (RRB) issued after the previous compilation time, etc.)

6.4.9. As soon as a corrected METAR or SPECI message is received from a station, the ROC should transmit it as a corrected bulletin to all recipients.

6.5. Responsibilities of Inter-regional OPMET Gateway (IROGs)

6.5.1. IROGs collect all TAC and IWXXM METAR/SPECI bulletins from the ICAO region responsible for, as well as all AFI OPMET data.

6.5.2. IROGs disseminate, via the AFS, all TAC and IWXXM METAR/SPECI bulletins to the IROG(s) of the ICAO-region(s) they are responsible for, depending on the requirements for AFI-OPMET data by that region(s).

6.5.3. IROGs disseminate, via the AFS, all TAC and IWXXM METAR/SPECI bulletins from the ICAO region(s) they are responsible for to the ROCs in the AFI-region.

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6.6. Format compliance and content of METAR and SPECI data (TAC and IWXXM)

6.6.1. When producing METAR and SPECI messages the AMS should strictly apply the code formats defined in WMO No. 306 and ICAO Annex 3.

6.6.1.1. TAC Format references :

- WMO No. 306, Manual on Codes, Volume I.1, Part A – Alphanumeric Codes FM 15-XII METAR and FM 16-XII SPECI;
- ICAO Annex 3, Chapter 4, and Appendix 3: Technical specifications related to meteorological observations and reports.

6.6.1.2. IWXXM Format references :

- WMO No. 306, Manual on Codes, Volume I.3, Part D – Representation in Extensible Markup Language:
  - ~ FM201: COLLECTION OF REPORTS: Collection of features = reports in a collective bulletin;
  - ~ FM205: IWXXM: Details on schemas for all OPMET data types (latest versions)

6.6.2. TAC Format METAR compliance, T_1T_2 = SA

6.6.2.1. Each METAR observation in a METAR collective bulletin should start with the code word METAR followed by the ICAO location indicator (CCCC) of the aerodrome and the date/time group (YYGGggZ), indicating the actual UTC time of observation. Corrected METAR messages, should start with METAR COR.

6.6.2.2. For METARs, which are not available at the time of compilation of the collective bulletin, the code word NIL should be inserted, followed by the date/time group indicating the standard time of observation.

Example: METAR FCOU 271220Z NIL=

6.6.2.3. For METARs, which are generated fully automated, the code word AUTO should be inserted followed by the date/time group.

Example : METAR HKJK 271220Z AUTO ……=

6.6.3. IWXXM Format METAR compliance, T_1T_2 = LA

6.6.3.1. The unit producing the METAR in IWXXM format, either being the originating station, its NOC or the delegated Data Translation Centre, is responsible for the IWXXM format compliance and equivalence with the corresponding TAC formatted METAR.

6.6.4. TAC Format SPECI compliance, T_1T_2 = SP

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6.6.4.1. A SPECI message included in a SPECI bulletin should start with the code word SPECI followed by the ICAO location indicator (CCCC) of the aerodrome and a date/time group (YYGGggZ) indicating the time of the observation of the meteorological conditions for which the SPECI is issued. Corrected SPECI messages should start with SPECI COR.

6.6.4.2. In ICAO AFI e-ANP, Volume II, the following is stated:

«In the AFI Region, routine observations, issued as a METAR, should be made throughout the 24 hours of each day at intervals of one hour or, for RS and AS designated aerodromes1, at intervals of one half-hour at aerodromes as indicated in Table MET II-2. ».

6.6.4.3. Additionally, ICAO Annex 3, 4.4.2, b) states the following:

«4.4.2 Reports of special observations should be issued as:

b) SPECI for dissemination beyond the aerodrome of origin (mainly intended for flight planning, VOLMET broadcasts and D-VOLMET or D-ATIS) unless METAR are issued at half-hourly intervals. »

6.6.4.4. A SPECI message included in a SPECI bulletin should start with the code word SPECI followed by the ICAO location indicator (CCCC) of the aerodrome and a date/time group (YYGGggZ) indicating the UTC time of the observation of the meteorological conditions for which the SPECI is issued. Corrected SPECI messages, should start with SPECI COR.

6.6.4.5. The following is an example of the format to be applied in preparing a SPECI bulletin by the ROC:

Parts of Message	**AODEX SP Bulletin**
AFTN header	
Priority Indicator and Address	GG FLKKYPYX
Date and time of filing and Originator	081647 FLLCYPYX
WMO Abbreviated Heading	SPCI31 FLKK 081645
SPECI message	SPECI FLLC 081645Z ..…… =
AFTN Normal Ending	NNNN

Table 6.6.4.5: Example for AFTN header of AODEX SP Bulletin

6.6.5. IWXXM Format SPECI compliance, T_1T_2 = LP

6.6.5.1. The unit producing the SPECI in IWXXM format, either being the originating station, its NOC or the delegated Data Translation Centre, is responsible for the IWXXM format compliance and equivalence with the corresponding TAC formatted SPECI.

6.6.5.2. The IROGs disseminate, via the SFA, all TAC and IWXXM bulletins from METAR/SPECI to the IROGs of the ICAO region(s) for which they are responsible, according to the OPMET data requirements of the AFI region.

6.6.5.3.

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7. TAF EXCHANGE

7.1. TAF General

7.1.1. Terminal aerodrome forecasts (TAF) are issued for AOP-aerodromes as required in the ICAO e-ANP, Volume II, MET Table II-2-Aerodrome Meteorological Offices (AMO). These TAFs should be included in the regular AODEX schema exchange.

7.1.2. Additional TAFs for non-AOP aerodromes issued on discretion by a State and/or required by users may also be included in the regular AODEX schema, if agreed by the States concerned «agreed non-AOP aerodromes».

Note: The ICAO eANP Volume II *Table MET II-2 includes the aviation user requirements for OPMET data (METAR and TAF) from AOP aerodromes. For the domestic airports not included in the ICAO eANP* Volume II *Table MET II-2 States are consulted on their agreement for providing these additional aerodromes. Once agreed, the States should provide the required OPMET information on a continuous basis.*

7.1.3. All TAF should be available on request from the RODBs.

7.1.4. NOC should compile e-ANP required TAF for international distribution in dedicated collective bulletins. TAFs not in the e-ANP (not required; for national usage or distribution based on bilateral agreements) should be compiled in different collective bulletins. Those bulletins are to be differentiated by using different ii-bulletin numbers in the abbreviated header ($T_1T_2A_1A_2$ii CCCC).

7.1.5. During the transition period from TAC towards IWXXM, AMOs should continue producing and distributing TAC OPMET data and the equivalent IWXXM OPMET data in parallel.

7.1.6. An AMO can delegate the translation of the TAC into IWXXM TAF to its NOC. The NOC can delegate the translation of TAF data from TAC to IWXXM to the assigned ROC or a Data Translation Centre if not (yet) capable to produce IWXXM formatted TAF data.

7.1.7. The IWXXM TAF Producer is responsible for the validation of the data against the most recent schema & schematron before international distribution.

7.2. Responsibilities of AMOs and NOCs

7.2.1. The AMOs produce TAF reports and send those to the responsible NOC.

7.2.2. The NOC compiles the collected TAF reports in one or more collective bulletins and sends those via the AFS to the responsible ROC. The NOC is responsible for the WMO No. 306 and ICAO Annex 3 code format compliance of TAF reports and bulletins from its State.

7.2.3. TAFs should be monitored by the originating AMOs. An amended TAF should be issued when the established criteria are met or when a TAF is cancelled.

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7.2.4. Amended or corrected TAFs should be sent by the originating station to the responsible NOC and further on to the responsible ROC without delay. The optional group BBB related to amendment or correction should be used in the WMO abbreviated heading in accordance with Appendix D-1, see 2.4, to indicate an amended TAF.

7.2.5. TAF messages should be quality controlled by the originating meteorological offices and, when necessary, a corrected message sent immediately after an error in an already transmitted message was identified.

7.2.6. According to ICAO Annex 3, paragraph 6.2.5 paragraph 3, TAFs that cannot be kept under continuous review should be cancelled.

7.3. Responsibilities of the ROCs

7.3.1. ROCs collect all TAC TAF bulletins and IWXXM TAF aggregations from the NOCs in their AoR via the AFS. When needed, for compliance with the ICAO AFI format standards for distribution, a ROC re-compiles TAF bulletins.

7.3.2. A ROC can act as a Data Translation Centre on behalf of the NOCs within its AoR.

7.3.3. A ROC disseminates, via the AFS, all TAC TAF bulletins and IWXXM TAF aggregations from their area of responsibility to the other ROCs, the IROG in their AoR and to the RODB in their AoR.

7.3.4. ROCs should provide TAC TAF bulletins and IWXXM TAF aggregations to the NOCs in their area of responsibility, as agreed between the ROC and the NOC. The possibility to provide IWXXM TAF aggregations depends on the capabilities of a NOC to use extended AMHS.

7.3.5. AODEX centres should establish a cut-off time for reception of TAFs from AMOs and/or NOCs in their area of responsibility, e.g., not earlier than one hour prior to the beginning of its validity period and not after 10 minutes after the filing/transmission times specified in Appendix B-1 and Appendix B-2. At the cut-of time AMBEX centres should compile TAF bulletin(s) containing all prescribed aerodromes, without indicating any missing TAF with “NIL” centre and not earlier than one hour prior to the beginning of its validity period.

7.3.6. The filing time for 24- and 30-hour TAF bulletins should be one hour before the start of the validity period.

7.3.7. AODEX centres should transmit the compiled TAF bulletins to other AMBEX centres and the RODBs according to the distribution lists as specified for each TAF bulletin in Appendix B-2.

7.3.8. AODEX centres should transmit the TAF bulletins compiled by them, as well as TAF bulletins received from other AODEX centres, as necessary, to the NOCs and/or other offices in the States in their area of responsibility, as agreed between the AODEX centre and the meteorological authorities of the States concerned.

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7.3.9. A TAF message received by a AODEX centre after the scheduled transmission of the corresponding bulletin is a delayed TAF. The AODEX centre should then prepare an AODEX bulletin of all TAFs received.

7.3.10. Amended TAF (TAF AMD) received from an AMO or NOC should be distributed with no delay as an amended TAF bulletin to all recipients in the distribution list for the TAF bulletin, to which the originating aerodrome belongs. The optional BBB group should be used in the WMO bulletin heading accordingly.

7.3.11. Each ROC should establish a cut-off time for the reception of AODEX messages from stations within its AOR. The cut-off time should be about twenty minutes after the times of preparation of TAFs shown in column 6 of Appendix B-2.

7.3.12. No addresses other than those listed in column 10 of Appendix B-2 should be used except in response to request messages.

7.3.13. The following is an overview of the procedures to be followed by AODEX centers in the preparation of AODEX bulletins.

Parts of the Message	Corresponding Coding
a) Priority indicator and addresses.	GG DAZZYPYX FAJSYMYX FCZZXLBX GOOZZSNGX HAZZYPYX HEZZYPYX HKZZYPBX LFZZMSXX
b) Date and Time of Deposit and Generator.	281130 DRRNYPYX
c) WMO Abbreviated Header (See Appendix D-1).	FTA033 DRRN 281000
d) TAF received from the AoR MET centers in, in the order indicated in column 2 of Appendix B-2.	TAF DRRN 281010Z 2812/2912 24003KT 8000 BKN020 BECMG 2813/2815 SCT018CB BKN020 TEMPO 2817/2820 VRB03 TSRA SCT015CB BKN020 FM290600 16008KT 9999 BKN020 BKN120=

TAF DGAA 281100Z 2812/2912 13010KT 9000 BKN020 TEMPO 2816/2820 3000 DZ BKN005 OVC050 FM290400 17010KT 9999 BKN015 BNK100=

TAF DBBB 281100Z 2812/2912 26008KT 9000 BKN020 PROB30 TEMPO 2815/2818 3000 TSRA BKN005 SCT020CB FM290000 24006KT 9000 BKN010=

TAF DNKN 281100Z 2812/2912 VRB03KT 9999 BKN015 PROB30 TEMPO 2813/2816 2000 FG BKN003 BKN010 FM282000 24006KT 9000 BKN020=

TAF DNMM 281128Z 2812/2912 24006KT 9000 BKN020 PROB30 TEMPO 2814/2816 3000 DZ BKN005 BKN010=

TAF DXXX 281130Z 2812/2912 26008KT 9999 BKN015 BECMG 2815/2817 SCT015CB BKN020 TEMPO 2818/2820 22020G35KT 2000 TSRA SCT010CB BKN020 FM282030 26006 9999 BKN020 BKN100=

TAF FTTJ 281130Z 2812/2912 12006KT CAVOK TEMPO 2818/2820 SCT030=

TAF DFFD 281130Z 2812/2912 20004KT 9999 BKN020 BECMG 2814/2816 SCT018CB BKN020 TEMPO 2816/2818 24010KT TSRA SCT015CB BKN020 FM290600 22008KT 9999

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BKN020 BKN100=

e) Fin Normale du message NNNN.

7.3.14. TAFs received by an AODEX Centre after the cut-off time, and which have still at least 6-hour validity left, should be included in one or more bulletins of delayed TAFs. The WMO Abbreviated Heading for such bulletins should be the same as for the bulletin from which the TAFs are missing, with the addition of the optional groups RRA, RRB, RRC etc. (to indicate the first, second, third etc. bulletin of delayed TAFs), in accordance with Appendix D-1, paragraph 2.4.

7.3.15. When an AODEX centre receives amended TAFs from originating stations or NOCs, it should prepare bulletins of amended TAFs. The WMO abbreviated heading for such bulletins should be the same as for the bulletin containing the original TAF, with the addition of the optional groups AAA, AAB, AAC etc. (to indicate the first, second, third etc. amendment to TAFs in the original bulletin), in accordance with Appendix D-1, paragraph 2.4.

7.3.16. "NIL" to indicate a missing TAF should not be used in AMBEX bulletins.

7.3.17. In addition to its own AODEX bulletins, each ROC should distribute bulletins received from other ROCs to the MET offices within its originating stations or NOCs.

7.4. Format and content of TAF bulletins

7.4.1. Issuance and period of validity:

7.4.1.1. 24- and 30-hour TAFs should be issued at intervals of six hours, with the period of validity beginning at one of the main synoptic hours (00, 06, 12, 18 UTC), as shown in the table below.

Synoptic hours (UTC)	**24-hour TAF**		**30-hour TAF**	
	Period of validity	**Filing Time**	**Period of validity**	**Filing Time**
00	00 – 24	23*(-1)	00 – 06 (+1)	23*(-1)
06	06 – 06	05	06 – 12 (+1)	05
12	12 – 12	11	12 – 18 (+1)	11
18	18 – 18	17	18 – 24 (+1)	17

**Note: "-1" indicates the previous day and "+1" indicates the next day*

Table 7.4.1.1: TAF issuance and period of validity

7.4.1.2. All TAFs in a AODEX TAF Bulletin should have a common period of validity. It is not permitted to mix TAF with different periods of validity in one bulletin.

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7.4.1.3. 7.4.1.3. Each TAF message in a TAF bulletin must begin with the TAF code word followed by the ICAO location indicator (CCCC) of the aerodrome and the date/time group (YYGGggZ) indicating the official time of issue. Corrected TAF messages should start with TAF COR. Amended forecasts should start with TAF AMD.

7.4.1.4. The use of the BBB group in the WMO heading for delayed, corrected, or amended TAFs is described in section 5.2.4.

7.4.2. IWXXM Format TAF compliance, T_1T_2 = LC and LT.

7.4.2.1. The IWXXM TAF Originating Unit, either being the AMO, its NOC or the delegated Data Translation Centre, is responsible for the IWXXM format compliance and equivalence with the corresponding TAC formatted FC and FT TAF.

7.5. Responsibilities of the IROGs

7.5.1. IROGs collect all TAC TAF bulletins and IWXXM TAF aggregations from the ICAO region responsible for, as well as all AFI OPMET data.

7.5.2. IROGs disseminate, via the AFS, all TAC TAF bulletins and IWXXM TAF aggregations to the IROG(s) of the ICAO-region(s) they are responsible for, depending on the requirements for AFI-OPMET data by that region(s).

7.5.3. IROGs disseminate, via the AFS, all TAC TAF bulletins and IWXXM TAF aggregations from the ICAO region(s) they are responsible for to the ROCs in the AFI-region.

7.6. Format and content of TAF data

7.6.1. Applicable ICAO and WMO documents

7.6.1.1. AMOs issuing TAF messages should strictly apply the code formats defined in WMO No. 306 and ICAO Annex 3.

7.6.1.2. TAC Format References

- WMO No. 306, Manual on Codes, Volume I.1, Part A – Alphanumeric Codes FM 51-XV TAF.
- ICAO Annex 3, Chapter 6, and Appendix 5: Technical specifications related to forecasts.

7.6.1.3. IWXXM Format References

- WMO No. 306, Manual on Codes, Volume I.3, Part D – Representation in Extensible Markup Language
  - ~ FM201: COLLECTION OF REPORTS: Collection of features = reports in a collective bulletin;

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~ FM205: IWXXM: Details on schemas for all OPMET data types (latest versions).

7.6.2. TAC Format TAF compliance, T_1T_2 = FC and FT.

7.6.2.1. Originating AMOs (or other designated forecasting offices) should prepare the required TAF messages for the periods of validity indicated in Appendices B-1 and B-2. TAFs should be sent by the AMOs or NOCs and to the responsible before the cut-off time set by this centre and not earlier than one hour prior to the beginning of its validity period.

7.6.2.2. Each TAF message in a TAF bulletin should start with the code word TAF followed by the ICAO location indicator (CCCC) of the aerodrome and the date/time group (YYGGggZ), indicating the official UTC time of issuance.

7.6.2.3. TAFs should be monitored by the originating AMOs and amend TAF (TAF AMD) should be issued according to the established criteria. Amended TAFs should be sent by the originating station to the responsible AODEX centre with no delay. The optional group BBB should be used in the WMO abbreviated heading to indicate amended TAF in accordance with Appendix D-1.

7.6.2.4. An amended TAF, if issued after the beginning of validity of the original TAF, should have the beginning of validity set to the closest whole hour preceding the time of issuance of the TAF AMD. The time of issuance itself should be indicated in the YYGGggZ group. No changes should be done on the date-time group in the WMO Abbreviated Header Line.

7.6.2.5. Example TAF AMD

FTCM20 FKKD 011100

TAF FKKD 011100Z 0112/0212 16010KT 9999 BKN015 TEMPO 0112/0115 4000 -RADZ BKN003 BKN010 BECMG 0118/0120 BKN007 BKN012 TEMPO 0120/0209 2000 -RADZ OVC004=

FTCM20 FKKD 011100 AAA

TAF AMD FKKD 011558Z 0115/0212 16009KT 6000 BKN020 TEMPO 0120/0209 4000 -RA BKN003=

7.6.2.6. In the particular case in which the TAF AMD is issued before the beginning of validity of the original TAF, the beginning of validity should remain unchanged.

7.6.2.7. An amended TAF which is issued due to a cancellation is not covered in detail in regard to the validity period by ICAO ANNEX 3. Therefore, it is up to a State to decide whether the same rules are followed as for a “regular” TAF amendment (see above) or whether the original validity period is used when cancelling a TAF.

7.6.2.8. Example TAF AMD for cancelling a TAF

TAF AMD FLLS 161845Z 1618/1703 CNL=

7.6.2.9. TAF message should be quality controlled by the originating meteorological offices and, when necessary, a corrected TAF (TAF COR) should be sent immediately after an error in an already transmitted message has been identified.

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7.6.2.10. The NOC should send the TAF messages for the ROC to receive them not later than 5 minutes after the time shown in column 6 of Appendix B-1.

7.6.2.11. The ROC should send the TAF bulletins for the RODBs to receive them not later than 10 minutes after the time shown in column 6 of Appendix B-2.

7.6.2.12. The following is an outline of the procedures to be applied in preparing an AODEX message at an office other than a ROC:

Parts of messages	**AODEX FT Bulletin**
Priority Indicator and Address	GG DRRNYPYX
Date and Time of Filing and Originator	281100 DGAAYMYX
WMO Abbreviated Heading (see Appendix C)	FTGH31 DGAA 281100
TAF	TAF DGAA 281100Z 2812/2918 ... =
Normal ending	

Table 7.5.2.12: Example for AFTN header of AODEX FT Bulletin

7.6.2.13. A missing TAF in a TAF collective bulletin should be indicated with "NIL", as shown in the following example:

TAF HKNA 281100Z NIL=

7.6.2.14. CNL is only to be used in conjunction with an issued amendment but not within regular compilations. If a TAF was cancelled and no new TAF is produced, NIL should be used within the compilation.

8. SPECIAL AIREP EXCHANGE

8.1. General

8.1.1. This Section contains guidance regarding the collection of routine air reports (AIREP) received by voice communications or air-ground data link and special air-reports (SPECIAL AIREP – ARS) from aircraft by meteorological watch offices (MWO) through their associated ATS units.

8.1.2. The meteorological watch offices (MWO) are responsible for collection through their associated ATS units of special air reports (AIREP SPECIAL – ARS) received from aircraft within their FIR or CTA.

8.2. Special AIREP (ARS)

8.2.1. MWOs should collect all special air-reports and prepare one-hour collectives in the form of a UA bulletin for transmission to the responsible AODEX centre at the time specified by the AODEX centre.

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Notes:

1) *The transmission of air-reports to the WAFCs as required by Annex 3 should be arranged by the meteorological authorities concerned.*
2) *MWOs should follow the special requirements for the dissemination of special air-reports as defined by Annex 3,*

8.2.2. ARS are covered by ICAO Annex 3 and **are of urgent nature** as detailed below.

8.2.2.1. Routine and special air-reports received by data-link communications, the air traffic services units relay them without delay to their associated meteorological watch office, the WAFCs and the centres designated by regional air navigation agreement for the operation of aeronautical fixed service Internet-based services.

8.2.2.2. Special air-reports by voice communications, the air traffic services units relay them without delay to their associated meteorological watch office..

8.2.3. Special air-reports of pre-eruption volcanic activity should also be sent to the appropriate VAAC. Special air-reports received at the meteorological watch office, which are deemed not to warrant issuance of a SIGMET, should be disseminated in the same way as SIGMET messages.

8.2.4. When supplementary dissemination of air-reports is required to satisfy special aeronautical or meteorological requirements, such dissemination should be arranged and agreed upon between the meteorological authorities concerned.

An example AIREP SPECIAL is given below:

FF EGRRVANW KWBCYMYX EGZZMAFI
090726 HKMOYMYX
UASR71 H 090700
ARS QFA129 0328N 12831E 0639 FL380 VOLCANO DUKONO 0608-01
DRIFT OF VA SE PLUME HGT EST FL100 OR LOWER SUP INFO REPORTS

GOOD VISIBILITY=

8.3. WMO headers

8.3.1. The WMO headers used to send the AIREP should follow the WMO regulations - WMO No 386, table D-3 – as indicated here:

UA	01 – 59	Routine aircraft reports
UA	60 – 69	Special aircraft reports, except for volcanic ash
UA	70 – 79	Special aircraft reports related to volcanic ash

Table 8.3.1.: WMO headers bulletins of AIREP

8.3.2. Example

8.3.2.1. ARS received in a Ivato ATS unit and related to volcanic ash should be sent with a WMO bulletin header such as UAMG70 FMMI.

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8.3.2.2. ARS received in a Ivato ATS unit and not related to volcanic ash should be sent with a WMO bulletin header such as UAMG60 FMMI.

8.4. Example ARS on volcanic ash

8.4.1. Pilot to ACC Ivato

8.4.1.1. A pilot transmits a ARS on volcanic ash via voice communications to ACC. Referencing PANS-ATM Appendix 1, Part 1 – Reporting instructions sections 1-4 and 9, the following example was created:

AIREP SPECIAL UNITED AIRLINES TREE TOO TOO POSITION FIFE FIFE ZERO TREE NORTH WUN SEVEN ZERO TOO ZERO EAST FLIGHT LEVEL TREE ZERO ZERO CLIMBING TO FLIGHT LEVEL TREE FIFE ZERO VOLCANIC ASH CLOUD

8.4.2. ACC Ivato (TNR) to MWO Antananarivo

8.4.2.1. There are different arrangements between ACC and MWO (e.g. information received by fax or phone vs. AFTN). The following is an example of providing an ARS from the ACC to the MWO via the AFS (AFTN/AMHS).

8.4.2.2. Air-reports should be exchanged in the format in which they are received example by MWO is given below.

ARS UAL322 5503N17020E 0105 F300 ASC F350 VA CLD=

8.4.3. MWO Ivato to VAAC Toulouse, Regional OPMET Centre-(ROC) Pretoria, SADIS, WIFS.

8.4.3.1. The format used for forwarding of an ARS from the MWO to VAAC, ROC, SADIS and WIFS is in accordance with Annex 3, Appendix 6, Table A6-1B. Following example will be created based on the information given by the ACC.

ARS UAL322 2503S17020E 0105 F300 ASC F350 VA CLD =

8.5. Example ARS on severe turbulence

8.5.1. Pilot to ACC Johannesburg

8.5.1.1. A pilot provides a ARS on severe turbulence via voice communications to ACC. Referencing PANS-ATM Appendix 1, Part 1 – Reporting instructions sections 1-4 and 9, the following example was created.

‘AIREP SPECIAL AIR NEW ZEALAND WUN ZERO WUN POSITION FIFE ZERO ZERO FIFE NORTH ZERO ZERO TOO ZERO WUN WEST WUN FIFE TREE SIX FLIGHT LEVEL TREE WUN ZERO CLIMBING TO FLIGHT LEVEL TREE FIFE ZERO SEVERE TURBULENCE ‘

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8.5.2. ACC Johannesburg (FAOR) to MWO Johannesburg (AWC)

8.5.2.1. There are different arrangements between ACC and MWO (e.g. information received by fax or phone vs. AFTN). The following is an example of providing an ARS from the ACC to the MWO via AFTN.

8.5.2.2. The format used for forwarding of meteorological information received by voice communications to the associated meteorological watch office (MWO) is defined in subtitle 3 of Appendix 1 of PANS-ATM. Following example was created based on the information given by the pilot or dispatch.

ARS SFR101 2505S00201E 1536 F310 ASC F350 SEV TURB=

8.5.3. MWO Johannesburg to Regional OPMET Centre-ROC Pretoria, then IROC Toulouse to SADIS, WIFS.

8.5.3.1. The format used for forwarding of an ARS from the MWO to ROC, SADIS and WIFS is in accordance to Annex 3, 5.9.6. Following example is created based on the information given by the ACC.

ARS SFR101 2505S00201E 1536 FL310 SEV TURB=

8.5.3.2. The MWO should send this information using the World Meteorological Organization Abbreviated Header Line (WMO AHL) of **UAZB62 FAOR** to the appropriate NOC which will send it to the responsible ROC (in this case, ROC Pretoria with AFTN address **FAORYMYX)** which will then route to SADIS and WIFS according to the regional OPMET exchange schema via ROC Pretoria.

9. EXCHANGE OF SIGMET, AIRMET AND ADVISORIES

9.1. General

9.1.1. SIGMET and AIRMET should be prepared by the meteorological watch offices (MWOs), designated by the State's meteorological authority, for the FIRs required by the ICAO e-ANP, Volume II, MET Table II-1.

9.1.2. Detailed information on the format of the SIGMET messages is provided in the AFI Regional SIGMET Guide, 9th edition, 2007, Amendment 2, June 2011, at the Web page

http://www.icao.int/wacaf/edocs/WACAF_Regional_SIGMET_Guide_en.pdf

9.1.3. SIGMET messages should be distributed to other ICAO regions and made available for uplink through SADIS. This distribution should be carried out through the relevant Inter-regional OPMET Gateways (IROGs).

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9.1.4. When preparing SIGMET/AIRMET-messages, MWOs should follow the guidelines indicated in the ICAO AFI SIGMET/ AIRMET Guide).

9.1.5. SIGMET should be distributed to the two AFI RODBs, either directly or through the responsible AODEX centre. The RODBs should make SIGMET messages available on request. In order to facilitate that, the originating MWOs, should use fixed WMO headings for their SIGMET bulletins as given in Appendix G.

9.1.6. All SIGMET/AIRMET should be available on request from the RODBs.

9.1.7. During the transition period from TAC towards IWXXM, MWOs should continue producing and distributing TAC OPMET data and the equivalent IWXXM OPMET data in parallel.

9.1.8. An MWO can delegate the translation of the TAC into IWXXM SIGMET/AIRMET to its NOC. The NOC can delegate the translation of SIGMET/AIRMET data from TAC to IWXXM to the assigned ROC or a Data Translation Centre if not (yet) capable to produce IWXXM formatted SIGMET/AIRMET data.

9.1.9. The IWXXM SIGMET/AIRMET Producer is responsible for the validation of the data against the most recent schema & schematron before international distribution.

9.2. Volcanic Ash Advisory

9.2.1. Volcanic Ash Advisories (VAA) should be issued by the designated Volcanic Ash Advisory Centres (VAAC), as indicated in ICAO Doc 9766, *Handbook on the International Airways Volcano Watch (IAVW)*.

- VAAC Toulouse for the rest of the EUR-region, AFI and MID regions.

9.2.2. The RODBs should make TCA and VAA messages available on request.

9.3. Tropical Cyclone Advisory

9.3.1. The advisories produced by the TCAC and VAAC should be disseminated in accordance with the regional OPMET data exchange schemas.

9.3.2. Tropical Cyclone Advisories (TCA) should be issued by the designated Tropical Cyclone Advisory Centres (TCAC).

9.3.3. Tropical Cyclone Advisories (TCAs) and volcanic ash advisories (VAAs) should be issued by the designated tropical cyclone and volcanic ash advisory centres (TCAC and VAAC), as indicated in the FASID Table MET 3A and MET 3B.

9.3.4. The TCACs and VAACs should send the advisories to the RODBs. The RODBs should make TCAs and VAAs messages available as appropriate or on request. In order to facilitate that, the originating TCACs and VAACs should use fixed WMO headings for their TCA and VAA bulletins as given in Appendix G.

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9.4. Space Weather Advisory messages

9.4.1. The ICAO space weather service is provided by joint operation of several global space weather centres (SWXC), each providing the service, on a rotational basis, for 2 weeks.

9.4.2. Space Weather Advisory messages should be issued by the designated Space Weather Centre (SWXC), as indicated in the ICAO Doc 10100 *(Manual on Space Weather Information in Support of International Air Navigation)*.

9.4.3. National OPMET Centre (NOC)

9.4.3.1. The role of the NOC is to gather OPMET messages, compile national data into bulletins, validate the bulletin structure and distribute them according to the regional distribution schema. As necessary, the NOC associated with the SWXC (the Originating NOC) will add the Bulletin (WMO) header and send it to all other SWXCs. The Originating NOC will also send the SWX Advisories to its associated ROC via the AFS and will distribute, or make available via agreed State briefing services, the SWX Advisories to users within its national area of responsibility (AoR).

9.4.3.2. The NOCs should distribute the Space Weather Advisory Messages to area control centres, flight information centres, NOTAM offices as well as aerodrome meteorological offices according to national agreements.

9.4.4. Regional OPMET Centre

9.4.4.1. The advisories produced by the SWXCs should be disseminated in accordance with regional OPMET data exchange, meaning that SWX-Centres should send their advisories to the ROC responsible for the area the SWX-Centre is located in (see App. D – 2, para. 6.4).

9.4.4.2. An originating ROC is responsible for the collection of the SWX Advisories from the originating NOC and for the validation of the SWX Advisories message format. The originating ROC will then disseminate SWC Advisories, via AFS, to IROGs, RODBs and all others ROCs within its Region, and to SADIS/WIFS.

9.4.4.3. The ROCs should distribute the Space Weather Advisory Messages (T_1T_2 = FN, LN) via the AFS to the NOCs in the AoR, SADIS and AFI RODBs according to the AODEX schema.

9.4.5. Regional OPMET Data Bank (RODB)

9.4.5.1. The RODBs should make SWXA messages available on request.

9.4.6. Inter-Regional OPMET Gateway (IROG)

9.4.6.1. The IROGs in the originating Regions are responsible for the collection of the SWX Advisories and dissemination of the SWX Advisories to their partner IROGs in other Regions.

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9.5. Responsibilities of the MWOs and NOCs.

9.5.1. The SWXCs are the data originator. They produce the SWX Advisories in TAC form and in IWXXM form. They will send the SWX Advisories to their associated NOCs.

9.5.2. After receiving a VAA-message (T_1T_2 = FV, LU) or a TCA-message (T_1T_2 = FK, LK), the responsible MWO should issue a SIGMET for volcanic ash (T_1T_2 = WV, LV) or a tropical cyclone (T_1T_2 = WC, LY) in case that the own FIR and/or UIR is affected.

9.5.3. The MWOs send the SIGMET-messages to their NOC, which will forward those to the responsible ROC (See ICAO AFI SIGMET Guide).

9.6. Responsibilities of The ROCs

9.6.1. ROCs collect all TAC and IWXXM SIGMET, AIRMET and advisory bulletins from the NOCs in their AoR via the AFS.

9.6.2. A ROC can act as a Data Translation Centre on behalf of the NOCs within its AoR.

9.6.3. A ROC disseminates, via the AFS, all TAC and IWXXM SIGMET, AIRMET and advisory bulletins from their area of responsibility to the other ROCs, the IROG in their AoR and to the RODB in their AoR.

