

INTERNATIONAL CIVIL AVIATION ORGANIZATION



AFI MET BULLETINS EXCHANGE (AMBEX) HANDBOOK

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ABBREVIATIONS AND ACCRONYMES

ADMIN	Administrative
AFI	Africa and Indian Ocean region of ICAO
AFMAG	AFI MET Advisory Group
AFS	Aerodrome flight information service
AFTN	Aeronautical fixed telecommunication network
AIREP	Air-report
AMBEX	AFI MET Bulletins Exchange (System)
AMD	Amend/Amended
ANP	Air Navigation Plan
APIRG	AFI Planing and Implementation regional Group
ASIA/PAC	Asia and Pacific Region of ICAO
BCC	Bulletin Compilation Centre
BRDO	Banque Régionale des Données OPMET
COM	Communications
ESAF	East and South African (Office)
EUR	Europe region of ICAO
FASID	Facilities and Services Implementation Document
ICAO	International Civil Aviation Organization
ICD	Interface Control Document
IROG	Inter-regional OPMET gateway
ISCS	International Satellite Communication System
MET	Meteorology
MET/SG	MET Sub-group
METAR	Aerodrome routine meteorological report
MID	Middle East region of ICAO
NAM	North American region of ICAO
NOC	National OPMET Centre
ODREP	OPMET Data Regional Exchange Points
OMM	Organisation Météorologique Mondiale
OPMET	Operational meteorological (<i>information</i>)
RODB	Regional OPMET Data Bank
SADIS	Satellite Distribution of Aeronautical Information
SAM	South African (Office)
SARP	Standards and Recommended Practices [ICAO]
SIGMET	Information concerning en-route weather phenomena which may affect the safety of aircraft operation
SPECI	Aerodrome special meteorological report (<i>in meteorological code</i>)
TAF	Aerodrome forecast
TCA	Tropical Cyuclone Advisory
TCAC	TCA Centre
VAA	Volcanic Ash Advisory
VAAC	VAA Centre
WACAF	Western and Central African (Office) of ICAO
WMO	World Meteorological organization

1. INTRODUCTION

1.1 The Africa- Indian (AFI) Meteorological Bulletin Exchange (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. AMBEX was implemented starting on 29 August 1986.

1.2 AMBEX scheme was intended initially only for TAF exchanges. AIREPs and METAR were added to the scheme at a later stage and SIGMET, Volcanic Ash Advisory (VAA) and tropical Cyclone (TCA) has been added in this edition. 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 Centre. The operational exchange has been carried out according to agreed transmission schedules; the bulletin contents were specified in the AMBEX Handbook.

1.3 The procedures described hereunder are based to a significant degree on corresponding procedures in use in the Regional OPMET Bulletin Exchange (AMBEX) Scheme (AFI). Although uniformity is desired, the AMBEX Scheme is not intended as a rigid scheme for the AFI Region where variations or adaptation of the basic principles appear more efficient. AMBEX centre authorities are strongly requested to suggest to the Secretary of the MET/SG any local changes that are considered desirable for the enhancement of the efficiency of the scheme.

1.4 Based on communications (COM) facilities of very limited capacity in the early seventies, the AMBEX scheme was strictly planned to accommodate only those OPMET exchanges considered vital for the flight operations. Over the years, the COM facilities have been improving considerably and the AMBEX scheme has been developed accordingly.

1.5 Recently, it has been identified that significant changes in the scheme were needed in order to make it compatible with the existing COM 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.

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

1.7 The AMBEX Handbook is published and kept up-to-date by the ICAO ESAF and WACAF Offices.

2. AMBEX SCHEME - GENERAL

2.1 Objective

2.1.1 The main purpose of the AFI Meteorological Bulletins Exchange (AMBEX) Scheme is to:

- ensure the most efficient and economical exchange of operational meteorological (OPMET) information within the AFI Region as well as with the other ICAO regions to meet the requirements of users of OPMET information, and
- ensure the implementation of the OPMET-related SARPs in Annex 3 and Annex 10, and the relevant provisions of the ICAO Air Navigation Plan (ANP) for the AFI Region in a highly efficient and standardized way.

2.2 Structure

2.2.1 The above objective is achieved by implementing a number of AMBEX collecting and disseminating centres (AMBEX centres), Regional OPMET data banks (RODBs)*, and inter-regional OPMET gateways (IROGs). All these operational units form the **AMBEX scheme**. In order to ensure seamless global exchange of the required OPMET information, the AMBEX Scheme should be developed in compliance with similar structures in the other ICAO regions, as well as with the aeronautical fixed system (AFS) satellite distribution systems used to disseminate OPMET data.

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

2.3 Products

2.3.1 The AMBEX scheme prepares and delivers to the aviation users the required OPMET information in the form of **bulletins**. The scheme should handle all types of OPMET information in alphanumeric bulletin form and should provide facilities and services for scheduled and non-scheduled delivery of OPMET information to users.

2.4 Communications -General

2.4.1 Use of AFS Components

According to Annex 3, 11.2, "telecommunications facilities used for the exchange of operational meteorological information should be the aeronautical fixed service". The use of the AFS for the OPMET exchange encompasses two components:

- Use of terrestrial AFTN circuits; and
- Use of satellite distribution systems-SADIS .

2.4.2 Use of the AFTN

2.4.2.1 In the AMBEX scheme AFTN circuits are used for collection of the OPMET messages by the AMBEX centres and for regional and inter-regional exchanges of OPMET bulletins. The access to the regional OPMET data banks (request-reply service provided by the RODBs) is also provided through the AFTN.

2.4.2.2 OPMET bulletins transmitted via the AFTN shall be in encapsulated in the text part of the AFTN message format (Annex 3, Appendix 10, 2.1.4).

2.4.2.3 Transit times of the AFTN messages and bulletins containing OPMET information are specified in Annex 3, Appendix 10, 1.1

2.4.2.4 OPMET bulletins via AFTN should use the following **priority indicators**:

- **FF: SIGMET, AIREP SPECIAL, VAA,TCA and TAF amend** (cf. Annex 10 Vol II, 4.4.1.1.3)
- **GG: TAF, METAR and SPECI** (cf. Annex 10 VolII, 4.4.1.1.4)

2.4.2.5 **Filing times** of the bulletins should be according to Annex 3, Appendix 10, 2.1.2

2.4.3 Use of the Satellite Distribution System for aeronautical information (SADIS-operated by the UK)

2.4.3.1 SADIS satellite broadcast is used by the authorized users in the States for receiving global OPMET DATA.

2.4.3.2 FASID Table MET 7 of the AFI regional plans contains a list of authorized users for the SADIS broadcast.

2.5 Use of the Internet

2.5.1 Internet may be used to the dedicated internationally agreed circuits for exchange of meteorological data. An internet based FTP service to SADIS has been operational since 2002.

2.5.2 In future, it is intended that RODBs should also provide internet based facilities for retrieval of OPMET information. ROdB Dakar is already using the Internet to provide METARs and TAFs.

2.6 Management

2.6.1 Monitoring of the OPMET exchange under the AMBEX Scheme, planning for improvements and preparation of proposals for any changes that may be necessary, are carried by the APIRG. In order to achieve these tasks, the AMBEX implementation status and planning is part of the agenda of the AFI MET Sub-group MET/SG.

Note: When necessary, contributory bodies may be established by APIRG or the MET Sub-group to deal with OPMET specific issues. The AFI OPMET Management Task Force, established by APIRG/16 is currently tasked to deal with all OPMET related issues in the AFI Region

2.6.2 Any proposals for amendments to the AMBEX Scheme , which States or international

organizations concerned consider it necessary, due to changes in operational requirements for OPMET data or to developments of the AFS , should be forwarded for consideration by the ICAO Regional Offices of Dakar, Senegal and Nairobi, Kenya as the case may be.

2.7 Documentation

2.7.1 The AMBEX Handbook is the main guidance material related to the AMBEX Scheme. It should be kept up-to-date by the ICAO Regional offices referred to above coordinated by the Secretary of the OPMET Task Force in close coordination with the Secretary of the MET Sub-group.

2.7.2 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. DEFINITIONS AND SYMBOLS

3.1 Within the AMBEX Scheme, the following definitions and symbols are used:

- i) AMBEX: AFI MET Bulletins Exchange (Scheme);
- ii) AMBEX Bulletin: A collection of AMBEX 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;
- iii) National OPMET center (NOC). Normally, a NOC is associated with the State's national AFTN centre/switch. The role of the NOC is to collect all OPMET messages generated by the originating stations in the State and to send them to the responsible AMBEX bulletin compiling center (AMBEX BCC). Some NOCs serve also as AMBEX BCCs. National regulations should be developed to ensure that NOCs disseminate the international OPMET data within their own State, as necessary.
- iv) AMBEX Bulletin Compiling Centre (BCC): AMBEX centres (former TCC, MCC or ACC, etc..) are responsible for collection of OPMET messages from the originating stations or NOCs in their area of responsibility and for compiling these messages into AMBEX bulletins. FASID Tables MET 4A and MET 4B determine the areas of responsibility (or, collection areas) of the AMBEX centres for METAR/SPECI, and TAF, respectively.
- v) 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, and/or on a request/reply basis;
- vi) YPYX: Fifth, sixth, seventh and eighth letter of an addressee indicator to be used:
 - a) with the normal four-letter location indicators, to designate BCCs
 - b) with indicators for pre-determined distribution within a BCC collection area.
- vii) Regional OPMET Data Bank (RODB): A centre charged with task to collect OPMET bulletins from AMBEX 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 AMBEX centres on any deficiencies, monitor the OPMET traffic and report to the ICAO Regional Office on the results

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

4. OPMET INFORMATION AND OPMET EXCHANGES

4.1 OPMET Data Type

4.1.1 The following OPMET data types should be handled by the AMBEX scheme:

Data type	Abbreviated name	WMO data type designator
Aerodrome reports	METAR	SA
	SPECI	SP
Aerodrome forecasts	TAF: 24 and 30 hour	FT
SIGMET information	SIGMET	WS
	SIGMET for TC	WC
	SIGMET for VA	WV
Volcanic ash and tropical cyclone advisories	Volcanic Ash Advisory	FV
	Tropical Cyclone Advisory	FK
Air-reports	AIREP SPECIAL (ARS)	UA
Administrative	ADMIN	NO

4.2 OPMET bulletins

4.2.1 The exchange of OPMET data is carried out through bulletins containing one or more meteorological messages (METAR, SPECI, TAF or other OPMET information). An OPMET bulletin contains messages of the same type.

