International Civil Aviation Organization

MIDANPIRG Meteorology Sub-Group
Fourth Meeting (MET SG/4)

(Cairo, Egypt, 25 – 27 June 2013)

Agenda Item 4.3:   **Review of Requirements for OPMET Data and Status of OPMET**
Data Exchange

OPMET DATA EXCHANGE

(Presented by the Secretariat)

SUMMARY
This paper provides a status on OPMET Data Exchange in the MID Region.

1.   INTRODUCTION

1.1   The meeting will recall several OPMET related Conclusions adopted by MIDANPIRG/13 that are each addressed in the discussions. In addition, monitoring of OPMET exchange in the MID Region by Regional OPMET Centre (ROC) Vienna will be used to identify long standing OPMET deficiencies.

2.   DISCUSSION

2.1   The meeting will recall MIDANPIRG/13 Conclusion 13/55 to correct the addressing to Regional OPMET Centre (ROC) Vienna, eliminate multiple bulletins received at ROC Vienna and non-receipt of OPMET (SA, FC, FT) requests during monitoring. State letter AN 10/11 – 10/183 dated 18 June 2012 requested States to remedy these deficiencies. ROC Vienna will provide a paper to the BMG/3 meeting that includes bulletins sent multiple times, OPMET data provided multiple times within different bulletins, incorrect AFTN addressing to EUR (either being sent to Denmark which is incorrect or not being sent to ROC Vienna properly), OPMET format errors, and requests for OPMET not received. The BMG/3 meeting is expected to address these issues and provide a summary to the MET SG/4 meeting.

2.2   The meeting will recall MIDANPIRG/13 Conclusion 13/56 for States to be notified of procedures related to METAR and TAF compilation and dissemination times as per the guidance material attached to State letter AN 10/11 -12/182 dated 18 June 2012.

2.3   The meeting will recall MIDANPIRG/13 Conclusion 13/54 that called for the MID BMG to 1) determine requirements associated with the establishment of Regional OPMET Centres (ROC) in the MID Region and 2) to carry out a survey based on requirements developed in 1) to determine States' capabilities for establishing ROCs.

2.4   Three States (Iran, Saudi Arabia, and United Arab Emirates) replied to the survey (SL AN 10/11 – 12/205 dated 3 July 2012). The survey replies are provided at **Appendix A** to this working paper for review and discussion by the meeting. A recommendation of potential ROCs in the MID Region provided by the MET SG/4 meeting would be considered by the MIDANPIRG/14 meeting.

2.5   When making a recommendation of potential ROCs in the MID Region, the meeting should also consider States' capabilities to develop the ability to exchange METAR and SPECI, TAF and SIGMET in digital form (XML/GML) to support the ICAO Meteorological Exchange Model (IWXXM). It is important to note that the EUR Data Management Group is expected to develop a concept of operations on IWXXM with support from WMO and Eurocontrol under the auspices of ICAO Meteorological Aeronautical Requirements and Information Exchange Project Team (MARIE-PT). This document was expected to address issues such as the source of data and storage, traceability including whether a transformation (XML to TAC or TAC to XML) took place and where it was transformed, who should make the transformations, how to treat non-standard data and conversions, compression, inter-regional exchange and many other issues identified by WMO, Eurocontrol and ICAO.

2.6   Given the above, the meeting may consider the following draft Conclusion:

DRAFT CONCLUSION 4/XX: ESTABLISHMENT OF MID REGIONAL OPMET CENTRES

That, the MID Regional OPMET Centres (ROC) of (City, State) and (City, State) be developed to improve the regional and inter-regional OPMET efficiency by adhering to the requirement detailed in **Appendix B**.

3.   ACTION BY THE MEETING

3.1   The meeting is invited to:

a)   note the contents in this paper; and

b)   consider the draft Conclusion in paragraph 2.6.

APPENDIX A

MID ROC Survey Summary

Received from Iran, Saudi Arabia, United Arab Emirates

Question	Answer		
	Iran	**Saudi Arabia**	**United Arab Emirates**
Can a facility in your State be capable of collecting, validating and disseminating OPMET data from NOCs in the Area of Responsibility (AoR) as well as from the national NOC?	Yes, I.R. of Iran Meteorology Organization (IRIMO) has the Capacity to do so	Yes	The answer is currently No
Can a facility in your State be capable of collecting OPMET data from other ROCs in the Region?	Yes	Yes	Currently no, could be done as long as the data is being distributed via AFTN or GTS this would be easily achievable, but if there was to be some other data source the complexity and costs would be currently unknown.
Can a facility in your State be capable of disseminating bulletins received from: 1) ICAO Regions; 2) Other ROCs; and 3) NOCs in their AoR in -other ROCs according to predefined distribution lists; -MID Regional OPMET Data Banks (RODBs); and -other NOCs in their AoR?	Yes	Yes to all	Currently no, could be done as long as the data is being distributed via AFTN or GTS this would be easily achievable, but if there was to be some other data source the complexity and costs would be currently unknown.