9.6.4. ROCs should provide TAC and IWXXM SIGMET, AIRMET and advisory bulletins to the NOCs in their area of responsibility, as agreed between the ROC and the NOC. The possibility to provide IWXXM SIGMET, AIRMET and advisory bulletins depends on the capabilities of a NOC to use extended AMHS.

9.7. Responsibilities of the IROGs

9.7.1. IROGs collect all TAC and IWXXM SIGMET, AIRMET and advisory bulletins from the ICAO region responsible for, as well as all AFI OPMET data.

9.7.2. IROGs disseminate, via the AFS or AMHS, all TAC and IWXXM SIGMET, AIRMET and advisory bulletins to the IROG(s) of the ICAO-region(s) they are responsible for, depending on the requirements for OPMET data by that region(s).

9.7.3. IROGs disseminate, via the AFS, all TAC and IWXXM SIGMET, AIRMET and advisory bulletins from the ICAO region(s) they are responsible for to the ROCs in the AFI-region.

9.8. SIGMET/AIRMET format and content compliance.

9.8.1. MWOs issuing SIGMET/AIRMET messages should apply strictly the code formats defined in the following documents:

9.8.1.1. The TAC code format of SIGMETs/AIRMETs is prescribed in:

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- ICAO Annex 3, Chapter 7, and Appendix 6: Technical specifications related to SIGMET and AIRMET information, aerodrome warnings and wind shear warnings and alerts.
- Special procedures for the AFI Region can be found in the SIGMET and AIRMET Guide) which is available from the website of the ICAO Office WACAF/ESAF.
- WMO No. 49, Technical Regulations, Volume II, Part II, Appendix 6, [C.3.1] 1

9.8.1.2. For the IWXXM SIGMET/AIRMET production applicable to the TAC code format, refer to:

- WMO No. 306, Manual on Codes, Volume I.3, Part D – Representation in Extensible Markup Language.
- FM201: COLLECTION OF REPORTS: Collection of features = reports in a bulletin;
- FM205: IWXXM: Details on schemas for all OPMET data types (latest versions).

10. REGIONAL OPMET DATA BANK (RODB)

10.1. General

10.1.1. A Regional OPMET Databank (RODB), also known by its French acronym BRDO (Banque Régionale des Données OPMET), is a critical component of the international system for exchanging aeronautical meteorological information, mandated by the International Civil Aviation Organization (ICAO). Its primary function is to collect, store, and distribute crucial OPMET (OPerational METeorology) data across a specific geographical region to support safe and efficient air navigation.

10.1.2. The RODB acts as a regional hub for aviation weather data, ensuring that all necessary information is readily available to users like Air Traffic Services (ATS) and airline operators.

i) **Data Collection and Storage**: It receives OPMET reports from various contributing states within its designated region. These reports include current observations and forecasts for airports and air routes. It gathers all mandatory OPMET messages (such as METAR, TAF, and SIGMET etc.) from multiple states within its designated ICAO region. It maintains a current, comprehensive database of this regional OPMET information.

ii) **Data Distribution**: It responds to requests from users in its region, providing them with the required OPMET data for flight planning and in-flight operations. The RODB doesn't just continuously broadcast all data. A crucial characteristic is its support for the Request/Reply mechanism.

iii) **Authorized users** (like airlines or air traffic services) can query the databank to receive specific, filtered data based on criteria (e.g., all TAFs for a certain area valid at a given time), instead of receiving large, unfiltered data streams.

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iv) Quality Control and Monitoring: It helps monitor the availability, timeliness, and format compliance of the data it receives, ensuring the quality of the meteorological information used by the aviation community. The RODB is actively involved in ensuring the reliability of the meteorological information.

a) **Quality Control:** It performs validation checks on incoming data to ensure it adheres to ICAO formatting standards and timeliness.

b) **Availability Monitoring:** It tracks the completeness and regularity of OPMET data supplied by contributing states.

10.2. Core Characteristics of the RODB

10.2.1. The databank must be built to handle modern digital exchange requirements.

i) Dual Format Support: It handles both the traditional character-based TAC (Textual Area Codes) format and the newer, machine-readable IWXXM (XML/GML) digital format.

ii) Communication Interface: It communicates primarily over the secure aviation network (AMHS/AFTN) but is also being adapted to support web services and protocols for the future SWIM (System-Wide Information Management) environment.

In essence, the RODB is a high-reliability digital library for aviation weather data, designed to give pilots and air traffic controllers quick, validated access to the precise information they need for safe flight operations.

iii) Data Source and Ingestion: The OPMET data that flows into the RODB (originating from national meteorological services) often travels over communication links that are shared or coordinated with the national and regional components of the GTS.

10.3. AFI Regional OPMET Data Bank

10.3.1. The AFI Regional OPMET Data Bank (RODB), is the dedicated repository for operational meteorological (OPMET) information within the ICAO Africa-Indian Ocean (AFI) Region. It is a crucial component of the AFI Meteorological Bulletins Exchange (AODEX) Schema, established by the AFI Planning and Implementation Regional Group (APIRG).

10.3.2. For resilience and area coverage, the AFI Region operates two designated Regional OPMET Data Banks (Dakar and Pretoria). These centers work in tandem to ensure continuous collection and distribution of OPMET data across the entire region.

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RODB Location	AFTN Adress (For TAC Data)	AMHS Adress (For IWXXM Data)	Area of Primary Responsibility (AODEX Centers)
Dakar AIBD (GOBD) (Senegal)	GOOYYZYZ	XF AMHS ADRESS SCHEME /C=XX/A=ICAO/P=GO/O=AFTN/OU=GOOYYZYZ/	• Brazzaville (FCBB • **Dakar AIBD (GOBD)** • Niamey (DRRN)
Pretoria (FAPR) (South Africa)	FAPRYMYX	XF AMHS ADRESS SCHEME /C=XX/A=ICAO/P=FA/O=FAPR=AFTN/OU=FAPRYMYX/	• Addis Ababa (HAAB) • Antananarivo (FMMI) • Nairobi (HKNA) • **Pretoria (FAPR)**

Table 10.3.2.: Corresponding AFTN and AMHS Addresses

10.3.3. Core Responsibilities

10.3.3.1. The primary functions of the AFI RODBs are to enhance the availability, quality, and exchange essential weather data for air navigation:

i) **Centralized Collection:** They collect all mandatory OPMET bulletins (METAR, SPECI, TAF, SIGMET, AIRMET, VAA, TCA, SWXA) from the AODEX centers within their respective areas of responsibility;

ii) **Data Storage:** They maintain a continuously updated database of this OPMET information;

iii) **Request/Reply Service:** They provide facilities for users to access specific, non-routine or occasional OPMET data using a «request/reply» mechanism via the Aeronautical Fixed Service (AFS) or, increasingly, over the Internet.

10.3.4. Quality control & Monitoring

10.3.4.1. A critical function is the regular monitoring of OPMET data provided by AFI States. They check for issues like timeliness, regularity, and compliance with ICAO format standards (Traditional Alphanumeric Codes - TAC). They issue quarterly reports to ICAO and the contributing states to address deficiencies.

11. INTER-REGIONAL OPMET EXCHANGE

11.1. Inter-regional OPMET Gateway (IROG)

11.1.1. Inter-regional OPMET Gateways (IROGs) are designated for the purpose of exchanging OPMET data between AFI Region and the other ICAO Regions, as shown in the table below.

11.1.2. They coordinate the exchange of AFI OPMET data with other ICAO regions via designated Inter-regional OPMET Gateways (IROGs) to ensure global coverage for long-haul flights.

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AODEX IROG	For Exchange of OPMET data between regions
Dakar	MID, ASIA/PAC as backup to Pretoria
Pretoria	SAM, NAM, CAR as backup to Dakar

Table 11.1.2.: Exchange Data Programme between Regions

11.1.3. IROGs and their functions are described at Appendix E. IROGs arrange for relaying all AODEX bulletins to a corresponding OPMET Gateway in the other ICAO regions concerned. In particular:

- *Dakar* IROG relays all AFI bulletins to ROC Toulouse in the EUR Region, which serves the EUR, SAM, NAM and CAR Regions, and should receive and store all required OPMET bulletins from these Regions;
- *Pretoria* IROG relays all AFI bulletins to ROC Toulouse in the EUR Region and IROG Bangkok in the ASI/PAC Regions, and should receive and store all required OPMET bulletins from MID, ASIA/PAC, EUR, SAM Regions;

11.1.4. The following principles are applied to IROGs:

11.1.4.1. IROGs should :

a) have reliable and efficient AFTN/AMHS connection to the regions, for which they have exchange responsibilities, with adequate capacity to handle the OPMET data flow between the regions;

b) be associated with AFTN/AMHS relay centres capable of handling efficiently the volume of traffic anticipated; and

c) be capable of handling all OPMET data types, as described in 5.1.

11.1.5. In order to avoid duplication of the OPMET traffic and information, all interregional OPMET exchange should be directed through the IROGs. Interregional exchange via direct AFTN/AMHS addressing from the originator or ROC to recipients in the other ICAO Regions should be avoided, except when bilateral or other agreements require such direct exchanges.

11.1.6. In order to ensure the global availability of all AODEX bulletins at the SADIS and WIFS gateways, IROG Dakar and Pretoria should relay all AFI bulletins to the SADIS gateway (London), and IROGs Tokyo and Nadi should relay the bulletins to the WIFS gateway (Washington).

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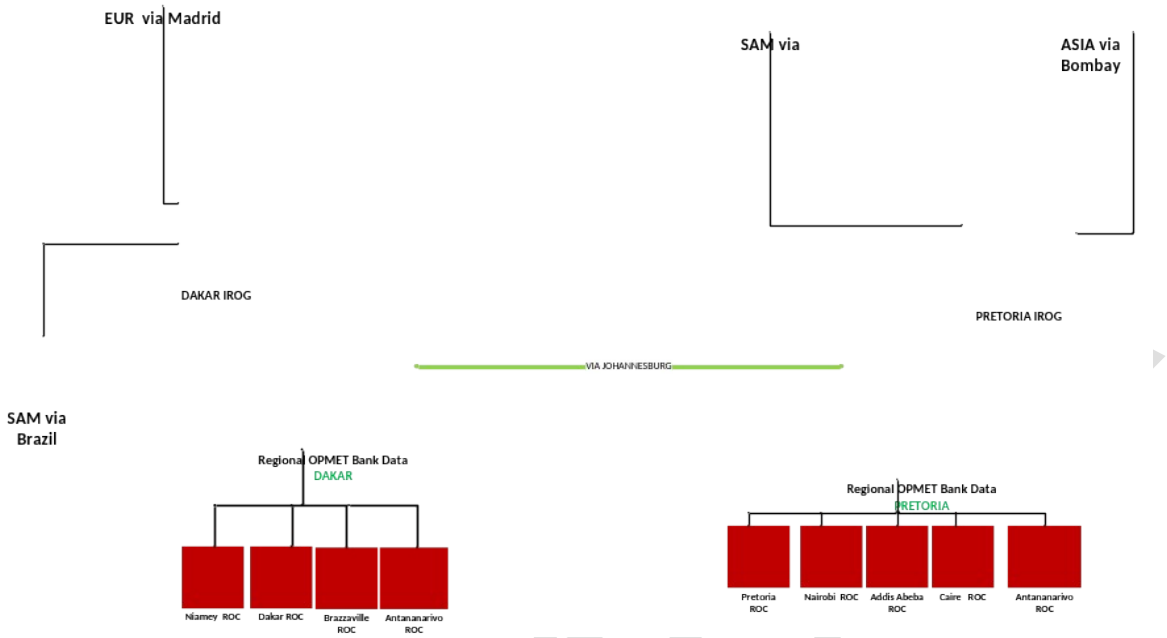

Figure 11.1.6: Interconnection between AFI RODB and other regions

12. MANAGEMENT OF OPMET EXCHANGE

12.1. OPMET Update Procedure

12.1.1. Information about changes to AODEX bulletins should be disseminated to all ROCs, and national OPMET centres (NOC) concerned well in advance in order to allow the centres to introduce the necessary changes to their message handling systems. In this regard, a lead time of two months (or two AIRAC cycles) is considered appropriate.

12.1.2. The ROC planning the change should send a notification by e-mail to the ICAO Office, WACAF and ESAF, with a copy to all AODEX Focal Points. The notification should include detailed information about the changes and the proposed time schedule. The Regional Office should inform all other ICAO Regional Offices of the changes to be introduced and the effective date of implementation.

12.1.3. Notification via AFTN/AMHS should be done by means of a METNO message, which is to be sent by the originating ROC to all other ROCs and to the respective IROGs in the other ICAO regions two weeks prior to the implementation date. The format of the METNO message is given in *Appendix D-2.*

12.1.4. All requests by users for changes to ROBEX bulletins should be addressed to the ICAO Regional Office. The Regional Office should carry out the necessary coordination with the States and ROCs concerned. The duration of the coordination process should be minimized so that the period between the user request and the implementation of the change (if agreed) should normally be less than three months.

12.2. Quality Management of OPMET Exchange

12.2.1. Objectives and Scope

12.2.1.1. **Objectives:** Develop a management system that provides general guidance on procedures applied to OPMET exchange, which includes quality control aspects and introduces non-real-time monitoring for OPMET exchange.

12.2.1.2. **Scope:** Management of OPMET data exchange will be organized in the following sections.

Quality Control	*Data quality control applies to OPMET validation and correction during data processing and during the preparation of messages.*
OPMET Monitoring	*Monitor and evaluate the performance indicators for the scheduled OPMET data.*

Table 12.2.1.2.: Quality control and Monitoring

12.2.2. Quality Control – general requirements

12.2.2.1. Quality control (QC) consists of the examination of OPMET data at NOCs, ROCs and RODBs to check the messages for formatting and coding errors, as well as for time and space consistency.

12.2.2.2. OPMET data should be checked in real-time or as close to it as possible, at the first point, i.e., the originator, which may be: meteorological station, aerodrome meteorological office or meteorological watch office. Errors may occur during the coding or transcription of meteorological messages by the observer or forecaster. The originating office should apply quality control procedures during data processing and preparation of messages in order to eliminate the main sources of errors.

12.2.2.3. The National OPMET centre (NOC) should apply QC procedures on the incoming messages from national sources and on the compiled national bulletins.

12.2.2.4. It is also advisable to apply QC checks at the ROC, where the AODEX bulletins are received or compiled. If automation is available, it should be used or partly assisted by computing facilities. The principle is that every message should be checked, preferably at the various points along the data chain.

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12.2.2.5. The checks that have already been performed by originating offices and ROCs are usually repeated at the OPMET data banks. Erroneous messages found by the RODB should be either rejected or corrected by reference back to the source or by the databank itself. Data corrected by the databanks should be flagged in the database for record purposes.

12.2.2.6. As a result of the quality control process described above, OPMET data of established quality will be used in the exchange and stored in the databanks. The RODBs should compile information with regard to errors that were found and compile records, such as the numbers and types of errors detected during quality control. Such non-conformities should be reported to ICAO Regional Office, Bangkok, for follow-up action.

12.2.3. Quality Control Procedures

12.2.3.1. General guidance on the quality control procedures for each type of OPMET is outlined in *Appendix G.*

12.3. OPMET Monitoring

12.3.1. Monitoring of Scheduled OPMET data

12.3.1.1. The monitoring should focus on the measurement of three performance indicators (PIs) (Compliance, Availability and Regularity indices) of the scheduled, routine METAR and TAF OPMET data (TAC - SA and FT; IWXXM – LA and LC)) exchanged in the region. The PIs are described in detail in *Appendix H, section 1.2.*

12.3.1.2. Monitoring Reference: The monitoring should involve the recording and analysis of data provided by the AFTN/AMHS circuit. The three PIs should be monitored against the respective AODEX Tables.

12.3.1.3. Methodology: Data is monitored with reference to the procedures defined in *Appendix G, section 1.2.*

12.3.2. Monitoring of Non-Scheduled OPMET data

12.3.2.1. Monitoring of non-routine OPMET data should include:

a) TAC - TCA (FK), VAA (FV) and SIGMET (WC, WS, and WV).

b) IWXXM – TCA (LK), VAA (LU), SIGMET (LY, LS, LV).

12.3.2.2. Monitoring of SIGMET, VAA and TCA should be performed during the scheduled regional SIGMET tests in accordance with the procedures published by the WACAF and ESAF ICAO Offices.

12.3.2.3. Additional monitoring of SIGMET issuance may be scheduled as necessary to monitor the issuance of SIGMET in specific FIRs over specific periods when such monitoring would be useful to support the rectification of deficiencies in the provision of SIGMET services.

12.3.2.4. The monitoring results should be presented in a bulletin-oriented format, one line per bulletin indicating the abbreviated header ($T_1T_2A_1A_2$ii CCCC YYGGgg), the FIR/UIR where applicable, receipt time and originator.

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12.3.3. Reporting OPMET monitoring results

12.3.3.1. OPMET monitoring reports should provide data for all locations where OPMET is required (i.e. locations in *ANP Table MET II-1* and *Table MET II-2*) and additional locations where States have been consulted and agreed to provide this additional information.

12.3.3.2. OPMET monitoring reports should provide sufficient data to help States identify problems in OPMET issuance, e.g., the actual number of messages received per day at locations where OPMET monitoring identifies that the number of messages received does not meet the given percentage of the total number of messages expected.

12.3.3.3. Reports of the results of OPMET monitoring conducted in accordance with the guidelines in this Handbook should be presented in a format that enables ease of comparison between the reports from the various designated OPMET monitoring entities (e.g., IATA and RODBs) and ease of interpretation of the data by States and users concerned.

12.4. AODEX Focal Points

12.4.1. To facilitate the exchange of information within the AODEX system and with the interregional interface centers, focal points have been established. The contact details of the persons designated as AODEX focal points by the authorities of the States concerned are provided in Annex H (or via the link).

12.4.2. Transition to Digital Exchange (IWXXM)

12.4.2.1. The AFI RODBs are central to the region's modernization efforts, specifically the transition from traditional TAC code to the new, machine-readable XML/GML format, IWXXM.

- The RODBs are implementing the required capabilities to handle and exchange data in the IWXXM format, moving the region toward the global System-Wide Information Management (SWIM) environment.

- Details of this section can be found to *Appendix I* (ICD).

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Appendices

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APPENDIX A-1: Collection and dissemination of METAR (SA) Bulletins by the NOCs

Table A-1: METAR

Explanation of Table

Column

Col 1 : Name of the NOC compiling the bulletin.

Col 2 : ICAO location indicator of the NOC.

Col 3 : Bulletin identifier-The identifier to be used in the WMO abbreviated heading of AODEX METAR on TAC format bulletins prepared by the NOC in Column 1.

Col 4 : Bulletin identifier-The identifier to be used in the WMO abbreviated heading of AODEX METAR on IWXXM format bulletins prepared by the NOC in Column 1.

Col 5 : ICAO location indicator of the aerodrome forming part of the collection area of the NOC in Column 1.

Col 6 : Name of the aerodrome forming part of the collection area of the NOC in Column 1.

Col 7 : Time slot during which observations are made during the station's opening hours.

Col 8 : Time frame for preparing and transmitting observation reports to the NOC of column 1

Col 9 : Availability delay for the compilation of METAR bulletins at the NOC of column 1

Col 10 : Name of the responsible center for the dissemination of the METAR/ SPECI bulletin in Columns 3 and 4.

Col 11 : Distribution of the bulletin to other AODEX centres and ROCs – AFTN address of the AODEX/ROCs.

* :

- Distribution of the bulletin to other, NOCs, and corresponding NOCs – Name of the main ROCs in **bold**.
- Operation hour in red color to be completed and updated by the States.
- For addresses not in compliance with these addresses a migration process should be conducted allow the harmonization of the addresses in the AFI region.
- AMHS address refereed to AMHS scheme in Appendix N.

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NOC		Bulletin METAR							Diffuser à	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Hours of Operation (7)**	**Preparation (8)**	**Available (9)**	**ROC/NOC (10)**	**AFTN/AMHS Address* (11)**
ANGOLA										
LUANDA	FNLU	SAAN31	LAAN31	*FNCA* FNHU FNLU	*Cabinda* Huambo Luanda de Feveiro	H00-23 H00-23 H00-23	H+3	H+5	Brazzaville	FCBBYPYX
ASCENSION ISLAND (United Kingdom)										
	FHAW	SAUK31	LAUK31	*FHAW*	*Ascension Island*	H00-23	H+3	H+5	Dakar	GOBDYPYX
BENIN										
COTONOU/	DBBB	SABJ31	LABJ31	DBBB	COTONOU/ C.	S00-23	H+3	H+5	Niamey	DRRNYPYX
BOTSWANA										
GABORONE/ SIR S.	FBSK	SABC31	LABC31	FBFT FBSK *FBGZ* FBKE FBMN FBSP	Francistown Gaborone *Ghanzi* Kasane Maun Selibe-Phikwe	H00-23 H00-23 H00-23 H06-18 H00-23 H00-23	H+3	H+5	Pretoria	FAPRYMYX
BRITISH INDIAN OCEAN TERRITORY (United Kingdom)										
	FJDG	SAUK32	LAUK32	*FJDG*	*Diego Garcia*	H00-23	H+3	H+5	Dakar	GOBDYPYX
BURKINA FASO										
OUAGADOUGOU	DFFD	SAHV31	LAHV31	DFFD DFOO	Ouagadougou Bobo-Dioulasso	S00-23 H00-23	H+3	H+5	Niamey	DRRNYPYX
BURUNDI										
	HBBA	SABI31	LABI31	HBBA	Bujumbura	H00-23	H+3	H+5	Nairobi	HKNAYPYX

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NOC		Bulletin METAR							Diffuser à	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Hours of Operation (7)**	**Preparation (8)**	**Available (9)**	**ROC/NOC (10)**	**AFTN/AMHS Address* (11)**
CAMEROUN										
DOUALA	FKKD	SACM31	LACM31	FKKD *FKKR* FKKL FKKN FKYS	Douala Airport *Garoua* Maroua/ Salak N'gaoundere Yaounde/ N'simalen	S00-23 H00-23 H00-23 H00-23 S00-23	H+3	H+5	Brazzaville	FCBBYPYX
CAPE VERDE										
Amilcar Cabral	GVAC	SACV31	LACV31	GVAC GVNP GVSV	Amilcar Cabral/ Sal Praia Sap Pedro/ S. V.	H00-23 H00-23 H00-23	H+3	H+5	Dakar	GOBDYPYX
CENTRAL AFRICAN REPUBLIC										
BANGUI	FEFF	SACE31	LACE31	*FEFG* FEFF FEFT	*Bangassou* Bangui/ Mpoko Berberati	H00-23 S00-23 H00-23	H+3	H+5	Brazzaville	FCBBYPYX
CHAD										
N'DJAMENA	FTTJ	SACD31	LACD31	*FTTD* FTTJ *FTTA*	*Moundou* Ndjamena Airport *Sarh*	H06-18 S00-23 H06-18	H+3	H+5	Niamey	DRRNYPYX
COMOROS										
MORONI	FMCH	SAIC31	LAIC31	FMCV FMCZ	Anjouan/ Ouani Dzaoudzi	H03-18 S00-23	H+3	H+5	Antananarivo Dakar	FMMIYPYX GOBDYPYX

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NOC		Bulletin METAR							Diffuser à	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Hours of Operation (7)**	**Preparation (8)**	**Available (9)**	**ROC/NOC (10)**	**AFTN/AMHS Address* (11)**
				FMCH	Moroni/ Ihahaia	H03-18				
CONGO										
BRAZZAVILLE	FCBB	SACG40	LACG40	*FCPD*	*Dolisie*	H06-15	H+3	H+5	Brazzaville	FCBBYPYX
				FCOI	*Impfondo*	H06-15				
				FCOU	*Ouesso*	H06-15				
		SACG31	LACG31	FCBB	Brazzaville	S00-23	H+3	H+5		
				FCOM	*Ollombo*	H00-23				
				FCPP	Pointe-Noire	S00-23				
COTE D'IVOIRE										
ABIDJAN	DIAP	SAIV31	LAIV31	DIAP	Abidjan/ F. O. B.	S00-23	H+3	H+5	Dakar	GOBDYPYX
				DIBK	Bouake	H00-23				
				DIKO	*Korhogo*	H00-23				
				DIMN	*Man*	H00-23				
				DISP	*San Pedro*	H00-23				
				DIYO	*Yamoussoukro*	H00-23				
DEMOCRATIC REPUBLIC OF CONGO										
KINSHASA	FZAA	SAZR31	LAZR31	FZAA	Kinshasa/ Ndjili	H00-23	H+3	H+5	Brazzaville	FCBBYPYX
				FZAB	*Kinshasa/ Ndolo*	H00-23				
				FZBN	*Malebo*	H00-23				
				FZEA	*Mbandaka*	H00-23				
				FZIC	Kisangani-B.	H00-23				
				FZNA	Goma	H00-23				

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NOC		Bulletin METAR							Diffuser à	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Hours of Operation (7)**	**Preparation (8)**	**Available (9)**	**ROC/NOC (10)**	**AFTN/AMHS Address* (11)**
				FZOA	*Kindu*	H00-23				
				FZOS	*Kasese*	H00-23				
				FZQA	Lumbubashi-Luano	H00-23				
				FZRF	*Kalemie*	H00-23				
				FZSA	*Kamina-Base*	H00-23				
				FZWA	Mbuji-Mayi	H00-23				
DJIBOUTI										
DJIBOUTI	HDAM	SADJ31	LADJ31	HDAM	Djibouti/Ambouli	H00-23	H+3	H+5	Addis Ababa	HAABYPYX
EQUATORIAL GUINEA										
MALABO	FGSL	SAGQ31	LAGQ31	FGBT	Bata	H00-23	H+3	H+5	Brazzaville	FCBBYPYX
				FGMY	Mongomoyen	H00-23	H+3			
				FGSL	Malabo	S00-23	H+3			
ERITREA										
ASMARA	HHAS	SAEI31	LAEI31	HHAS	Asmara	H00-23	H+3	H+5	Addis Ababa	HAABYPYX
				HHSB	Assab	H00-23	H+3			
ETHIOPIA										
ADDIS ABABA	HAAB	SAET31	LAET31	HAAB	Addis Ababa	H00-23	H+3	H+5	Addis Ababa	HAABYPYX
				HADR	Dire Dawa	H00-23	H+3			
GABON										
LIBREVILLE	FOOL	SAGO31	LAGO31	FOON	Franceville/ M	H00-23	H+3	H+5	Brazzaville	FCBBYPYX
				FOOL	Libreville	H00-23	H+3			
				FOOD	*Moanda*	H00-23	H+3			

DRAFT AODEX

NOC		Bulletin METAR							Diffuser à	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Hours of Operation (7)**	**Preparation (8)**	**Available (9)**	**ROC/NOC (10)**	**AFTN/AMHS Address* (11)**
				FOOG	Port-Gentil	H00-23	H+3			
GAMBIA										
BANJUL	GBYD	SAGB31	LAGB31	GBYD	Banjul Intl.	H00-23	H+3	H+5	Dakar	GOBDYPYX
GHANA										
ACCRA	DGAA	SAGH31	LAGH31	DGAA *DGAH* DGLE *DGLW* DGSI *DGSN* *DGTK*	Accra Int'l. *Ho* Tamale *Wa* Kumasi *Sunyani* *Takoradi*	H00-23 H00-23 H00-23 H00-23 H00-23 H00-23 H00-23	H+3	H+5	Niamey	DRRNYPYX
GUINEA										
CONAKRY	GUCY	SAGN31	LAGN31	GUCY *GUFH* GULB GUNZ *GUOK* GUXN	Conakry/ Gbessia *Faranah/ Badala* Labe/ Tata Nzerekore/ Konia *Boke/ Baralande* Kankan/ Kankan	H00-23 H00-23 H00-23 H00-23 H00-23 H00-23	H+3	H+5	Dakar-AIBD	GOBDYPYX
GUINEA-BISSAU										
BISSAU	GGOV	SAGW31	LAGW31	GGOV	Bissau/ O. V. Intl.	H00-23	H+3	H+5	Dakar-AIBD	GOBDYPYX
ILE DE LA REUNION (France)										
SAINT DENIS	FMEE	SARE31	LARE31	FMEE	Saint-Denis G.	H00-23	H+3	H+5	Antananarivo	FMMIYPYX

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NOC		Bulletin METAR							Diffuser à	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Hours of Operation (7)**	**Preparation (8)**	**Available (9)**	**ROC/NOC (10)**	**AFTN/AMHS Address* (11)**
KENYA										
NAIROBI	HKNA	SAKN31	LAKN31	HKEL HKJK *HKKI* *HKML* HKMO *HKNW*	Eldoret Intl. Nairobi : J. K. I.A. *Kisumu* *Malindi* Mombassa Moi I. *Nairobi/ Wilson*	H00-23 H00-23 H00-23 H00-23 H00-23 H03-19	H+3	H+5	Nairobi	HKNAYPYX
LESHOTO										
MASERU	FXMM	SALS31	LALS31	FXMM	Maseru M. I.	H00-23	H+3	H+5	Pretoria	FAPRYMYX
LIBERIA										
MONROVIA	GLRB	SALI31	LALI31	GLMR GLRB	Monrovia/ S. P. Monrovia/ R. Intl.	H00-23 H00-23	H+3	H+5	Dakar-AIBD	GOBDYPYX
MADAGASCAR										
ANTANANARIVO	FMMI	SAMG31	LAMD31	FMMI FMMS FMMT FMNA FMNM FMNN FMSD	Antananarivo/ I. Sainte-Marie Toamasina Antsiranana/ A. Mahajanga/ Ph. T. Nosy-Be Tolagnaro	H00-23 H00-23 H00-23 H00-23 H00-23 H00-23 H00-23	H+3	H+5	Antananarivo	FMMIYPYX
MALAWI										
LILONGWE	FWKI	SAMW31	LAMW31	FWCL	Blantyre/ Chileka	H00-23	H+3	H+5	Pretoria	FAPRYPYX

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NOC		Bulletin METAR							Diffuser à	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Hours of Operation (7)**	**Preparation (8)**	**Available (9)**	**ROC/NOC (10)**	**AFTN/AMHS Address* (11)**
				FWKI	Lilongwe/ Kamusu	H00-23				
MALI										
BAMAKO	GABS	SAMI31	LAMI31	GABS	Bamako/ Sénou	S00-23	H+3	H+5	Dakar-AIBD	GOBDYPYX
				GAGO	Gao	H00-23				
				GAKD	Kayes	H00-23				
				GAKL	Kidal	H00-23				
				GAMP	Mopti/ Ambodedjo	H00-23				
				GANR	Nioro	H00-23				
				GATB	Tombouctou	H00-23				
MAURITANIA										
NOUAKCHOTT	GQNN	SAMT31	LAMT31	GQNI	Nema	H00-23	H+3	H+5	Dakar-AIBD	GOBDYPYX
				GQNK	*Kaedi*	H00-23				
				GQNN	Nouakchott/ Airp.	S00-23				
				GQPA	Atar	H00-23				
				GQPP	Nouadhibou	H00-23				
				GQPZ	Zoueratt/ Tazadit	H00-23				
MAURITIUS										
SIR SEEWOOSAGUR	FIMP	SAMA31	LAMA31	FIMP	Sir Seewoosagur R.	H00-23	H+3	H+5	Antananarivo	FMMIYPYX
				FIMR	*Rodrigues/ P. C. A.*	H00-23				
MOZAMBIQUE										
MAPUTO	FQMA	SAMZ31	LAMZ31	FQBR	Beira	H00-23	H+3	H+5	Pretoria	FAPRYPYX
				FQMA	Maputo	H00-23				

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NOC		Bulletin METAR							Diffuser à	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Hours of Operation (7)**	**Preparation (8)**	**Available (9)**	**ROC/NOC (10)**	**AFTN/AMHS Address* (11)**
				FQNP	*Nampula*	H00-23				
				FQQL	*Quelimane*	H00-23				
				FQTT	*Tete/ Chingodzi*	H00-23				
NAMIBIA										
HOSEA KUTAKO	FYWH	SANM31	LANM31	FYKT	Keetmanshoop	H00-23	H+3	H+5	Pretoria	FAPRYPYX
				FYWB	Walvis Bay	H00-23				
				FYWH	Hosea Kutako I. A.	H00-23				
NIGER										
NIAMEY	DRRN	SANR31	LANR31	DRRN	Niamey	S00-23	H+3	H+5	Niamey	DRRNYPYX
				DRZA	Agades Sud	H00-23				
				DRZF	*Zinder*	H00-23				
NIGERIA										
LAGOS	DNMM	SANI31	LANI31	DNAA	Abuja	H00-23	H+3	H+5	Niamey	DRRNYPYX
				DNBE	*Akure Benin*	H00-23				
				DNCA	Calabar/ Margare	H00-23				
				DNEN	*Enugu/ Akumu*	H00-23				
				DNGO	*Gombe*	H00-23				
				DNIB	*Ibadan*	H00-23				
				DNIL	Ilorin	H00-23				
				DNIM	Sam Mbakwe Intl.	H00-23				
				DNJO	*Jos*	H00-23				
				DNKA	Kaduna	H00-23				