4.2.2 The format of OPMET bulletins is determined by:

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

4.3 Types of OPMET exchange

4.3.1 **Regional exchange – AMBEX scheme**

4.3.1.1 The AMBEX scheme covers the exchange of OPMET information in the AFI region. It includes several types of exchanges as described below.

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

4.3.1.1.2 *Non-regular exchange.* This includes:

- a) *Exchange on request (request-reply service).* The RODBs store OPMET data and make them available on request.
- b) *Exchange of non-routine reports:* SPECI; TAF AMD; SIGMET; TCA and VAA; ADMIN messages.;

4.3.2 Inter-regional OPMET exchange

4.3.2.1 Exchange of OPMET data between the AFI 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/receiving specified OPMET data between AFI and every other ICAO region for which AFI OPMET data are required.

Note: The former name of these centres is ODREP.

4.3.2.2 Inter-regional OPMET exchange via IROGs is carried out through the ground segment of the AFS (currently, through the AFTN).

4.3.3 Exchange of OPMET information through the satellite segment of the AFS

4.3.3.1 The three satellite broadcasts provided by the United Kingdom (Satellite Distribution System for Aeronautical Information Relating to Air Navigation - SADIS) and the United States (International Satellite Communication System – ISCS/1 and ISCS/2), form another type of OPMET exchange, which is global in nature and is intended to cover the emerging requirement for global access to all available OPMET data.

4.3.3.2 All AFI data handled by the AMBEX scheme should be relayed to the SADIS for global broadcast.

4.3.4 Other OPMET exchanges

4.3.4.1 Where OPMET exchanges described in the above paragraphs are not sufficient, direct AFTN addressing should be utilized by the originating centres.

5 COMPOSITION OF AMBEX

5.1 Components of the AMBEX

5.1.1 AMBEX scheme involves a number of aeronautical meteorological stations, aeronautical telecommunication stations, aerodrome meteorological offices and other operational units. The following operational units should be considered as components of the AMBEX scheme:

- Originating station
- National OPMET center (NOC)
- AMBEX bulletin compiling centre (BCC)-AMBEX Centre
- Regional OPMET Data Banks (RODBs)
- Interregional OPMET gateway (IROG) .

5.2 Originating Station

5.2.1 It is an aeronautical meteorological station or an aerodrome meteorological office, or a forecasting office, or a MWO, or a TCAC, or a VAAC. The duties and responsibilities of these originating stations should be defined by the State's meteorological authority.

5.3 National OPMET Center (NOC).

5.3.1 Normally, a NOC is associated with the State's national AFTN centre/switch. The role of the NOC is to collect all OPMET messages generated by the originating stations in the State and to send them to the responsible AMBEX bulletin compiling center (AMBEX BCC). Some NOCs serve also as AMBEX BCCs. National regulations should be developed to ensure that NOCs disseminate the international OPMET data within their own State, as necessary.

5.4 AMBEX Bulletin Compiling Centre (AMBEX BCC or, in brief, AMBEX centre).

5.4.1 AMBEX centres are responsible for collection of OPMET messages from the originating stations or NOCs in their area of responsibility and for compiling these messages into AMBEX bulletins. FASID Tables MET 4A and MET 4B determine the areas of responsibility (or, collection areas) of the AMBEX centres for METAR/SPECI and AIREP SPECIAL, and TAF, respectively.

5.4.2 The AMBEX centres are responsible for the transmission of the bulletins compiled by them to:

- other AMBEX centres, according to predefined distribution lists, specific for each bulletin;
- AFI RODBs (Dakar and Pretoria);
- NOCs or other COM or MET offices in the States in their area of responsibilities, as agreed between the AMBEX centre and the States' authorities concerned.

Note: The former AMBEX scheme involved separate compiling centres for METAR and TAF (METAR Collection Centres, and TAF Collection Centres. In some cases, METAR from an aerodrome was compiled by one center, and the TAF from another center. The evolution of AMBEX should be towards unified AMBEX centers responsible for collecting/distributing of all OPMET data types within their area of responsibility.

5.5 Regional OPMET Data Banks (RODB)

5.5.1 Two centres have been designated by APIRG (APIRG/13 Conclusion 13/67, 2001), to serve as Regional OPMET Data Banks: Dakar and Pretoria. FASID Table MET 4C reflects the requirements for the operation of the AFI OPMET data banks to support the AMBEX Scheme.

5.5.2 The **main responsibilities** of the RODBs are defined, as follows:

- to support the AMBEX Scheme and to facilitate a regular exchange of OPMET information based on predetermined distribution within the AFI Region;
- to operate as Inter-regional OPMET Gateway (IROG) with responsibility of exchanging OPMET information between AFI Region and the adjacent Regions; and
- to provide facilities for request/response type of access to the stored OPMET data for users to obtain non-regular or occasional information.

Note. — The interrogation procedures applicable to the OPMET data banks and catalogues are provided in the “AFI Regional Interface Control Document (ICD) - OPMET Data Bank Access Procedures”, published and maintained by the ICAO Regional Offices in Dakar and Nairobi

5.6 Inter-regional OPMET Gateways (IROG).

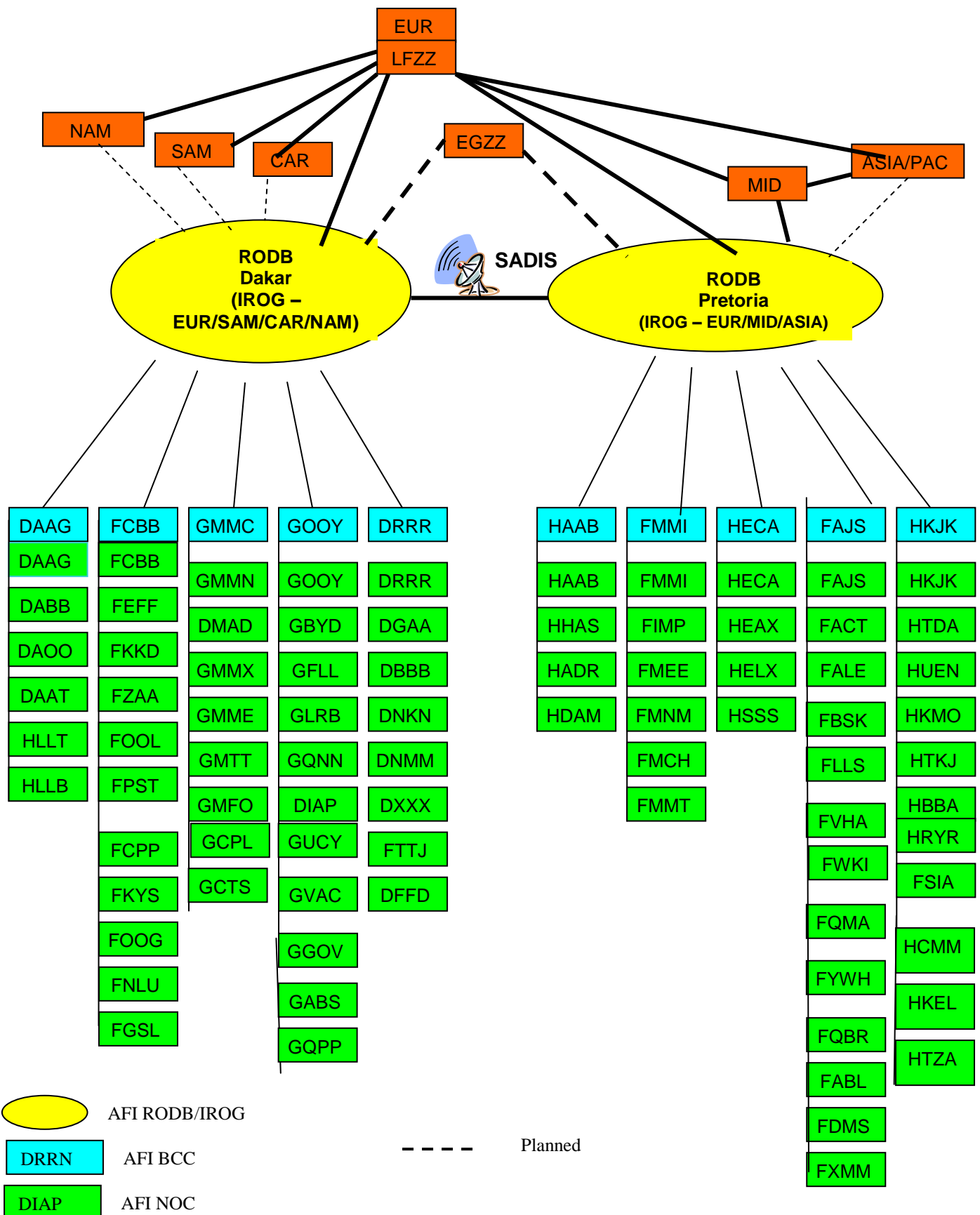
5.6.1 The Inter-regional OPMET Gateways in the AFI Region are the designated RODBs. Each RODB is assigned responsibility for exchange of OPMET information with other ICAO Regions. The responsibilities of the IROGs for AFI is shown in para. 11.1 of this Handbook.

5.6.2 **Support to the SADIS broadcast.** The RODBs and IROGs should facilitate the global exchange of OPMET data carried out through the SADIS satellite broadcast. In order to achieve this, close liaison should be maintained between the IROGs and the corresponding SADIS gateways. Availability of AFI data on SADIS should be monitored and any systematic shortfalls of data identified should be reported to the relevant ICAO regional office.

5.7 Structure of the AMBEX Scheme

5.7.1 The overall structure of the AMBEX scheme is presented in the following diagram

AMBEX SCHEME



6. TAF EXCHANGE

6.1 General

6.1.1 Aerodrome forecast (TAF) should be prepared by the aerodrome meteorological offices (AMOs) or other meteorological offices, designated for provision of TAF by the State's meteorological authority, for all international aerodromes, for which TAF is required according to FASID Table MET 1A of the AFI ANP.

6.1.2 All TAFs required should be included in the regular AMBEX exchange. In addition, TAFs from a number of other, including domestic aerodromes, required by the users, should also be included in the regular AMBEX exchange, if so agreed by the States concerned.

Notes:

- 1) *The recent requirement by airlines is that TAF for all international aerodromes listed in AFI FASID Table MET 1A should be available through regular exchange and through the satellite distribution system SADIS..*
- 2) *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 TAF exchanges not covered by the AMBEX Scheme, but required operationally, should be met by means of direct addressed AFTN messages.