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NOC		Bulletin METAR							Diffuser à	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Hours of Operation (7)**	**Preparation (8)**	**Available (9)**	**ROC/NOC (10)**	**AFTN/AMHS Address* (11)**
				DNKT	*Katsina*	H00-23				
		SANI32	LANI32	DNKN	Kano/ M. A. K.	H00-23				
				DNMA	*Maiduguri*	H00-23				
				DNMM	Lagos/ M. M.	H00-23				
				DNMN	*Minna*	H00-23				
				DNPO	Port Harcourt	H00-23				
				DNSO	Sokoto/ Saddiq	H00-23				
				DNSU	*Osubi*	H00-23				
				DNYO	Yola	H00-23				
REUNION (FRANCE)										
SAINT-DENIS G.	FMEE	SARE31	LARE31	FMEE	Saint-Denis G.	H00-23	H+3	H+5	Antananarivo	FMMIYPYX
RWANDA										
KIGALI	HRYR	SARW31	LARW31	HRYR	Kigali/ G. K.	H00-23	H+3	H+5	Nairobi	HKNAYPYX
				HRZA	*Kamembe*	H00-23				
SAO TOME AND PRINCIPE										
SAO TOME	FPST	SATP31	LATP31	FPST	Sao Tome Intl. SA	H00-23	H+3	H+5	Brazzaville	FCBBYPYX
SENEGAL										
DAKAR-AIBD	GOBD	SASG31	LASG31	GOBD	Diass Intl. Airport	S00-23	H+3	H+5	Dakar-AIBD	GOBDYPYX
				GOGG	Zinguinchor	H00-23				
				GOGS	Cap Skiring	H00-23				
				GOOY	Dakar Yoff	S00-23				
				GOSS	Saint Louis	H00-23				

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NOC		Bulletin METAR							Diffuser à	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Hours of Operation (7)**	**Preparation (8)**	**Available (9)**	**ROC/NOC (10)**	**AFTN/AMHS Address* (11)**
				GOTT	Tambacounda	H00-23				
SEYCHELLES										
SEYCHELLES	FSIA	SASC31	LASC31	FSIA	Seychelles Intl.	H00-23	H+3	H+5	Antananarivo	FMMIYPYX
SIERRA LEONE										
FREETOWN	GFLL	SASL31	LASL31	GFLL	Freetown/ Lungi	H00-23	H+3	H+5	Dakar-AIBD	GOBDYPYX
SOMALIA										
MOGADISHU	HCMM	SASI31	LASI31	HCMI	Berbera	H00-23	H+3	H+5	Nairobi	HKNAYVYX
				HCMV	Burao	H00-23				
				HCMH	Hargeisa	H00-23				
				HCMK	Kisimayu	H00-23				
				HCMM	Mogadishu	H00-23				
SOUTH AFRICA										
JOHANNESBURG	FAOR	SAZA31	LAZA31	*FAAB*	*Alexander Bay*	H00-23	H+3	H+5	Pretoria	FAPRYPYX
				FABL	Bloemfontein	H00-23				
				FACT	Cape Town Intl.	H00-23				
				FAEL	*East London*	H00-23				
				FAGG	*George Airport*	H00-23				
				FAJS	Johannesburg Intl.	H00-23				
				FAKM	*Kimberley Airport*	H00-23				
				FALA	Lanceria	H00-23				
		SAAP32	LAAP32	*FAGM*	*Rand*	H00-23				
				FAMM	Mafikeng Intl. AD	H00-23				

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NOC		Bulletin METAR							Diffuser à	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Hours of Operation (7)**	**Preparation (8)**	**Available (9)**	**ROC/NOC (10)**	**AFTN/AMHS Address* (11)**
				FANS	Nelspruit	H00-23				
				FAOR	OR Tambo Intl.	H00-23				
				FAPE	Port Elizabeth	H00-23				
				FAPI	Pietersburg (Civil)	H00-23				
				FAUP	Upington	H00-23				
SUDAN										
JUBA	HJJJ	SASU31	LASU31	*HNDN*	*Dongola*	H00-23	H+3	H+5	Nairobi	HKNAYPYX
				HSOB	*El Obeid Intl.*	H00-23				
				HJJJ	Juba	H00-23				
				HSKA	Kassala	H00-23				
				HSSS	Khartoun	H00-23				
				HSPN	Port Sudan	H00-23				
SWAZILAND										
MANZINI	FDMS	SASV31	LASV31	FDMS	Manzini/ Matsapha	H00-23	H+3	H+5	Pretoria	FAPRYMYX
TOGO										
LOME	DXXX	SATG31	LATG31	DXXX	Ngasigbe Int. Airp.	S00-23	H+3	H+5	Niamey	DRRNYPYX
				DXNG	Niamtougou	H00-23				
				DXSD	Sokode	H00-23				
UGANDA										
ENTEBBE	HUEN	SAUG31	LAUG31	HUEN	Entebbe Intl.	S00-23	H+3	H+5	Nairobi	HKNAYPYX
UNITED REPUBLIC OF TANZANIA										
MWALIMU J. K.	HTDA	SATN31	LATN31	HTDA	Mwalimu Julius K.	H00-23	H+3	H+5	Nairobi	HKNAYVYX

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NOC		Bulletin METAR							Diffuser à	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Hours of Operation (7)**	**Preparation (8)**	**Available (9)**	**ROC/NOC (10)**	**AFTN/AMHS Address* (11)**
				HTKJ	Kilimanjaro	H00-23				
				HTMW	*Mwanza*	H00-23				
				HTTG	*Tanga*	H00-23				
				HTZA	Zanzibar-Kisauni	H00-23				
ZAMBIA										
LUSAKA	FLKK	SAZB31	LAZB31	FLLI	Livingstone	H00-23	H+3	H+5	Pretoria	FAPRYPYX
				FLKK	Lusaka/ K. K. Intl.	H00-23				
				FLMS	Mfuwe	H00-23				
				FLND	Ndola	H00-23				
ZIMBABWE										
HARARE	FVHA	SAZW31	LAZW31	FVBU	J. M. Nkomo	H00-23	H+3	H+5	Pretoria	FAPRYMYX
				FVFA	Victoria Falls	H00-23				
				FVHA	Harare Intl.	H00-23				

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APPENDIX A-2: Collection and dissemination of METAR (SA) Bulletins by the ROCs or RODBs

Table A-2: METAR

Explanation of Table

Column

Col 1 : Name of the ROC or RODB compiling the bulletin.

Col 2 : ICAO location indicator of the ROC or RODB.

Col 3 : Bulletin identifier-The identifier to be used in the WMO abbreviated heading of AODEX METAR on TAC format bulletins prepared by the ROC in Column 1.

Col 4 : Bulletin identifier-The identifier to be used in the WMO abbreviated heading of AODEX METAR on IWXXM format bulletins prepared by the ROC in Column 1.

Col 5 : ICAO location indicator of the aerodrome forming part of the collection area of the ROC in Column 1.

Col 6 : Name of the aerodrome forming part of the collection area of the ROC in Column 1.

Col 7 : Preparation Times at which ROC in column 1 should prepare METAR bulletins for further dissemination.

Col 8 : Name of the responsible center for the dissemination of the METAR/ SPECI bulletin in Columns 3. And 4.

Col 9 : Distribution of the bulletin to other AODEX centres and RODBs – AFTN address of the AODEX/RODB Centre.

* :

- Distribution of the bulletin to other, NOCs, and corresponding NOCs – Name of the main ROCs in **bold**.
- For addresses not in compliance with these addresses a migration process should be conducted allow the harmonization of the addresses in the AFI region.
- AMHS address refereed to AMHS scheme in Appendix N.

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Table A-2: METAR

RODB/ROC		**METAR Bulletin**					**Dissemination to**	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Preparation (7)**	**RODB/ROC /NOC (8)**	**AFTN/AMHS Address (9)**
ADDIS ABABA	HAAB	SAEA31	LAEA31	HAAB	Addis Ababa	H+10	Nairobi	HKZZYPBX
				HADR	Dire Dawa		Addis Ababa	HAZZYPYX
				HDAM	Djibouti/ Ambouli		Niamey	DRZZNAZX
				HHAS	Asmara		Antananarivo	FMZZYPYY
				HHMS	*Massawa*		Dakar RODB	GOOYYZYZ
				HHSB	Assab		Dakar-AIBD	GOZZSNGX
ANTANANARIVO	FMMI	SAIO31	LAIO31	FMMI	Addis Ababa	H+10	**Pretoria**	**FAPRYMYX**
				FMNM	Mahajanga			
				FMMT	Toamasina			
				FMNA	Antsiranana			
				FMNN	Nosy-Be			
				FMMS	Sainte-Marie			
				FMSD	Tolagnaro			
		SAIO34	LAIO34	FIMP	Mauritius	H+10		
				FIMR	*Rodrigues*			
				FJDG	*Diego Garcia*			
				FMCH	Moroni			
				FMEE	Saint-Denis			
				FMCZ	*Dzaoudzi*			
				FMEP	*Sain Pierre*			
BRAZZAVILLE	FCBB	SAAM31	LAAM31	FCBB	Brazzaville	H+10	Brazzaville	FCZZXLBX
				FCPP	Pointe-Noire		Niamey	DRZZNAZX

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RODB/ROC		METAR Bulletin					Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Preparation (7)**	**RODB/ROC /NOC (8)**	**AFTN/AMHS Address (9)**
	FCBB	SAAM31	LAAM31	FEFF	Bangui	H+10	Addis Ababa	HAZZYPYX
				FEFT	Berberati		Nairobi	HKZZYPBX
				FKKD	Douala		Pretoria	FAPRYMYX
				FKKR	Garoua		Dakar	GOZZSNGX
				FKKN	Ngaoundéré		**Dakar**	**GOOYYZYZ**
				FKYS	Yaoundé Nsimalen			
				FKKL	Maroua/ Salak			
		SAAM34	LAAM34	FZAA	Kinshasa	H+10		
				FZNA	Goma			
				FZIC	Kisangani			
				FZQA	Lubumbashi			
				FZWA	Mbuji-Mayi			
		SAAM36	LAAM36	FOOL	Libreville	H+10		
				FOOG	Port Gentil			
				FOON	Franceville			
				FNLU	Luanda			
				FNHU	Huambo			
				FGSL	Malabo			
				FGBT	*Bata*			
				FPST	Sao-Tomé			
DAKAR	GOOY	SAOA30	LAOA30	GOOY	Dakar	H+10	Antananarivo	FMZZYPYB
				GOGS	Cap Skiring		Brazzaville	FCZZXLBX
				GOOK	*Kaolack*		Niamey	DRZZNAZX

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RODB/ROC		METAR Bulletin					Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Preparation (7)**	**RODB/ROC /NOC (8)**	**AFTN/AMHS Address (9)**
				GOSS	Saint Louis		**Dakar**	**GOOYYZYZ**
	GOOY			*GOTK*	*Kedugou*	H+10	Dakar	GOZZSNGX
				GOTT	Tambacounda		Pretoria	FAPRYMYX
				GOGG	Ziguinchor		Toulouse	LFZZMAFI
							Rio de Janeiro	SBGLYMYX
							Bangkok	VTBDYMYX
							Jeddah	OEJNYMYX
		SAAO31	LAOA31	*FHAW*	*Ascension*	H+10		
				GGOV	Bissau			
				DIAP	Abidjan			
				DIBK	Bouake			
				DIYO	*Yamoussokro*			
		SAAO32	LAOA32	GABS	Bamako			
				GAGO	Gao			
				GAKD	Kayes			
				GAKL	Kidal			
				GAMB	Mopti			
				GANR	Nioro			
				GATB	Tombouctou			
		SAAO33	LAOA33	GQPP	Nouadhibou			
				GQNN	Nouakchott			
				GQPA	Atar			
				GQNI	Nema			

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RODB/ROC		METAR Bulletin					Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Preparation (7)**	**RODB/ROC /NOC (8)**	**AFTN/AMHS Address (9)**
				GQPZ	Zoueratt			
				GUCY	Conakry			
				GUXN	Kankan			
				GULB	Labe			
				GUNZ	N'zerekore			
				GBYD	Banjul			
				GFLL	Freetown			
				GLRB	Monrovia			
DAKAR	GOOY	SAAO34	LAOA34	GVAC	Sal	H+10		
				GVBA	*Rabil/Boa Vista*			
				GVNP	Praia			
				GVSV	*Sao Pedro/Sao V.*			
				FAOR	Johannesburg		Addis Ababa	HAZZYPYX
				FACT	Cape Town		Antananarivo	FMZZYPYB
				FALE	*Durban/King Shaka*		Nairobi	HKZZYPBX
				FAEL	East London		Dakar	GOZZSNGX
				FAGG	George		**Dakar**	**GOOYYZYZ**
PRETORIA	FAPR	SAAP31	LAAP31	*FAHS*	*Hoedspruit*	H+10	Johannesburg	FAORYMYX
				FAKM	Kimberley		**Pretoria**	**FAPRYMYX**
				FAKN	*Kruger Mpumalanga*		Toulouse	LFZZMAFI
				FADN	Durban/Intl		Rio de Janeiro	SBGLYMYX
				FALA	Lanseria		Bangkok	VTBDYMYX
							Jeddah	OEJNYMYX

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RODB/ROC		METAR Bulletin					Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Preparation (7)**	**RODB/ROC /NOC (8)**	**AFTN/AMHS Address (9)**
PRETORIA	FAPR	SAAP32	LAAP32	FAMM	Mafikeng			
				FALM	*Makhado*			
				FAUT	*Mthatha*			
				FANS	Nelspruit			
				FAPI	Pietersburg			
				FAPN	*Pilanesberg*			
				FAPP	*Polokwane*			
		SAAP33	LAAP33	FAPE	Port Elizabeth	H+10	Addis Ababa	HAZZYPYX
				FAGM	*Rand*		Antananarivo	FMZZYPYB
				FAUP	Upington		Nairobi	HKZZYPBX
				FAWK	*Waterkloof*		Dakar	GOZZSNGX
				FAWB	*Wonderboom*		**Dakar**	**GOOYYZYZ**
				FBSK	Gaborone		Johannesburg	FAORYMYX
				FBFT	Francistown		**Pretoria**	**FAPRYMYX**
				FBKE	Kasane		Toulouse	LFZZMAFI
				FBMN	Maun		Rio de Janeiro	SBGLYMYX
		SAAP34	LAAP34	FBSP	Selibe-Phikwe		Bangkok	VTBDYMYX
				FVHA	Harare		Jeddah	OEJNYMYX
				FVCZ	*Buffalo Range*		Addis Ababa	HAZZYPYX
				FVWN	*Hwange*		Antananarivo	FMZZYPYB
				FVBU	J.M. Nkomo		Nairobi	HKZZYPBX
				FVKB	*Kariba*		Dakar	GOZZSNGX
				FVMV	*Masvingo*		**Dakar**	**GOOYYZYZ**

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RODB/ROC		METAR Bulletin					Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Preparation (7)**	**RODB/ROC /NOC (8)**	**AFTN/AMHS Address (9)**
				FVFA	Victoria Falls		Johannesburg	FAORYMYX
		SAAP35	LAAP35	FWKI	Lilongwe	H+10	**Pretoria**	**FAPRYMYX**
				FWCL	Blantyre/Chileka		Toulouse	LFZZMAFI
				FLKK	Lusaka/Keneth K.		Rio de Janeiro	SBGLYMYX
				FLHN	Livingstone/H. N		Bangkok	VTBDYMYX
				FLMF	Mfuwe		Jeddah	OEJNYMYX
				FLSK	Ndola/Simon K.			
				FDMS	Manzini			
		SAAP36	LAAP36	FQBR	Beira	H+10		
				FQMA	Maputo			
				FQCH	*Chimoi*			
				FQIN	*Inhambane*			
				FQLC	*Lichinga*			
				FQNP	Nampula			
				FQPB	*Pemba*			
				FQQL	*Quelimane*			
				FQTT	*Tete Chingodzi*			
				FQVL	*Vilankilo*			
		SAAP37	LAAP37	FXMM	Maseru			
				FYWH	Windhoek/Hosea K.			
				FYGF	Groorfontein			
				FYOA	*Ondangwa*			
				FYWE	*Windhoek*/Eros			

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RODB/ROC		METAR Bulletin					Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Preparation (7)**	**RODB/ROC /NOC (8)**	**AFTN/AMHS Address (9)**
				FYKT	Keetmanshoop			
				FYWB	Walvis Bay			
NAIROBI	HKNA	SAEA32	LAEA32	HKJK	Nairobi	H+10	Addis Ababa	HAABYPYX
				HKMO	Mombasa		Antananarivo	FMZZYPYB
				HKEL	Eldoret		**Pretoria**	**FAPRYMYX**
				HKKI	Kisumu		Brazzaville	FCZZXLBX
				HTDA	Dar-Es-Salaam		Niamey	DRZZNAZX
				HTZA	Zanzibar		Dakar	GOOYYZYZ
				HTKJ	Kilimanjaro		Dakar	GOZZSNGX
				HJJJ	Juba		Nairobi	HKZZYPBX
				HBBA	Bujumbura			
		SAEA35	LAEA35	HUEN	Entebbe	H+10		
				HRYR	Kigali			
				HRZA	*Kamembe*			
				HCMM	Mogadishu			
				HCMI	Berbera			
				HCMV	Burao			
				HCMH	Egal			
				HCMK	Kisimayu			
NIAMEY	DRRN	SAAO20	LAAO20	DRRN	Niamey		Addis Ababa	HAABYPYX
				DRZA	Agades		Brazzaville	FCZZXLBX
				DRRM	*Maradi*		**Dakar**	**GOOYYZYZ**
				DRRT	*Tahoua*		Dakar	GOZZSNGX

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RODB/ROC		METAR Bulletin					Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Preparation (7)**	**RODB/ROC /NOC (8)**	**AFTN/AMHS Address (9)**
				DRZR	Zinder		**Pretoria**	**FAPRYMYX**
				DGAA	Accra		Nairobi	HKZZYPBX
				DGTK	*Takoradi*		Niamey	DRZZNAZX
				DGSI	Kumasi		Addis Ababa	HAABYPYX
				DGLE	Tamale			
		SAAO21	LAAO21	DNKN	[2]	H+10		
				DNMM	Lagos			
				DNAA	Abuja/Nnamdi			
				DNAK	Akure			
				DNBE	*Benin*			
				DNCA	Calabar/Margaret			
				DNEN	*Enugu/Akanu*			
				DNGO	*Gombe*			
		SAAO22	LAAO22	DNIB	*Ibadan*			
				DNIL	Ilorin			
				DNIM	*Imo/Sam*			
				DNJO	*Jos*			
				DNKA	Kaduna			
	DRRN	SAAO23	LAAO23	DNKT	*Katsina*		Addis Ababa	HAABYPYX
				DNMA	Maiduguri		Brazzaville	FCZZXLBX
				DNMN	*Minna*		**Dakar**	**GOOYYZYZ**
				DNSU	*Osubi*		Dakar	GOZZSNGX
				DNPO	Port Harcourt		Pretoria	FAPRYMYX

DRAFT AODEX

RODB/ROC		METAR Bulletin					Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Preparation (7)**	**RODB/ROC /NOC (8)**	**AFTN/AMHS Address (9)**
				DNSO	Sokoto/Saddiq		Nairobi	HKZZYPBX
				DNYO	*Yola*		Niamey	DRZZNAZX
				DNZA	*Zaria*			
				DXXX	Lome			
				DXNG	Niamtougou			
				DXSK	*Sokode*			
		SAAO23	LAAO24	DBBB	Cotonou	H+10		
				FTTJ	N'djamena			
				FTTC	*Abeche*			
				FTTY	*Faya Largeau*			
				FTTD	*Moundou*			
				FTTA	*Sarh*			
				DFOO	Bobo Dioulasso			
				DFFD	Ouagadougou			

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APPENDIX B-1: Collection and dissemination of TAF Bulletins by the NOCs

Table B -1: TAF

Explanation of Table

Column

Col 1 : Name of the NOC compiling the bulletin.

Col 2 : ICAO location indicator of the NOC.

Col 3 : Bulletin identifier - The identifier to be used in the WMO abbreviated header of AODEX TAF on TAC bulletins prepared by the NOC in column 1.

Col 4 : Bulletin identifier - The identifier to be used in the WMO abbreviated header of AODEX TAF on IWXXM bulletins prepared by the NOC in column 1.

Col 5 : ICAO location indicator of the aerodrome forming part of the collection area of the ROC in Column 1.

Col 6 : Name of the aerodrome forming part of the collection area of the ROC in Column 1.

Col 7 : Bulletin Filing Time -The latest filing times for AODEX bulletins containing TAFs with the validities listed in Column 8.

Col 8 : Distribution of the bulletin to other, NOCs, and corresponding NOCs – Name of the main ROCs in **bold**.

Col 9 : Dissemination of the bulletin to other AODEX and ROC centers – AFTN/AMHS address of AODEX/ROC centers.

Col 10 : Name of the center responsible for distributing the TAF bulletin in column 3.

Col 11 : Distribution of the bulletin to other AODEX and BRDO centers – AFTN address of the AODEX/BRDO center.

* :

- Distribution of the bulletin to other NOCs and corresponding NOCs - Names of the main ROCs in **bold**.
- The operating hours in **red** must be completed and updated by the States.
- For addresses that do not conform to these addresses, a migration process should be carried out to enable the harmonization of addresses in the AFI region.
- AMHS address refereed to AMHS scheme in Appendix N.

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NOC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC (10)**	**AFTN/AMHS Address* (11)**
ANGOLA										
LUANDA	FNLU	FTAN31	LTAN31	FNLU	Luanda/ De F.	0500 1100 1700 2300	0600 1200 1800 0000	30h	Brazzaville	FCBBYPYX
		FTAN21	LTAN21	*FNCA*	*Cabinda*			24h		
		FCAN40	LCAN40	FNHU	Huambo	0500 1100	0600 1200	12h		
ASCENSION ISLAND (United Kingdom)										
	FHAW	FTUK31	LTUK31	*FHAW*	*Ascension Island*	0500 1100 1700 2300	0600 1200 1800 0000	24h	Dakar-AIBD	GOBDYPYX
BENIN										
COTONOU	DBBB	FTBJ31	LTBJ31	DBBB	Cotonou/ C.	0500 1100 1700 2300	0600 1200 1800 0000	30h	Niamey	DRRNYPYX
BOTSWANA										
GABORONE	FBSK	FTBC31	LTBC31	FBSK	Gaborone/ S. S. K.	0500 1100 1700 2300	0600 1200 1800 0000	30h	Pretoria	FAPRYPYX

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NOC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC (10)**	**AFTN/AMHS Address* (11)**
		FTBC21	LTBC21	FBFT *FBGZ* FBKE FBMN FBSP	Francistown *Ghanzi* Kasane Maun Selibe-Phikwe			24h		
BRITISH INDIAN OCEAN TERRITORY (United Kingdom)										
	FJDG	FTUK32	LTUK32	*FJDG*	*Diego Garcia*	0500 1100 1700 2300	0600 1200 1800 0000	24h	Dakar-AIBD	GOBDYVYX
BURKINA FASO										
OUAGADOUGOU	DFFD	FTHV31	LTHV31	DFFD DFDS	Ouagadougou Donsin	0500 1100 1700 2300	0600 1200 1800 0000	30h	Niamey	DRRNYVYX
		FTHV21	LTHV21	DFOO	Bobo-Dioulasso			24h		
BURUNDI										
BURUNDI	HBBA	FTBI21	LTBI21	HBBA	Bujumbura	0500 1100 1700 2300	0600 1200 1800 0000	24h	Bujumbura	HAABYVYX
CAMEROON										

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NOC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC (10)**	**AFTN/AMHS Address* (11)**
DOUALA	FKKD	FTCM31	LTCM31	FKKD	Douala Airport	0500 1100 1700 2300	0600 1200 1800 0000	30h	Brazzaville	FCCCYVYX
		FTCM21	LTCM21	FKYS	Yaounde/ Nsimalen			24h		
		FCCM40	LCCM40	*FKKR* FKKL FKKN	*Garoua* Maroua/ Salak Ngaoundere	0500 1100	0600 1200	12h		
CAPE VERDE										
Amilcar Cabral/ Sal	GVAC	FTCV31	LTCV31	GVAC	Amilcar Cabral/ Sal	0500 1100 1700 2300	0600 1200 1800 0000	30h	Dakar-AIBD	GOBDYVYX
		FTCV21	LTCV21	GVNP *GVSV*	Praia *Sap Pedro/ S. V.*			24h		
CENTRAL AFRICAN REPUBLIC										
BANGUI	FEFF	FTCE31	LTCE31	FEFF	Bangui/ Mpoko	0500 1100 1700 2300	0600 1200 1800 0000	30h	Brazzaville	FCBBYPYX
		FCCE40	LCCE40	FEFG	*Bangassou*	0500 1100	0600 1200	12h		

DRAFT AODEX

NOC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC (10)**	**AFTN/AMHS Address* (11)**
CHAD										
NDJAMENA	FTTJ	FTCD31	LTCD31	FTTJ	Ndjamena	0500 1100 1700 2300	0600 1200 1800 0000	30h	Niamey	DRRNYPYX
		FCCD40	LCCD40	*FTTA*	*Sarh*	1100	1200	9h		
				FTTD	*Moundou*	0500	0600			
COMORES										
MORONI	FMCH	FTIC21	LTIC21	FMCV FMCZ FMCH	Anjouan/ Ouani Dzaoudzi Moroni/ Ihahaia	0500 1100 1700 2300	0600 1200 1800 0000	24h	Antananarivo	FMMIYPPX
CONGO										
BRAZZAVILLE	FCBB	FTCG31	LTCG31	FCBB	Brazzaville	0500 1100 1700 2300	0600 1200 1800 0000	30h	Brazzaville	FCBBYPYX
		FTCG21	LTCG21	FCPP FCOM	Pointe-Noire Ollombo			24h		
		FCCG40	LCCG40	FCPD FCOI FCOU	Dolisie Impfondo Ouesso			9h		

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NOC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC (10)**	**AFTN/AMHS Address* (11)**
COTE D'IVOIRE										
ABIDJAN	DIAP	FTIV31	LTIV31	DIAP	Abidjan/ F. H. B.	0500 1100 1700 2300	0600 1200 1800 0000	30h	Dakar-AIBD	GOBDYPYX
		FTIV21	LTIV21	*DISP* *DIYO*	*San Pedro* *Yamoussoukro*			24h		
		FTIV40	LTIV40	DIBK *DIKO* *DIMN*	Bouake *Korhogo* *Man*			12h		
DEMOCRATIC REPUBLIC OF CONGO										
KINSHASA	FZAA	FTZR31	LTZR31	FZAA	Kinshasa/ Ndjili	0500 1100 1700 2300	0600 1200 1800 0000	30h	Brazzaville	FCBBYPYX
		FTZR21	LTZR21	*FZSA* FZOS *FZOA* FZAB FZBN *FZEA*	*Kamina-Base* *Kasese* *Kindu* *Kinshasa/ Ndolo* *Malebo* *Mbandaka*			24h		
DJIBOUTI										

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NOC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC (10)**	**AFTN/AMHS Address* (11)**
DJIBOUTI	HDAM	FTDJ31	LTDJ31	HDAM	Djibouti/ Ambouli	0500 1100 1700 2300	0600 1200 1800 0000	24h	Addis Ababa	HAABYPYX
EQUATORIAL GUINEA										
MALABO	FGSL	FTGQ31	LTGQ31	FGSL	Malabo	0500 1100 1700 2300	0600 1200 1800 0000	30h	Brazzaville	FCBBYPYX
		FTGQ21	LTGQ21	FGBT FGMY	Bata Mongomoyen			24h		
ERITREA										
ASMARA	HHAS	FTEI31	LTEI31	HHAS	Asmara	0500 1100 1700 2300	0600 1200 1800 0000	24h	Addis Ababa	HAABYPYX
			LCEI40	HHSB	Assab	0500 1100	0600 1200	12h		
ETHIOPIA										
ADDIS ABABA	HAAB	FTET31	LTET31	HAAB	Addis Ababa	0500 1100 1700	0600 1200 1800	30h	Addis Ababa	HAABYPYX

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NOC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC (10)**	**AFTN/AMHS Address* (11)**
						2300	0000			
		FCET40	LCET40	HADR	Dire Dawa	0500 1100	0600 1200	12h		
GABON										
LIBREVILLE	FOOL	FTGO31	LTGO31	FOOL	Libreville	0500 1100 1700 2300	0600 1200 1800 0000	30h	Brazzaville	FCBBYPYX
		FTGO21	LTGO21	FOON FOOG	Franceville/ M Port-Gentil			24h		
GAMBIE										
BANJUL	GBYD	FTGB31	LTGB31	GBYD	Banjul Intl.	0500 1100 1700 2300	0600 1200 1800 0000	30h	Dakar-AIBD	GOBDYPYX
GHANA										
ACCRA	DGAA	FTGH31	LTGH31	DGAA	Accra Int.	0500 1100 1700 2300	0600 1200 1800 0000	30h	Niamey	DRRNYPYX DRRRYMYX
		FTGH21	LTGH21	*DGTK* DGSI	*Takoradi* Kumasi			24h		

DRAFT AODEX

NOC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC (10)**	**AFTN/AMHS Address* (11)**
				DGLE	Tamale					
				DGSN DGLW	Sunyani Wa					
				DGAH	Ho					
GUINEA										
CONAKRY	GUCY	FTGN31	LTGN31	GUCY	Conakry/ Gbessia	0500 1100 1700 2300	0600 1200 1800 0000	30h	Dakar-AIBD	GOBDYPYX
		FTGN21	LTGN21	GULB GUNZ GUXN	Labe/ Tata Nzerekore/ Konia Kankan/ Kankan			24h		
		FCGN40	LCGN40	*GUOK* *GUFH*	*Boke/ Baralande* *Faranah/ Badala*	0500 1100	0600 1200	12h		
GUINEA BISSAU										
BISSAU	GGOV	FTGW21	LTGW21	GGOV	Bissau/ O. V. Intl.	0500 1100 1700 2300	0600 1200 1800 0000	24h	Dakar-AIBD	GOBDYPYX
ILE DE LA REUNION (France)										
SAINT DENIS	FMEE	FTRE31	LARE31	FMEE	Saint Denis G.	0500 1100	0600 1200	30h	Antananarivo	FMMIYPYX

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NOC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC (10)**	**AFTN/AMHS Address* (11)**
						1700 2300	1800 0000			
KENYA										
NAIROBI	HKNA	FTKN31	LTKN31	HKJK	Nairobi : J. K. A.	0500 1100 1700 2300	0600 1200 1800 0000	30h	Nairobi	HKJKYPYX
		FTKN21	LTKN21	HKEL *HKKI* HKMO	Eldoret Intl. *Kisumu* Mombassa Moi I.			24h		
		FCKN40	LCKN40	*HKML* *HKNW*	*Malindi* *Nairobi/ Wilson*			12h		
LESOTHO										
MASERU	FXMM	FTLS21	LTLS21	FXMM	Maseru M. I.	0500 1100 1700 2300	0600 1200 1800 0000	24h	Pretoria	FAPRYPYX
LIBERIA										
MONROVIA	GLRB	FTLI21	LTLI21	GLRB	Monrovia/ R. Intl.	0500 1100 1700 2300	0600 1200 1800 0000	24h	Dakar-AIBD	GOBDYPYX

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NOC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC (10)**	**AFTN/AMHS Address* (11)**
		FCLI40	LCLI40	GLMR	Monrovia/ S. P.	0500 1100	0600 1200	12h		
MADAGASCAR										
ANTANANARIVO	FMMI	FTMG31	LTMG31	FMMI	Antananarivo	0500 1100 1700 2300	0600 1200 1800 0000	30h	Antananarivo	FMMIYPYX
		FTMG21	LTMG21	FMNM FMMT	Mahajanga/ Ph. T. Toamasina			24h		
		FCMG40	LCMG40	FMNA FMNN	Antsiranana/ A. Nosy-Be	0500 1100	0600 1200	12h		
MALAWI										
LILONGWE	FWKI	FTMW31	LTMW31	FWKI	Lilongwe/ Kamuzu	0500 1100 1700 2300	0600 1200 1800 0000	30h	Pretoria	FAPRYPYX
MALI										
BAMAKO	GABS	FTMI31	LTMI31	GABS	Bamako/ Sénou	0500 1100 1700 2300	0600 1200 1800 0000	30h	Dakar-AIBD	GOBDYPYX
		FTMI21	LTMI21	GAGO	Gao			24h		

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NOC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC (10)**	**AFTN/AMHS Address* (11)**
				GAMB	Mopti/ Ambodedjo					
MAURITANIA										
NOUAKCHOTT	GQNN	FTMT31	LTMT31	GQNN	Nouakchott/ Airp.	0500 1100	0600 1200	30h	Dakar-AIBD	GOBDYPYX
						1700 2300	1800 0000			
		FTMT21	LTMT21	GQPP	Nouadhibou			24h		
MAURITIUS										
SIR SEEWOOSAGUR	FIMP	FTMA31	LTMA31	FIMP	Sir Seewoosagur R.	0500 1100 1700 2300	0600 1200 1800 0000	30h	Antananarivo	FMMIYPYX
		FTMA21	LTMA21	FIMR	*Rodrigues/ P. C. A.*			24h		
MOZAMBIQUE										
MAPUTO	FQMA	FTMZ31	LTMZ31	FQMA	Maputo	0500 1100 1700 2300	0600 1200 1800 0000	30h	Pretoria	FAPRYPYX
		FTMZ21	LTMZ21	FQBR *FQNP* *FQQL* *FQTT*	Beira *Nampula* *Quelimane* *Tete/ Chingodzi*			24h		
NAMIBIA										

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NOC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC (10)**	**AFTN/AMHS Address* (11)**
	FYWH	FTNM31	LTNM31	FYWH	Hosea Kutako I. A.	0500 1100 1700 2300	0600 1200 1800 0000	30h		
NIGER										
NIAMEY	DRRN	FTNR31	LTNR31	DRRN	Niamey	0500 1100 1700 2300	0600 1200 1800 0000	30h	Niamey	DRRNYPYX
		FTNR21	LTNR21	DRZA *DRZF*	Agades Sud *Zinder*			24h		
NIGERIA										
LAGOS	DNMM	FTNI31	LTNI31	DNKN DNMM DNAA DNPO	Kano/ M. A. K. Lagos/ M. M. Abuja Port Harcourt	0500 1100 1700 2300	0600 1200 1800 0000	30h	Niamey	DRRNYPYX
		FTNI21	LTNI21	*DNBE* DNCA *DNEN* DNGO *DNIB* DNIL	*Akure Benin* Calabar/ Margaret *Enugu/ Akumu* Gombe *Ibadan* Ilorin			24h		

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NOC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC (10)**	**AFTN/AMHS Address* (11)**
		FTNI22	LTNI22	DNIM	Sam Mbakwe Intl.	0500	0600			
				DNJO	*Jos/Yakubu*	1100	1200			
				DNKA	Kaduna	1700	1800			
				DNKT	*Katsina*	2300	0000			
				DNMA	Maiduguri					
				DNMN	*Minna*					
				DNSU	*Osubi*					
				DNSO	Sokoto/ Saddiq					
				DNYO	Yola					
REUNION (FRANCE)										
SAINT-DENIS	FMEE	FTRE31	LTRE31	FMEE	Saint-Denis G.	0500 1100 1700 2300	0600 1200 1800 0000	30h	Antananarivo	FMMIYPYX
RWANDA										
KIGALI	HRYR	FTRW31	LTRW31	HRYR HRZA	Kigali/ Gregoire K. Kamembe	0500 1100 1700 2300	0600 1200 1800 0000	24h	Nairobi	HKNAYPYX
SAO TOME AND PRINCIPE										
SAO TOME	FPST	FTTP31	LTTP31	FPST	Sao Tome Intl.	0500 1100	0600 1200	30h	Brazzaville	FCBBYPYX

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NOC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC (10)**	**AFTN/AMHS Address* (11)**
						1700 2300	1800 0000			
SENEGAL										
DAKAR-AIBD	GOBD	FTSG31	LTSG31	GOBD GOOY	Diass Intl. Airport Dakar Yoff Intl.	0500 1100	0600 1200	30h	Dakar-AIBD	GOBDYPYX
						1700 2300	1800 0000			
		FTSG21	LTSG21	GOSS	Saint Louis			24h		
		FCSG40	LCSG40	GOGS GOSS GOGG	Cap Skiring Saint Louis Zinguinchor	0500 1100	0600 1200	12		
SEYCHELLES										
SEYCHELLES	FSIA	FTSC31	LTSC31	FSIA	Seychelles/ Mahe	0500 1100 1700 2300	0600 1200 1800 0000	24h	Antananarivo	FMMIYPYX
SIERRA LEONE										
FREETOWN	GFLL	FTSL31	LTSL31	GFLL	Freetown/ Lungi	0500 1100 1700 2300	0600 1200 1800 0000	30h	Dakar-AIBD	GOBDYPYX
SOMALIA										

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NOC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC (10)**	**AFTN/AMHS Address* (11)**
MOGADISHU	HCMM	FTSI31	LTSI31	HCMM	Mogadishu	0500	0600	24h	Nairobi	HKNAYPYX
						1100 1700 2300	1200 1800 0000			
SOUTH AFRICA										
JOHANNESBURG	FAOR	FTAP31	LTAP31	FAOR	Johannesburg	0500	0600	30h	Pretoria	FAPRYPYX
				FACT FADN	Cape Town Durban Interna	1100 1700 2300	1200 1800 0000			
		FTAP21	LTAP31	FABL *FAEL* *FAGG* *FAKM* FAPE *FALE* FALA FAUP FAWK	Bloemfontein *East London* *George Airport* *Kimberley Airport* Port Elizabeth *Durban/ King* Lanseria Upington Waterkloof			24h		
		FCAP40	FCAP40	FAGM	Rand	0500 1100	0600 1200	12h		
SUDAN										
JUBA	HSSJ	FTSU31	LTSU31	HJJJ	Juba	0500	0600	30h	Nairobi	HKNAYPYX

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NOC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC (10)**	**AFTN/AMHS Address* (11)**
						1100	1200			
						1700 2300	1800 0000			
		FTSU21	LTSU21	*HSDN* *HSOB* HSSS	*Dongola/ Dongola* *El Obeid Intl.* Khartoum/ K. C. A.			24h		
SWAZILAND										
MANZINI	FDMS	FTSV31	LTSV31	FDMS	Manzini/ Matsapha	0500 1100 1700 2300	0600 1200 1800 0000	24h	Pretoria	FAPRYPYX
TOGO										
LOME	DXXX	FTTG31	LTTG31	DXXX	Ngasigbe Int. Airpt.	0500 1100 1700 2300	0600 1200 1800 0000	30h	Niamey	DRRNYPYX
		FTTG21	LTTG21	DXNG	Niamtougou			24h		
UGANDA										
ENTEBBE	HUEN	FTUG31	LTUG31	HUEN	Entebbe Intl.	0500 1100 1700 2300	0600 1200 1800 0000	30h	Nairobi	HKNAYPYX
UNITED REPUBLIC OF TANZANIA										

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NOC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC (10)**	**AFTN/AMHS Address* (11)**
MWALIMU	HTDA	FTTN31	LTTN31	HTDA	Mwalimu Julius K.	0500 1100 1700 2300	0600 1200 1800 0000	30h	Nairobi	HKNAYPYX
		FTTN21	LTTN21	HTKJ HTZA	Kilimanjaro Zanzibar-Kisauni			24h		
		FTTN40	LTTN40	*HTMW* *HTTG*	*Mwanza* *Tanga*	0500 1100	0600 1200	12h		
ZAMBIE										
LUSAKA	FLKK	FTZB31	LTZB31	FLKK	Lusaka/ K. K. Intl.	0500 1100 1700 2300	0600 1200 1800 0000	30h	Pretoria	FAPRYPYX
		FTZB21	LTZB21	FLLI FLMS FLND	Livingstone Mfuwe Ndola			24h		
ZIMBABWE										
HARARE	FVHA	FTZW31	LTZW31	FVHA	Harare Intl.	0500 1100 1700 2300	0600 1200 1800 0000	30h	Pretoria	FAPRYPYX
		FTZW21	LTZW21	FVFA	Victoria Falls	0500	0600	24h		

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NOC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC (10)**	**AFTN/AMHS Address* (11)**
						1100	1200			

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APPENDICE B-2: Collection and dissemination of TAF Bulletins

Table B -2: TAF

Explanation of Table

Column

Col 1 : Name of the ROC compiling the bulletin.

Col 2 : ICAO location indicator of the ROC.

Col 3 : Bulletin identifier-The identifier to be used in the WMO abbreviated heading of AODEX TAF on TAC format bulletins prepared by the NOC in Column 1.

Col 4 : Bulletin identifier-The identifier to be used in the WMO abbreviated heading of AODEX TAF on IWXXM format bulletins prepared by the NOC in Column 1.

Col 5 : ICAO location indicator of the aerodrome forming part of the collection area of the NOC in Column 1.

Col 6 : Name of the aerodrome forming part of the collection area of the NOC in Column 1.

Col 7 : Preparation Times at which NOC in column 1 should prepare TAF bulletins for further dissemination.

Col 8 : Start of validity period

Col 9 : TAF validity

Col 10 : Name of the responsible center for the dissemination of the TAF bulletin in Columns 3 and 4.

Col 11 : Distribution of the bulletin to other AODEX centres and ROCs – AFTN address of the AODEX/ROCs.

Col 12 : Distribution of the bulletin to other AODEX centres and ROCs – AMHS address of the AODEX/ROCs.

Notes:

- The RODB responsible for storing the bulletin is in **bold**
- Operation hour in red color to be completed and updated by the States.
- For addresses not in compliance with these addresses a migration process should be conducted allow the harmonization of the addresses in the AFI region.
- AMHS address refereed to AMHS scheme in Appendix N.

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ROC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC/ RODB (10)**	**AFTN/AMHS Adress (11)**
ADDIS ABABA	HAAB	FTEA31	LTEA31	HAAB	Addis Ababa	0500 1100 1700 2300	0600 1200 1800 0000	30h	Addis Ababa Nairobi Dakar Brazzaville Niamey Antananarivo **Pretoria** Dakar Jeddah	HAABYMYX HKZZYPBX GOZZSNGX FCZZXLBX DRZZNAZX FMZZYPYB **FAPRYMYX** GOOYYZYZ OEJDYPYX
		FTEA39	LTEA39	HHAS *HHMS* HADR HDAM	Asmara *Massawa* Dire Dawa Djibouti/ Ambouli	0500 1100 1700 2300	0600 1200 1800 0000	24h		
ANTANANARIVO	FMMI	FTIO31	LTIO31	FMMI FIMP FMEE	Antananarivo Mauritius Saint-Denis	0500 1100 1700 2300	0600 1200 1800 0000	30h	Antananarivo Dakar Nairobi Addis Abeba **Pretoria** Nairobi Dakar	FMZZYPYB GOOYYZYZ HKZZYPBX HAZZYPYX **FAPRYMYX** HKZZYPBX GOZZSNGX
		FTIO39	LTIO39	FMNM FMMT FMCH *FJDG* *FIMR* FSIA	Mahajanga Toamasina Moroni *Diego Garcia* *Rodrigues* Seychelles/Mah	0500 1100 1700 2300	0600 1200 1800 0000	24h		
BRAZZAVILLE	FCBB	FTAM31	LTAM31	FCBB FEFF FKKD	Brazzaville Bangui Douala	0500 1100 1700	0600 1200 1800	30h	Antananarivo Niamey Pretoria	FMZZYPYB DRZZNAZX FAPRYMYX

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ROC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC/ RODB (10)**	**AFTN/AMHS Adress (11)**
BRAZZAVILLE	FCBB	FTAM31	LTAM31	FZAA	Kinshasa	2300	0000	30h	Brazzaville	FCZZXLBX
				FOOL	Libreville				Dakar	GOZZSNGX
				FPST	Sao-Tomé				Nairobi	HKZZYPBX
				FGSL	Malabo				Addis Ababa	HAZZYPYX
				FNLU	Luanda				Toulouse	LFZZMAFI
		FTAM21	LTAM21	FCPP	Pointe-Noire	0500	0600	24h	**Dakar**	**GOOYYZYZ**
				FKYS	Yaoundé	1100	1200			
				FOOG	Port Gentil	1700	1800			
				FZSA	*Kamina-Base*	2300	0000			
				FZOS	*Kasese*					
				FZOA	*Kindu*					
				FZAB	*Kinshasa/ Ndolo*					
				FZBN	*Malebo*					
				FZEA	*Mbandaka*					
DAKAR	GOOY	FTAO30	LTAO30	GOOY	Dakar			30h	Antananarivo	FMZZYPYB
				GBYD	Banjul				Niamey	DRZZNAZX
				GABS	Bamako	0500	0600		Pretoria	FAPRYMYX
				GFLL	Freetown	1100	1200		Brazzaville	FCZZXLBX
				GUCY	Conakry	1700	1800		Dakar	GOZZSNGX
				GQNN	Nouakchott	2300	0000		Nairobi	HKZZYPBX
				DIAP	Abidjan				Addis Ababa	HAZZYPYX
				GVAC	Sal				Toulouse	LFZZMAFI

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ROC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC/ RODB (10)**	**AFTN/AMHS Adress (11)**
		FTAO35	LTAO35	GOGS	Cap Skiring	0500	0600	24h	**Dakar**	**GOOYYZYZ**
				GOSS	Saint Louis	1100	1200			
				GLRB	Monrovia	1700	1800			
				GQPP	Nouadhibou	2300	0000			
				GGOV	Bissau					
DAKAR	GOOY	FTAO35	LTAO35	GAGO	Gao	0500	0600	24h		
				FHAW	*Ascension I.*	1100	1200			
				GVBA	*Rabil/Boa Vista*	1700	1800			
				GVSV	*Sao Pedro/Sao V*	2300	0000			
				DIYO	*Yamoussoukro*					
PRETORIA	FAPR	FTAP32	LTAP32	FAOR	Johannesburg	0500 1100 1700 2300	0600 1200 1800 0000	30h	Dakar	GOZZSNGX
				FACT	Cape Town				Addis Ababa	HAZZYPYX
				FADN	Durban Interna				Antananarivo	FMZZYPYB
				FBSK	Gaborone				Brazzaville	FCZZXLBX
				FVHA	Harare				Dakar	GOOYYZYZ
				FWKI	Lilongwe				Nairobi	HKZZYPBX
				FLKK	Lusaka/Keneth				Toulouse	LFZZMAFI
				FQMA	Maputo				**Pretoria**	**FAPRYMYX**
				FYWH	Windhoek/Hosea				Rio de Janeiro	SBGLYMYX
									Bangkok	VTBDYMYX
									Jeddah	OEJNYMYX
		FTAP38	LTAP38	FQBR	Beira			24h		

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ROC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC/ RODB (10)**	**AFTN/AMHS Adress (11)**
				FQCH	*Chimoi*	0500	0600			
				FQIN	*Inhambane*	1100	1200			
				FQLC	*Lichinga*	1700	1800			
				FQNP	Nampula	2300	0000			
				FQPB	*Pemba*					
				FQQL	*Quelimane*					
				FQTT	*Tete Chingodzi*					
				FQVL	*Vilankilo*	0500	0600			
PRETORIA	FAPR	FTAP39	LTAP39	FAPE	Port Elizabeth	1100	1200	24h		
				FALE	*Durban/King*	1700	1800			
				FDMS	Manzini	2300	0000			
				FXMM	Maseru					
				FALA	Lanseria					
				FAUP	Upington					
NAIROBI	HKNA	FTEA32	LTEA32	HKJK	Nairobi			30h	Addis Ababa	HAZZYPYX
				HTDA	Dar-Es- Salaam				Antananarivo	FMZZYPYB
				HUEN	Entebbe				**Pretoria**	**FAPRYMYX**
		FTEA39	LTEA39	HKMO	Mombasa			24h	Brazzaville	FCZZXLBX
				HKEL	Eldoret/Intl.	0500	0600		Dakar	GOZZSNGX
				HKKI	Kisumu	1100	1200		Niamey	DRZZNAZX
				HTZA	Zanzibar	1700	1800		Dakar	GOOYYZYZ
				HBBA	Bujumbura	2300	0000			

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ROC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC/ RODB (10)**	**AFTN/AMHS Adress (11)**
				HRYR	Kigali					
				HRZA	*Kamembe*					
				HCMM	Mogadishu					
NIAMEY	DRRN	FTAO20	LTAO20	DRRN	Niamey			30h	Addis Ababa	HAZZYPYX
				DGAA	Accra				Brazzaville	FCZZXLBX
				DNKN	Kano	0500	0600		**Dakar**	**GOOYYZYZ**
				DNMM	Lagos	1100	1200		Pretoria	FAPRYMYX
				DNAA	Abuja/Nnamdi	1700	1800		Nairobi	HKZZYPBX
				DNPO	Port Harcourt	2300	0000		Dakar	GOZZSNGX
				DXXX	Lome					
				FTTJ	N'djamena					
				DFFD	Ouagadougou					
		FTAO24	LTAO24	DFOO	Bobo-Dioulasso			24h		
				DGTK	*Takoradi*					
				DGSI	Kumasi					
				DNAK	*Akure*	0500	0600			
				DNBE	*Benin*	1100	1200			
				DNCA	Calabar/Margaret	1700	1800			
				DNEN	*Enugu/Akanu*	2300	0000			
				DNGO	*Gombe*					

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ROC		TAF Bulletin							Dissemination to	
Name (1)	**CCCC (2)**	**TAC Bul. (3)**	**IWXXM Bul. (4)**	**CCCC (5)**	**Aerodrome (6)**	**Filing Time (7)**	**Start of validity (8)**	**TAF validity (9)**	**ROC/ RODB (10)**	**AFTN/AMHS Adress (11)**
				DNIB	*Ibadan*					
				DNIL	Ilorin					
		FTAO35	FTAO35	*DNIM*	*Imo/Sam*					
				DNJO	*Jos/Yakubu*					
				DNKA	Kaduna					
NIAMEY	DRRN	FTAO35	FTAO35	DNKT	*Katsina*				Addis Ababa	HAZZYPYX
				DNMA	Maiduguri				Brazzaville	FCZZXLBX
				DNMN	*Minna*				**Dakar**	**GOOYYZYZ**
				DNSU	*Osubi*				Pretoria	FAPRYMYX
				DNSO	Sokoto/Saddiq				Nairobi	HKZZYPBX
				DNYO	*Yola*				Dakar	GOZZSNGX
				DXNG	Niamtougou					

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APPENDIX C: IROG/RODB/ROC/NOC Back-up procedures

1. Introduction

1.1. In order to ensure the continuous provision of OPMET data within the AFI Region and with the other regions, back up procedures should be developed tested activated and implemented in AODEX centres. The backup procedures should include:

- the general principles of the backup-procedure;
- the scenarios in which backup will be applied;
- the procedures to be followed.

1.2. If not yet done, and with regard their functions, the AODEX centres should develop the following mutual back-up procedures:

- backup procedures between Dakar IROG/RODB and Pretoria IROG/RODBs;
- backup procedures between adjacent ROCs;
- backup procedures between ROCs and NOCs.

1.3. The backup procedures should take into all the failing cases that may occur between the two centres, including:

- COM-Centre Outage (switch, COM Support);
- RODB outage.

2. Purpose

2.1. The purpose of the backup-procedure is to guarantee the continuous provision of TAC as well as IWXXM OPMET data via the AFS to all IROG/RODB, ROCs and NOCs, in case of a long-term outage due to e.g. switch failure (soft- or hardware failure) or a telecommunication support failure (VSAT, link).

2.2. Back-up procedures developed will be tested to validate the dissemination process for notification messages between IROGs, ROCs and NOCs and, ensure that the Procedures for handover and takeover of responsibility are functional.

3. Impact of Outage on IROG/RODB, ROC and NOC Functionalities

3.1. In case of an IROG/RODB functionalities failure, the following services will be affected:

- Reception of OPMET data from outside the AFI region and dissemination within the region;
- Provision of AFI OPMET data to other ICAO-region(s);
- Receiving from and disseminating to the centres in the AoR of the ROC with OPMET data;
- Compilation and distribution of national routine and non-routine OPMET data by the NOC;
- IWXXM translation service will not be taken over by the backup ROC. Therefore, OPMET data of States utilizing that service, will only be available in TAC-format.

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3.2. In case of an outage of a ROC, the following associated NOCs services will be affected:

- compilation and distribution of national routine OPMET data by the NOC;
- distribution of national non-routine OPMET data by the NOC;
- providing NOCs in the AoR of the ROC with OPMET data;
- receiving and disseminating of data from NOCs in the AoR of the ROC.

3.3. In case of an outage of a NOC, the following functionality will be affected:

- OPMET data from the NOC will not be available to all other AODEX components.

3.4. Other Services to be impacted

- TAC to IWXXM translation service will not be available in the backup plan. Therefore, OPMET data of States utilizing that service will only be available in TAC format.
- Unavailability of the OPMET data (TAC & IWXXM) on SADIS.

4. Backup Procedures

4.1. Appropriate backup procedures should be defined, developed, tested and activated for the following outages cases:

4.1.1. IROG outage

4.1.1.1. Both Dakar and Pretoria IROG /RODBs ensure the Regional and Interregional functions of collection and dissemination of OPMETs and operate as mutual backup each other and are responsible for updating the distribution list as and when required.

4.1.1.2. If the IROG centre is entirely out of service, including the switch system (AMHS/ AFTN) and /or the loss of communications (e.g. VSAT, interferences), both IROGs/RODB (Dakar and Pretoria) should develop and maintain the backup procedures and identify areas for improvement.

4.1.1.3. Backup procedures for Pretoria's outage

(To be developed by the Dakar IROG/RODB)

4.1.1.4. Backup procedures for Dakar's outage

(To be developed by the Pretoria's IROG/RODB)

4.2. The link the other IROG is out of service

(To be developed by the AFI IROG/RODB)

(Usage of the ICAO AFS, exchanging data via AFTN and/or AMHS)

4.2.1. RODB outage

4.2.1.1. The RODB functionality is not available

- Both databases hold almost the same content. In case of outage of one of the Data Base, the other data base will continue to update its OPMET Database, by receiving the OPMET from AFI region and from the other regions (EUR, SAM, MID APAC) and from SADIS.
- The Users can query the backup database. Further details about the RODBs can be found in *Appendix K* (Interface Control Document).

4.2.1.2. The link between the RODB and the COM center is not available

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- The two Databases will not more be synchronized, and will be missing some data from the AFI area. Each RODB (Dakar and Pretoria) will continue to update its Database, by receiving the OPMET from other region as required (EUR, SAM, MID APAC) and from API SADIS. For the AFI region missing data, each center will apply the backup procedure in coordination with the other region centers concerned to receive the missing data.
- The Users can continue to query the database to have all the OPMET data.

4.2.2. ROC outage (any of the height ROCs)

4.2.2.1. The Center (switch, COM Support) is entirely out of service, including the switch system (AMHS/ AFTN) and / or the loss of communications on means (e.g. VSAT, interferences):

a) Backup of Dakar ROC by Niamey and Brazzaville ROCs

(Backup procedures to be developed by the involved ROCs)

b) Backup of Niamey ROC by Dakar ROC

(Backup procedures to be developed by the Niamey's and Dakar's ROCs)

c) Backup of Brazzaville ROC by Dakar ROC

(Backup procedures to be developed by the Brazzaville's and Dakar's ROCs)

d) Backup of Antananarivo ROC by Dakar ROC

(Backup procedures to be developed by the Antananarivo's and Dakar's ROCs)

e) Backup of Antananarivo ROC by Pretoria ROC

(Backup procedures to be developed by the Antananarivo's and Pretoria's ROCs)

f) Backup of Pretoria ROC by Dakar ROC

(Backup procedures to be developed by the Dakar's and Pretoria's ROCs)

g) Backup of Addis Ababa ROC by Nairobi ROC

(Backup procedures to be developed by the Nairobi's and Addis Ababa's ROCs)

h) Backup of Nairobi ROC by Pretoria ROC

(Backup procedures to be developed by the Pretoria and Nairobi ROCs).

4.2.2.2. The link with NOC is out of service (alternate procedure to be agreed with the ROC).

4.2.3. NOC outage

4.2.4. The Center (switch, COM Support) is entirely out of service, including the switch system (AMHS/ AFTN) and / or the loss of communications on means (e.g. VSAT, interferences);

(Backup procedure to be agreed with the ROC)

4.2.5. The link with NOC is out of service (alternate procedure to be agreed with the ROC).

5. Real-Time Back-up Test Procedure

5.1. As the back-up test and monitoring could consume considerable resources, both IROGs have to monitor a list of selected AFI OPMET bulletins. IROG back-up procedures are to be tested.

5.2. Communication test

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5.2.1. The communication test between the IROGs should be conducted through real-time back-up exercise.

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6. Assessment

6.1. Both IROGs should evaluate the monitoring result and address the following issues:

i) Monitoring result in terms of message throughput (comparison of the percentage of messages received against messages relayed);

ii) Transit time of the relayed messages;

iii) Undertake the necessary follow-up of issues that arose from the exercise; and

iv) Verify and improve existing procedures.

7. Technical setup

7.1. Normal operation

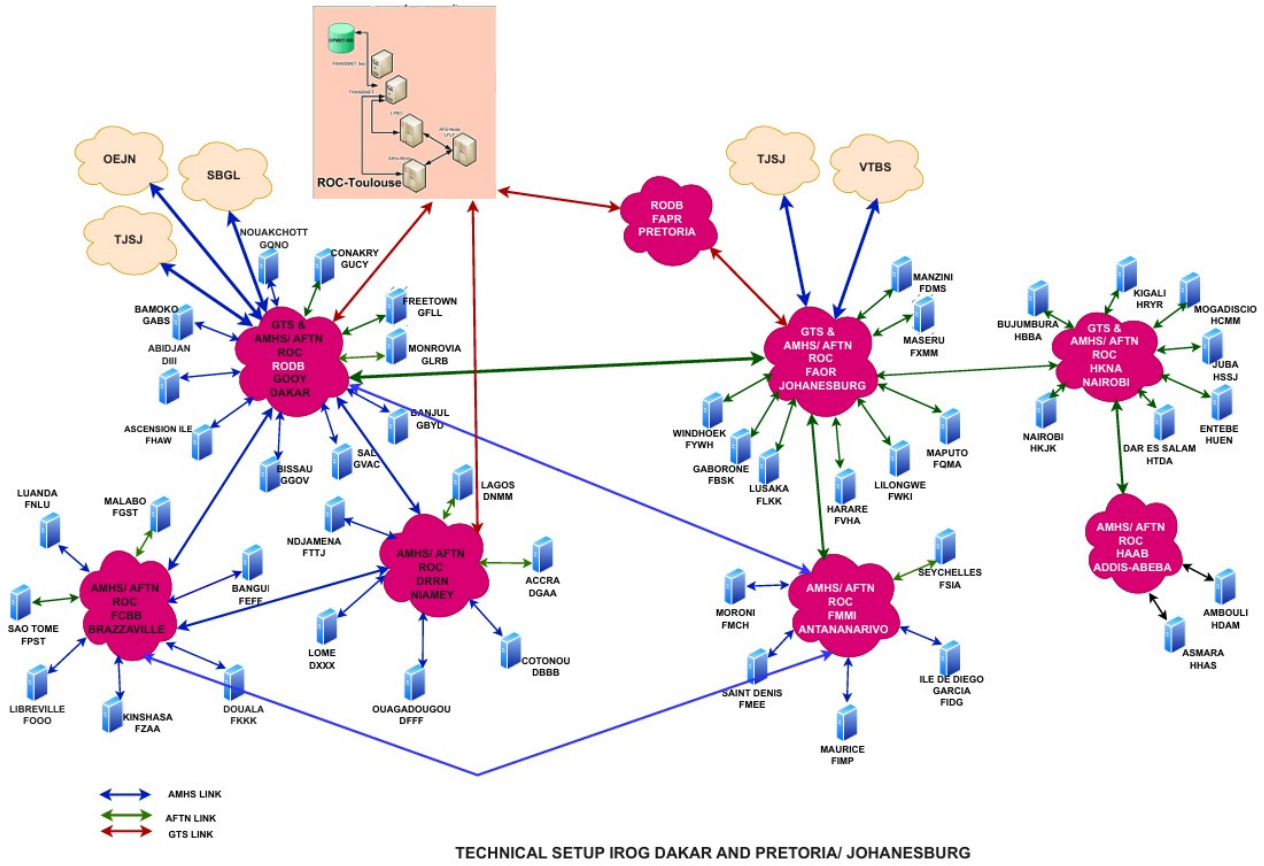

Figure 7.1: Technical setup IROG Dakar and Pretoria Johannesburg

7.2. ROC/ IROG setup

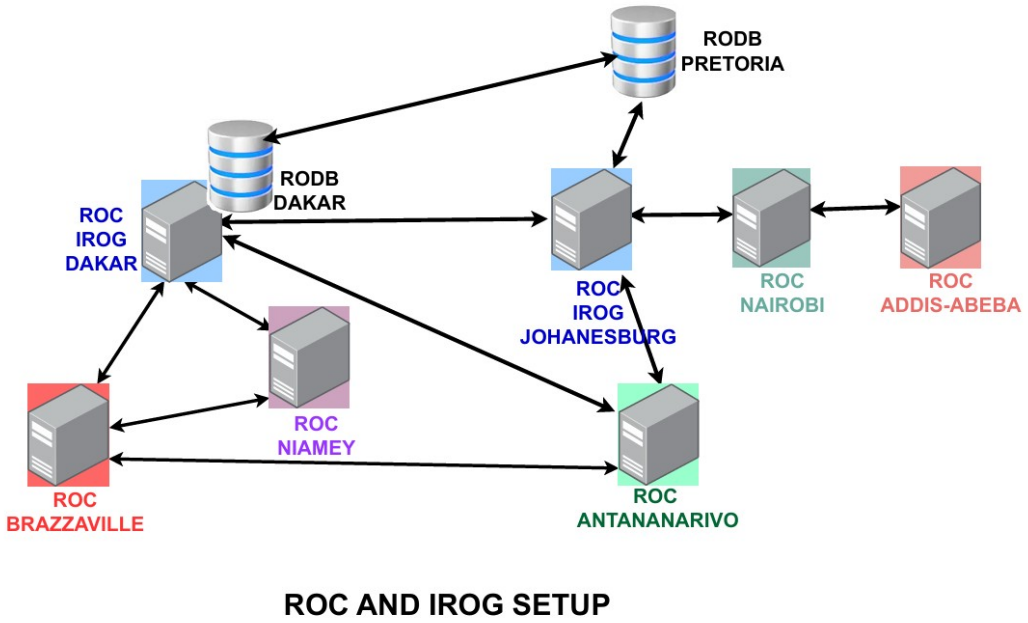

Figure 7.2: ROC and IROG Setup

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APPENDIX D-1: Use of WMO Abbreviated Heading (For use in AODEX Messages and Bulletins)

1. Each ROBEX bulletin should have a WMO abbreviated heading in accordance with *WMO No. 386, Manual on the Global Telecommunication System, Part II – Operational Procedures for the GTS*. The symbolic form of the WMO abbreviated heading is as follows:

$T_1T_2A_1A_2$ii CCCC YYGGgg [BBB]

2. Explanation of the symbols

2.1. **$T_1T_2A_1A_2$ii** – this group is used in accordance with *WMO No. 386, Manual on the Global Telecommunication System, Part II – Operational Procedures for the GTS, Attachment II-5*.

- **«T_1T_2»** – stands for the data type designator (e.g. SA for METAR in TAC format or LK for Tropical Cyclone Advisory in IWXXM format.
- **A_1A_2:** - Geographical designator, composed of two letters, according to WMO No. 386, Manual on the Global Telecommunication System, Part II – Operational Procedures for the GTS, Attachment II-5, Table C_1. The following principles should apply:
  a) For AODEX bulletins containing OPMET data from a single State or territory, the A_1A_2 designator should be chosen from Table C_1, Part I – Country or territory designator;
  b) For AODEX bulletins containing OPMET data from more than one State or territory, a suitable A_1A_2 designator should be chosen from Table C_1, Part II – Area Designators;
  c) The part of the Table C_1, Part II – Area Designators, which is relevant to the AODEX scheme, is reproduced below.