6.1.4 The requirements for the exchange of 24 or 30-hour TAFs (so called "long" TAFs with WMO data designator – FT), are set in FASID Table MET 1A of the ANP. "Short" TAFs with 9- or 12-hour period of validity (WMO data designator - FC), are no longer issued by States in the AFI region

6.1.5 AMBEX messages and bulletins are normally sent via the AFTN. In exceptional circumstances, when the AFTN cannot give adequate support to AMBEX traffic, the temporary use of alternative existing communications systems should as far as possible be coordinated with the ICAO Regional Offices concerned.

6.1.6 Each AMBEX message and AMBEX bulletin should conform strictly to the Annex 10 message format.

6.1.7 Each AMBEX message and AMBEX bulletin should carry a WMO abbreviated heading (see **Appendix C**).

6.1.8 Each AMBEX message or bulletin, should terminate with an equal (=) sign (signal no. 22 of International Telegraph Alphabet no.2 in the figure case).

6.1.9 The procedures described in this Handbook are intended for the manual preparation of AMBEX messages and bulletins. It is not intended, however, that the Handbook precludes the use of automated or semi-automated procedures. When required, the procedures described hereunder should be modified and applied in a manner which will fully exploit the capabilities of the equipment available. The AMBEX messages and bulletins produced by application of such modified procedures should be in a

format compatible with the format described in this Handbook.

6.2 Responsibilities and procedures to be followed by originating aerodrome meteorological offices (AMOs) and NOCs

6.2.1 Originating AMOs (or other designated forecasting offices) should prepare the required TAF messages for the periods of validity indicated in **Appendix B**. TAFs should be sent by the AMOs or NOCs and to the responsible AMBEX center before the cut-off time set up by this centre.

6.2.2 Aerodrome meteorological offices in preparing TAF should follow strictly the template for TAF in Annex 3, Appendix 5 and the WMO TAF code form (FM 51-XII TAF, WMO – No. 306, *Manual on Codes*, Volume I.1, Part A – *Alphanumeric Codes*).

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

6.2.4 TAF messages 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 had been identified.

6.2.5 Within five minutes of the time of preparation of the TAFs, an AMBEX message should be filed for transmission to the BCC concerned.

6.2.6 Not later than five minutes after being filed for transmission, the AMBEX messages should be sent to the BCCs. This means that BCCs should have available AMBEX messages from all stations in their area of responsibility (AOR) within ten minutes of the times shown in column 6 of **Appendix B**.

6.2.7 The following is an outline of the procedures to be applied in preparing an AMBEX message at an office other than a BCC:

<u>Parts of Message</u>	<u>Resulting Page Copy</u>
a) Priority Indicator and Address	GG DRRNYPYX
b) Date and Time of Filing and Originator	281010 DGAAYMYX
c) WMO Abbreviated Heading (see Appendix C)	FTGH31 DGAA 281000
d) TAF	TAF DGAA 281030Z 2812/2912 13010KT 9000 BKN020 TEMPO 2816/2820 3000 DZ BKN005 OVC05 FM290430 17010KT 9999 BKN015 BKN100 =
e) Normal Ending.	

6.2.8 If an amendment to a TAF previously issued becomes necessary, a new AMBEX message should be prepared and sent to the BCC concerned. The WMO abbreviated heading for this message should be the same as for the AMBEX message containing the original TAF, with the addition of the optional groups AAA, AAB, AAC etc. (to indicate the first, second, third etc. amendment to the original TAF). Optional groups are also used for sending delayed TAFs, RRA, RRB, RRC, etc and corrected TAFs CCA, CCB, CCC, etc in accordance with **Appendix C**.

6.2.9 TAFs for individual aerodromes in the AMBEX Scheme should not be addressed to aerodromes in those cases where the AMBEX Scheme already caters reliably for their dissemination.

6.2.10 Requests for missing bulletins should be sent to the BCC responsible for compiling the bulletins and should be in the following format:

<u>Parts of Message</u>	<u>Resulting Page Copy</u>
a) Priority Indicator and Address of the BCC concerned	GG HKJKYPYX
b) Date and Time of filing and Originator	051305 FMMIYMYX
c) Text	RQM/SAYSSY, YBBN, YMML=
d) Normal ending	NNNN.

Note: Certain BCCs may require AFTN addresses other than those of the BCCs themselves to be used for request messages. A list of such addresses will be compiled and included in the AMBEX Handbook.

6.2.11 Provisions concerning request messages to the AFI RODBs are given in the ICD of the Dakar and Pretoria RODBs.

6.3 Responsibilities and procedures to be followed the AMBEX Centres (BCCs)

6.3.1 AMBEX centres should collect TAFs from the AMOs and/or NOCs in their area of responsibility and compile TAF Bulletins according to **Appendix B**. The areas of responsibility, as far as practicable, should group together aerodromes and their alternates. AMBEX centres should ensure that TAFs within their area of responsibility have common periods of validity.

6.3.2 AMBEX centres should establish a cut-off time for reception of TAFs from AMOs and/or NOCs in their area of responsibility, e.g., 15 minutes before the filing/transmission times specified in **Appendix B**. At the cut-of time AMBEX centres should compile TAF bulletin(s) containing all prescribed aerodromes, without indicating any missing TAF with "NIL".

6.3.3 The filing time for 24- and 30-hour TAF bulletins should be **two hours** before the start of the validity period.

6.3.4 AMBEX 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**.

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

6.3.6 A TAF message received by a AMBEX centre after the scheduled transmission of the corresponding bulletin is a delayed TAF. The AMBEX centre should then prepare an AMBEX bulletin of all TAFs received. If a TAF is not available, for any reason, at the cut-off time, the latest **still valid** TAF for the missing station may be included instead.

6.3.7 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.

6.3.8 Each BCC should establish a cut-off time for the reception of AMBEX 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**.

6.3.9 A new tape, containing the address, origin and WMO abbreviated heading of the bulletin, is prepared. The bulletin is then assembled by combining this new tape with the text portions of the AMBEX messages received and adding a normal ending. Details of the WMO abbreviated headings that should be used by BCCs in their bulletins are given in **Appendix C**.

6.3.10 AMBEX centres should disseminate their own bulletins to the stations listed in column 9 of **Appendix B**. This dissemination should take place some **thirty minutes** after the time for preparation of the TAFs shown in column 6 of **Appendix B**.

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

6.3.12 The following is an outline of the procedures to be followed by AMBEX centres in the preparation of AMBEX bulletins.

<u>Parts of Bulletin</u>	<u>Resulting Page Copy</u>
a) Priority Indicator and Address	GG DAZZYPYX FAJSYMYX FCZZXLBX GOOZZSNGX HAZZYPYX HEZZYPYX HKZZYPBX
b) Date and Time of Filing and Originator	281030 DRRNYPYX
c) WMO Abbreviated Heading (see Appendix B)	FTA033 DRRN 281000
d) TAFs received from the stations in the AOR, in order shown in column 2 of Appendix B	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 281020Z 2812/2912 13010KT 9000 BKN020 TEMPO 2816/2820 3000 DZ BKN005 OVC050 FM290400 17010KT 9999 BKN015 BNK100 =

TAF DBBB 281030Z 2812/2912 26008KT 9000 BKN020 PROB30 TEMPO 2815/2818 3000 TSRA BKN005 SCT020CB FM290000 24006KT 9000 BKN010 =

TAF DNKN 281030Z 2812/2912 VRB03KT 9999 BKN015 PROB30 TEMPO 2813/2816 2000 FG BKN003 BKN010 FM282000 24006KT 9000 BKN020 =

TAF DNMM 281028Z 2812/2912 24006KT 9000 BKN020 PROB30 TEMPO 2814/2816 3000 DZ BKN005 BKN010=

TAF DXXX 281030Z 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 281030Z 2812/2912 12006KT CAVOK TEMPO 2818/2820 SCT030 =

TAF DFFD 281030Z 2812/2912 20004KT 9999 BKN020 BECMG 2814/2816 SCT018CB BKN020 TEMPO 2816/2818 24010KT TSRA SCT015CB BKN020 FM290600 22008KT 9999 BKN020 BKN100 =

e) Normal Ending NNNN.

6.3.13 TAFs received by an AMBEX 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 C**, paragraph 4.

6.3.14 When an AMBEX 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 C**, paragraph 4.

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

6.3.16 If an AMBEX centre finds it impossible to meet the specified filing times due to systematic late receipt of TAFs from originating stations or NOCs, it should reach an agreement with these stations on another filing time for their AMBEX messages and thereafter propose to the Secretary of the AFI MET/SG that this filing time be incorporated in the Handbook.

6.3.17 In addition to its own AMBEX bulletins, each BCC should distribute bulletins received from other BCCs to the MET offices within its originating stations or NOCs.

6.4 **Format and content of TAF bulletins**

6.4.1 Issuance and period of validity:

6.4.1.1 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	22 (-1)*	00-06 (+1)	22 (-1)*
06	06-06	04	06-12 (+1)	04
12	12-12	10	12-18 (+1)	10
18	18-18	16	18-24 (+1)	16

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

6.4.1.2 All TAFs in a AMBEX TAF bulletin should have a common period of validity. It is not allowed to mix “long” and “short” TAFs in one bulletin.

6.4.2 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 time of issuance. Corrected TAF messages, should start with TAF COR. Amended forecasts should start with TAF AMD.

6.4.3 The use of the BBB group in the WMO heading for delayed, corrected, or amended TAFs is described in **Appendix C**.

6.4.4 The following is an outline of the format to be applied by a AMBEX centre in preparing a TAF bulletin, containing “long” TAFs (24 or 30 hour):

Parts of Message	AMBEX FT Bulletin
<i>AFTN header</i>	
Priority Indicator and Address	GG YBBBYPYX
Date and Time of filing and Originator	271104 ZBBBYPYX
<i>WMO Abbreviated Heading</i>	FTCI31 ZBBB 271100
<i>TAF messages</i>	TAF ZBAA 271000Z 2712/2812.....= TAF ZBTJ 271000Z 2712/2818.....=
<i>AFTN Normal Ending</i>	NNNN.....

6.4.5 A missing TAF in a non TAF bulletin should be indicated with “NIL”, as shown in the following example:

TAF VTBD 281000Z NIL=

6.4.6 A cancelled TAF in a TAF bulletin should be indicated with “CNL”, as shown in the following example:

TAF VTBD 281000Z 2812/2912 CNL=

7. SPECIAL AIREP EXCHANGE

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

Note: – Routine air-reports received by data-link communications should be relayed directly to the WAFCS by the ATS unit.

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

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,*

7.3 AFI FASID Table 2B describes the exchange of SIGMET and special AIREP reports procedures.

8. METAR/SPECI EXCHANGE

8.1 General

8.1.1 Hourly METAR reports should be prepared by all international aerodromes listed in FASID Table MET 1A. METAR should be issued **on an hour intervals** for those aerodromes, included in the HF VOLMET broadcasts (cf. FASID Table ATS 2 – HF Radiotelephony VOLMET Broadcasts), or D-VOLMET.

8.1.2 METAR from all international aerodromes listed in Table AOP 1 of the Basic ANP and , in FASID Table MET 1A, should be included in the regular AMBEX exchange. In addition, METAR from a number of domestic aerodromes, required by the users, should also be included in the regular AMBEX exchange in accordance with para. 12.1.3, if so agreed by the States concerned.

Note: 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.

8.1.3 Description of the AFI METAR bulletins included in the regular AMBEX exchange, containing the responsible compiling AMBEX centre, WMO bulletin identification, and the list of aerodromes included in the bulletin, is given in **Appendix A**.

8.1.4 The official hour of observation to be included in the METAR bulletin heading is indicated in the table in **Appendix A**.

8.1.5 All METAR bulletins should be sent to both RODBs Dakar and Pretoria. AMBEX centres should exchange METAR bulletins according to the distribution lists given in **Appendix A**.

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

8.1.7 Exchange of METAR/SPECI messages outside AMBEX scheme, if necessary should be carried out by direct AFTN addressed messages.

8.2 Responsibilities of originating stations and NOCs

8.2.1 The originating stations (aeronautical meteorological stations) and/or NOCs should prepare METAR messages for the observation times indicated in **Appendix A** and send them to their responsible AMBEX center.

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

8.2.3 In preparing METAR and SPECI messages the originating stations should follow strictly the specifications for METAR and SPECI in Annex 3 (Chapter 4 and Appendix 3 including the template in Table A3-2) and the WMO METAR and SPECI code forms (FM 15-XII METAR and FM 16-XII SPECI, WMO – No. 306, *Manual on Codes*, Volume I.1, Part A – *Alphanumeric Codes*).

8.2.4 METAR messages should be sent to the responsible AMBEX centre before the cut-off time specified by the AMBEX centre, 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.

8.2.5 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 C**.*

8.3 Responsibilities of AMBEX Centres

8.3.1 AMBEX centres should collect METAR messages from the aerodromes in their area of responsibility and compile METAR bulletins, according to **Appendix A**. The content of bulletins and the order of stations in each bulletin should be kept fixed until a bulletin change is requested and coordinated according to the established procedure.

8.3.2 AMBEX centers should determine a cut-off time for the reception of METAR from the stations in their area of responsibility. At the cut-off time, the AMBEX centre should compile METAR bulletin(s) containing all prescribed aerodromes, indicating any missing METAR with “NIL”.

8.3.3 At scheduled transmission times AMBEX centres should transmit the compiled METAR bulletins to other AMBEX centres and RODBs according to the distribution lists specified for each METAR bulletin in **Appendix A**. METAR bulletins should be filed for transmission not later than 5 minutes after the observation time.

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

8.3.5 A SPECI when received by an AMBEX centre 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.

8.3.6 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.

8.3.7 A METAR message received by the AMBEX centre after the scheduled transmission of the corresponding bulletin is a delayed METAR. The AMBEX centre should send a delayed bulletin as soon as one or more delayed messages are received or at specified times after the scheduled bulletin time (e.g., the first delayed bulletin (RRA) issued 10 minutes after the regular time; the second delayed bulletin (RRB) issued 20 minutes after the regular time, etc.).

8.3.8 As soon as a corrected METAR or SPECI message is received from a station the AMBEX centre should transmit it as a corrected bulletin to all recipients.

8.4 Format and content of METAR Bulletins

8.4.1 Each METAR message in a METAR 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 official time of observation. Corrected METAR messages, should start with METAR COR.

8.4.2 The following is an example of the format to be applied in preparing a METAR bulletin by the AMBEX centre:

Parts of Message	AMBEX SA Bulletin
<i>AFTN header</i>	
Priority Indicator and Address Date and Time of filing and Originator	GG VTBBYPYX 271304 ZBBBYPYX
<i>WMO Abbreviated Heading</i>	SACI31 ZBBB 271300
<i>METAR messages</i>	METAR ZBAA 271300Z = METAR ZBTJ 271300Z =
<i>AFTN Normal Ending</i>	NNNN

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

8.4.3 The rules related to the use of the BBB group in the WMO abbreviated heading, in regard to delayed or corrected bulletins, are given in **Appendix C**.

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

Example: METAR ZBTJ 271200Z NIL=

8.5 Format and content of SPECI Bulletins

8.5.1 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. The following is an example of the format to be applied in preparing a SPECI bulletin by the AMBEX centre:

Parts of Message	AMBEX SP Bulletin
<i>AFTN header</i>	
Priority Indicator and Address Date and Time of filing and Originator	GG VTBBYPYX 081647 ZBBBYPYX
<i>WMO Abbreviated Heading</i>	SPCI31 ZBBB 081645
<i>SPECI message</i>	SPECI ZBAA 081645Z =
<i>AFTN Normal Ending</i>	NNNN

9. EXCHANGE OF SIGMET AND ADVISORIES

9.1 SIGMET should be prepared by the meteorological watch offices (MWO) designated by the State's meteorological authority. The MWOs and their areas of responsibility are given in the FASID Table MET 1B of AFI ANP.

9.2 SIGMET should be distributed to the two RODBs, either directly or through the responsible AMBEX 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 E**.

9.3 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).

9.4 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

9.5 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.

9.6 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 E**

9.7 VAA and TCA messages should be distributed to other ICAO regions and made available for uplink through SADIS. This distribution should be carried out either directly by the VAACs and TCACs or through the relevant Inter-regional OPMET Gateway (IROG) such as Toulouse, France.

10. REGIONAL OPMET DATA BANKS (RODB)

10.1 The AFI Regional OPMET Data Banks and the AFTN addresses to be used for direct access to the banks are shown below:

RODB	AFTN ADDRESS	AMBEX CENTRES AND AREA OF RESPONSIBILITY
Dakar	GOOYYZYZ	Alger/DAMM Brazzaville/FCBB Casablanca/GMMC Dakar/GOOO Niamey/DRNN
Pretoria	FAJSYMYX	Addis Ababa/HAAB Antananarivo/FMMI Cairo/HECA Johannesburg/FAJS Nairobi/HKNA

10.2 Responsibilities:

10.2.1 Collect OPMET bulletins from the AMBEX centres in the area of responsibility and store them in a data base.

10.2.2 Handle all type of OPMET bulletins, as described in p. 3.1.1.

10.2.3 Provide facilities for “request-reply” service to the authorized users.

10.2.4 Maintain a catalogue of bulletins and introduce changes to the bulletins when necessary according to the established procedures.

10.2.5 Quality control the incoming bulletins and inform the AMBEX centres of any discrepancies or shortfalls.

10.2.6 Monitor the OPMET traffic by carrying out regular tests on the availability and timeliness of the bulletins; report to the ICAO Regional Office on the results.

10.3 The interrogation procedures applicable to the designated RODBs and the OPMET information stored are presented in the AFI Regional Interface Control Document (ICD) - OPMET Data Bank Access Procedures.

10.4 Guidance on the management and quality control is provided in chapter 12 of this Handbook.

11. INTER-REGIONAL OPMET EXCHANGE - IROG FUNCTIONS

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

AMBEX IROG	For Exchange of OPMET data between Regions
Dakar	AFI and EUR; SAM, NAM, CAR; MID, ASIA/PAC as backup to Pretoria
Pretoria	AFI and MID; ASIA/PAC, EUR; SAM, NAM, CAR as backup to Dakar

11.2 IROGs and their functions are described at **Appendix D**. IROGs arrange for relaying all AMBEX 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 the ASI/PAC Regions, and should receive and store all required OPMET bulletins from MID, ASIA/PAC, EUR, SAM Regions;

11.3 The following principles are applied to IROGs:

- a) IROGs should have reliable and efficient AFTN connection to the regions, for which they have exchange responsibilities, with adequate capacity to handle the OPMET data flow between the regions;
- b) IROGs should be associated with AFTN relay centres capable of handling efficiently the volume of traffic anticipated;
- c) IROGs should be capable of handling all OPMET data types, as described in para.4.1.1.

11.4 In order to avoid duplication of the OPMET traffic and information, all inter-regional OPMET exchange should be directed through the IROGs. Inter-regional exchange via direct AFTN addressing from the originator or AMBEX centre to recipients in the other ICAO Regions should be avoided, except when bilateral or other agreements require such direct exchanges.

12. MANAGEMENT OF OPMET EXCHANGE UNDER THE AMBEX SCHEME

12.1 OPMET Bulletins Update Procedure

12.1.1 Information for changes of AMBEX bulletins should be disseminated to all AMBEX centres 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 period of two months (*or two AIRAC cycles*) is considered appropriate.

12.1.2 The AMBEX centre planning the change, should send a notification by e-mail or fax to the ICAO Office, Dakar or Nairobi with copy to all AMBEX Focal Points. The notification should include detailed information of 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 All requests by users for changes to AMBEX bulletins should be addressed to the ICAO Regional Office concerned. The Regional Office should carry out the necessary coordination with the States and AMBEX centres 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 3 months.

12.2 Quality Management of OPMET Exchange under the AMBEX Scheme

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 a 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	<i>Data quality control applies to OPMET validation and correction during data processing and during preparation of messages</i>
OPMET monitoring	<i>Monitor and evaluate the performance indicators for the scheduled OPMET data</i>

12.2.2 Quality Control – General Requirements

12.2.2.1 Quality control (QC) consists of examination of OPMET data at NOCs, AMBEX Centres 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 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 AMBEX Centre, where the AMBEX 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.

12.2.2.5 The checks that have already been performed by originating offices and AMBEX Centres 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 data bank itself. Data corrected by the data banks should be flagged in the database for record purpose.

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 data banks. 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, Dakar or Nairobi 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 F**.

12.3 OPMET Monitoring

12.3.1 Monitoring of Scheduled OPMET Data

12.3.1.1 The monitoring shall focus on the measurement of three performance indicators (PIs), viz., Compliance, Availability and Regularity indices of the scheduled, routine OPMET data (SA, FT, FC) exchanged in the region. The PIs are described in detail in **Appendix F**.

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

12.3.1.3 Methodology: Data is monitored with reference to the procedures defined in **Appendix G** the EUR OPMET Data Monitoring Procedures as produced by APIRG MET/SG (Bulletin Management Group).

12.3.2 Monitoring of Non-Scheduled OPMET data

12.3.2.1 Monitoring of non-routine OPMET data shall be executed for FK, FV, WC, WS, and WV.

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 Regional Offices, Dakar and Nairobi.