WMO Country or Territory designators

Aerodrome		A_1A_2	Centres AODEX
Name	**Type**		
Abeche	NAOP	CD	Aerodrome
Abidjan	AOP	IV	NOC
Abuja/Nnamdi	AOP	NI	Aerodrome
Accra	AOP	GH	NOC
Addis Ababa	AOP	ET	ROC
Agadez	AOP	NR	Aerodrome
Akure	NAOP	NI	Aerodrome
Annaba	AOP	AL	Aerodrome
Antananarivo	AOP	MG	ROC
Antsiranana	AOP	MG	Aerodrome
Ascension I	NAOP	UK	NOC
Asmara	AOP	EI	NOC
Assab	AOP	ET	Aerodrome
Atar	AOP	MT	Aerodrome
Bamako	AOP	MI	NOC
Bangui	AOP	CE	NOC
Banjul	AOP	GB	NOC
Bata	NAOP	GQ	Aerodrome
Beira	AOP	MZ	Aerodrome
Benin	NAOP	NI	Aerodrome
Berbera	AOP	SI	Aerodrome
Berberati	AOP	CE	Aerodrome

Aerodrome		A_1A_2	Centres AODEX
Name	**Type**		
Manzini	AOP	SV	NOC
Maputo	AOP	MZ	NOC
Maradi	NAOP	NR	Aerodrome
Maroua/Salak	AOP	CM	Aerodrome
Maseru	AOP	LS	NOC
Massawa	NAOP	ET	Aerodrome
Masvingo	NAOP	ZW	Aerodrome
Maun	AOP	BC	Aerodrome
Mauritius	AOP	MA	NOC
Mbuji-Mayi	AOP	ZR	Aerodrome
Mfuwe	AOP	ZB	Aerodrome
Minna	NAOP	NI	Aerodrome
Mogadishu	AOP	SI	NOC
Mombasa	AOP	KN	Aerodrome
Monrovia	AOP	LI	NOC
Mopti	AOP	MI	Aerodrome
Moroni	AOP	IC	NOC
Moundou	NAOP	CD	Aerodrome
Mthatha	NAOP	ZA	Aerodrome
Nairobi	AOP	KN	ROC
Nampula	NAOP	MZ	Aerodrome
N'Djamena	AOP	CD	NOC

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Aerodrome		A_1A_2	Centres AODEX
Name	Type		
Bissau	AOP	GW	NOC
Blantyre/Chileka	AOP	MW	Aerodrome
Bobo Dioulasso	AOP	HV	Aerodrome
Bouake	AOP	IV	Aerodrome
Brazzaville	AOP	CG	ROC
Buffalo Range	NAOP	ZW	Aerodrome
Bujumbura	AOP	BI	NOC
Burao	AOP	SI	Aerodrome
Calabar/Margaret	AOP	NI	Aerodrome
Cap Skiring	AOP	SG	Aerodrome
Cape Town	AOP	ZA	Aerodrome
Chimoi	NAOP	MZ	Aerodrome
Conakry	AOP	GN	NOC
Cotonou/C. B. C.	AOP	BJ	NOC
Dakar	AOP	SG	RODB
Dar-es-Salaam	AOP	TN	NOC
Diego Garcia	NAOP	UK	NOC
Dire Dawa	AOP	EI	Aerodrome
Djibouti/Ambouli	AOP	DJ	NOC
Douala	AOP	CM	NOC
Dolisie	NAOP	CG	Aerodrome
Durban/King S.	NAOP	ZA	Aerodrome
Durban/Intl.	AOP	ZA	Aerodrome
Dzaoudzi	NAOP	MG	Aerodrome
East London	NAOP	ZA	Aerodrome
Egal	AOP	SI	Aerodrome
Eldoret	AOP	KN	Aerodrome
Entebbe	AOP	UG	NOC
Enugu/Akanu	NAOP	NI	Aerodrome
J.M. Nkomo	AOP	ZW	Aerodrome
Johannesburg	AOP	ZA	NOC
Jos	NAOP	NI	Aerodrome
Juba	AOP	SU	NOC
Kaduna	AOP	NI	Aerodrome
Kamembe	NAOP	RW	Aerodrome
Kankan	AOP	GN	Aerodrome
Kano	AOP	NI	Aerodrome
Kaolack	NAOP	SG	Aerodrome
Kariba	NAOP	ZW	Aerodrome
Kasane	AOP	BC	Aerodrome
Katsina	NAOP	NI	Aerodrome
Kayes	AOP	MI	Aerodrome
Kedougou	NAOP	SG	Aerodrome
Keetmanshoop	AOP	NM	Aerodrome
Kidal	AOP	MI	Aerodrome
Kigali	AOP	RW	NOC
Kilimanjaro	AOP	TN	Aerodrome
Kimberley	AOP	ZA	Aerodrome
Kinshasa	AOP	ZR	NOC
Kisangani	AOP	ZR	Aerodrome
Kisimayu	AOP	SI	Aerodrome

Aerodrome		A_1A_2	Centres AODEX
Name	Type		
Ndola/Simon K.	AOP	ZB	Aerodrome
Nelspruit	AOP	ZA	Aerodrome
Nema	AOP	MT	Aerodrome
N'gaoundere	AOP	CM	Aerodrome
Niamey	AOP	NR	ROC
Niamtougou	AOP	TG	Aerodrome
Nioro	AOP	MI	Aerodrome
Nosy-Be	AOP	MG	Aerodrome
Nouadhibou	AOP	MT	Aerodrome
Nouakchott	AOP	MT	NOC
N'zerekore	AOP	GN	Aerodrome
Ollombo	NAOP	CG	Aerodrome
Ondangwa	NAOP	NM	Aerodrome
Osubi	NAOP	NI	Aerodrome
Ouagadougou	AOP	HV	NOC
Ouesso	NAOP	CG	Aerodrome
Pemba	NAOP	MZ	Aerodrome
Pietersburg	AOP	ZA	Aerodrome
Pilanesberg	NAOP	ZA	Aerodrome
Pointe Noire	AOP	CG	Aerodrome
Polokwane	NAOP	ZA	Aerodrome
Port Elizabeth	AOP	ZA	Aerodrome
Port Gentil	AOP	GO	Aerodrome
Port Harcourt	AOP	NI	Aerodrome
Praia	AOP	CV	Aerodrome
Pretoria	AOP	ZA	RODB
Quelimane	NAOP	MZ	Aerodrome
Rabil/Boa Vista	NAOP	CV	Aerodrome
Rand	NAOP	ZA	Aerodrome
Rodrigues	NAOP	MA	Aerodrome
Saint Louis	AOP	SG	Aerodrome
Saint Pierre	NAOP	FR	Aerodrome
Saint-Denis	AOP	RE	NOC
Sainte-Marie	AOP	MG	Aerodrome
Sal/Amilcar Cabral	AOP	CV	NOC
Sao Pedro/Sao V.	NAOP	CV	Aerodrome
Sao Tome	AOP	TP	NOC
Sarh	NAOP	CD	Aerodrome
Selibe-Phikwe	AOP	BC	Aerodrome
Sokode	NAOP	TG	Aerodrome
Sokoto/Saddiq	AOP	NI	Aerodrome
Sunyani	NAOP	GH	Aerodrome
Tahoua	NAOP	NR	Aerodrome
Takoradi	NAOP	GH	Aerodrome
Tamale	AOP	GH	Aerodrome
Tambacounda	AOP	SG	Aerodrome
Tete Chingodzi	NAOP	MZ	Aerodrome
Toamasina	AOP	MG	Aerodrome
Tolagnaro	AOP	MG	Aerodrome
Tombouctou	AOP	MI	Aerodrome
Upington	AOP	ZA	Aerodrome

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Aerodrome		A_1A_2	Centres AODEX
Name	**Type**		
Kisumu	AOP	KN	Aerodrome
Kruger Mpumalanga	NAOP	ZA	Aerodrome
Kumasi	AOP	GH	Aerodrome
Labe	AOP	GN	Aerodrome
Lagos	AOP	NI	NOC
Lanseria	AOP	ZA	Aerodrome
Libreville	AOP	GO	NOC
Lichinga	NAOP	MZ	Aerodrome
Lilongwe	AOP	MW	NOC
Livingstone/H. N.	AOP	ZB	Aerodrome
Lome	AOP	TG	NOC
Luanda	AOP	AN	NOC
Lubumbashi	AOP	ZR	Aerodrome
Lusaka/Keneth K.	AOP	ZB	NOC
Mafikeng	AOP	ZA	Aerodrome
Mahajanga	AOP	MG	Aerodrome
Mahe/Seychells	AOP	SC	NOC
Maiduguri	AOP	NI	Aerodrome
Makhado	NAOP	ZA	Aerodrome
Malabo	AOP	GQ	NOC

Aerodrome		A_1A_2	Centres AODEX
Name	**Type**		
Victoria Falls	AOP	ZW	Aerodrome
Vilankilo	NAOP	MZ	Aerodrome
Wa	NAOP	GH	Aerodrome
Walvis Bay	AOP	NM	Aerodrome
Waterkloof	NAOP	ZA	Aerodrome
Windhoek/Hosea K.	AOP	NM	NOC
Wonderboom	NAOP	ZA	Aerodrome
Yamoussoukro	NAOP	IV	Aerodrome
Yaounde	AOP	CM	Aerodrome
Yola	NAOP	NI	Aerodrome
Zanzibar	AOP	TN	Aerodrome
Zaria	NAOP	NI	Aerodrome
Ziguinchor	AOP	SG	Aerodrome
Zinder	AOP	NR	Aerodrome
Zoueratt	AOP	MT	Aerodrome

RODBs are also a ROC
ROCs are also NOCs; and
NOCs are also aerodromes.
AOP: aerodrome listed in AFI Table AOP 1
NAOP: not listed in AFI AOP table AOP 1

2.1.1.1. In bulletins prepared by ROCs, the following geographical designators should be used:

ROC	A_1A_2	ROC	A_1A_2
Addis Ababa	EA	Pretoria	AP
Antananarivo	IO	Nairobi	EA
Brazzaville	AM	Niamey	AO
Dakar	AO		

2.1.1.2. For AODEX bulletins containing SWX Advisories from the designated SWXCs, the A_1A_2 designator XX is used (see also 2.3).

2.1.2. **«ii»** – is the bulletin number of the bulletin also used to determine whether the bulletin is for global, inter-regional or national distribution. The list of «ii» to be used in the AFI-region can be found in the following table.

ii	Use
01 – 19	Global distribution
20 – 39	Regional and interregional distribution
40 – 89	National and bilateral distribution
90 – 99	Reserved

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Conventionally, for AFI Region exchanges the "ii" will be used as follows:

ii	Use
01 – 19	Not used
20	Used by The Data Producer (OU, AMO, MWO, etc.)
21	Used by national compilation (NOC)
31	Used by AODEX compilation or dissemination (ROC, IROG)
32 - 39	Used by ROC, IROG, RODB others compilations centers
40 – 97	National and bilateral distribution
98	Used for requests to the Databank and to announce change in METNO
99	Used for replies to the Databank and to confirm change in METNO

2.2. Location indicator (CCCC)

- **CCCC:** International four-letter location indicator of the station or centre originating or compiling the bulletin, as agreed internationally, and published in ICAO Doc 7910 – Location indicator and WMO-No.9, Volume C1 – Catalogue of Meteorological Bulletins.

2.3. International date time group (YYGGgg)

- **YY:** Day of the month
- **GGgg:** For bulletins containing meteorological reports intended for standard times of observation, the time should be the standard time of observation in UTC. For aerodrome, route and area (aeronautical) forecasts, it is the standard time of validity.

2.4. Modification group [BBB]

- **BBB:** Should be added when the abbreviated heading line has already been used for the transmission of a corresponding initial bulletin. Once the initial bulletin has been transmitted, the centre responsible will use the modification group for subsequent, corrected, or amended bulletins as follows:
  - To transmit information or reports normally contained in an initial bulletin after the initial bulletin has been transmitted or for a subsequent or additional issuance of a bulletin whose abbreviated heading has already been used, the BBB indicator to be used is RRx, where x =:
    - A, for the first bulletin after the issuance of the initial bulletin;
    - B, if another bulletin needs to be issued;
    - and so on up to and including x = X.
  - To transmit a bulletin containing amendments to the information included in a previously issued bulletin. The BBB indicator to be used is AAx, where x =:

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~ A, for the first bulletin containing amendments to information;

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~ B, for a second bulletin containing amendments to information;

~ and so on up to and including x = X.

Note: The rules related to the use of the BBB. group in the WMO abbreviated heading (OMM-No386, Vol.1, see 2.3.2).

2.5. For AODEX bulletin containing Advisories from the designated SWXCs, the **$T_1T_2A_1A_2$ii CCCC** designators used, based on SWX impact type [ii], SWXC originator location indicator [CCCC], and data type/message form [T_1T_2], are as follows:

SWXC	SWX Impact	$T_1T_2A_1A_2$ii CCCC	
		TAC form	IWXXM form
ACFJ – Australia	GNSS	FNXX01 YMMC	LNXX01 YMMC
	HF COM	FNXX02 YMMC	LNXX02 YMMC
	RADIATION	FNXX03 YMMC	LNXX03 YMMC
	SATCOM	FNXX04 YMMC	LNXX04 YMMC
ACFJ – France	GNSS	FNXX01 LFPW	LNXX01 LFPW
	HF COM	FNXX02 LFPW	LNXX02 LFPW
	RADIATION	FNXX03 LFPW	LNXX03 LFPW
	SATCOM	FNXX04 LFPW	LNXX04 LFPW
CRC – China	GNSS	FNXX01 ZBBB	LNXX01 ZBBB
	HF COM	FNXX02 ZBBB	LNXX02 ZBBB
	RADIATION	FNXX03 ZBBB	LNXX03 ZBBB
	SATCOM	FNXX04 ZBBB	LNXX04 ZBBB
CRC – Russian Federation	GNSS	FNXX01 UUAG	LNXX01 UUAG
	HF COM	FNXX02 UUAG	LNXX02 UUAG
	RADIATION	FNXX03 UUAG	LNXX03 UUAG
	SATCOM	FNXX04 UUAG	LNXX04 UUAG
PECASUS – Finland	GNSS	FNXX01 EFKL	FNXX01 EFKL
	HF COM	FNXX02 EFKL	FNXX02 EFKL
	RADIATION	FNXX03 EFKL	FNXX03 EFKL
	SATCOM	FNXX04 EFKL	FNXX04 EFKL
PECASUS – United Kingdom	GNSS	FNXX01 EGRR	FNXX01 EGRR
	HF COM	FNXX02 EGRR	FNXX02 EGRR
	RADIATION	FNXX03 EGRR	FNXX03 EGRR
	SATCOM	FNXX04 EGRR	FNXX04 EGRR
United States	GNSS	FNXX01 KWNP	FNXX01 KWNP
	HF COM	FNXX02 KWNP	FNXX02 KWNP
	RADIATION	FNXX03 KWNP	FNXX03 KWNP
	SATCOM	FNXX04 KWNP	FNXX04 KWNP

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APPENDIX D-2: Procedure and Format of METNO bulletin for AODEX OPMET Bulletins

1. METNO Procedure – General rules

1.1. A METNO (Meteorological Notification) is an administrative message issued for:

- Announce the addition of an OPMET bulletin (METAR, TAF, SIGMET, etc.);
- Announcing the removal of a bulletin;
- Announcing a change to a bulletin (change in content, header, schedule, etc.);
- Notify a structural change in an OPMET exchange scheme.

1.2. The METNO procedure allows:

- to ensure the global consistency of OPMET bulletins;
- une procédure détaillée étape par étape pour un NOC ou un BRDO.

1.3. In the AFI Region, METNOs are validated by the AFI-ROMG (AFI Regional OPMET Management Group).

1.4. Modification requests to the production of national OPMET-data should be reported by the NOC (National OPMET Centre) to the Regional OPMET Centre (ROC). The ROC then forwards the requests to the regional Focal point (FP) or regional Team for publication, evaluation and FP processing accepted changes.

1.5. The regional Team (AFI-ROMG) verifies the conformity of the change proposal against ICAO DOC 7910 (only registered Location Indicators can be accepted), ANP Volume II – MET tables, WMO No. 386 documents, and the syntax conforms to the METNO procedure. Implementation of IWXXM data: no IWXXM without TAC will be accepted. In addition, separated bulletins will be produced for AOP airport and agreed exchanged non-AOP airports OPMET data.

1.6. Modification requests for an upcoming AIRAC date have to be sent at the latest by the preceding AIRAC date. This will guarantee that all subsequent steps can be performed in time. For planning purposes, modification requests should be provided well in advance (between 30 and 60 days before the AIRAC date) to allow full assessment by the regional FP (or regional group in charge of OPMET) and to provide confirmation to the originator that all changes will be made at the required date.

1.7. The regional group members will review the requests and should communicate any comments to the Focal Point (FP) at the latest 14 days after the preceding (14 days before the upcoming) AIRAC date. Nil comments should be considered as a positive response.

1.8. At 21 days after the preceding (7 days before the upcoming) AIRAC date, the FP should announce the list of accepted amendments to the ICAO Regional Office, the NOCs by means of a standard formatted METNO message for routine meteorological information sent via Aeronautical Fixed Service (AFS - SADIS and WIFS by their regional associated ROC).

1.9. The involved NOCs, in turn, should notify users in their State about their requested modifications.

1.10. In addition, regional contacts (as agreed during regional MET meetings) will receive a confirmation by email. Motivated subscription to (or to unsubscribe from) the METNO Bulletins can be submitted via the regional MET Group or directly by utilizing the contact form provided on the regional website (where available).

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1.11. The modifications should be implemented by all affected centres on AIRAC date, at 02:00 UTC or when a new bulletin header is created, on opening hours the day before the implementation date.

1.12. The AIRAC OPMET data updates should be applied by: The ROCs and IROGs for routing the current OPMET data in accordance with the regional dissemination Schema.

1.13. In order to avoid difficulties in processing OPMET Data modifications during major holidays, it can be decided to skip a particular AIRAC Cycle occurring in these periods.

1.14. In the event of an urgent change, it may be decided, with the explicit agreement of AFI-ROMG, to expedite the process by deviating from the usual schedule. AFI-ROMG will then issue a METNO AIRAC bulletin, or a METNO EXTRA bulletin for interim updates, with immediate application of new or expiring bulletins.

1.15. Key issues to be considered for the management of AFS data traffic volumes are:

- Avoid data duplication
- Authenticated data only
- ANP required data (AOP)
- Agreed exchanged non-AOP data.

1.16. Standardized Regional OPMET Data Catalogues, including METNO-registered data, can be compiled from the database of METNO-registered OPMET data: TAC & IWXXM, on AFS:

- Regional OPMET Database (RODB) catalogue
- Regional and Global OPMET data catalogues.

2. Format and Content of the METNO-message The METNO Syntax: The syntax of a METNO statement is presented hereafter. It may also include the list of AFS addressees actually used as well as examples for the various OPMET data update METNO statements.

2.1. The METNO Header: The header of the METNO bulletin is NOXX31 CCCC YYGGgg, where:

- XX is a general area designator (example: EU for EUR and see Appendix D-1, 2.1.1.1 for AFI).
- CCCC is the AFTN location indicator of the regional planning centre (example: EBBR for EUR, GOBD or FAPR for AFI).

2.2. The METNO statements for registration and updating of OPMET / IWXXM data are:

- ADDRPT/RMVRPT: for adding/removing Routine OPMET data in an already registered bulletin;
- NEWBUL/DELBUL: for registering a new/unregistering an expiring (Non-)Routine OPMET bulletin and its contained data.

2.2.1. ADDRPT

2.2.1.1. This statement is used when a new location indicator is added to an already registered bulletin. It can be used in combination with METAR or TAF bulletins.

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2.2.1.2. Adding METAR/TAF in TAC format to a registered bulletin results in the automatic registration of the equivalent IWXXM data since November 5, 2020.

2.2.1.3. Adding IWXXM METARs/TAFs to a registered bulletin will, by default, result in adding the equivalent TAC METARs/TAFs for their parallel distribution. There can be no IWXXM data without any equivalent TAC-formatted version of the data.

2.2.2. RMVRPT

2.2.2.1. This statement is used for METARs/TAFs planned to be removed from an already registered bulletin. Removed reports can possibly be registered for all locations in other existing or in newly registered bulletins.

2.2.2.2. Removing TAC-formatted METARs/TAFs from a registered bulletin will also remove the equivalent IWXXM data from the OPMET data register in case it has already been registered. There is no IWXXM data without equivalent TAC-formatted data.

2.2.2.3. Removing IWXXM METARs/TAFs will by default result in removing equivalent TAC METARs/TAFs from the OPMET data register. If the TAC data need to be continued, it has to be re-registered explicitly, using ADDRPT.

2.2.3. NEWBUL

2.2.3.1. This statement is used for the registration of a new bulletin. It can be used for all supported data.

2.2.3.2. The registration of a new IWXXM bulletin by default implies the introduction of the TAC equivalent.

2.2.4. DELBUL

2.2.4.1. This instruction allows you to delete a saved ballot. It can be used for all supported OPMET data types.

2.2.4.2. The deletion of a registered IWXXM bulletin automatically implies the deletion of the TAC equivalent. TAC equivalents that are meant to be continued have to be re-introduced explicitly by applying NEWBUL.

2.2.4.3. Deletion of a TAC OPMET bulletin, by default, also deletes the IWXXM equivalent.

3. AFI-ROMG AND METNO– Prerequisites and Actions

3.1. The prerequisites for AFI-ROMG are as follows:

- Generic email address (including FP persons and backups);
- AFS connection address;
- Access to ICAO references (documents and regional contacts);
- Data management software for processing basic lists of METNO-registered data to be shared inter-regionally in standardized international data formats (*.csv, *.txt)

3.2. AFI-ROMG accepts update requests at any time by email:

- Preferably via ROC, but also from NOCs;
- After authentication, sort updates based on the suggested implementation date (AIRAC if no date proposed);

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- Compiles AIRAC METNO or EXTRA METNO for intermediate updates with immediate implementation of new or expiring bulletins;
- Forward requests for ANP additional OPMET data via email to the Regional ICAO Office contact.
- Co-ordination and evaluation of received update requests via email;
- Compilation of AIRAC/ EXTRA METNO bulletin for distribution to regional ROCs / IROGs;
- Maintenance of regional METNOs and registered OPMET data;
- Reports to AFI-ROMG;
- Facilitates OPMET data monitoring.

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4. METNO Process Diagram

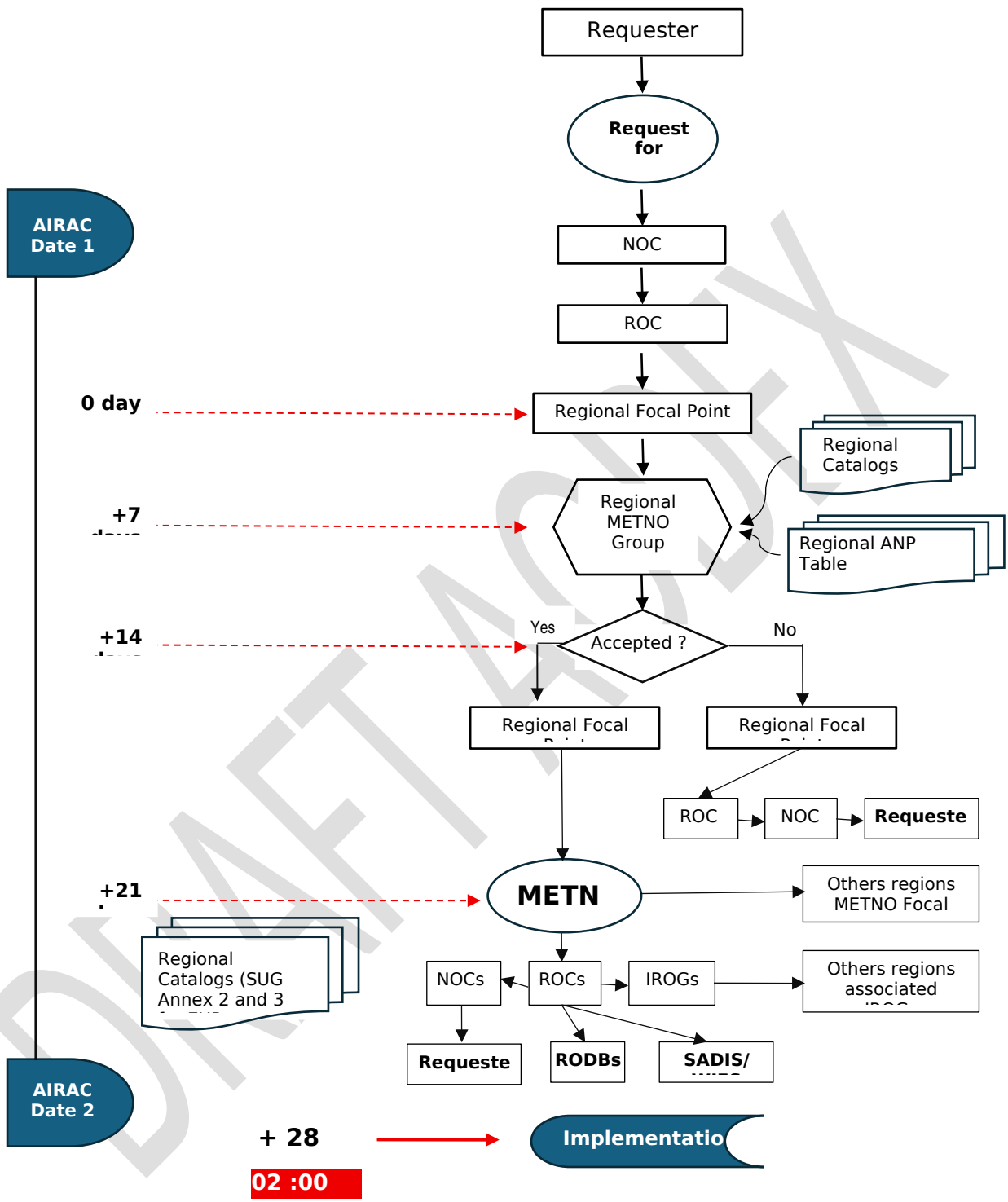

Figure App_D-2_4: METNO Process Diagram

5. Syntax of the METNO Message with Example

Item	Example (fictitious) : AFS
Abbreviated header	NOAO99 GOBD YYGGgg
Message Identifier (METNO)+ Product Description (AFI OPMET) + AIRAC Date (YYMMDD)	METNO AFI OPMET YYMMDD
New Bulletin: **NEWBUL $T_1T_2A_1A_2$ii CCCC Locind**(s), or **NEWBUL $T_1T_2A_1A_2$ii CCCC FIR/UIR** for Non-Routine bulletin where applicable	NEWBUL FCIC21 FMCV FMCZ NEWBUL LAAO31 FHAW GGOV DIAP DIBK DIYO
Delete Bulletin: **DELBUL $T_1T_2A_1A_2$ii CCCC,** or **DELBUL $T_1T_2A_1A_2$ii CCCC FIR/UIR** for Non-Routine bulletin where applicable	DELBUL FTAM33 FCBB DELBUL FVCM20 FKKD
End of METNO	END

```
NOAO99 GOBD 121420
METNO AFI OPMET 060119
NEWBUL FCIC21 FMCV FMCZ
NEWBUL LAAO31 FHAW GGOV DIAP DIBK DIYO
DELBUL FTAM33 FCBB
DELBUL FVCM20 FKKD
END
```

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Complete example (modification of a bulletin) in the NOC of Brazzaville

FCPPYMYX FMMMYPYX DRRNYMYX GOOYYMYX LFPWYMYX LFPVYMYX FAPRYMYX FAJSYMYX FTTTYMYX HSSSYMYX FQPTYMYX

NOAM99 FCBB 121420

METNO 04/26

FROM: NOC BRAZZAVILLE (FCBB)
TO: ALL OPMET CENTRES AFI / EUR / MID / APAC / SAM
DATE: 20260422 0945 UTC

SUBJECT: MODIFICATION OF OPMET BULLETIN FTAM31 FCBB

1. DESCRIPTION

Effective 15 MAY 2026 at 0000 UTC, the following modifications will be implemented in the AODEX OPMET exchange scheme for bulletin FTAM31 FCBB:

a) Change of bulletin header:

- **Current header:** FTAM31 FCBB
- **New header:** FTAM32 FCBB

b) Change of compilation times:

- **Current:** HH00 at HH20
- **New:** Half-hourly at HH00 and HH30

c) Change of aerodromes included:

- **Removal:** FCBB (Brazzaville/Maya-Maya)
- **Addition:** FCOO (Owando)

2. DETAILS OF THE BULLETIN

- **New Header:** FCPP33 FCPP
- **Content:** METAR for FCBD, FCOO, FCPA
- **Frequency:** HH00 / HH30
- **Distribution:** AFI → EUR (via IROG Toulouse) → Global

3. REASON FOR CHANGE

Update of national OPMET dissemination requirements and alignment with revised AFI regional OPMET availability objectives.

4. ACTION REQUIRED

All AMBEX centres, RODB, IROG and OPMET data users shall update routing tables and distribution schemes before 15 MAY 2026 0000 UTC.

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5. CONTACT

- NOC Brazzaville – FCPP
- AFTN: FCPPYMYX
- Email: noc.opmet@anac-congo.cg
- Tel: +242 06 000 0000

6. Syntax of the AFI RODB METNO bulletins with Example

Item	Example (fictitious) : AFS - AFTN
Abbreviated header	NOAM98 FCBB YYGGgg
Message Identifier (METNO)+ Product Description (EUR OPMET DB) + AIRAC Date (YYMMDD)	METNO AFI OPMET DB YYMMDD
Reference number (*1)	ICD AMD YYYY/xxx
AFTN Address of the GOBD DB Amendment or NONE AFTN Address of the FAPR DB Amendment or NONE AFTN Address of the LFPW DB Amendment or NONE	GOOYYZYZ: THE DAKAR RODB OPMET DATABASE REPORTS THAT… FAPRYZYX: THE TOULOUSE EUR OPMET DATABASE REPORTS THAT ... LFPWYZYX: THE VIENNA EUR OPMET DATABASE REPORTS THAT ...
End of METNO	END

(*1) **YYYY** = 4 digits year and **xxx** = sequence number of the amendments of the year **YYYY**.

6.1. The message always includes all two AFI OPMET Databases. If there are not any changes to be mentioned, it should be indicated by "**NONE"** for the concerned Database, as shown in the following example.

NOFA98 FAPR 131100

METNO AFI OPMET DB 030220

ICD AMD 2003/001

FAPRYMYX:

THE PRETORIA AFI OPMET DATABASE REPORTS THAT THE FORMAT OF THEIR DATABASE REPLIES WILL BE MODIFIED ON AIRAC DATE 20/02/2003.

IN ACCORDANCE WITH THE WMO/ICAO CODE CHANGES OF NOVEMBER 2026, THE METAR/TAF REPLIES WILL, FROM THAT DATE ONWARDS, ALWAYS CONTAIN THE KEYWORDS METAR, TAF OR TAF AMD FOR EVERY STATION IN THE REPLY.

LFPWYZYX:

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NONE

LOWMYZYX:

NONE

END

7. Form the requesting additional OPMET Data

7.1. Explanations to the application form

7.1.1. **Requesting User:** Company or National OPMET Centre (NOC) that is requesting the information.

7.1.2. **Application Reference Number:** AFI OPMET Req A_1A_2–YYYY/MM/DD–nnn (to be filled in by the AFI Focal Points).

- **A_1A_2:** WMO Area designator of the applying NOC Centre, for example "GR" for Greece;
- **YYYY/MM/DD:** Application date;
- **nnn:** Number of requests at that specific day.

7.1.3. Example: "AFI OPMET Req GR – 2007/01/30 – 001"

7.1.4. **Part 1:** Section to be completed by the ROC based on the request made by the NOC.

7.1.5. **Part 2:** the Focal Point specifies the most appropriate AFTN or AMHS Address of the ROC or the I/R Gateway Centre for the AFI distribution of the OPMET Data applied for.

7.1.6. **Part 3:** part to be filled in by the relevant Regional ICAO Office, specifying:

7.1.6.1. The Provider State and Region;

7.1.6.2. On acceptance

- The Bulletin Header used for the AFI distribution: $T_1T_2A_1A_2$ii CCCC;
- The nearest following AIRAC Date by which the data will be provided via the ROC or IROG: DD/MM/YYYY;
- All useful information on the availability and the regularity of the required OPMET Data;

7.1.6.3. If the request is declined:

- Explanation for rejecting the EUR distribution of the OPMET Data applied for.

7.1.7. **Date:** Deliberation date, DD/MM/YYYY.

7.1.8. **Name:** Name of the person endorsing the decision.

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WACAF and ESAF

Request for OPMET data from aerodrome or FIRs/UIRs

Requesting User:.....