12.3.2.3 The monitoring results shall be presented in bulletin-oriented format, one line per bulletin indicating the abbreviated header (TTAAii CCCC YGGgg), the FIR/UIR where applicable, receipt time and originator.

12.4 AMBEX Focal Points

12.4.1 In order to facilitate exchange of information between the AMBEX centres a system of AMBEX focal points have been developed. Contact details of the persons designated as AMBEX focal points by the relevant State's authorities is provided in **Appendix I**.

APPENDIX A

AMBEX COLLECTION AND DISSEMINATION OF METAR (SA) BULLETINS

Table A : METAR

Explanation of Table

Column

- 1: Name of the AMBEX Centre (BCC) compiling the bulletin.
2. ICAO location indicator of the AMBEX Centre compiling the bulletin.
3. Bulletin identifier- The identifier to be used in the WMO abbreviated heading of AMBEX METAR bulletins prepared by the BCC in Column 1.
4. ICAO location indicator of the aerodrome forming part of the collection area of the BCC in Column 1.
5. Name of the aerodrome forming part of the collection area of the BCC in Column 1.
6. Preparation - Times at which BCC in column 1 should prepare METAR bulletins for further dissemination.
7. Distribution of the bulletin to other AMBEX centres and RODBs – Name of the AMBEX/RODB Centre
8. Distribution of the bulletin to other AMBEX centres and RODBs – AFTN address of the AMBEX/RODB Centre.

*Note: The RODB responsible for storing the bulletin is in **bold***

- Notes:**
- 1 Aerodromes with shaded text are included in the HF VOLMET Broadcast
 - 2 The RODB responsible for storing the bulletin is in bold
 - 3 Non-AOP aerodeomes indicated in *italics*

AMBEX CENTRE		METAR BULLETIN				DISSEMINATION TO	
Name	CCCC	Bul. Id.	CCCC	Aerodrome	Prepar.	RODB/AMBEX Centre	AFTN Adress
1	2	3	4	5	6	7	8
ADDIS ABABA	HAAB	SAEA31	HAAB HAAY HADR HDAM	Addis Ababa Asmara Dire Dawa Djibouti	H+10	Addis Ababa Nairobi Dakar Brazzaville Niamey Antananarivo Cairo Johannesburg	HAABYMYX HKZZYPBX GOZZSNGX FCZZXLBX DRZZNAZX FMZZYPYX HEZZYPYX FAJSYMYX
ALGER	DAMM	SAAF31	DAMM DABB DAOO DAAT DTTA HLLT HLLB	Alger Annaba Oran Tamanrasset Tunis Tripoli Benghazi	H+10	Cairo Casablanca Dakar Niamey	HEZZYPYX GMZZYPYX GOOYYZYZ DRZZNAZX
ANTANANARIVO	FMMI	SAI031	FMMI FMNM FIMP FMCH FMEE FMMT	Antananarivo Mahajanga Mauritius Moroni Saint-Denis Toamasina	H+10	Nairobi Addis Ababa Johannesburg Nairobi	HKZZYPBX HAZZYPYX FAJSYMYX HKZZYPBX
BRAZZAVILLE	FCBB	SAAM31	FCBB FCPP FEFF FKKD FKYS FZAA FOOL FOOG FNLU FGSL FPST	Brazzaville Pointe Noire Bangui Douala Yaounde Kinshasa Libreville Port Gentil Luanda Malabo Sao Tome	H+10	Dakar Niamey Addis Ababa Johannesburg Nairobi	GOOYYZYZ DRZZNAZX HAZZYPYX FAJSYMYX HKZZYPBX
CAIRO	HECA	SAAF32	HECA HEAX HELX HSSS	Cairo Alexandria Luxor Khartoum	H+10	Addis Ababa Nairobi Antananarivo Niamey Johannesburg	HAZZYPYX HKZZYPBX FMZZYPYX DRZZNAZX FAJSYMYX

AMBEX CENTRE		METAR BULLETIN				DISSEMINATION TO	
Name	CCCC	Bul. Id.	CCCC	Aerodrome	Prepar.	RODB/AMBEX Centre	AFTN Adress
1	2	3	4	5	6	7	8
CASA BLANCA	GMMC	SAMC31	GMMC GMAA GMMX GMME GMIT GCLP GCTS	Casablanca Agadir Marrakech Rabat Tanger Las Palmas Tenerife Sur	H+10	Alger Dakar Cairo	DAZZYPYP GOOYYZYZ HEZZYPYX
DAKAR	GOOY	SAA032	GOOY DIAP GBYD GABS GUCY GFLI GLRB GQPP GQNN GVAC GGOV	Dakar Abidjan Banjul Bamako Conakry Freetown Monrovia Nouadhibou Nouakchott Sal Bissau	H+10	Casablanca Alger Niamey Johannesburg Brazzaville Nairobi Addis Ababa Toulouse Dakar Rio de Janeiro	GMMCYPYX DAZZYPYP DRZZNAZX FAJSYMYX FCZZXLBX HKZZYPBX HAZZYPYX LFZZMAFI GOOYYZYZ SBGLYMYX
JOHANNE SBURG	FAJS	SAAP32	FAJS FABL FACT FALE FBSK FVHA FWKI FLLS FDMS FQBR FQMA FXMM FYWH	Johannesburg Bloemfontein Cape Town King Shaka Gaborone Harare Lilongwe Lusaka Manzini Beira Maputo Maseru Windhoek	H+10	Addis Ababa Antananarivo Brazzaville Cairo Dar Es Salaam Dakar Nairobi Toulouse Johannesburg Rio de Janeiro Bangkok Jeddah	HAZZYPYX FMZZYPYX FCZZXLBX HFZZYPYX HTDAYMYX GOOYYZYZ HKZZYPBX LFZZMAFI FAJSYMYX SBGLYMYX VTBDYMYX OEJNYMYX

APPENDIX B

AMBEX COLLECTION AND DISSEMINATION OF LONG TAF (FT) BULLETINS

Table B : FT TAF

Explanation of the Table

Column

- 1: Name of the AMBEX Centre (BCC) compiling the bulletin.
2. ICAO location indicator of the AMBEX Centre compiling the bulletin.
3. Bulletin identifier- The identifier to be used in the WMO abbreviated heading of AMBEX TAF (FT) bulletins prepared by the BCC in Column 1.
4. ICAO location indicator of the aerodrome forming part of the collection area of the BCC in Column 1.
5. Name of the aerodrome forming part of the collection area of the BCC in Column 1.
6. Bulletin Filing Time -The latest filing times for AMBEX bulletins containing TAFs with the validities listed in Column 8.
7. Start of validity period
8. TAF validity
9. Distribution of the bulletin to other AMBEX centres and RODBs – Name of the AMBEX/RODB Centre
10. Distribution of the bulletin to other AMBEX centres and RODBs – AFTN address of the AMBEX/RODB Centre

Notes: 1 The RODB responsible for storing the bulletin is in bold

AMBEX CENTRE		TAF BULLETIN						DISSEMINATION TO	
Name	CCCC	Bul. Id.	CCCC	Aerodrome	Filing Time	Start of validity	TAF validit	RODB/ AMBEX Centre	AFTN Adress
1	2	3	4	5	6	7	8	9	10
ADDIS ABABA	HAAB	FTEA31	HAAB	Addis Ababa	0400 1000 1600 2200	0600 1200 1800 0000	30h	Addis Ababa Nairobi Dakar Brazzaville	HAABYMYX HKZZYPBX GOZZSNGX FCZZXLBX
		FTEA39	HAAY HADR HDAM	Asmara Dire Dawa Djibouti	0400 1000 1600 2200	0600 1200 1800 0000	24h	Niamey Antananarivo Cairo Johannesburg Jeddah	DRZZNAZX FMZZYPYY HEZZYPYX FAJSYMYX OEJDYPYX
ALGER	DAMM	FTAF39	DAMM DABB DAOO DAAT DTTA HLLT HLLB	Alger Annaba Oran Tamanrasset Tunis Tripoli Benghazi	0400 1000 1600 2200	0600 1200 1800 0000	24h	Cairo Casablanca Dakar Niamey	HEZZYPYX GMZZYPYX GOOYYZYZ DRZZNAZX
ANTANA NARIVO	FMMI	FTI031	FMMI FIMP FMEE FMCH	Antananarivo Mauritius Saint-Denis Moroni	0400 1000 1600 2200	0600 1200 1800 0000	30h	Nairobi Addis Ababa Johannesburg	HKZZYPBX HAZZYPYX FAJSYMYX
		FTI039	FMNM FMMT	Mahajanga Toamasina	0400 1000 1600 2200	0600 1200 1800 0000	24h	Nairobi	HKZZYPBX
BRAZZA VILLE	FCBB	FTAM31	FCBB FEFF FKKD FZAA FOOL FPST FGSL	Brazzaville Bangui Douala Kinshasa Libreville Sao Tome Malabo	0400 1000 1600 2200	0600 1200 1800 0000	30h	Dakar Niamey Addis Ababa Johannesburg	GOOYYZYZ DRZZNAZX HAZZYPYX FAJSYMYX
		FTAM39	FCPP FKYS FOOG FNLU	Pointe Noire Yaounde Port Gentil Luanda	0400 1000 1600 2200	0600 1200 1800 0000	24h	Nairobi	HKZZYPBX

AMBEX CENTRE		TAF BULLETIN						DISSEMINATION TO	
Name	CCCC	Bul. Id.	CCCC	Aerodrome	Filing Time	Start of validity	TAF validit	RODB/ AMBEX Centre	AFTN Adress
1	2	3	4	5	6	7	8	9	10
CAIRO	HECA	FTAF39	HECA HEAX HELX HSSS	Cairo Alexandria Luxor Khartoum	0400 1000 1600 2200	0600 1200 1800 0000	24h	Addis Ababa Nairobi Antananarivo Niamey Johannesburg	HAZZYPYX HKZZYPBX FMZZYPYX DRZZNAZX FAJSYMYX
CASA BLANCA	GMMC	FTMC31	GMMC GMAA GMMX GMME GMIT	Casablanca Agadir Marrakech Rabat Tanger	0400 1000 1600 2200	0600 1200 1800 0000	30h	Alger Dakar Cairo	DAZZYPYP GOOYYZYZ HEZZYPYX
		FTMC39	GCLP GCTS	Las Palmas Tenerife Sur	0400 1000 1600 2200	0600 1200 1800 0000	24h		
DAKAR	GOOY	FTA032	GOOY GBYD GABS GFL GLRB GQNN DIAP	Dakar Banjul Bamako Freetown Monrovia Nouakchott Abidjan	0400 1000 1600 2200	0600 1200 1800 0000	30h	Casablanca Alger Niamey Johannesburg Brazzaville	GMMCYPYX DAZZYPYP DRZZNAZX FAJSYMYX FCZZXLBX
		FTA039	GUCY GQPP GVAC GGOV	Conakry Nouadhibou Sal Bissau	0400 1000 1600 2200	0600 1200 1800 0000	24h	Nairobi Addis Ababa Toulouse Dakar	HKZZYPBX HAZZYPYX LFZZMAFI GOOYYZYZ
JOHANNE SBURG	FAJS	FTAP32	FAJS FACT FALE FBSK FVHA FWKI FLLS FQMA	Johannesburg Cape Town King Shaka Gaborone Harare Lilongwe Lusaka Maputo	0400 1000 1600 2200	0600 1200 1800 0000	30h	Addis Ababa Antananarivo Brazzaville Cairo Dar Es Salaam Dakar Nairobi	HAZZYPYX FMZZYPYX FCZZXLBX HFZZYPYX HTDAYMYX GOOYYZYZ HKZZYPBX
		FTAP39	FQBR FABL FDMS FXMM FYWH	Beira Bloemfontein Manzini Maseru Windhoek	0400 1000 1600 2200	0600 1200 1800 0000	24h	Toulouse Johannesburg Rio de Janeiro Bangkok Jeddah	LFZZMAFI FAJSYMYX SBGLYMYX VTBDYMYX OEJNYMYX

AMBEX CENTRE		TAF BULLETIN						DISSEMINATION TO			
Name	CCCC	Bul. Id.	CCC C	Aerodrome	Filing Time	Start of validity	TAF validit	RODB/ AMBEX Centre	AFTN Adress		
1	2	3	4	5	6	7	8	9	10		
NAIROBI	HKJK	FTEA32	HKJK	Nairobi	0400	0600	30h	Addis Ababa Antananarivo Johannesburg	HAABYPYX		
			HTDA	Dar-Es-Salaam	1000	1200			FMZZYPYX		
			HUEN	Entebbe	1600	1800			FAJSYMYX		
					2200	0000					
		FTEA39	HKMO	Mombasa	0400	0600	24h	Brazzaville	FCZZXLBX		
			HTKJ	Kilimanjaro				1000	1200	Dakar	GOZZSNGX
			HBBA	Bujumbura				1000	1200	Cairo	HEZZYPYX
			HRYR	Kigali				1600	1800	Niamey	DRZZNAZX
			FSIA	Mahe				2200	0000		
			HCMM	Mogadishu							
NIAMEY	DRRR	FTAO33	DRNN	Niamey	0400	0600	30h	Addis Ababa	HAZZYPYX		
			DGAA	Accra				1000	1200	Alger	DAZZYPYP
			DBBB	Cotonou				1600	1800	Cairo	HEZZYPYX
			DNKN	Kano				2200	0000	Brazzaville	FCZZXLBX
			DNMM	Lagos						Dakar	GOOYYZYZ
			DXXX	Lome						Johannesburg	FAJSYMYX
			FTTJ	N'djamena						Nairobi	HKZZYPBX
			DFFDY	Ouagadougou							

APPENDIX C

WMO ABBREVIATED HEADINGS
(for use in AMBEX messages and bulletins)

1. Each AMBEX 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:

TTAAii CCCC YYGGgg (BBB)

2. Explanation of symbols

2.1. TTAAii - TT - 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.

2.1.1 **TT** - Data type designator, used for OPMET data as follows:

Data Type	Abbreviated Name	WMO data type designator TT
Aerodrome reports	METAR SPECI	SA SP
Aerodrome forecasts	TAF: 24 and 30 hour 9 and 12 hour	FT FC
SIGMET information	SIGMET SIGMET for TC SIGMET for VA	WS WC WV
Volcanic ash and tropical cyclone advisories	VAA TCA	FV FK
Air-reports	AIREP	UA
Administrative	ADMIN	NO

2.1.2 **AA** - 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 C1. The following principles shall apply:

- a) For AMBEX bulletins containing OPMET data from a single State or territory, the AA designator should be chosen from Table C1, Part I – Country or territory designators;
- b) For AMBEX bulletins containing OPMET data from more than one State or territory, a suitable AA designator should be chosen from Table C1, Part II – Area Designators;
- c) The part of the Table C1, Part II – Area Designators, which is relevant to the AMBEX scheme is reproduced bellow.

2.1.3 In AMBEX messages prepared by offices other than BCCs for transmission to BCCs, the following geographical designators should be used:

NOC	AA	NOC	AA
Abidjan	IV	Casablanca	MC
Accra	GH	Conakry	GN
Addis Ababa	ET	Cotonou	BJ
Aden	DY	Dakar	SG
Agadir	MC	Dar-es-Salaam	TN
Alger	AL	Djibouti	DJ
Alexandria	EG	Douala	CM
Annaba	AL	Durban	ZA
Antananarivo	MG	Entebbe	UG
Asmara	ET	Freetown	SL
Bamako	MI	Gaborone	BC
Bangui	CE	Harare	ZW
Banjul	GB	Jeddah	SD
Beira	MZ	Johannesburg	ZA
Beirut	LB	Kano	NI
Benghazi	LY	Khartoum	SU
Bissau	GW	Kigali	RW
Bloemfontein	ZA	Kilimanjaro	TN
Brazzaville	CG	Kinshasa	ZR
Bujumbura	BI	Lagos	NI
Cairo	EG	Las Palmas	CR
Cape Town	ZA	Libreville	GO
Lilongwe	MW	Niamey	NR
Lomé	TG	Nouadhibou	MT
Luanda	AN	Nouakchott	MT
Lusaka	ZB	Oran	AL
Luxor	EG	Ouagadougou	HV
Madinah	SD	Pointe Noire	CG
Mahajanga	MG	Port Gentil	GO
Mahé	SC	Rabat	MC
Malabo	GQ	Riyadh	SD
Manzini	SV	Saint-Denis	RE
Maputo	MZ	Sal	CV
Marrakech	MC	Sao Tomé	TP
Maseru	LS	Tamanrasset	AL
Mauritius	MA	Tanger	MC
Mogadishu	SI	Tenerife	CR
Mombasa	KN	Toamasina	MG
Monrovia	LI	Tunis	TS
Moroni	IC	Tripoli	LY
Nairobi	KN	Windhoek	NM
N'Djamena	CD	Yaounde	CM

2.1.4 In bulletins prepared by BCCs, the following geographical designators should be used:

BCC	AA	BCC	AA
Addis Ababa	EA	Casablanca	MC
Alger	AF	Dakar	AO
Antananarivo	IO	Johannesburg	AP
Brazzaville	AM	Nairobi	EA
Cairo	AF	Niamey	AO

2.1.5 **ii** Number used to differentiate two or more bulletins which contain data in the same code and which originate from the same geographical area and from the same originating centre. It shall be a number with a maximum of two digits. The IROGs may use numbers 36 to 38. The numbers 31 to 35, 39 shall be used in AMBEX bulletins for purposes other than those of IROGfunctions. .

2.2 **CCCC**: ICAO location indicator of location preparing the AMBEX bulletin (BCCs) or AMBEX messages (offices other than BCCs).

2.3. **YYGGgg**: Date-time group. To be used as follows:

2.3.1 YY - Day of the month

2.3.2 GGgg - hours and minutes.

- For METAR bulletins/messages: the standard time of observation in UTC.
- For TAF bulletins: the full hour in UTC (the last two digits shall be 00) preceding the transmission time.
- For all other bulletin/messages - the time of compilation in UTC.

2.4. **BBB** - Optional group indicating an amended, corrected or delayed bulletin.

2.4.1 An abbreviated heading defined by TTAAii CCCC YYGGgg shall be used only once. Consequently, if this abbreviated heading has to be used again for an addition, a correction or an amendment, it shall be mandatory to add an appropriate BBB indicator, which shall be added after the date-time group. The indicator BBB shall be used as defined below:

- RRx – for delayed routine meteorological messages/bulletins;
- CCx – for corrections to previously relayed messages/bulletins;
- AAx – for amendments to TAF messages/bulletins;
- Pxx – for segmenting a large set of information into several bulletins.

Note 1: *The “x” above is an alphabetic character of A through X, indicating the sequential number of the irregular bulletin of certain type. For instance, for amended TAFs, AAA is used for the first amendment, AAB for the second, AAC for the third, etc.; for delayed METARs or TAFs, RRA is used for the first delayed message, RRB for the second, etc.; and, for corrections to any OPMET bulletin, CCA is used for the first correction, CCB for the second, etc.*

Note 2: *The use of the third letter A, B, C, etc. permits differentiation between bulletins/messages*

with the same type of information of the original bulletin/message. For example, assuming that a certain bulletin had the following abbreviated heading: "FTA031 DIAP 281000", a delayed bulletin containing TAF(s) which are missing from the original bulletin will bear the heading: "FTA033 DRRN 281000 RRA"; and a second delayed bulletin, containing additional missing TAF(s) will bear the heading: "FTA031 DIAP 281000 RRB".

Note 3: *The following data designators should be used by BCCs:*

	TAF	METAR
Addis Ababa	FTEA31 HAAB FTEA39 HAAB	SAEA 31
Alger	FTAF31 DAMM	SAAF 31
Antananarivo	FTIO31 FMMI FTIO39 FMMI	SAIO 31
Brazzaville	FTAM31 FCBB FTAM39 FCBB	SAAM 31
Cairo	FTAF32 HECA	SAAF 32
Casablanca	FTMC31 GMMC FTMC39 GMMC	SAMC 31
Dakar	FTAO32 GOOY FTAO39 GOOY	SAAO 32
Johannesburg	FTAP32 FAJS FTAP39 FAJS	SAAP 32
Nairobi	FTEA32 HKJK FTEA39 HKJK	SAEA 32
Niamey	FTAO33 DRRN	SAAO 33

APPENDIX D

EXCHANGE OF OPMET DATA BETWEEN THE AFI, EUR, MID AND ASIA REGION

IROGs RESPONSIBILITIES

1. DAKAR IROG

1.1. Outgoing responsibilities

1.1.1 The whole set of METAR, TAF, AIREP SPECIAL and SIGMET bulletins, as described in appendices A, B, C and D of this Handbook, received by RODB DAKAR shall be distributed to Rio de Janeiro and ROC Toulouse, which shall send them to the EUR ROCs deserving other adjacent regions and to the SADIS.

1.2. Incoming responsibilities

1.2.1 The bulletins containing the required international OPMET data as indicated in the FASID Table MET 1A (or 2A) shall be sent by Rio de Janeiro, Jeddah and ROC Toulouse to IROG DAKAR, that shall send the bulletins following the States requirements.