Application Reference Number: AFI OPMET Req A_1A_2 – YYYY/MM/DD – nnn

Part 1 To be completed by: **applying ROC centre** **(Mark requested data type(s))**	Requested ICAO-Location Indicator(s): …….……. Name(s) of requested aerodrome / FIR, UIR or CTA: Requested Report: TAC or (TAC and IWXXM) formatted OPMET data TAC: ☐ SA/SP ☐ FC ☐ FT (24 or 30) ☐ WS/WV/WC and IWXXM: ☐ LA/LP ☐ LC ☐ FT (24 or 30) ☐ LS/LV/LY Other : ……..…. Reasons : ……..
Part 2 To be completed by: **WACAF or ESAF Focal Point**	**FOR Non-AFI OPMET Data**
Select IROG AFTN Address	AFTN – Destination Address to the African I/R OPMET Gateway Centre: (The AFTN Address to be used by the originating Compiling Centre to make available the requested OPMET data.)
	Choose the IROG AFTN-Address
	FOR AFI OPMET Data
Select IROG AMHS Address	AMHS – Destination Address to the I/R OPMET Gateway Centre: (The AMHS Address to be used by the originating Compiling Centre in order to make available the requested OPMET data.)
	Choose the ROC AFTN/AMHS-Address
Part 3 To be completed by: **Regional ICAO Office / National Aviation MET-Authority / National OPMET Centre / Responsible ROC Centre of requested OPMET data**	Regional ICAO Office: (ICAO Region/State/Location Indicator) Region of Provider State: - For the Provider State: Organization: ..... Name: …….. Phone: ……..…… E-mail: ……..…… …… a) The request is accepted Bulletin Header used ($T_1T_2A_1A_2$ii CCCC): ..... Start AIRAC Date: (DD/MM/YYYY) . (Any useful information on the requested data) ..... b) The request is declined: (Because)

Date: (DD/MM/YYYY) **Name:**

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8. Flow chart for requests of AFI OPMET Data

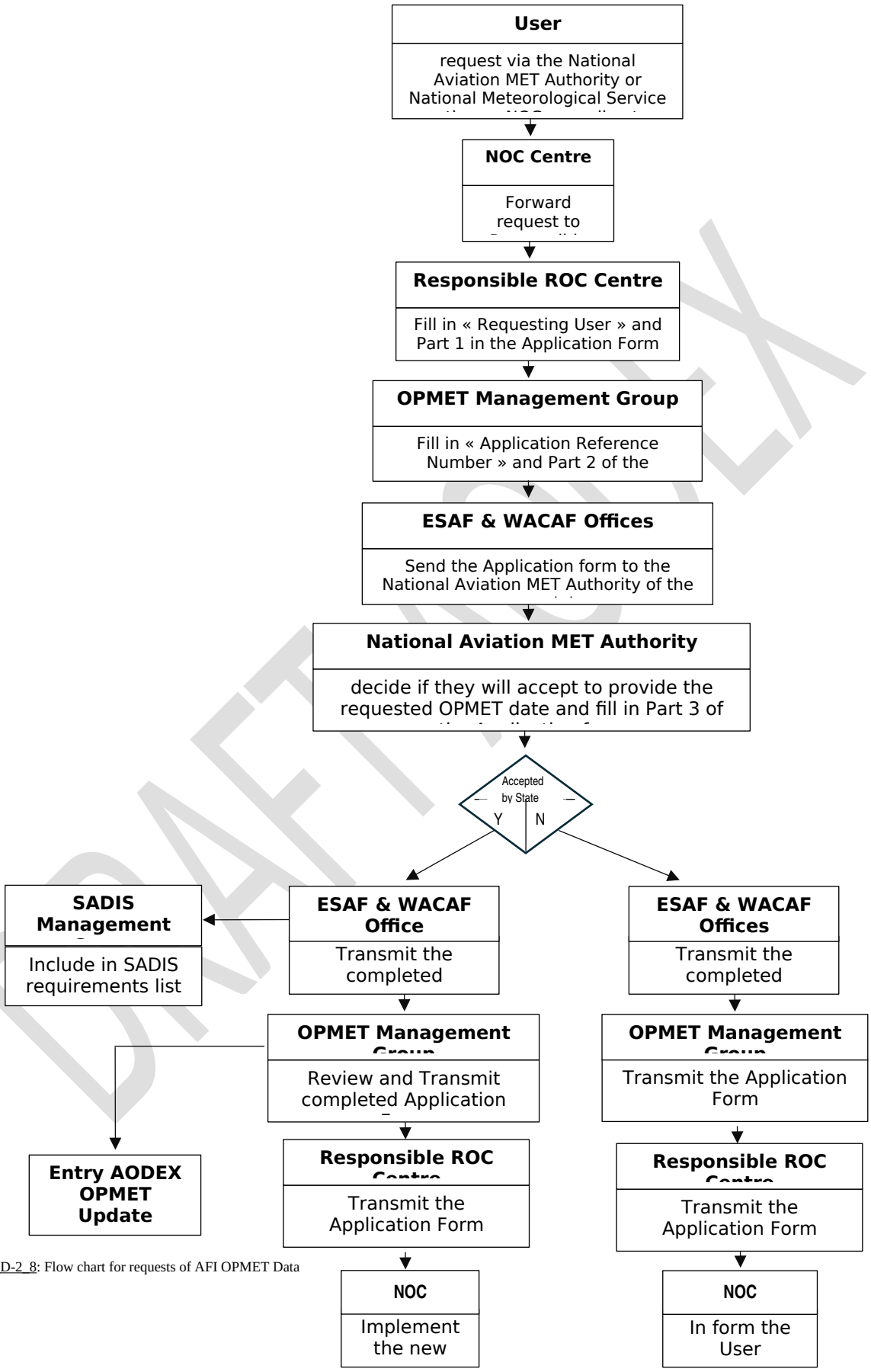

Figure: App_D-2_8: Flow chart for requests of AFI OPMET Data

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APPENDIX E: Exchange of OPMET Data between the AFI, EUR, MID, SAM and APAC Regions (IROG Responsibilities)

1. The IROG Concept

An IROG is a specialized center responsible for:

- **Collecting** OPMET data from its region;
- **Validating** and **monitoring** data quality;
- **Routing** OPMET data to other ICAO regions;
- **Receiving** OPMET data from other IROGs;
- **Ensuring compliance** with ICAO Annex 3, regional handbooks, and IWXXM/SWIM transition plans;
- **Providing backup** for other IROGs when needed.

The IROGs form a **global backbone** for OPMET exchange.

2. Region-by-Region Overview of OPMET Exchange and IROG Responsibilities

2.1. AFI Region (Africa & Indian Ocean)

- Framework: AODEX (AFI OPMET Data Exchange)
- IROG Toulouse (France) acts as the primary interregional gateway for AFI.
- AFI RODB responsibilities (Dakar & Pretoria) :
  - Collect and store AFI OPMET data;
  - Provide remote access (web services);
  - Exchange AFI data with the Toulouse IROG;
  - Monitor compliance, availability, and regularity indices (APIRG Conclusion 20/23);
  - Prepare quarterly and annually performance reports;
  - Support IWXXM/SWIM implementation.
- IROG Toulouse responsibilities for AFI:
  - Ensure AFI OPMET data reaches EUR, MID, APAC, SAM;
  - Validate format and timeliness;
  - Provide backup routing when AFI RODBs are unavailable.

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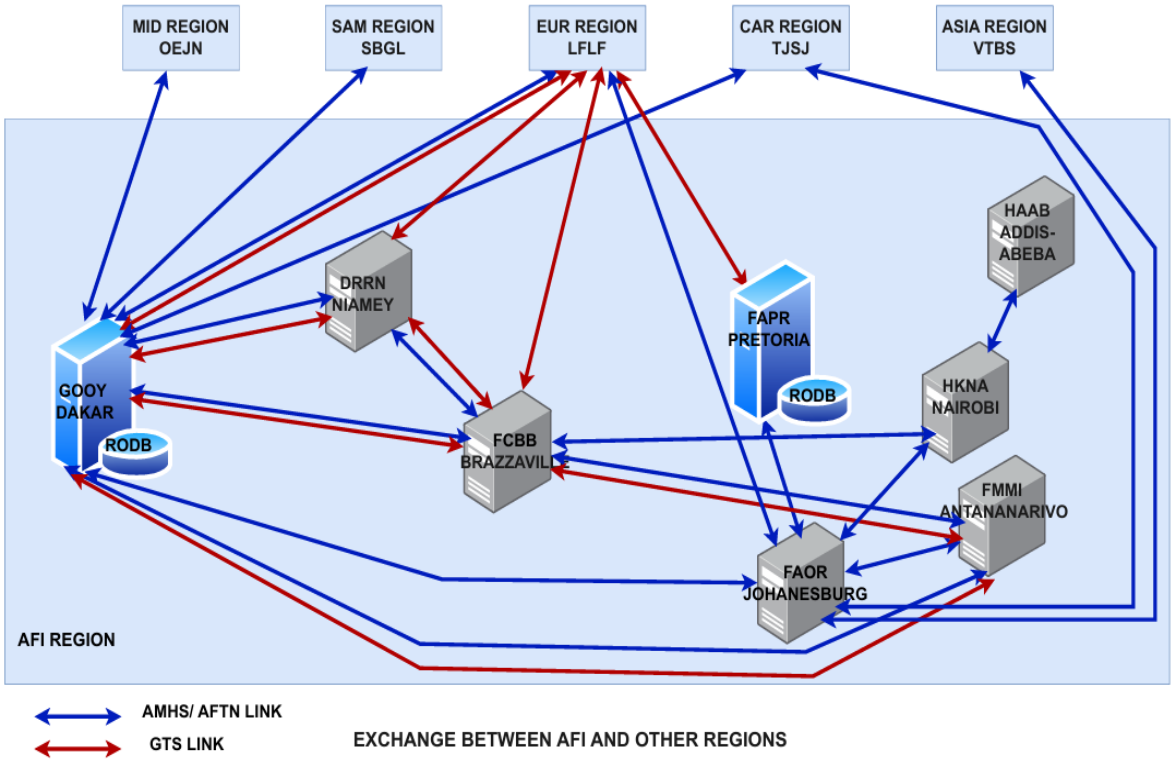

Figure 2.1: Exchange between AFI region and Other Regions

2.2. EUR Region (Europe)

- Framework: RODEX (Regional OPMET Data Exchange) IROGs:
  - Brussels (Belgium);
  - Moscow (Russian Federation);
  - Toulouse (France) (dual role: EUR + AFI gateway).
- EUR IROG responsibilities:
  - Manage the largest global OPMET exchange network;
  - Validate OPMET data via ROC (Regional OPMET Centres);
  - Apply the EUR OPMET Data Monitoring Procedure;
  - Route EUR data to AFI, MID, APAC and SAM;
  - Maintain the RODEX backup scheme;
  - Support IWXXM exchange and metadata validation.

2.3. MID Region (Middle East)

- Framework: MID OPMET Bulletin Exchange
- IROG: Bahrain (primary), with support from Jeddah
- MID IROG responsibilities:
  - Collect OPMET data from MID States;
  - Route data to EUR IROGs (mainly Brussels/Toulouse);

- Ensure availability of SIGMET and TAF for long-haul flights crossing MID airspace;
- Coordinate with AFI and APAC for interregional flows.

2.4. SAM Region (South America)

- Framework: SAM OPMET Exchange Scheme
- IROG: Brasilia (Brazil)
- SAM IROG responsibilities:
  - Consolidate OPMET data from South American States;
  - Exchange data with EUR (Brussels/Toulouse), AFI (via Toulouse), and APAC;
  - Monitor timeliness and compliance;
  - Support IWXXM transition in coordination with WMO/ICAO regional groups.

2.5. APAC Region (Asia–Pacific)

- Framework: APAC OPMET Exchange Scheme
- IROGs:
  - Tokyo (Japan);
  - Singapore
- APAC IROG responsibilities:
  - Collect and validate APAC OPMET data;
  - Route data to EUR, AFI, MID and SAM;
  - Ensure availability of tropical cyclone advisories, volcanic ash SIGMETs, and METAR/TAF for major hubs;
  - Maintain backup routing between Tokyo and Singapore.

3. Inter-regional trade flows

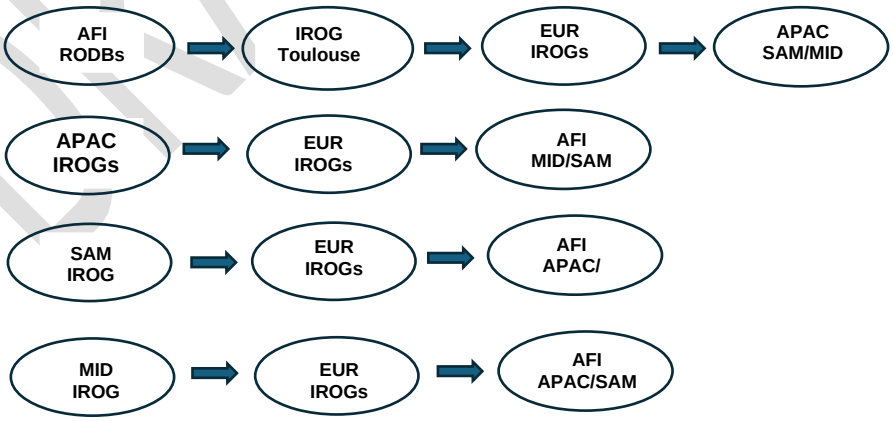

Figure: App_E_3: Inter-regional trade flows

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APPENDIX F: WMO heading for SIGMET bulletins used by AFI Meteorological Watch Office (MWOs)

Explanation of the table

Column

Col 1 : State and name of the MWO.

Col 2 : ICAO location indicator of the MWO.

Col 3 : $T_1T_2A_1A_2ii$ group of the WMO heading for the WS SIGMET bulletin in TAC and IWXXM format.

Col 4 : $T_1T_2A_1A_2ii$ group of the WMO heading for the WC SIGMET bulletin (tropical cyclone) in TAC and IWXXM format.

Col 5 : $T_1T_2A_1A_2ii$ group of the WMO heading for the WV SIGMET bulletin (volcanic ash) in TAC and IWXXM format.

Col 6 : ICAO location indicator of the FIR/CTA served by the MWO.

Col 7 : Remarks.

MWO Location (1)	**ICAO location indicator (2)**	**WMO SIGMET Headings**			**FIR/ACC served**	**Remarks (7)**
		WS (LS) (3)	**WC (LY) (4)**	**WV (LV) (5)**	**ICAO location indicator (6)**	
ANGOLA LUANDA/4 de Fevereiro	FNLU	WSAN31 LSAN31	-	WVAN31 LVAN31	FNAN	
BOTSWANA GABORONE/Sir Seretse Khama	FBSK	WSBC31 LSBC31	WCBC31 LYBC31	WVBC31 LVBC31	FBGR	
BURUNDI BUJUMBURA/Bujumbura	HBBA	WSBI31 LSBI31	-	WVB131 LVBI31	HBBA	
CAPE VERDE SAL I/Amilcar Cabral	GVAC	WSCV31 LSCV31	-	WVCV31 LVCV31	GVSC	
CHAD N'DJAMENA/N'djamena	FTTJ	WSCD31 LSCD31	-	WVCD31 LVCD31	FTTT	
CONGO BRAZZAVILLE/Maya-Maya	FCBB	WSCG31 LSCG31	-	WVCG31 LVCG31	FCCC	
D.R. CONGO KINSHASA/N'Djili	FZAA	WSZR31 LSZR31	WCZR31 LYZR31	WVZR31 LVZR31	FZAA	
ETHIOPIA ADDIS ABABA/Bole Intl	HAAB	WSET31 LSET31	-	WVET20 LVET20	HAAA	
ERITREA ASMARA	HHAS	WSEI31 LSEI31	-	WVEI31 LVEI31	HHAA	

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MWO Location (1)	ICAO location indicator (2)	WMO SIGMET Headings			FIR/ACC served	Remarks (7)
		WS (LS) (3)	WC (LY) (4)	WV (LV) (5)	ICAO location indicator (6)	
GHANA ACCRA/Kotoka Int'l	DGAA	WSGH31 LSGH31	-	WVGH31 LVGH31	DGAC	
KENYA KENYA/Jomo Kenyatta Int'l	HKJK	WSKN31 LSKN31	WCKN31 LYKN31	WVKN31 LVKN31	HKNA	
LIBERIA MONROVIA/Roberts Int'l	GLRB	WSLI31 LSLI31	-	WVSL31 LVSL31	GLRB	
MADAGASCAR ANTANANARIVO/Ivato	FMMI	WSMG31 LSMG31	WCMG20 LCMG20	WVMG20 LVMG20	FMMM	
MALAWI LILONGWE/Lilongwe Int'l	FWKI	WSMW31 LSMW31	WCMW31 LYMW31	WVMW31 LVMW31	FWLL	
MAURITIUS MAURITIUS/Sir Seewoosagur Ramgoolam Int'l	FIMP	WSMA31 LSMA31	-	WVMA31 LVMA31	FIMM	
MOZAMBIQUE MAPUTO/Maputo Int'l	FQMA	WSMZ31 LSMZ31	WCMZ20 LYMZ20	WVMZ31 LVMZ31	FQBE	
NAMIBIA WINDHOEK/Hosea Kutako	FYWH	WSNM31 LSNM31	-	WVNM31 LVNM31	FYWH	
NIGER NIAMEY/Diori Hamani Int'l	DRRN	WSNR31 LSNR31	-	WVNR31 LVNR31	DRRR	
NIGERIA KANO/Mallam Aminu Kano Int'l	DNKN	WSNI31 LSNI31	-	WVNI31 LVNI31	DNKK	
RWANDA KIGALI/Gregoire Kayibanda	HRYR	WSRW31 LSRW31	-	WVRW31 LVRW31	HRYR	
SENEGAL Aéroport Int. Blaise DIAGNE (AIBD)	GOBD	WSSG31 LSSG31	-	WVSG31 LVSG31	GOOO	
SEYCHELLES MAYE/Seychelles Int'l	FSIA	WSSC31 LSSC31	WCSC20 LYSC20	WVSC31 LVSC31	FSSS	
SOMALIA MOGADISHU/Mogadishu	HCMM	WSSI31 LSSI31	-	WVSI31 LVSI31	HCSM	
SOUTH AFRICA JOHANNESBURG/Johannesburg	FAOR	WSZA31 LSZA31	WCZA31 LYZA31	WVZA31 LVZA31	FACA FAJA FAJO	
UGANDA ENTEBBE/Entebbe Int'l	HUEN	WSUG31 LSUG31	-	WVUG31 LVUG31	HUEC	
UNITED REPUBLIC OF TANZANIA DAR-ES-SALAAM/Dar-es-Salaam	HTDA	WSTN31 LSTN31	WCTN31 LYTN31	WVTN31 LVTN31	HTDC	
ZAMBIA Keneth Kaunda/Lusaka Int'l	FLKK	WSZB31 LSZB31	-	WVZB31 LVZB31	FLFI	
ZIMBABWE HARARE/Harare	FVHA	WSZW31 LSZW31	WCZW31 LYZW31	WVZW31 LVZW31	FVHA	

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APPENDIX G: OPMET Quality Control and Monitoring Procedures

1. Quality Control Procedures

1.1. OPMET Data Validation

1.1.1. The ROCs and RODBs should not modify the content of the meteorological data, e.g. visibility, QNH etc., but only items contained in the WMO bulletin headings, such as location indicators or observation times.

1.1.2. WMO Abbreviated Heading ($T_1T_2A_1A_2$ii CCCC YYGGgg BBB) Validation

T_1T_2	Message Type; should comprise two alphabetical characters
A_1A_2	Location Indicator; should comprise two alphabetical characters
ii	Comprise two digits, from 01 to 99
CCCC	A 4-letter ICAO location indicator should comprise four alphabetical characters.
YYGGgg	The date-time group of the bulletin should be configured to validate it with the current time
BBB	BBB is an optional group. The use of the BBB group should comply with the rules in the WMO abbreviated heading in regard to delayed, corrected and amended bulletins.

Example	After QC check
METAR with incorrect YYGGgg: SACE31 FEFF 100830 **UTC** METAR FEFF 100830Z 18005KT 8000 FEW025 31/18 Q0950 =	 SACE31 FEFF **100830** METAR FEFF 100830Z 18005KT 8000 FEW025 31/18 Q0950 =
TAF without AHL :	
112324 GQNOYMYX TAF GQPP 112324Z 1200/1224 00000KT 4000 RA BKNT017 BECMG 1203/1205 20010KT 9000 SCT017=	**FTMT31 GQNO 112300** TAF GQPP 112324Z 1200/1224 00000KT 4000 RA BKNT017 BECMG 1203/1205 20010KT 9000 SCT017=
TAF with invalid BBB :	
FTCG31 FCBB 030525 **AMD** TAF AMD FCPP 030525Z 0306/0406 16010KT CAVOK BECMG 0308/0312 33017KT 5000 PROB30 TEMPO 0308/0314 0800 DU=	FTCG31 FCPP 030525 AAA TAF AMD FCPP 030525Z 0306/0406 16010KT CAVOK BECMG 0308/0312 33017KT 5000 PROB30 TEMPO 0308/0314 0800 DU=

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1.1.3. METAR/SPECI Validation

1.1.3.1. For each individual METAR or SPECI within a bulletin, the following additional fields should be validated:

Prefix checks	METAR METAR COR SPECI SPECI COR	SA SA SP SP
Observation Time YYGGggZ	The report should have a valid date and time of observation, including the character 'Z'. In a SPECI bulletin, this group will be the same as (or very close to) the YYGGgg, part of the abbreviated bulletin heading.	
End-of-message format "="	Each METAR or SPECI report should be terminated by the "=" character.	

Example	After QC check
METAR with Observation Time error:	
SAPK31 OPKC **030159** RRA OPKC **030200** 26004 8000 BKN020 27/23 Q1007 NOSIG=	SAPK31 OPKC **030200** RRA OPKC **030200** 26004 8000 BKN020 27/23 Q1007 NOSIG=
METAR with mistyped observation time:	
SAID31 WADD **120100** METAR WADD **121000Z** 17004KT 9999 FEW018CB SCT120 BKN300 28/26 Q1005=	SAXX31 WADD **120100** METAR WADD **120100Z** 17004KT 9999 FEW018CB SCT120 BKN300 28/26 Q1005=
SPECI with incorrect Message Type, TT:	
SANZ31 NZKL 040000 **SPECI** NZWP 040000Z 17005KT 010V240 25KM FEW020 FEW020CB SCT035 BKN050 18/15 Q1018 NOSIG=	**SPNZ31** NZKL 040000 AAA **SPECI** NZWP 040000Z 17005KT 010V240 25KM FEW020 FEW020CB SCT035 BKN050 18/15 Q1018 NOSIG=

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1.1.4. TAF Validation

1.1.4.1. For each individual TAF within a bulletin, the following additional items should be validated:

Prefix checks	TAF TAF COR TAF AMD	FT or FC FT or FC FT or FC
Issue Time YYGGggZ	The report should have a valid date and time of observation, including the character 'Z'. In a SPECI bulletin, this group will be the same as (or very close to) the YYGGgg, part of the abbreviated bulletin heading.	
Validity $Y_1Y_1G_1G_1/Y_2Y_2G_2G_2$	If the field is included, it should have a valid date and time of origin of the forecast, including 'Z'.	
End-of-Message format "="	Each forecast should be terminated by the "=" character	

Example	After QC check
TAF with issue time error (wrong date): FCCG31 FCBB 181630 TAF FCOU **041630Z** 0418/0503 00000KT 9000 FEW025 BECMG 0422/0424 16005KT=	FCCG31 FCBB 181630 TAF FCOU **181630Z** 0418/0503 00000KT 9000 FEW025 BECMG 0422/0424 16005KT=
TAF with mistyped Validity Period: FTSL31 GFLL 132200 TAF GFLL 132200Z **1400/1428** 04006KT 9999 SCT036 BKN300 TEMPO 1400/1406 02010KT 5000 –SHRA FEW020 BKN270 TX32/1405Z TN22/1421Z=	FTSL31 GFLL 132200 TAF GFLL 132200Z **1400/1424** 04006KT 9999 SCT036 BKN300 TEMPO 1400/1406 02010KT 5000 –SHRA FEW020 BKN270 TX32/1405Z TN22/1421Z=
TAF with Validity error (wrong date):	
FCGN33 GUCY 170748 TAF GUXN 170700Z **3009/3018** 30005KT 9999 FEW017CB SCT140 BKN270=	FCGN33 GUCY 170748 TAF GUXN 170700Z **3009/3018** 30005KT 9999 FEW017CB SCT140 BKN270=
TAF with 4-digit Validity period:	
FTKN31 HKJK 170121 TAF HKJK **0618** 06010G20KT 9999 SCT018 BECMG 1712/1714 00000KT 7000=	FTKN31 HKJK 170121 TAF HKJK **1706/1718** 06010G20KT 9999 SCT018 BECMG 1712/1714 00000KT 7000=

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1.1.5. SIGMET Validation

CCCC on the AHL	A valid 4-letter ICAO location indicator indicating the FIR for which the SIGMET was.	
Prefix checks	SIGMET for TS, TURB, ICE, MTW, DS, SS and RDOACT CLD SIGMET for VA SIGMET for TC	WS WV WC
Validity Period DDHHMM/DDHHMM	Should have a valid period of validity. Validity periods may be corrected if: • Missing VALID string • Incorrect SIGMET number format • Incorrectly formatted validity period.	
Note: For SIGMET validation, please refer to the format described in the ASIA/PAC Regional SIGMET Guide.		

Example	After QC check
SIGMET without $T_1T_2A_1A_2ii$	
SIGMET FZAA 121525Z FZAA SIGMET 1 VALID 121530/122130 OYSNSANAA FIR EMBD TS OBS/FCST OVER WESTERN AND SOUTHWESTERN MOUNTAINS AND COASTAL AREAS CB TOPS FL36 NC=	**WSZR31** FZAA 121525Z FZAA SIGMET 1 VALID 121530/122130 OYSNSANAA FIR EMBD TS OBS/FCST OVER WESTERN AND SOUTHWESTERN MOUNTAINS AND COASTAL AREAS CB TOPS FL36 NC=
SIGMET with incorrect number format	
WCLI30 GLRB 210445 SIGMET NO 01 VALID 210000/210600 RPLL TC OBS N0830 E12900 ….=	WCLI30 GLRB 210445 SIGMET 01 VALID 210000/210600 RPLL TC OBS N0830 E12900 … =
SIGMET with incorrectly formatted validity period	
WSMW31 FWLI 181800 FWLI SIGMET 06 VALID **18/1600 TO 18/2000 UTC** VIDPDELHI FIR EMBD TS … =	WSMW31 FWLI 181800 FWLI SIGMET 06 VALID **181600/182000** VIDPDELHI FIR EMBD TS … =
WSNI20 DNKN 220503 DNKN SIGMET 01 VALID **220500 TO 220900** DNKK FIR ….=	WSNI20 DNKN 220503 DNKN SIGMET 01 VALID **220500/220900** DNKK FIR … =

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1.2. Quality Control Methods

OPMET Data	Elements Defining	Control Methods
METAR METAR COR SPECI (SA, SP)	• AHL • Code name • Observation date/time	Software verification Manual validate Periodic Quality Control & PI Monitoring
TAF TAF AMD TAF COR (FT, FC)	• AHL • Code name • Originating station ICAO location indicator • Date/time of issue • Date, time of starting, time of the end of the period the forecast refers to	Software verification Manual validate Periodic Quality Control & PI Monitoring
SIGMET (WS, WC, WV)	• AHL • SIGMET Sequence No • Date/time groups indicating the period of validity Additional Checks (recommended): • Name of the FIR or the CTA the message is issued for • Location indicator of the MWO originating the message	Software verification Manual validate Periodic SIGMET Quality Control Monitoring
Volcanic Ash Advisory FV	• Type of message • Issue date and time Additional Checks (recommended): • Location indicator or name of the VAAC centre originating the message	Software verification Manual validate Periodic VA Quality Control Monitoring
Tropical Cyclone Advisory FK	• Type of message • Issue date and time Additional Checks (recommended) • Location indicator or name of the TCAC centre originating the message	Software verification Manual validate Periodic TC Quality Control Monitoring

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2. OPMET Monitoring

2.1. Monitoring of Scheduled OPMET data

2.1.1. Performance Indicators (PIs). The indices to be used by the RODBs are based on those developed by the European Bulletin Management Group BMG) (refer to the *EUR OPMET Data Management Handbook, Appendix F, Output Performance Indices*).

(i) Compliance Index

The AODEX Compliance index can be calculated from:

2.1.1.1. The Compliance Index is to assess the level of compliance to the ROBEX scheme. The determination of the compliance index is performed as follows:

- The total number of reports received for AODEX bulletin during the monitoring period, including reports in the retard bulletins.
- Weed out correction and amendment bulletins, as these are retransmitted messages, can be disregarded.

Explanation **«No». of reports received for a bulletin** is the number of reports that are not "NIL." In other words, do not count the reports that are "NIL." In addition, do not count reports that are corrections and amendments in nature. However, the assessment should include the delayed reports in the retard bulletins.

No. of reports required for a bulletin is the number of reports that each RODB should expect to receive within each particular bulletin.

Procedure :

1. For each day, run through the aerodromes within each bulletin. Count the number of reports that do not contain optional elements and are not «NIL» Alternatively, count the number of reports that contain "Optional RRX
2. For each day, calculate the required number of reports for each bulletin by adding the number of required reports for each aerodrome listed in each bulletin.
3. For each day, calculate the compliance index by taking the ratio of the No. of reports received for a bulletin (calculated in 1.) and the number of reports required for a bulletin (calculated in 2.).
4. To calculate the monthly compliance index, add up the compliance index (calculated in 3.) of all the days in a month and divide by the number of days in the month, e.g., 288/288 + 240/288 + 288/288 + ... + 288/288 => (31 elements for 31 days).
5. Alternatively, to calculate the monthly compliance index, add up the number of reports received for a bulletin (calculated in 1.) for all the days in a month and divide by the number of reports required for a bulletin (calculated in 2.) in that month.

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Example 1:

Le bulletin SAAO24 concerne six aérodromes (DBBB, FTTJ, FTTC, FTTY, FTTD et FTTA). Pour chaque aérodrome, le nombre de rapports requis pour la publication du bulletin est de 2 × 24 = 48 rapports. Les observations officielles étant effectuées toutes les heures et demi-heures (HH+00 et HH+30), deux rapports sont attendus par période de 24 heures. Si, le 2 mars seulement, la BRDO ne reçoit aucun rapport d'un aérodrome, calculez l'indice de conformité du bulletin SAAO24 pour ce mois.

Answer:

No. of reports received for a bulletin = (6 aerodromes*48 reports*30 days) + (5 aerodromes*48 reports*1 day) = 8,640 + 240 = 8,880

No. of reports required for a bulletin = (6 aerodromes*48 reports*31 days) = 8,928

March compliance index = 8,880/8,928 = 0.9946

(ii) Availability Index

The availability index measures the current coverage of the OPMET distribution against the ROBEX exchange requirements. The determination of the availability index is performed on a daily basis from the data captured during the monitoring period. If at least one non-NIL report is received from the aerodrome during the 24-hour period, that aerodrome is considered to have been available. The daily availability index of a particular bulletin can be calculated as:

NIL data type is defined as a data element that reports there are no observations (SA) or forecasts (FT).

Non-NIL data type is defined as a data element that is not “NIL”, i.e. not (METAR VTBD 270200Z NIL=).

No of aerodromes for which one or more non-NIL data types are received is the number of aerodromes that receive one or more non-NIL data types within a period of one day or 24 hours.

No of aerodromes required in the bulletins is the total number of aerodromes listed in the bulletin from which RODB should receive data.

For example, the Bulletin SAAO24:

SAAO24 DRRN 012350

METAR DBBB 012350Z 16004KT 2500 HZ SCT018 BKN100 28/26 Q0996 NOSIG=

METAR FTTJ 012350Z NIL=

METAR FTTC 012350Z 14007KT 6000 SCT015 BKN100 27/26 Q0998 NOSIG=

METAR FTTY 012350Z 17005KT 4000 HZ BKN010 OVC100 28/25 Q0997 TEMPO RA=

METAR FTTD 012350Z NIL=

METAR FTTA 012350Z NIL=

The number of aerodromes required in the bulletin SASD31 for that particular day is 6 aerodromes.

Procedure :

1. For each day or the period of 24 hours, obtain the number of aerodromes required in the bulletin.

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2. For each day or the period of 24 hours, run through the aerodromes within each bulletin. Count the numbers of reports received from each aerodrome that contain non-NIL data type. If the number exceeds zero, then that aerodrome receives one point, else zero points. Add up the points of each aerodrome to obtain the number of aerodromes for which one or more non-NIL data type is received.

3. For each day, calculate the availability index by taking the ratio of the number of aerodromes for which one or more non-NIL data types are received (calculated in 2.) and the number of aerodromes required in the bulletin (calculated in 1.).

4. To calculate the monthly availability index, add up the daily availability index (calculated in 3.) of all the days in a month and divide by the number of days in the month, e.g., 6/6 + 6/6 + 6/6 + 5/6 + 4/6 + 6/6 + ... + 2/6 => (31 elements for 31 days).

5. Alternatively, , to calculate the monthly availability index, add up the number of aerodromes for which one or more non-NIL data types are received (calculated in 2.) for all the days in a month and divide by the number of aerodromes required in the bulletin (calculated in 1.) in that month.

Example 2:

Bulletin SAAO24 continued from example 1.

Calculate the availability index for Bulleting SAAO243 in March.?

Answer:

No. of aerodromes required in the bulletin = 6 aerodromes *31 days = 186

No of aerodromes for which one or more non-NIL data type are received = (6 aerodromes*30 days) + (5 aerodromes*1 day) = 180 + 5 = 185

March availability index = 185/186 = 0.9946

(iii) Regularity Index

The regularity index measures the consistency in the number of reports provided by an aerodrome. The computation of the Regularity Index assumes that the number of reports follows a normal distribution and attempts to ascertain the distribution characteristics (mean and standard deviation) from a set of data. These characteristics are used to determine if the subsequent number of reports from an aerodrome is “regular”.

Denoting mean and standard deviation by and μ , a threshold report numbers σ can be established as:

$$\tau = \mu - \sigma$$

The threshold is a reporting characteristic of an aerodrome. If the subsequent daily number of reports meets or exceeds the threshold, it is considered “regular”. The daily regularity index for a bulletin can be expressed as:

The **threshold** is the number of reports provided by the aerodrome, which is considered “regular.” This number is defined by calculating the statistics (mean and standard deviation) of the number of reports provided by the aerodrome within a time frame, e.g., six months, one year, or five years.

No of aerodromes which the number of reports exceeds the threshold is the number of aerodromes that provide more than τ reports within a period of one day or 24 hours.

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No of aerodromes required in the bulletin is the total number of aerodromes listed in the bulletin from which RODB should receive data from.