1.2.2 Regular contacts with the adjacent IROG (s) shall insure the efficiency of the data exchange. A list of exchanged bulletins should be agreed and updated, as necessary.

2. PRETORIA IROG

2.1. Outgoing responsibilities

2.1.1 The whole set of METAR, TAF, AIREP SPECIAL and SIGMET bulletins, as described in appendices A, B, C and D of this Handbook received by RODB Pretoria shall be distributed to Rio de Janeiro, Jeddah, Bangkok and ROC Toulouse, that shall send to the EUR ROCs deserving other adjacent regions and to the SADIS

2.2. Incoming responsibilities

2.2.1 The bulletins containing the required international OPMET data as indicated in the FASID table MET 1A (or 2A) shall be sent by Rio de Janeiro, Jeddah, Bangkok and ROC Toulouse to IROG PRETORIA, that shall send the bulletins following the States requirements.

2.2.2 Regular contacts with the adjacent IROG(s) should insure the efficiency of the data exchange. A list of exchanged bulletins should be agreed and updated, as necessary

APPENDIX E

AFI REGIONAL OPMET DATA BANKS AND SIGMET REQUIREMENTS

The AFI Regional OPMET Data Banks (RODBs) and the AFTN address to be used for direct access to the banks are shown below:

RODB	AFTN Address	AMBEX Centres of Responsibility
Dakar	GOOYYZYZ	Alger/DAMM, Brazzaville/FCBB Casablanca/GMMC Dakar/GOOO Niamey/DRNN
Pretoria	FAJSYMYX	Addis Ababa/HAAB, Antananarivo/FMMI Cairo/HECA Johannesburg/ (FAJS)** Nairobi/HKNA ** BCC located at South African Weather Service HQ.

Responsibilities:

1. Collect OPMET bulletins from AMBEX centres in the area of responsibility and store them in the data base;
2. Handle all types of OPMET bulletins;
3. Provide facilities for “request-reply” service to authorized users;
4. Maintain a catalogue of bulletins and introduce changes to the bulletins when necessary according to established procedures;
5. Quality control the incoming bulletins and inform AMBEX centres on any deficiencies;
6. Monitor the OPMET traffic by carrying on regular test on the availability and timeliness of the bulletins; report to the ICAO Regional Office on the results.

APPENDIX E-1**WMO HEADINGS FOR SIGMET BULLETINS USED BY AFI
METEOROLOGICAL WATCH OFFICES (MWOs)**

EXPLANATION OF THE TABLE

Col 1: State and name of the MWO

Col 2: ICAO location indicator of the MWO

Col 3: T₁T₂A₁A₂ii group of the WMO heading for the WS SIGMET bulletin

Col 4: T₁T₂A₁A₂ii group of the WMO heading for the WC SIGMET bulletin (tropical cyclone)

Col 5: T₁T₂A₁A₂ii group of the WMO heading for the WV SIGMET bulletin (volcanic ash)

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

Col 7: Remarks

**WMO HEADINGS FOR SIGMET BULLETINS
USED BY AFI METEOROLOGICAL WATCH OFFICES**

MWO Location	ICAO location indicator	WMO SIGMET Headings			FIR/ACC served	Remarks
		WS	WC	WV		
1	2	3	4	5	6	7
ALGERIA ALGER/Baraki	DAAL	WSAL31		WVAL31	DAAA	
ANGOLA LUANDA/4 de Fevereiro	FNLU	WSAN31		WVAN31	FNAN	
BOTSWANA GABORONE/Sir Seretse Khama	FBSK	WSBC31	WCBC31	WVBC31	FBGR	
BURUNDI BUJUMBURA/Bujumbura	HBBA	WSBI31		WVB131	HBBA	
CANARY ISLANDS (Spain) GRAN CANARIA/Gran Canary, Canary I	GCLP	WSCR31		WVCR31	GCCC	
CAPE VERDE SAL I/Amilcar Cabral	GVAC	WSCV31		WVCV31	GVSC	
CHAD N' DJAMENA/N' djamena	FTTJ	WSCD31		WVCD31	FTTT	
CONGO BRAZZAVILLE/Maya-Maya	FCBB	WSCG31		WVCG31	FCCC	
D.R. CONGO KINSHASA/N' Djili	FZAA	WSZR31	WCZR31	WVZR31	FZAA	
EGYPT CAIRO/Cairo International	HECA	WSEG31	WCEG31	WVEG31	HECC	
ETHIOPIA ADDIS ABABA/Bole Intl	HAAB	WSET31		WVET20	HAAA	
ERITREA ASMARA	HHAS	WSEI31		WVEI31	HHAA	
GHANA ACCRA/Kotoka Int'l	DGAA	WSGH31		WVGH31	DGAC	
KENYA KENYA/Jomo Kenyatta Int'l	HKJK	WSKN31	WCKN31	WVKN31	HKNA	
LIBERIA MONROVIA/Roberts Int'l	GLRB	WSLI31		WVSL31	GLRB	
LIBYAN ARAB JAMAHIRIYA TRIPOLI/Tripoli Int'l	HLLT	WSLY31		WVLY31	HLLL	
MADAGASCAR ANTANANARIVO/Ivato	FMMI	WSMG31	WCMG20	WVMG20	FMMM	
MALAWI LILONGWE/Lilongwe Int'l	FWKI	WSMW31	WCMW31	WVMW31	FWLL	

MWO Location	ICAO location indicator	WMO SIGMET Headings			FIR/ACC served	Remarks
		WS	WC	WV		
1	2	3	4	5	6	7
MAURITIUS MAURITIUS/Sir Seewoosagur Ramgoolam Int'l	FIMP	WSMA31		WVMA31	FIMM	
MOROCCO CASABLANCA/Anfa	GMMC	WSMC31		WVMC31	GMMM	
MOZAMBIQUE MAPUTO/Maputo Int'l	FQMA	WSMZ31	WCMZ20	WVMZ31	FQBE	
NAMIBIA WINDHOEK/Hosea Kutako	FYWH	WSNM31		WVNM31	FYWH	
NIGER NIAMEY/Diori Hmani Int'l	DRRN	WSNR31		WVNR31	DRRR	
NIGERIA KANO/Mallam Aminu Kano Int'l	DNKN	WSNI31		WVNI31	DNKK	
RWANDA KIGALI/Gregoire Kayibanda	HRYR	WSRW31		WVRW31	HRYR	
SENEGAL Leopold Sedar Senghor	GOOY	WSSG31		WVSG31	GOOO	
SEYCHELLES MAYE/Seychelles Int'l	FSIA	WSSC31	WCSC20	WVSC31	FSSS	
SOMALIA MOGADISHU/Mogadishu	HCMM	WSSI31		WVSI31	HCSM	
SOUTH AFRICA JOHANNESBURG/Johannesburg	FAJS	WSZA31	WCZA31	WVZA31	FACA FAJA FAJO	
SUDAN KHARTOUM/Khartoum	HSSS	WSSU31		WVSU31	HSSS	
TUNISIA TUNIS/Carthage	DTTA	WSTS31		WVTS31	DTTC	
UGANDA ENTEBBE/Entebbe Int'l	HUEN	WSUG31		WVUG31	HUEC	
UNITED REPUBLIC OF TANZANIA DAR-ES-SALAAM/Dar-es-Salaam	HTDA	WSTN31	WCTN31	WVTN31	HTDC	
ZAMBIA LUSAKA/Lusaka Int'l	FLLS	WSZB31		WVZB31	FLFI	
ZIMBABWE HARARE/Harare	FVHA	WSZW31	WCZW31	WVZW31	FVHA	

APPENDIX F

OPMET Quality Control and Monitoring Procedures

(To be developed and confirmed by the QC team of the OPMET Management Task Force)

1 Quality Control Procedures

1.1 OPMET Data Validation

1.1.1 The AMBEX Centres 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 (TTAAii CCCC YYGGgg BBB) Validation

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

Examples	After QC check
<p>METAR with incorrect YYGGgg:</p> <p>SABM31 VYMD 100830 UTC VYMD 100830Z 18005KT 8000 FEW025 31/18 Q1000 =</p>	<p>SABM31 VYMD 100830 VYMD 100830Z 18005KT 8000 FEW025 31/18 Q1000 =</p>
<p>TAF without AHL:</p> <p>112324 WIDDYMYX TAF WIDD 112324Z 1200/1224 00000KT 4000 RA BKNT017 BECMG 1203/1205 20010KT 9000 SCT017=</p>	<p>FTID31 WIDD 112300 TAF WIDD 112324Z 1200/1224 00000KT 4000 RA BKNT017 BECMG 1203/1205 20010KT 9000 SCT017=</p>
<p>TAF with invalid BBB:</p> <p>FTBN31 OBBI 030525 AMD TAF AMD OBBI 030525Z 0306/0406 16010KT CAVOK BECMG 0308/0312 33017KT 5000 PROB30 TEMPO 0308/0314 0800 DU=</p>	<p>FTBN31 OBBI 030525 AAA TAF AMD OBBI 030525Z 0306/0406 16010KT CAVOK BECMG 0308/0312 33017KT 5000 PROB30 TEMPO 0308/0314 0800 DU=</p>

1.1.3 METAR/SPECI Validation

For each individual METAR or SPECI within a bulletin the following additional fields shall be validated:

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

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

1.1.4 TAF Validation

For each individual TAF within a bulletin, the following additional items shall be validated:

Prefix checks	TAF TAF COR TAF AMD	FT or FC FT or FC FT or FC
Issue Time YYGGggZ	If the field is included, it shall have a valid date and time of origin of forecast including 'Z'.	
Validity Y ₁ Y ₁ G ₁ G ₁ /Y ₂ Y ₂ G ₂ G ₂	Some TAFs are still produced with a 4-digit validity period. These shall be corrected by inserting a date consistent with the current date and the date time group of the bulletin header. If a TAF is received without a validity period it shall be discarded.	
End-of-Message format “=”	Each forecast shall be terminated by the “=” character.:	