Procedure :

1. Calculate the threshold for each aerodrome within the RODB's responsibility by collecting the number of reports each aerodrome receives within the given time frame.
2. For each aerodrome, find the mean (average) and standard deviation (deviation from the mean), e.g., for a time frame of five days (for simplicity), VECC provides daily 10, 7, 10, 8, and 9 reports respectively, therefore, Mean = (10+7+10+8+9)/5 = 8.8 and Standard deviation = sqrt [(10-8.8)^2+(7-8.8)^2+(10-8.8)^2+(8-8.8)^2+(9-8.8)^2] / 5 = 1.304.
3. Calculate the threshold by subtracting the standard deviation from the mean. From the above example, the threshold τ = 8.8-1.304 = 7.45 reports.
4. For each day or the period of 24 hours, run through the aerodromes within each bulletin. Count the number of reports received from each. If the number exceeds τ, then that aerodrome receives one point, else zero point. Add up the points of each aerodrome to obtain the No of aerodromes which the number of reports exceeds the threshold.
5. For each day or the period of 24 hours, obtain the number of aerodromes required in the bulletin.
6. For each day, calculate the regularity index by taking the ratio of the number of aerodromes which the number of reports exceeds the threshold (calculated in 4) and the number of aerodromes required in the bulletin (calculated in 5).
7. To calculate monthly regularity index, add up the daily availability index (calculated in 3) of all the days in a month and divide by the number of days in month, e.g., 6/6 + 6/6 + 6/6 + 5/6 + 4/6 + 6/6 + ... + 2/6 => (31 elements for 31 days).
8. Alternatively, to calculate the monthly availability index, add up the number of aerodromes in which the number of reports exceeds the threshold (calculated in 4) for all the days in a month and divide by the number of aerodromes required in the bulletin (calculated in 5) in that month.

Example 3:

Bulletin SAAO32 continued from example 1.

Aerodrome	Threshold
GABS	10 reports
GAGO	10 reports
GAKD	10 reports
GAKL	10 reports
GAMB	10 reports
GANR	10 reports
GATB	10 reports

If on the 2nd and 15th of March, the RODB does not receive reports from VQPR and on 15th of March, the RODB does not receive reports from VGEG. On any other days, all the aerodromes provided more than ten reports. Calculate the regularity index for Bulletin SAIN33 in March.

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Answer:

No. of aerodromes required in the bulletin = 6 aerodromes *31 days = 186

No of aerodromes which the number of reports exceeds the threshold = (6 aerodromes*29 days) + (5 aerodromes*2 days) = 174 + 10 = 184

March regularity index = 184/186 = 0.9892

2.2. Monitoring of non-scheduled OPMET data

2.2.1. Monitoring of non-scheduled OPMET data should be executed for FK, FV, WC, WS, and WV types of bulletins.

2.2.2. The monitoring results should be presented in a bulletin-oriented format, one line per bulletin indicating the abbreviated header ($T_1T_2A_1A_2$ii CCCC YYGGgg), the FIR/UIR where applicable, receipt time and originator.

2.2.3. Example non-routine OPMET monitoring result file formats :

T_1T_2	A_1A_2ii	CCCC	YYGGgg	FIR/UIR	Rx Time	Origin
WS	MG31	FMMI	271004	FMMM	271004	FMMIYMYX
WS	MW31	FWLI	271000	FWLL	271007	FWLIYMYX
WS	MA31	FIMP	271100	FIMM	271030	FIMPYMYX
WS	MZ31	FQMA	271150	FQBE	271150	FQMAYMYX
WS	NM31	FYWH	272013	FYWH	272013	FYWHYMYX
WS	RW31	HRYR	272225	HRYR	272228	HRYRYMYX
FV	AU01	ADRM	270323		270330	YMMCYMYX
FK	PQ30	RJTD	270500		270504	RJTDYMYX

Explanation of the table :

- *TT:* Type of bulletin FK, FV, WC, WS, WV
- *AAii:* Bulletin ID
- *CCCC :* Compiling Station
- *YYGGgg:* Standard time of the report
- *FIR/UIR:* ICAO Location indicator of the FIR/UIR or blank (4 spaces) as applicable
- *RxTime: Time of receipt*
- *Origin: Originator address.*

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2.2.4. Analysis of Monitoring Results:

2.2.4.1. Each RODB collects and analyses the relevant result in order to determine the effectiveness and suitability of the quality management system and to highlight any possible improvement to the ICAO Office, Bangkok.

2.3. Examples of Monitoring Results – PI Measurements

2.3.1. The following tables show values of Compliance, Availability and Regularity Index for AFI OPMET bulletins compiled by the Pretoria RODB:

Note: *Entry dashed out (--) means no reports of this type (SA or FT) are required*

a) Table A: AODEX Compliance Index

Table A	AODEX Compliance Index		
	SA	**FT**	**FC**
AM31 FCBB	0.81	--	--
AM29 FCBB	--	0.99	--
AM28 FCBB	0.96	0.99	--
AO30 GOOY	--	0.98	--
AO31 GOOY	--	0.85	--
AO32 GOOY	1.00	0.99	0.97

***Note*:** *Results in tiled dots (--) indicate that no such reporting (SA or TF) is required*.

b) Table B: AODEX Availability Index

Table B	AODEX Availability Index		
	SA	**FT**	**FC**
AM31 FCBB	0.98	--	--
AM29 FCBB	--	1.00	--
AM28 FCBB	0.99	1.00	--
AO30 GOOY	--	0.99	--
AO31 GOOY	--	0.96	--
AO32 GOOY	1.00	1.00	1.00

c) Table C: AODEX Regularity Index

Table B	AODEX Regularity Index		
	SA	**FT**	**FC**
AM31 FCBB	0.86	--	--
AM29 FCBB	--	0.96	--
AM28 FCBB	0.93	0.96	--
AO30 GOOY	--	0.96	--
AO31 GOOY	--	0.96	--
AO32 GOOY	0.90	0.90	0.96

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APPENDIX H: List of AODEX Focal Points

No	State	First/ Family Name	Function	Address	E-mail	Phone
1.	Angola					
2.	Ascension Island (United Kingdom					
3.	Benin					
4.	Botswana					
5.	Burkina Faso					
6.	Burundi					
7.	Cameroon					
8.	Cape-Verde					
9.	Central African Rep					
10.	Chad					
11.	Comoros					
12.	Congo					
13.	Central Africa Republic					
14.	Cote d'Ivoire					
15.	Democratic Republic of Congo					
16.	Djibouti					
17.	Equatirial Guinea					
18.	Eritrea					
19.	Ethiopia					

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No	State	First/ Family Name	Function	Address	E-mail	Phone
20.	Eswatini					
21.	Gabon					
22.	Gambia					
23.	Ghana					
24.	Guinea					
25.	Guinea Bissau					
26.	Ile de la Reunion (France)					
27.	Kenya					
28.	Lesotho					
29.	Liberia					
30.	Madagascar					
31.	Malawi					
32.	Mali					
33.	Mauritania					
34.	Mauritius					
35.	Mozambique					
36.	Namibia					
37.	Niger					
38.	Nigeria					
39.	Reunion (France)					
40.	Rwanda					
41.	Sao Tome					

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No	State	First/ Family Name	Function	Address	E-mail	Phone
42.	Senegal					
43.	Seychelles					
44.	Sierra Leone					
45.	Somalia					
46.	South Africa					
47.	Soudan					
48.	South Sudan					
49.	Swaziland					
50.	Tanzania					
51.	Togo					
52.	Uganda					
53.	Zambia					
54.	Zimbabwe					
	United Kingdom (SADIS)					
	ASECNA					
	IATA					
	Dakar RODB					
	Pretoria RODB					
	WMO					
	ICAO/ESAF					
	ICAO/WACAF					
	EUR DMG					
	Toulouse IROG					

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No	State	First/ Family Name	Function	Address	E-mail	Phone
	ASIA/PAC IROG					
	SAM IROG					
	MID IROG					

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APPENDIX I : Interface Control Document

1. INTRODUCTION

1.1. This document defines the standard access procedures for the designated ICAO Regional OPMET databanks (RODB) in the AFI Region.

1.2. It also informs about the standard formats for request and reply messages.

1.3. By accessing these databanks, the user implicitly acknowledges the disclaimer in A.12.

2. AFI REGIONAL OPMET DATABANKS

2.1. RODB-Sites in the AFI-Region

2.1.1. The designated OPMET Regional Data Banks (BRDO) in the AFI region are located in Dakar AIBD in Senegal and Pretoria in South Africa.

2.2. Backup procedures

2.2.1. In case of an outage of one of the two AFI OPMET databanks, any of the other databank can be used as fall-back. To this end, the user should simply change the AFTN/AMHS-address to which the request is sent.

2.3. Access addresses

2.3.1. The AFI OPMET Databanks can be accessed via the ICAO AFS only, either via AFTN or AMHS

2.3.2. The AFTN addresses to be used to access the OPMET databanks via an AFTN user system/terminal are the following:

RODB	AFTN Adress	AMHS Adress
Dakar AIBD	GOOYYZYZ	/C=XX/A=ICAO/P=GO/O=AFTN/OU=GOOYYZYZ
Pretoria	FAPRYMYX	/C=XX/A=ICAO/P=FA/O =AFTN/OU=FAPRYMYX

2.3.3. Meteorological Data Types

- The types of data processed are listed in paragraphs 5.1.2 and 5.1.3.
- A reply for a METAR request will consist of the latest METAR or SPECI reports available for the concerned station.
- Available only at Dakar AIBD and Pretoria RODB.
- When a query for WS (TAC format) or LS (IWXXM format) SIGMETs is received, the reply will contain all valid SIGMETs (General, Volcanic Ash and Tropical Cyclone) that are available for the FIR and or UIR.
- Due to the lack of an ICAO identifier in the message, the reply to a FV/FK request, and where available to an FN request, will contain all valid FV/FK/FN messages at the time of the request. Therefore, a dummy ICAO indicator “XXXX” is used in the request (see further for the request format)

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2.3.4. OPMET Databank Requests:

- Request messages should follow the standard AFTN/AMHS telecommunications procedures as defined in ICAO Annex 10, Volume II. The text portion of the messages is defined in this document.
- Requests for TAC data can be sent via the AFS using AFTN or AMHS. These requests work as described in current RODB Interface Control Documents (ICD) or equivalent document.

2.3.5. Request for TAC data using AFTN

a) Request messages should use the AFTN priority code GG. The general format of the request message is as follows:

GG xxxxxxxx
YYGGgg yyyyyyyy
RQM/T_1T_2CCCC/ T_1T_2AAii/ T_1T_2AAii……. =
RQM/T_1T_2CCCC, T_1T_2/ T_1T_2AAii……..……=
……..=

GG is the AFTN Priority indicator

xxxxxxxx: is the ROBD AFTN address (GOOYYZYZ or FAPRYMYX)

YYGGgg is the Date-hour-minutes of request

yyyyyyyy: is the AFTN address of the request originator.

b) Each data query line is composed of the following elements:

RQM/ indicates the start of a data query line

T_1T_2: the WMO data type identifier (in accordance with Appendix D-1, chapter 2).

CCCC: the 4-letter location indicator (in accordance with ICAO Doc 7910)

Where **A_1A_2ii** the bulletin identifier (WMO Manual No. 386, Table C_1 for A_1A_2).

=: the end-of-query-line indicator.

c) Delimiters can be used in a query line as follows:

,: indicates more queries for messages or bulletins for the same data type or different data types for a location.

/: indicates a query for new data in the same data query line.

2.3.5.1.1. The query line length should not exceed 69 characters, including the abbreviation 'RQM' and the '=' sign. Up to ten query lines may be included in an AFTN query message, unless otherwise specified by the RODB (see the Restrictions Section in the Appendices).

2.3.5.1.2. There are different types of requests allowed in the query message text:

- *Type 1: To request a type of data for a station.*

RQM/$\mathbf{T_1T_2}$CCCC where:

*Example 1: RQM/**SA**DFFD= (To request the latest METAR data of DFFD station)*

- *Type 2: To request a type of data for multiple stations*

  RQM/$\mathbf{T_1T_2}$CCCC, CCCC, CCCC=

  *Example 2: RQM/**FT**FCBB, LFPG, DIAP=*

- *Type 3: To request multiple types of data for multiple stations*

  RQM/$\mathbf{T_1T_2}$CCCC, CCCC/ $\mathbf{T_3T_4}$CCCC/ $\mathbf{T_6T_7}$CCCC, CCCC, CCCC=

  *Example 3: RQM/**SA**FTTJ, GOOY/**WS**FTTT, FCCC/**FT**FGSL, HAAB, FLBO=*

- *Type 4: To request multiple types of data for a station*

  RQM/$\mathbf{T_1T_2}$CCCC, $\mathbf{T_3T_4}$, $\mathbf{T_5T_6}$ =

  *Example 4: RQM/ **SADRRN, FT, WS** =*

- *Type 5: To request for a weather bulletin*

  The query line format for obtaining a Weather Bulletin is as follows:

  RQM/T_1T_2AAii=

  Example 5 : RQM/SAAO32=

  RQM/FTAE31=

Note: Only one bulletin can be the subject of a query in an RQM query line. Up to six bulletins can be included in a query message.

2.3.6. Request for TAC data using AMHS

2.3.6.1. Request messages for TAC data sent via AMHS should follow the AMHS standard telecommunication procedures as defined in ICAO Annex 10, volume II and ICAO Doc 9880 "Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards" – Part II.

2.3.6.2. The request message should be sent as Text Body Part. The Text Body Part should contain a single REQUEST LINE as defined in A.2.6.

- *RQM-request examples*

RQM/SAHAAB=	One request of single report of type SA
RQM/WSFCCC=	One request of all valid SIGMET messages in a single FIR/UIR
RQM/FTFMMI, FMCH=	One request of two reports of type FT
RQM/SAHAAB/FTFMMI, FMCH/WSFCCC=	Three requests of above combined
RQM/SALFBO, FT=	A request of a SA type and a FT type report for the same station
RQM/UAGOOO=	*One request of all valid ARS messages in a single FIR or UIR (not supported yet by all ROBDs)*

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- *Example of an RQM embedded in an AFTN request message:*

```
GG FAPRYMYX
121452 DNKNYMYX
RQM/SAFTTJ, FKKD/WSFCCC=
```

2.3.6.3. Databank Reply Format

a) If the originator AFTN/AMHS address is authorized, the databank will automatically reply to the AFTN/AMHS originator address given in the request message.

b) Valid requests will produce one or several answers, which will be returned in a standard WMO bulletin format embedded as text in a standard AFTN message or as a Text Body Part of an AMHS message. Each bulletin will be sent as a separate AFTN/AMHS message.

c) Per group of valid requested reports belonging to the same type, one or more bulletins will be generated.

d) For regular messages (METAR, TAF...) the reply will consist of the latest valid, not NIL reports.

e) For non-regular messages (SIGMET) the reply will consist of all valid SIGMET-messages for the requested FIR.

f) For ARS, if supported by the RODB, the reply will consist of all ARS messages received during the last hour and containing phenomena reported within the lateral boundaries of the requested FIR or UIR, not taking into consideration the height/flight level of the report. This means, that a ARS may be replied for an FIR as well as for an UIR above.

g) Only ARS which include co-ordinates as position are supported by the RODBs.

h) For advisory messages the reply will contain the most recent valid message for each volcano, tropical cyclone or the valid Space Weather Advisories.

i) The abbreviated heading of a reply message will be constructed as $T_1T_2A_1A_2$ii CCCC YYGGgg where:

TT = the requested data type

AA = XX: fixed geographical designator for databank reply

ii = 99: fixed bulletin number for databank reply

CCCC = location indicator of the replying databank (e.g. FAPR, GOBD,)

YYGGgg = depending on the original DTG of the Bulletin Header.

2.3.6.4. The Report(s) within the collective bulletin are copied as received. Reports which result to have the same DTG will be grouped in one or more collective bulletins with a maximum length of 1800 characters (see ref.: ICAO Annex10 Vol II section 4.4.5.7). Where necessary, consecutive messages will be generated with the same header and will start with a complete report (reports will not be split).

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2.3.6.5. Examples for Databank Replies

- *Example 1*: Request to DAKAR ROBD at 08h35: **RQM/SADRRN, FCBB, LFPG**

  Reply message 1:

  SAXX99 GOBD 110850

  METAR DRRN 110830Z 30008KT 9999 FEW020CB 23/08 Q1015 NOSIG=

  METAR FCBB 110830Z 27010KT 9999 SCT200 26/17 Q1015 NOSIG=

  METAR LFPG 110800Z 28008KT 9999 BKN100 14/09 Q1016 NOSIG=

  Remark: the 0830Z METAR for LFPG was not available)

- *Example 2:* Request to Pretoria ROBD at 0832Z: RQM/SAHAAB, FT=

  Reply message 2:

  SAXX99 FAPR 110800

  METAR HAAB 110830Z 30008KT 9999 FEW020CB 13/08 Q1017 NOSIG=

  and

  FTXX99 FAPR 110500

  TAF HAAB 110530Z 1106/1212 30010KT SCT020 SCT040 PROB30 TEMPO 1110/1119 34015G25KT 5000 SHRA BKN016=

- *Example 3:* Request to Dakar RODB at 1215Z: RQM/WSGOOO=

  Reply message 3:

  WSXX99 GOBD 061215

  GOOO SIGMET 02 VALID 061215/061600 GOOO FIR/UIR SEV TURB FCST BTN GND/FL070 NC=

2.3.6.6. Error/Information replies

a) An appropriate error/information reply will be sent to the user in the following cases:
   - the request line contains a syntax error;
   - the user is not allowed to request this information
   - the station(s) for which data is requested is (are) unknown
   - the data is unavailable

b) Error/Information replies will be sent in WMO message format as a:
   - text Body Part of a AMHS message in case the request was received via AMHS;
   - AFTN message in case the request was received via AFTN.

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c) The abbreviated heading of an Information or Error Reply message will be constructed as $T_1T_2A_1A_2$ii CCCC YYGGgg, where:

T_1T_2 = ZZ

A_1A_2 = XX: fixed geographical designator for databank replies;

ii = 99: fixed bulletin number for databank reply;

CCCC = location indicator of the replying databank (e.g. EBBR, LFPW, LOWM);

YYGGgg = DTG corresponding to the issuing time of the Information or Error Reply.

2.3.6.7. Examples with error/information replies

- *Request to Dakar ROBD: RQM/SAGOO/FTGUCY=*

  Reply message:

  ZZXX99 GOBD 110912

  RQM/SAGOBD= SYNTAX ERROR=

  and

  FTXX99 GOBD 110800

  TAF GUCY 110800Z 1109/1118 35008KT 9999 SCT030=

2.3.6.8. Access not authorized

- *Request: RQM/SAEBBR=*

  Reply message:

  ZZXX99 GOBD 110915

  RQM/SAEBBR

  ACCESS NOT AUTHORISED

- *Request to Pretoria ROBD: RQM/SAEBBR/FTEHAM=*

  Reply message:

  ZZXX99 FAPR 110905

  RQM/FTEHAM

  ACCESS NOT AUTHORISED=

  and

  SAXX99 FAPR 110850

  METAR EBBR 110850Z 30008KT 9999 FEW020CB 13/08 Q1017 NOSIG=

  Remark: user is not authorised to retrieve TAF data.

2.3.6.9. Unknown data

- *Request: RQM/SAEBBB/FTLFPO=*

  Reply message:

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ZZXX99 FAPR 061221

RQM/SAEBBB=

UNKNOWN=

and

FTXX99 EBBR 061100

TAF LFPO 061100Z 0612/0718 35010KT 9999 SCT045 BECMG 0612/0614 CAVOK BECMG 0703/0705 33005KT SCT008 BKN012 BECMG 0709/0712 03006KT BKN035 BECMG 0712/0714 CAVOK=

2.3.6.10. NIL Data

- Reply messages:

  SAXX99 FAPR 110830

  METAR FOOL 110830Z 30008KT 9999 FEW020CB 13/08 Q1017 NOSIG=

  METAR DATG 110830Z 27010KT 9999 SCT200 15/10 Q1015 NOSIG=

  And

  ZZXX99 FAPR 110904
  RQM/ SAFMCH=
  METAR FMCH NIL=

  Remark: No valid METAR available for FMCH.

2.3.7. Request/Reply Message Format: IWXXM

2.3.7.1. General

- Request messages for OPMET data in IWXXM format can be sent via AMHS only

  a) Validation of query messages (RQM/) will strictly follow the Standardized Query Language as defined in the formal syntax notation in paragraph A.2.5, A.2.6 and shown in the examples for the request line in paragraph A.4.3.

  b) Queries or part of queries which do not conform to that notation will result in an error message returned to the originator of the query as described in paragraph A.4.5.

  c) Queries or part of queries which are not authorized or for which the data is not available will result in an information message returned to the originator of the query as described in paragraph A.4.5.

- Request messages

  a) Request messages for OPMET data in IWXXM format should be sent via AMHS and should follow the AMHS standard telecommunication procedures as defined in ICAO Annex 10, volume II, the EUR AMHS Manual (EUR Doc 20) and ICAO Doc 9880 Part II. The user requesting IWXXM data should make sure that a full AMHS path with Extended Services exists to the AFI OPMET Databank.

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b) The request message should be sent as Text Body Part. The Text Body Part should contain a single REQUEST LINE as defined below.

- RQX-request examples

Example	**Type of Request**
RQX/LAHKJK=	One request of single report of type LA
RQX/LSHAAA=	One request of all valid SIGMET messages in a single FIR and/or UIR
RQX/LTEBBR, LFPO=	One request of two reports of type LT
RQX/LAFTTJ/LTFCCB, LFPO/LSGOOO=	Three requests combined
RQX/LAFOOL, LT=	A request of a LA type and a LT type report for the same station

- OPMET Databank replies format

a) If the originator AMHS address is authorized, the databank will automatically reply to the AMHS originator address given in the request message.

b) Valid requests will produce an answer, which will be returned as one or more standard WMO IWXXM bulletins that are sent as a File Transfer Body Part of an AMHS message. Each AMHS reply message will contain only one single FTBP and an FTBP will only contain one single OPMET bulletin.

c) Per group of valid requested reports belonging to the same type, one or more bulletins will be generated.

d) For regular messages (METAR, TAF,..) the reply will consist of the latest valid, not NIL reports.

e) For non-regular messages (SIGMET) the reply will consist of all valid SIGMET-messages for the requested FIR.

f) For advisory messages the reply will contain the most recent valid message for each volcano or tropical cyclone or the valid Space Weather Advisories.

g) There is no distinction made between “operational” and “non-operational” data as defined by the XML-attribute “permissibleUsage”. The reply will contain actually available data.

h) The file name and bulletin identifier will be constructed as:

A_$T_1T_2A_1A_2$iiCCCCYYGGgg_**C**_CCCC_YYYYMMddhhmmss**.xml. [compression_suffix]**

where the elements in black and bold are fixed elements and:

T_1T_2 **= the requested data type**

A_1A_2 = XX: fixed geographical designator for databank reply

ii = **99:** fixed bulletin number for databank reply

CCCC = location indictor of the replying databank (e.g. EBBR, LFPW, LOWM)

YYGGgg = depending on the original DTG of the Bulletin Header

YYYYMMddhhmmss is the date/time group

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- Error/Information replies

a) An appropriate error/information reply will be sent to the user in the following cases:

- the request line contains a syntax error;
- the user is not allowed to request this information;
- the station(s) for which data is requested is (are) unknown;
- the data is unavailable in IWXXM format;
- the request was received via AFTN;
- the reply cannot be sent as there is no AMHS path with extended services to the user.

b) Error/Information replies will be sent in WMO message format as a :

- text Body Part of a AMHS message, in case the request was received via AMHS;
- AFTN message, in case the request was received via AFTN.

c) The abbreviated heading of an *Information* or *Error Reply* message will be constructed as **$T_1T_2A_1A_2$ii CCCC YYGGgg**, where:

T_1T_2 = ZZ

A_1A_2 = **XX**: fixed geographical designator for databank reply

ii = **99** : fixed bulletin number for databank reply

CCCC = location indicator of the replying databank (e.g. EBBR, LFPW, LOWM)

YYGGgg = DTG corresponding to the issuing time of the Information or Error Reply

d) For regular messages (METAR, TAF,) the reply will consist of the latest valid, not NIL reports.

e) For non-regular messages (SIGMET) the reply will consist of all valid SIGMET-messages for the requested FIR.

f) . For advisory messages the reply will contain the most recent valid message for each volcano or tropical cyclone or the valid Space Weather Advisories.

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3. ACCESS TO RODB VIA THE WEB

3.1. Access to the BDRO is also possible via the Web through the portals at the following addresses:

3.1.1. Adresse URL for Dakar ROBD

https://asecna.brdo.org

Figure: App_I_3.1.1: Home page of Dakar ROBD

3.2. URL address for Pretoria ROBD

3.2.1. https://aviation.weathersa.co.za/

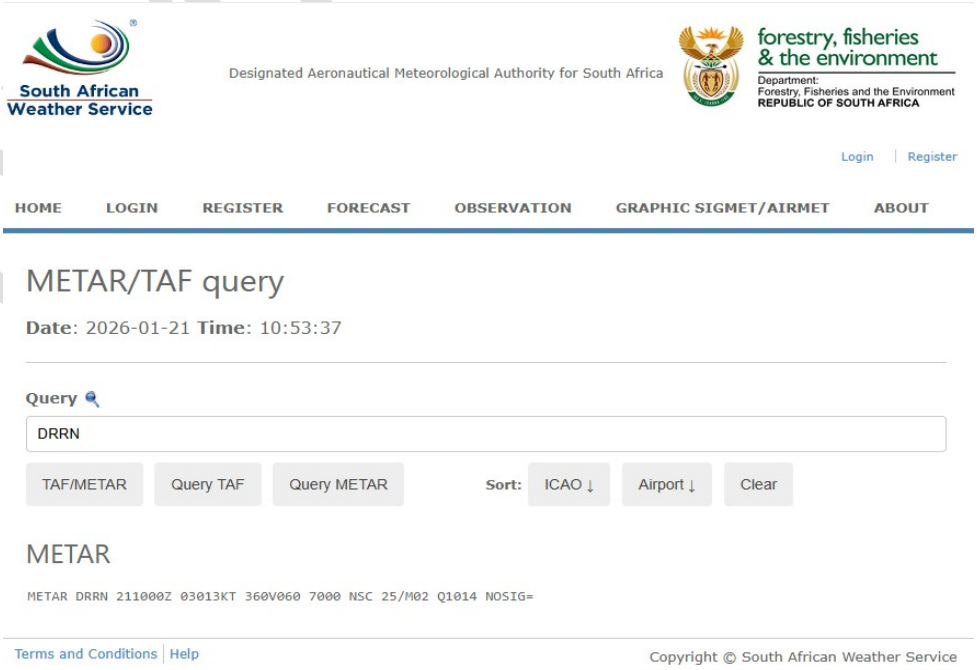

Figure: App_I_3.2.1: Home page of Dakar ROBD

4. DISCLAIMER

4.1. Usage of the AODEX implies that the user has taken notice of the disclaimer below and accepts the associated consequences.

> DISCLAIMER
>
> The Stations and FIR lists of the AFI OPMET Databank only consist of lists of required data. It does not mean that these data are presently received in the AODEX Databank or have been yet received.
>
> The fact that there is no data found for one location and one type of message in the AFI OPMET Databank does not mean that a message has not been generated for such a location but only means that no valid message concerning such a location and such a type of message has been received or stored by the AFI OPMET Databank.
>
> The user assumes the entire risk related to its use of data.

5. OTHER QUERY OPTIONS

5.1. ROBDs can apply other specific query formats and options such as querying several previous messages, certain types of data which should be described in the “specific query formats” section of the Appendices for each BRDO.

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APPENDIX J: AMHS profile information to support IWXXM Exchange

1. Introduction

1.1. A number of standards have been established by the International Standards Organization (ISO) for Message Handling Systems.

1.2. In order to describe which standards or group of standards, together with options and parameters, are needed to accomplish a function, it is necessary to specify a profile. Such profiles have been standardized by ISO and are known as International Standardized Profiles (ISPs). Profiles standardize the use of options and other variations in the base standards and deal primarily with the use of implemented capabilities in order to meet requirements for interoperability and efficient interworking.

1.3. ICAO Doc 9880 - *Technical Specifications for ATN using ISO/OSI Standards and Protocols*, Part II - *Ground-Ground Applications - Air Traffic Services Message Handling Services (ATSMHS)* contains the detailed technical specifications for ATSMHS (i.e. AMHS) based on a number of international standards and ISPs, complemented by additional requirements. The basic and the extended AMHS services meet the basic requirements of the respective ISPs but additional features and supplementary functions are incorporated as necessary in ICAO Doc 9880, Part II. In order to express conformance requirements, i.e. static capability, ICAO Doc 9880, Part II uses the classification defined in the ISPs to include different levels of support (mandatory, optional, etc.). These requirements, applying to the related parameters or elements are specified in the form of Profile Requirement Lists (PRLs). In a limited number of cases, the PRLs may also include dynamic behaviour requirements, using another classification also defined in the ISPs.

1.4. It is noted that the classification of a feature as mandatory in the ISPs corresponds to a requirement regarding static capability, i.e. the ability to generate and/or receive, encode and/or decode a specific parameter, but not to use this parameter in every message sent or received. The same logic is applicable to ICAO Doc 9880, Part II and, as an example, the EUR AMHS Manual.

1.5. Furthermore, it is recalled that in ICAO Doc 9880, Part II, for the Basic AMHS, the interface between the ATS Message User Agent and the ATS Message Server has been left open, since this is often an implementation matter local to each AMHS Management Domain. Conversely, for the Extended AMHS, implementation of a P2/P3 or P2/P7 profile compliant with the relevant MHS ISP (among ISP AMH23 to AMH26) is mandated.

1.6. The question of compliance with a P2/P3 or P2/P7 ISP for AMHS conformance should be addressed in the context of an implementation making use of some functionalities part of the Extended Service (i.e FTBP), but not of the whole of it. In particular, it is not specified whether a partial Extended Service implementation which does not include AMHS Security requires conformance with one of the AMH23 to AMH26 profiles or not.

1.7. User agents may be implemented exclusively for the support of a specific application/service. Such dedicated user agents may not need to implement all the features defined by ICAO Doc 9880, Part II, and parts of regional AMHS Manuals, where defined. For example, dedicated user agents implemented for the exchange of OPMET data formatted based on the IWXXM model are not supposed to generate messages with SS priority. Similarly, these user agents are not expected to receive messages with SS priority, although this could happen at the reception direction, at least by mistake.

1.8. Mandating implementation of features which are not required by the application/service served by certain user agents may generate additional complexity and impose implementation delay, effort and cost, without any operational benefit. In order to eliminate such impediments and facilitate the adoption of the AMHS by end users, the need of defining application/service oriented AMHS profiles, which clarify requirements

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and may relax some of them by mandating less features than the current AMHS specification, should be recognized. The definition of an IWXXM profile which is applicable to explicit, limited environments, i.e. submission of OPMET data, taking into consideration which features are useless for the specific application/service. The relaxed requirements concern message submission only.

1.9. Implementations complying with an application/service oriented AMHS profile are accepted for connection to the AMHS, although possibly not fully compliant from a formal standpoint, provided that conformance to the AMHS IWXXM profile is verified.

2. AMHS profile for OPMET IWXXM data exchange

AMHS is the intended communication means for MET IWXXM data exchanges using FTBP.

a) AMHS UAs complying with ICAO Doc 9880, Part II and where applicable, with the additional provisions of regional AMHS Manual, are capable to originate and receive AMHS messages containing such data. The support by UAs of IHE, defined in ICAO Doc 9880, Part II as part of the Extended AMHS, is additionally required but represents a minor upgrade already available in several UA implementations.

b) However, to ensure unambiguous interpretation of messages upon reception, and to facilitate their origination, it is necessary to establish a detailed specification of X.400 and AMHS parameters to be adopted for conveyance of such messages, including those associated with the AMHS FTBP.

2.1. Scope of the profile

2.1.1. This profile specification is established for application by AMHS UAs submitting and/or receiving OPMET data in IWXXM format through a P2/P3 or a P2/P7 interface, implemented as part of the following centres or systems:

- National OPMET Centre (NOC) ;
- Regional OPMET Centre (ROC)
- Inter-regional OPMET Gateway (IROG)
- Regional OPMET Databank (RODB)
- Any terminal or system receiving or requesting OPMET data in IWXXM format from one of the above centres/systems
- This specification is based on the following assumptions, which identify topics out of scope of the AMHS profile, which are addressed in the MET domain:
  - The MET domain may add further data types to the IWXXM without affecting the AMHS profile. It is assumed that irrespective of the data format (bulletin or report), the MET domain will always pass an unstructured binary file with a defined file-name to the AMHS.
  - Data compression will always be performed in the MET domain. The AMHS will not perform compression.
  - The MET Domain will define procedures for the submission of RQX messages to RODBs.

2.2. Number of body parts

2.2.1. The IPM body should contain exactly one body-part which is an FTBP.

2.2.2. The body part selection should be as represented using the following tabular description.

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Ref.	Element	Doc 9880 static support (Extended Service) Orig/Rec	Doc 9880 reference	Dynamic action upon generation of IWXXM message	Value and/or comments
Part 2: AMH21/A.1.3 IPM body					
1	ia5-text-body-part	O/M		X	
1.2	data	M/M	3.3.3	X	
10	bilaterally-defined	O/M	3.3.5	X	
Part 3: AMH21/A.1.3.1 Extended body part support					
1	ia5-text-body-part	O/M		X	
9	bilaterally-defined-body-part	O/M	3.3.5.1	X	
11	general-text-body-part	M/M	3.3.3 and Part 4, Table 3-1	X	
12	file-transfer-body-part	M/M	3.3.5.1 and 3.3.5.2	G	AMH21/ A.1.3.3
M= Mandatory support (static support) O= Operational support (static support) or optionally generated (dynamic behaviour) G= Generated X= Not used					

Table 1: Body part selection for the IWXXM profile (derived from ICAO Doc 9880 Part II Tables 3-1 and 3-2)

2.3. Selection of IMP heading parameters and parameter values

Ref.	Element	Doc 9880 static support (Extended Service) Orig/Rec	Doc 9880 reference	Dynamic action upon generation of IWXXM message	Value and/or comments
Part 1: AMH21/A.1.2 IPM heading field					
1	this-IPM	M/M	3.1.2.2.1, 3.1.4.2.1 (AMH21 support)	G	
2	originator	M/M		G	Address of the originating OPMET system (MET switch)
3	authorizing-users	O/M		X	
4	primary-recipients	M/M		G	Recipient addresses are populated by the MET switch based on its routing table (EUR Doc 033 section 5 .1.4)
5	copy-recipients	M/M		X	
6	blind-copy-recipients	O/M		X	
7	replied-to-IPM	M/M		X	
8	obsoleted-IPMs	O/M		X	
9	related-IPMs	O/M		X	
10	subject	M/M		G	This field should carry the $T_1T_2A_1A_2$iiCCCCYYGGggBBB part of the filename of FTBP. It is assumed that the subject field is easier to access for human operators in case of retrieval or analysis of

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Ref.	***Element***	***Doc 9880 static support (Extended Service) Orig/Rec***	***Doc 9880 reference***	***Dynamic action upon generation of IWXXM message***	***Value and/or comments***
					transferred messages
11	expiry-time	O/M		X	
12	reply-time	O/M		X	
13	reply-recipients	O/M		X	
14	importance	O/M		X	The receiving UA should assume that this field takes its default value (“normal”)
15	sensitivity	O/M		X	
16	auto-forwarded	O/M		X	
17	Extensions	M/M	3.3.4.1	G	
17.6	authorization-time	M/M	3.3.4.2	G	Equivalent to filing time
17.12	originators-reference	M/M	3.3.4.3	X	To avoid confusion with the use of this field in the IHE context (where it is carrying data converted to/from AFTN OHI)
17.13	precedence-policy-identifier	M/M	3.3.4.5, 3.3.4.6 and 3.3.4.7	G	OID value {iso (1) identified-organisation (3) icao (27) atn-amhs (8) parameters (0) amhs-precedence-policy (0)} (see Doc 9880, 3.3.4.7)
Part 4: AMH21/A.1.5 IPM common data types					
1	recipientSpecifier				
1.2	notification-requests	M/M	3.3.6	X	
1.2.1	rn	M/M	3.3.6	X	IWXXM never use priority SS
1.2.2	nrn	M/M		X	Doc 9880 does not foresee the presence of nrn-request
1.4	recipient-extensions	M/M	3.3.4.1	G	
1.4.3	precedence	M/M	3.3.4.8	G	Equivalent to priority GG: precedence value = 28 (TAF, METAR/SPECI, and also in case of AMD, COR or RTD reports/bulletins) Equivalent to priority FF: precedence value = 57 (AIRMET, SIGMET, VAA, TCA)
2	ORDescriptor				
2.1	formal-name	M1/M1		G	Used for originator-address and recipient-addresses
M= Mandatory support (static support) M1= mandatory O/R name minimal support (static support) O= Operational support (static support) or optionally generated (dynamic behaviour) G= Generated X= Not used					

Table 2: IPM Heading parameters for the IWXXM profile
(derived from ICAO Doc 9880 Part II Table 3-2)

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2.4. Content of body parts

2.4.1. The parameters composing the FTBP should be in line with the details provided in Table 3 below.

2.4.2. The reference to the EUR DOC 020 have been indicated to provide more details, if needed.

Ref.	***Element***	***Doc 9880 static support (Extended Service) Orig/Rec***	***Doc 9880 reference***	***Dynamic action upon generation of IWXXM message***	***Value and/or comments***
1	related-stored-file				
2	contents-type				
2.1	document-type				
2.1.1	document-type-name	M/M	A.2.4.2.1	G	default OID value: 1.0.8571.5.3 {iso (1) standard (0) 8571(8571) document-type (5) unstructured-binary (3)}
3	environment				
3.1	application-reference				
3.1.1	registered-identifier	O/M	A.2.4.2.2 and A.2.4.2.6	G	OID value: 1.3.27.8.1.2 {iso (1) identified-organisation (3) icao (27) atn-amhs (8) application (1) digital-met (2)}
3.4	user-visible-string	O/M	A.2.4.2.6	G	"Digital MET"
4	compression	-			See para below
5	file-attributes				
5.1	pathname				
5.1.1	incomplete-pathname	O/M	A.2.4.2.3	G	bulletin file name as specified in section 5.1.4
5.5	date-and-time-of-last-modification	O/M	A.2.4.2.4	O	
5.13	object-size				
5.13.2	actual-values	O/M	A.2.4.2.5	O	
6	extensions	-			
M= Mandatory support (static support) O= Operational support (static support) or optionally generated (dynamic behaviour) G= Generated X= Not used					

Table 2.4.2: File Transfer parameters for the IWXXM profile

2.4.3. Compression of the data to be transferred, if needed, should be performed in the MET domain before creating the FTBP. This avoids using the "compression" field of FTBP, reduces the UA complexity and limits the FTBP functionality to message exchange mechanisms.

2.4.4. The IWXXM data itself should be included in the FileTransferData element of the file-transfer-body-part. It should be noted that ISO/IEC 10021-7 / ITU-T X.420 (section 7.4.12) specifies the ASN.1 encoding to be used, and that ISO/IEC ISP 12062-2 (section A.1.3.1) expresses additional recommendations regarding this encoding, which should be "octet-aligned EXTERNAL". Only one EXTERNAL component should be used.

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2.5. Selection of used P1/P3 envelope parameter value

2.5.1. The mapping of P2 parameters onto P3 envelope parameters should be as specified in ICAO Doc 9880 and X.420.

2.5.2. IPMs with a precedence value of 28 should use the priority abstract-value “non-urgent”. IPMs with a precedence value of 57 should use the priority abstract-value “normal”.

2.5.3. The encoded-information-types in the P3 submission-envelope should be limited to the OID value specified for FTBP (see ITU-T X.420:1999 7.4.12.8, 20.4.c and Annex C), i.e. OID {joint-iso-itu-t(2) mhs(6) ipms(1) eit(12) file-transfer (0)}.

2.6. Relaxed requirements from complete AMHS specification

2.6.1. Implementers must be aware that due to the “relaxed” status of the requirements above, any of these requirements may be reverted back to a “mandatory” status in a future profile version, as soon as the need for the corresponding missing feature(s) appears operationally. Conformance with the profile implies a commitment to support such evolutions in the profile, which may be considered as “return-to-normal” in terms of AMHS conformance.

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APPENDIX K: Sample Tests for NOCs to Conduct when Introducing IWXXM

1. Proposed Conformance Tests

1.1. General description

1.1.1. This section proposes a list of functional tests that allows verification of conformance of User Agent (UA) implementations dedicated for OPMET IWXXM data exchange.

1.1.2. The proposed conformance tests are divided to three categories:

- profile specific submission tests ;
- profile specific delivery tests ; and
- submission and delivery tests.

1.1.3. The scope of the profile specific submission and delivery tests is to ensure conformance of UA implementations specifically deployed for the conveyance of OPMET IWXXM data to the respective profile. A test identification scheme of the form WXMxnn has been used, where x=1 is used for submission tests and x=2 for delivery tests. Wherever applicable and to provide more details, reference to the respective EUR AMHS Manual Appendix D-UA test is made.

1.1.4. Specific UA conformance testing is to ensure that UA implementations dedicated for OPMET IWXXM data exchange will not malfunction upon reception of a field or element not defined by the specific profile, but classified as mandatory in the ISPs and thus also mandatory in AMHS.

2. Tests

2.1. Profile specific submission tests

WXM101	**Submission of an IPM including a bulletin consisting of METAR**
Test criteria	The test is successful if the UA submits an IPM including a bulletin consisting of METAR according to the profile defined in Appendix L of this document
Scenario description	Submit from the UA under test an IPM including a bulletin consisting of METAR. Check that: • the P3 submission-envelope includes the following parameters with the correct values: o *originator-name*: OR-name of the originator o *recipient-name*: OR-name of each recipient of the message o *content-type* : 22 o *encoded-information-types* : OID 2.6.1.12.0 o *priority*: non urgent • the following IPM heading fields are present with the correct values: o *precedence*: 28 o *formal-name*: originator address and recipient addresses • the elements *rn* and *nrn* in the common data types are absent • the message has exactly one file-transfer-body-part • the parameters composing FTBP are according to ISO/IEC ISP 12062-2 (see section A.2.4.2 of the EUR AMHS Manual Appendix B) and the following elements are present with the correct values: o *document-type-name*: OID 1.0.8571.5.3 o *registered-identifier*: OID 1.3.27.8.1.2 o *user-visible-string*: 'Digital MET' o *incomplete-pathname*: bulletin file name as specified in section 5.1.4 for example:

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WXM101	**Submission of an IPM including a bulletin consisting of METAR**
	A_LAFR31LFPW171500_C_LFPW_20151117150010.xml. [compression_suffix] o If generated, check the element *date-and-time-of-last-modification* o If generated, check the element *actual-values*, the value of which represents the size of the Attachment data in bytes • the elements *related-stored-file*, *compression* and *extensions* of the FTBP parameters are absent • The IWXXM data itself are included in the FileTransferData element of the file-transfer-body-part; the octet-aligned encoding should be used.
EUR AMHS Manual, Appendix D-UA ref:	CTUA1501, FTBP Capability

WXM102	**Submission of IPMs including bulletins of different file size consisting of METAR**
Test criteria	The test is successful if the UA submits several IPMs including bulletins of different file size consisting of METAR according to the profile defined in Appendix L of this document.
Scenario description	Submit from the UA under test a sequence of several IPMs including each time a bulletin of different file size consisting of METAR. The size of the message should not exceed the limit defined in the regional AMHS Manual. Check all parameters listed in test case WXM101, with the corresponding values. If the element *actual-values* is generated check each time the respective value, which represents the size of the Attachment data in bytes.
EUR AMHS Manual Appendix D-UA ref:	CTUA1501, FTBP Capability with different body-part size

WXM103	**Submission of an IPM including a bulletin consisting of SPECI or TAF**
Test criteria	The test is successful if the UA submits an IPM including a bulletin consisting of SPECI or TAF according to the profile defined in Appendix L of this document
Scenario description	Submit from the UA under test an IPM including a bulletin consisting of SPECI. Check that all parameters and their respective values are in accordance to test case WXM101, except that the value of the element *incomplete-pathname* is according to the bulletin file name as specified in section 5.1.4. The test is repeated with the submission of an IPM including bulletin consisting of TAF.
EUR AMHS Manual Appendix D-UA ref:	CTUA1501, FTBP Capability
WXM104	**Submission of an IPM including a bulletin consisting of AIRMET**
Test criteria	The test is successful if the UA submits an IPM including a bulletin consisting of AIRMET according to the profile defined in Appendix L of this document.
Scenario description	Submit from the UA under test an IPM including a bulletin consisting of AIRMET. Check that all parameters and their respective values are in accordance to test case WXM101, except that: • the *priority* abstract value of the P3 submission-envelope is normal

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	• the value of the element *precedence* is 57 • the value of the element *incomplete-pathname* is according to the bulletin file name as specified in section 5.1.4.
EUR AMHS Manual Appendix D-UA ref:	CTUA1501, FTBP Capability

WXM105	**Submission of an IPM including a bulletin consisting of SIGMET or VAA or TCA**
Test criteria	The test is successful if the UA submits an IPM including bulletin consisting of SIGMET or VAA or TCA according to the profile defined in Appendix L of this document.
Scenario description	Submit from the UA under test an IPM including a bulletin consisting of SIGMET. Check that all parameters and their respective values are in accordance to test case WXM101, except that: • the *priority* abstract value of the P3 submission-envelope is normal • the value of the element *precedence* is 57 • the value of the element *incomplete-pathname* is according to the bulletin file name as specified in section 5.1.4. The test is repeated with the submission of an IPM including bulletin consisting of VAA. The test is repeated with the submission of an IPM including bulletin consisting of TCA.
EUR AMHS Manual Appendix D-UA ref:	CTUA1501, FTBP Capability

2.2. Profile specific delivery tests

WXM201	**Delivery of an IPM including a bulletin consisting of METAR**
Test criteria	The test is successful if an IPM, including a collection consisting of METAR, sent by an MTA is received by the UA under test and the parameters specified by the profile defined in Appendix A of this document are properly received.
Scenario description	The MTA sends an IPM including a bulletin consisting of METAR Check that the UA under test receives the IPM with the following parameters: • the message delivery envelope includes the following parameters with the correct values: o *originator-name*: OR-name of the originator o *this-recipient-name*: OR-name of the recipient to whom the message is delivered o *content-type*: 22 o *encoded-information-types*: OID 2.6.1.12.0 o *priority*: non urgent o *message-delivery-identifier*: it should have the same value as the message-submission-identifier supplied to the originator of the message when the message was submitted (X.411, section 8.3.1.1.1.1) o *message-delivery-time*: it contains the time at which delivery occurs and at which the MTS is relinquishing responsibility for the message (X.411, section 8.3.1.1.1.2) • the following IPM heading fields are present with the correct values: o *originator*

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	o *primary-recipients* o *subject*: $T_1T_2A_1A_2$iiCCCCYYGGggBBB part of the filename of FTBP o *importance* : normal, if present o *authorization-time* of the IPM heading extensions field: equivalent to filing time o *precedence-policy-identifier* of the IPM heading extensions field: OID 1.3.27.8.0.0 o *originators-reference* of the IPM heading extensions field: absent • the following parameters in the common data types are present with the corresponding values: o *precedence*: 28 • the elements *rn* and *nrn* in the common data types are absent • the message has exactly one file-transfer-body-part • the parameters composing the FTBP are according to section A.2.4.2 of the EUR AMHS Manual Appendix Y and the following elements are present with the correct values: o *document-type-name*: OID 1.0.8571.5.3 o *registered-identifier*: OID 1.3.27.8.1.2 o *user-visible-string*: 'Digital MET' o *incomplete-pathname*: bulletin file name as specified in section 5.1.4 IWXXM CONOPS, for example: A_LAFR31LFPW171500_C_LFPW_ 20151117150010.xml. [compression_suffix] o If generated, check the element *date-and-time-of-last-modification* o If generated, check the element *actual-values*, the value of which represents the size of the Attachment data in bytes. • the elements *related-stored-file*, *compression* and *extensions* of the FTBP parameters are absent • The IWXXM data itself are included in the FileTransferData element of the file-transfer-body-part; the octet-aligned encoding should be used.
EUR AMHS Manual Appendix D-UA ref:	CTUA1501, FTBP Capability
WXM202	**Delivery of IPMs including bulletins of different file size consisting of METAR**
Test criteria	The test is successful if several IPMs, including bulletins of different file size consisting of METAR, sent by an MTA are received by the UA under test and the parameters specified by the profile defined in Appendix L of this document are properly received.
Scenario description	The MTA sends a sequence of several IPMs including each time a bulletin of different file size consisting of METAR. Check that the UA under test receives all IPMs and that the parameters described in test case WXM201 are received with the corresponding values. If the element *actual-values* is present check each time the respective value, which represents the size of the Attachment data in bytes.
EUR AMHS Manual Appendix D-UA ref:	CTUA1601, FTBP Capability with different body-part size
WXM203	**Delivery of an IPM including a bulletin consisting of SPECI or TAF**
Test criteria	The test is successful if an IPM, including a bulletin consisting of SPECI or TAF, sent by an MTA is received by the UA under test and the parameters specified by the profile defined in Appendix L of this document are properly received.
Scenario	The MTA sends an IPM including a bulletin consisting of SPECI.

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description	Check that the UA under test receives the IPM and the parameters described in test case WXM201 are received with the corresponding values, except the element *incomplete-pathname* which value is according to the bulletin file name as specified in section 5.1.4. The test is repeated with the delivery of an IPM including a bulletin consisting of TAF.
AFI AMHS Manual ref:	CTUA1601, FTBP Capability
WXM204	**Delivery of an IPM including a bulletin consisting of AIRMET**
Test criteria	The test is successful if an IPM, including a bulletin consisting of AIRMET, sent by an MTA is received by the UA under test and the parameters specified by the profile defined in Appendix Lof this document are properly received.
Scenario description	The MTA sends an IPM including a bulletin consisting of AIRMET. Check that the UA under test receives the IPM and the parameters described in test case WXM201 are received with the corresponding values, except that: • the *priority* abstract value of the P3 submission-envelope is normal • the value of the element *precedence* is 57 • the value of the element incomplete-pathname is according to the bulletin file name as specified in section 5.1.4.
EUR AMHS Manual Appendix D-UA ref:	CTUA1601, FTBP Capability
WXM205	**Delivery of an IPM including a bulletin consisting of SIGMET or VAA or TCA**
Test criteria	The test is successful if an IPM, including a bulletin consisting of SIGMET or VAA or TAF, sent by an MTA is received by the UA under test and the parameters specified by the profile defined in Appendix A of this document are properly received.
Scenario description	The MTA sends an IPM including a bulletin consisting of SIGMET. Check that the UA under test receives the IPM and the parameters described in test case WXM201 are received with the corresponding values, except that: • the *priority* abstract value of the P3 submission-envelope is normal • the value of the element *precedence* is 57 • the value of the element incomplete-pathname is according to the bulletin file name as specified in section 5.1.4. The test is repeated with the delivery of an IPM including a bulletin consisting of VAA. The test is repeated with the delivery of an IPM including a bulletin consisting of TCA.
EUR AMHS Manual Appendix D-UA ref:	CTUA1601, FTBP Capability

Note: The execution of the delivery tests defined in EUR DOC 020 (EUR AMHS Manual) Appendix D-UA is encouraged. However, if this is not possible, the following test list from EUR DOC 020 (EUR AMHS Manual) Appendix D-UA is suggested.

Basic Delivery Operations (A2)	
CTUA201	Deliver an IPM to the Implementation Under Test (IUT) – basic capability (A2)
CTUA203	Deliver an IPM containing optional-heading-information in the ATS-message-header
CTUA204	Deliver an IPM containing different kinds of recipient addresses
CTUA206	Deliver an IPM with invalid originator address similar to CAAS
CTUA207	Deliver an IPM with invalid originator address similar to XF

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Specific Delivery Operations	
CTUA401	Deliver a non-delivery report (NDR) to an AMHS user

Enhanced Delivery UA Capability	
CTUA601	Deliver an IPM with the implemented capability of one body-part
CTUA602	Deliver an IPM with the implemented capability of two body-parts

Delivery Operations (A2-IHE)	
CTUA1201	Deliver an IPM with IHE to the IUT – basic capability (A2-IHE)
CTUA1203	Deliver an IPM with IHE, containing optional heading information
CTUA1204	Deliver an IPM with IHE, containing different kinds of recipient address

Specific Submission Operations with IHE	
CTUA1303	Checking of default envelope elements (flag setting) in submitted IPMs with IHE

Specific Delivery Operations with IHE	
CTUA1401	Deliver a non-delivery report (NDR) to an AMHS user

Enhanced Delivery UA Capability with IHE	
CTUA1602	Deliver an IPM with IHE with the implemented capability of two body-parts

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APPENDIX L: AMHS Adress Scheme and registered domains in the AFI Region

1. Introduction

1.1. This Appendix aims to the production of the AMHS addressing plan for all AMHS users. This plan should define the AMHS users addressing in easy way and it should be comprehensible and meaningful for human users.

2. AMHS Address

2.1. Each address consists of a set of components referred to address. There is a High-level address determined by the structuring by management and the domain to which the address belongs. The elements of address are:

- **(Country Name)** this is mandatory register with value **(XX) as ICAO**;
- **(ADMD)** this is mandatory, it must obtain the registration from ITU;
- **(PRMD)** this is optional, and take the name of AMHS service operated by private organization;
- **(Organization Name)**: it is the most significant naming attribute of O/R and, many organizations will operate as sub-naming authorities, it aims to provide a delivery mechanism of the message to its destination.
- **Organizations Unit name (OU)**: They are used within the context of an addressing structure as identifier by the organization name attribute and identify meaningful of that name.

<u>List of allowed characters</u>

- Country Name: 2 alphabet (XX)
- ADMD Name: 16 characters
- PRMD Name 16 characters
- Organization Name: 64 characters
- Organization Unit Name: 32 characters
- Common Name; 64 characters

2.1.1. AMHS Address Scheme

2.1.1.1. There are two address schemes defined by ICAO: the Translate Form (XF) and Common AMHS Address Scheme (CAAS).

2.1.1.1. Composition of an AMHS address in XF

- The conversion between XF address and the corresponding AFTN address is very simple.
- The XF is translated as an address is composed of the following components.

Attribute	Value	Example
Country name (C) =	XX	XX
ADinistrative Management Domain (ADMD)=	ICAO	ICAO

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Attribute	Value	Example
PRivate Management Domain (PRMD)	Two Letter country identifier	GO
Organization Name (O)	AFTN	AFTN
Organization Unit Name (OU)	Addressee indicator	GOOYYZYZ

Example: Dakar ROBD AMHS address **/C=XX/A=ICAO/P=GO/O=AFTN/OU= GOOYYZYZ/**

a) Composition of an AMHS address in CAAS

Attribute	Value	Example
Country name (C) =	XX	XX
ADministrative Management Domain (ADMD)=	ICAO	ICAO
PRivate Management Domain =	Country identifier (name or two letter designator)	EGYPT
Organisation Name (O)	Location indicator of the MTA	HECA
Organisation Unit Name (OU)	Location Indicator of the user	HETB
Common Name (CN)	The 8 letters AFTN address of the user	HETBYMYX

Example: **/C=XX/A=ICAO/P=EGYPT/O=HECA/OU=HETB/CN=HETBYMYX/**

Note*: The conversions of addresses from RSFTA to AMHS and vice versa will be done automatically by the message switches thanks to the AMC table introduced in their memory.*

3. AMHS Registered domains in AFI Region (From AMC)

Name	Nationality Letters	country-name	ADMD-name	PRMD-name	Addressing scheme	ATNDir
Algeria	DA	XX	ICAO	DA	CAAS	c=DZ
Benin	DB	XX	ICAO	DB	XF	c=BJ
Burkina Faso	DF	XX	ICAO	DF	XF	c=BF

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Name	Nationality Letters	country-name	ADMD-name	PRMD-name	Addressing scheme	ATNDir
Ghana	DG	XX	ICAO	DG	XF	c=GH
Côte d'Ivoire	DI	XX	ICAO	DI	XF	c=CI
Nigeria	DN	XX	ICAO	DN	CAAS	c=NG
Niger	DR	XX	ICAO	DR	XF	c=NE
Tunisia	DT	XX	ICAO	DT	CAAS	c=TN
Togo	DX	XX	ICAO	DX	XF	c=TG
South Africa	FA	XX	ICAO	FA	XF	c=ZA
Botswana	FB	XX	ICAO	FB	XF	c=BW
Congo	FC	XX	ICAO	FC	XF	c=CG
Eswatini	FD	XX	ICAO	FD	XF	c=SZ
Central African Republic	FE	XX	ICAO	FE	XF	c=CF
Equatorial Guinea	FG	XX	ICAO	FG	XF	c=GQ
Ascension I.(U.K.)	FH	XX	ICAO	FH	XF	c=SH
Mauritius	FI	XX	ICAO	FI	XF	c=MU
British Indian Ocean Territory	FJ	XX	ICAO	FJ	XF	c=IO
Cameroon	FK	XX	ICAO	FK	XF	c=CM
Zambia	FL	XX	ICAO	FL	XF	c=ZM
Madagascar	FM	XX	ICAO	FM	XF	c=MG
Comoros	FMC*	XX	ICAO	FMC	XF	c=KM
Dzaoudzi	FMCZ	XX	ICAO	FME	XF	c=RE
Réunion	FME*	XX	ICAO	FME	XF	c=RE
Europa	FMZE	XX	ICAO	FME	XF	c=RE
Grand Glorieuse	FMZG	XX	ICAO	FME	XF	c=RE
Juan De Nova	FMZJ	XX	ICAO	FME	XF	c=RE
Tromelin	FMZT	XX	ICAO	FME	XF	c=RE

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Name	Nationality Letters	country-name	ADMD-name	PRMD-name	Addressing scheme	ATNDir
Angola	FN	XX	ICAO	ANGOLA	CAAS	c=AO
Gabon	FO	XX	ICAO	FO	XF	c=GA
Sao Tome and Principe	FP	XX	ICAO	FP	XF	c=ST
Mozambique	FQ	XX	ICAO	FQ	XF	c=MZ
Seychelles	FS	XX	ICAO	FS	XF	c=SC
Chad	FT	XX	ICAO	FT	XF	c=TD
Zimbabwe	FV	XX	ICAO	FV	XF	c=ZW
Malawi	FW	XX	ICAO	FW	CAAS	c=MW
Lesotho	FX	XX	ICAO	FX	XF	c=LS
Namibia	FY	XX	ICAO	FY	XF	c=NA
Democratic Republic of the Congo	FZ	XX	ICAO	FZ	XF	c=CD
Mali	GA	XX	ICAO	GA	XF	c=ML
Gambia	GB	XX	ICAO	GB	XF	c=GM
Canary Islands	GC	XX	ICAO	SPAIN	CAAS	c=ES
Spain	GE	XX	ICAO	SPAIN	CAAS	c=ES
Sierra Leone	GF	XX	ICAO	GF	XF	c=SL
Guinea-Bissau	GG	XX	ICAO	GG	XF	c=GW
Liberia	GL	XX	ICAO	GL	XF	c=LR
Morocco	GM	XX	ICAO	GM	CAAS	c=MA
Senegal	GO	XX	ICAO	GO	XF	c=SN
Mauritania	GQ	XX	ICAO	GQ	XF	c=MR
Western Sahara	GS	XX	ICAO	GS	XF	c=EH
Guinea	GU	XX	ICAO	GU	XF	c=GN
Cape Verde	GV	XX	ICAO	GV	XF	c=CV
Ethiopia	HA	XX	ICAO	HA	CAAS	c=ET

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Name	Nationality Letters	country-name	ADMD-name	PRMD-name	Addressing scheme	ATNDir
Burundi	HB	XX	ICAO	HB	XF	c=BI
Somalia	HC	XX	ICAO	HC	XF	c=SO
Djibouti	HD	XX	ICAO	HD	XF	c=DJ
Egypt	HE	XX	ICAO	HE	CAAS	c=EG
Eritrea	HH	XX	ICAO	HH	XF	c=ER
South Sudan	HJ	XX	ICAO	HJ	XF	c=SS
Kenya	HK	XX	ICAO	HK	XF	c=KE
Libyan Arab Jamahiriya	HL	XX	ICAO	HL	XF	c=LY
Rwanda	HR	XX	ICAO	HR	XF	c=RW
Sudan	HS	XX	ICAO	HS	XF	c=SD
United Republic of Tanzania	HT	XX	ICAO	HT	XF	c=TZ
Uganda	HU	XX	ICAO	HU	XF	c=UG

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APPENDIX M: Terms of Reference of the AFI-ROMG (Africa Indian Ocean Regional OPMET Management Group)

1. Background

1.1. The AFI OPMET Data Exchange (AODEX) Scheme is a coordinated regional arrangement established to facilitate the efficient and timely exchange of meteorological information necessary for the safety, regularity and efficiency of international air navigation within the AFI Region and with adjacent ICAO Regions. It supports the exchange of key aeronautical meteorological products, including METAR, TAF, SIGMET, and related OPMET information, in the traditional alphanumeric code (TAC) format and, progressively, to ICAO Meteorological Information Exchange Model (IWXXM) formats.

1.2. The main purpose of the AFI OPMET Data Exchange (AODEX) Scheme is to ensure the most efficient exchange of OPMET information within AFI and with the other ICAO regions to meet the requirements of the users of OPMET information, as well as the implementation of the OPMET-related Standards And Recommended Practices (SARPs) in the ICAO Annex 3 and Annex 10, and the relevant provisions of the AFI Air Navigation Plan (ANP) in a highly efficient and standardised way.

1.3. The scheme, initially known as AMBEX, was established by APIRG in 1986 and has evolved from a product-based bulletin exchange arrangement into a more data-centric environment supporting digital exchange and future integration into the System Wide Information Management (SWIM) environment. Over time, the scheme has expanded in scope, structure and operational requirements, including the establishment of National OPMET Centres (NOCs), Regional OPMET Centres (ROCs), Inter-regional OPMET Gateways (IROGs), and Regional OPMET Databanks (RODBs).

1.4. In light of the need to monitor the operation of OPMET exchange, support all OPMET centres, manage regional requirements, oversee the transition from traditional alphanumeric code (TAC) to IWXXM, and maintain an effective interface with other ICAO Regions, there is a need to establish a dedicated AFI Region OPMET Management Group (AFI-ROMG) as the technical body responsible for the management of OPMET exchange matters in the AFI Region.

2. Purpose

2.1. The purpose of the AFI-ROMG is to serve as the technical and operational management body responsible for monitoring, coordinating and supporting the exchange of OPMET information within the AFI Region and between the AFI Region and other ICAO Regions in accordance with the AODEX scheme.

2.2. The AFI-ROMG provides a structured regional mechanism for reviewing operational performance, identifying deficiencies, proposing corrective measures, and supporting the efficient implementation of regional OPMET exchange procedures, including developments relating to digital exchange and IWXXM implementation.

2.3. The Group also serves as the advisory and coordination platform through which stakeholders collaborate to ensure the continued effectiveness, standardization, and sustainability of the AODEX Scheme.

3. Mandate of the Group

3.1. The AFI-ROMG is established by the AFI Aviation System Planning and implementation Group (AASPG) framework as the technical body responsible for the management of OPMET exchange in the AFI Region. It will regularly monitor the operation of intra-regional and inter-regional OPMET exchange and support the effective functioning of the AODEX Scheme.

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4. Group Key Functions and Tasks

4.1. The AFI-ROMG functions include:

(i) monitors the exchange of intra-regional and inter-regional OPMETs.

(ii) Monitor and analyse OPMETs' availability statistics and produce semi-annual reports to be submitted to ICAO's AFI Regional offices;

(iii) Propose relevant corrective measures to provide effective solutions to the exchange of OPMETs in the AFI Region;

(iv) Validate the draft METNO bulletins from the ROCs and the ROBDs;

(v) Informs all OPMET Centres and ICAO AFI ESAF and WACAF regional Offices, one month in advance, of future changes (insertion or deletion of one or more OPMET bulletins); and

(vi) coordinate and support the transition to digital meteorological information exchange in IWXXM format.

5. Composition

5.1. The AFI-ROMG shall be organised into two components:

a) Core Task Force (CTF):

The Core Task Force shall serve as the technical executive body of the AFI-ROMG and shall be responsible for technical analysis, operational monitoring, coordination activities, and the preparation of recommendations and reports. It shall consist of not more than fifteen (15) members, including:

(i) 1 Chairperson from the RODBs;

(ii) 1 Secretary from the ROCs / ICAO Regional Office as the Secretariat

(iii) 1 Deputy Secretary from the ROCs;

(iv) 3 representatives of the Regional OPMET Centres (ROCs);

(v) 4 representatives of the Regional OPMET Data Banks (RODBs); and

(vi) 5 subject matter experts in meteorological information exchange systems, drawn from the NOCs.

b) Plenary Group:

The Plenary Group shall comprise the designated focal points from all National OPMET Centres (NOCs) within the AFI Region. Members of the Plenary Group shall implement regional procedures at the national level, provide operational feedback to the AFI-ROMG, and participate in consultations and performance reviews.

c) Qualification Requirements for AFI-ROMG Membership

Members of the Core Task Force and NOC focal points should possess the qualifications and experience required in OPMET exchange, aeronautical meteorology, aeronautical telecommunications systems, and related regional implementation matters. The preferred qualifications include:

(i) Knowledge of:

- IWXXM digital meteorological exchange

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- Aeronautical Message Handling System (AMHS)
- OPMET bulletin routing and management

(ii) Analytical Competence: Ability to:

- Analyze OPMET performance statistics
- Evaluate data availability and latency
- Detect routing or formatting anomalies

(iii) Regulatory Knowledge

- Strong familiarity with:
- Regional OPMET procedures
- Relevant ICAO documentation

6. Working methods

6.1. The AFI-ROMG shall convene meetings in accordance with its approved work programme and operational needs. The Group shall make use of available electronic means, including teleconferencing and other virtual collaboration tools, to prepare and progress its work between meetings and to keep members updated on matters of concern. This approach shall support timely coordination, technical discussion and decision-making.

7. Reporting on implementation

7.1. The AFI-ROMG shall submit its reports including recommendations to the ICAO AFI Regional Offices for consideration and distribution to relevant stakeholders for further action as appropriate.

7.2. The AFI-ROMG shall maintain follow-up on agreed actions and implementation status, including changes to bulletins, regional procedures and technical arrangements, and shall ensure that participating States and OPMET centres are informed in a timely manner of agreed decisions affecting the regional OPMET exchange programme.

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