Examples	After QC check
<p>TAF with issue time error (wrong date):</p> <p>FCID31 WIII 181630 TAF WIII 041630Z 0418/0503 00000KT 9000 FEW025 BECMG 0422/0424 16005KT=</p>	<p>FCID31 WIII 181630 TAF WIII 181630Z 0418/0503 00000KT 9000 FEW025 BECMG 0422/0424 16005KT=</p>
<p>TAF with mistyped Validity Period:</p> <p>FTPH31 RPLL 132200 TAF RPLC 132200Z 1400/1428 04006KT 9999 SCT036 BKN300 TEMPO 1400/1406 02010KT 5000 -SHRA FEW020 BKN270 TX32/1405Z TN22/1421Z=</p>	<p>FTPH31 RPLL 132200 TAF RPLC 132200Z 1400/1424 04006KT 9999 SCT036 BKN300 TEMPO 1400/1406 02010KT 5000 -SHRA FEW020 BKN270 TX32/1405Z TN22/1421Z=</p>
<p>TAF with Validity error (wrong date):</p> <p>FCMS33 WMKK 170748 TAF WMKK 170700Z 3009/3018 30005KT 9999 FEW017CB SCT140 BKN270=</p>	<p>FCMS33 WMKK 170748 TAF WMKK 170700Z 1709/1718 30005KT 9999 FEW017CB SCT140 BKN270=</p>
<p>TAF with 4-digit Validity period:</p> <p>FTXX31 WIDD 170121 TAF WIDD 0618 06010G20KT 9999 SCT018 BECMG 1712/1714 00000KT 7000=</p>	<p>FTXX31 WIDD 170121 TAF WIDD 1706/1718 06010G20KT 9999 SCT018 BECMG 1712/1714 00000KT 7000</p>

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, CB, TURB, ICE, MTW, DS and SS SIGMET for VA SIGMET for TC	WS WV WC
Validity Period DDHHMM/DDHHMM	Shall have a valid period of validity. Validity periods may be corrected if: <ul style="list-style-type: none"> • Missing VALID string • Incorrect SIGMET number format • Incorrectly formatted validity period 	
<p><i>Note: For SIGMET validation, please refer to the format described in the AFI (WACAF or ESAF) Regional SIGMET Guide</i></p>		

Examples	After QC check
<p>SIGMET without TTAAii:</p> <p>SIGMET OYSN 121525Z OYSC SIGMET 1 VALID 121530/122130 OYSNSANAA FIR EMBD TS OBS/FCST OVER WESTERN AND SOUTHWESTERN MOUNTAINS AND COASTAL AREAS CB TOPS FL36 NC=</p>	<p>WSXX31 OYSN 121525Z OYSC SIGMET 1 VALID 121530/122130 OYSNSANAA FIR EMBD TS OBS/FCST OVER WESTERN AND SOUTHWESTERN MOUNTAINS AND COASTAL AREAS CB TOPS FL36 NC=</p>
<p>SIGMET with incorrect number format</p> <p>WCPH30 RPLL 210445 SIGMET NO 01 VALID 210000/210600 RPLL TC OBS N0830 E12900=</p>	<p>WCPH30 RPLL 210445 SIGMET 01 VALID 210000/210600 RPLL TC OBS N0830 E12900 ... =</p>
<p>SIGMET with incorrect formatted validity period:</p> <p>WSIN90 VIDP 181800 VIDP SIGMET 06 VALID 18/1600 TO 18/2000 UTC VIDPDELHI FIR ISOL TS ... =</p> <p>WSSD20 OEJD 220503 OEJD SIGMET 01 VALID 220500 TO 220900 OEJN- JEDDAH FIR=</p>	<p>WSIN90 VIDP 181800 VIDP SIGMET 06 VALID 181600/182000 VIDPDELHI FIR ISOL TS ... =</p> <p>WSSD20 OEJD 220503 OEJD SIGMET 01 VALID 220500/220900 OEJN-JEDDAH FIR</p>

1.2 Quality Control Methods

OPMET Data	Elements Defining	Control Methods
METAR METAR COR SPECI (SA,SP)	<ul style="list-style-type: none"> • AHL • Code name • Observation date/time 	Software verification Manual validate Periodic Quality Control & PI Monitoring
TAF TAF AMD TAF COR (FT,FC)	<ul style="list-style-type: none"> • AHL • Code name • Originating station ICAO location indicator • Date/time of issue • Date, time of starting, time of end of the period the forecast refers to 	Software verification Manual validate Periodic Quality Control & PI Monitoring
SIGMET (WS, WC, WV)	<ul style="list-style-type: none"> • AHL • SIGMET Sequence No • Date/time groups indicating the period of validity Additional Checks (recommended): <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Type of message • Issue date and time Additional Checks (recommended): <ul style="list-style-type: none"> • Location indicator or name of the VAAC centre originating the message 	Software verification Manual validate Periodic VA Quality Control Monitoring
Tropical Cyclone Advisory FK	<ul style="list-style-type: none"> • Type of message • Issue date and time Additional Checks (recommended): <ul style="list-style-type: none"> • Location indicator or name of the TCAC centre originating the message 	Software verification Manual validate Periodic TC Quality Control Monitoring

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 BMG for monitoring the SADIS distribution (ref. SADISOPSG/8, IP/5 – *SADIS OPMET Performance Indices*).

(i) ***Compliance Index***

The AMBEX Compliance index can be calculated from:

$$V_{bul\ compliance} = \frac{\text{No of reports received for a bulletin}}{\text{No of reports required for the bulletin}}$$

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

- Total number of reports received for AMBEX bulletin during the monitoring period, include reports in the retard bulletins.
- Weed out correction and amendment bulletins, as these are re-transmitted messages, can be disregarded.

(ii) Availability Index

The availability index measures the current coverage of the OPMET distribution against the AMBEX 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:

$$V_{bul\ availability} = \frac{\text{No of aerodromes for which one or more non-NIL data type are received}}{\text{No of aerodromes required in the bulletins}}$$

(iii) Regularity Index

The regularity index measures the consistency in the number of reports provided by an aerodrome. The computation of Regularity Index assumes that the number of report 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 subsequent number of reports from an aerodrome is “regular”.

Denoting mean and standard deviation by μ and σ , a threshold report numbers (τ) 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:

$$V_{bul\ regularity} = \frac{\text{No of aerodromes for which the number of reports equals or exceeds the threshold}}{\text{No of aerodromes required in the bulletin}}$$

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 bulletin-oriented format, one line per bulletin indicating the abbreviated header (TTAAii CCCC YGGgg), the FIR/UIR where applicable, receipt time and originator.

2.2.3 Example non-routine OPMET monitoring result file formats:

TT	AAii	CCCC	YYGGgg	FIR/UIR Rx	Time	Origin
WS	PF21	NTAA	271004	NTTT	271004	NTAAYMYX
WS	IN90	VIDP	271000	VIDP	271007	VECCYMYX
WS	BW20	VGZR	271100	VGZR	271030	VGZRYMYX
WS	CI31	RCTP	271150	RCTP	271150	RCTPYMYX
WS	MS31	WMKK	272013	WBFC	272013	WMKKYMYX
WS	CI35	ZGGG	272225	ZGZU	272228	ZGGGYZYX
FV	AU01	ADRM	270323		270330	YMMCYMYX
FK	PQ30	RJTD	270500		270504	RJTDYMYX

Explanations to the table:

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

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 ICAO Regional Offices, Dakar and Pretoria.

2.3 Examples of Monitoring Results – PI Measurements

The following tables show values of Compliance, Availability and Regularity Index for ASIA/PAC OPMET bulletins compiled by Singapore RODB in March 05:

TABLE A	ROBEX Compliance Index		
	SA	FT	FC
AE31 VECC	0.81	--	
AS31 VABB	---	0.99	
AS31 VTBB	0.96	0.99	
SA32 VABB	--	0.98	
AS32 VTBB	--	0.85	
AU31 YBBN	1.00	0.99	0.97

Note: Entry dashed out (--) means no reports of this type (SA or FT) are required

TABLE B	Availability Index		
	SA	FT	FC
AE31 VECC	0.98	--	
AS31 VABB	---	1.00	
AS31 VTBB	0.99	1.00	
SA32 VABB	--	0.99	
AS32 VTBB	--	0.96	
AU31 YBBN	1.00	1.00	1.00
.	.	.	.
.	.	.	.

TABLE C	Regularity Index		
	SA	FT	FC
AE31 VECC	0.86	--	
AS31 VABB	---	0.96	
AS31 VTBB	0.93	0.96	
SA32 VABB	--	0.96	
AS32 VTBB	--	0.96	
AU31 YBBN	0.90	0.90	0.96
.	.	.	.
.	.	.	.

APPENDIX G

AMBEX FOCAL POINTS (August 2011)

	State/Etat/ Organisation	Name/Nom et Prénom	Address/Adresse	E-mail	Fax	Telephone
1	Algeria					
2	Cameroon	ABONDO Cyrille	Chef de Service de la Météorologie Aéronautique	abondocyrille@yahoo.com	+237 22 30 33 62	+ 237 22 30 30 90
3	Congo	OLEMBE Alexis Laurence	B.P. 218 Brazzaville Aéroport CONGO	aolembe@yahoo.fr	+242 282 00 51	+242 972 16 77 / +242 411 48 95
4	Egypt					
5	Ethiopia					
6	Kenya					
7	France					
8	Madagascar	RAKOTONDRIANA Jérôme RABENASOLO Mamitiana Alain	Direction Générale de la Météo, BP 1254 Antananarivo B.P. 46 Ivato Aéroport MADAGASCAR	madagascarmto@asecna.org ; jerome@asecna.mg mamyalain6@yahoo.fr	+261 202 258 115 +261 20 22 581 15	+ 261 33 12 108 05 +261 3410 034 54
9	Morocco					
10	Niger	YERIMA Ladan	B.P. 1096 Niamey Aéroport NIGER	E-mail : yeriladan@yahoo.fr	+227 20 73 55 12	+227 94 85 22 27
11	Nigeria	IKEKHUA O. Felix Mrs. M. O. Iso	NIMET	felix_ikekhua@yahoo.com maryottuiso@yahoo.com	+234 9 4130710 +234 9 4130711	+234 1 477 16 62 +234 9 4130709 + 234 9 4130710
12	Senegal (Rapporteur)	DIEME Saïdou	ASECNA Sénégal	saidoudieme@yahoo.fr	+221 33 820 06 00 +221 33 820 02 72/	+221 33 869 22 03 : +221 77 652 53 87

			B.P. 8132 Dakar Aéroport Yoff SENEGAL	saidoudieme@yahoo.fr	+221 33 820 06 00	
13	South Africa					
14	United Kingdom (RU)					
15	ASECNA	NGOUAKA Dieudonné	ASECNA DG BP 3144 Dakar, Sénégal	ngouakadie@asecna.org	+221 33 8234654	+221 33 8695714
16	IATA					
17	WMO/OMM	Mr Scylla Siliayo,	WMO Scientific Officer, Aeronautical Meteorological Division Weather and Disaster Risk Reduction Services Department	ssillavo@wmo	+ 41.22.730.81.28	: + 41.22.730.84.08
18	EUR BMG					
19	IROG Toulouse					
20	ASIA/PAC/M TSF					