Can a facility in your State be capable of minimizing the duplication of OPMET data from within their AoR?	Yes	Yes	Quality control would be as per specifications in the document and included in IBL Comms. A manual backup would be put in place with the technicians.
Does your State use AFTN in the exchange of OPMET data?	Yes	Yes	Yes (reference first response attachment 1)
Would your State be capable of hosting a facility that has AFS relay capable of handling efficiently the volume of traffic anticipated (*Note that the EUR Data Management Group attempted to provide more details with reference to manpower and equipment, however, this group determined that it depended on how a State managed their communications and human resources and therefore could not prescribe a general requirement of manpower and equipment necessary to host a ROC*)?	The subject will be considered with more detail with regard to its technical specifications, but for the time being I would like to add that it will be available in the future.	Yes	Most of the workload would be on the software – but a human backup technician would be required to fully man the operation 24/7.
Is a facility in your State capable of handling all OPMET data types as described in the **Appendix A**?	Yes	Yes	Currently no, could be done with the addition of an enhanced IBI. Comms.
Would a facility in your State be capable of developing and maintaining detailed OPMET distribution arrangements based on FASID Table MET 2A (SADIS User Guide Annex 1) and notified addressing by other regions?	Yes	Yes	Currently no, with the addition of an enhanced IBI. Comms the answer could be yes. Also a manager would be required to manage the agreements put in place.

Does your State have a facility that would be capable of splitting OPMET bulletins received by GTS that is longer than 1800 characters for further distribution via AFTN links (*Note that the CCCC of the header is changed into the indicator of the recompiling ROC*)?	Yes	Yes	Currently no, could be yes with the addition of an enhanced IBL Comms only.
Does your State have a facility to distribute SIGMET messages, tropical cyclone and volcanic ash advisories to other ICAO Regions, VAACs and TCACs as appropriate, and SADIS and ISCS Gateways (*Note that by providing the data to IROG Vienna the further distribution to ROC/SADIS Gateway London is guaranteed. In this case, no extra routing is necessary as this would only lead to double transmission*)?	Yes	Yes	Currently no, could be yes with the addition of an enhanced IBL Comms.
Does your State accept the responsibility of exchanging OPMET data intra- and inter-regionally at no cost?	Yes	No (comment CFK: need to explain that the work necessary to provide services of a ROC is cost recoverable)	Yes
Would a facility in your State be capable of:			
-collecting the required OPMET data from another ICAO region or Regions?	Yes, IRIMO	Yes	Currently no, could be yes with new IBL Comms, probable AFTN and support staff

-disseminating the collected data to other ROCs and NOCs in the AoR with transit times that satisfy Annex 3, Appendix 10, 1.1?	Yes	Yes	Currently no, could be yes with new IBL Comms, probable AFTN and support staff
-sending required OPMET data from the ICAO MID-Region to other ICAO Region(s)?	Yes	Yes	Currently no, could be yes with new IBL Comms, probable AFTN and support staff
Would your State have a facility capable of collecting OPMET data from the ROCs as required in the respective FASID tables and store in a database for use internally within the Region?	Yes	Yes	Currently no, could be yes with new IBL Comms, probable AFTN and support staff
And maximize amount of available OPMET data?	Please elaborate more on the maximization of OPMET data.	Yes	Currently no, could be yes with new IBL Comms, probable AFTN and support staff
And provide request/response facilities for authorized users to obtain non-regular or occasional information?	Yes	Yes	Currently no, could be yes with new IBL Comms, probable AFTN and support staff
And provide regular monitoring to check the availability and timeliness of OPMET data and the possible misuse or abuse of the OPMET databanks (for reporting to the ICAO Office the results, where necessary)?	Yes	Yes	Currently no, could be yes with new IBL Comms, probable AFTN and support staff
And make tropical cyclone and volcanic ash advisory messages available on request?	Not answered	Yes	Currently no, could be yes with IBL Comms, probable AFTN and support staff
Not required, but desirable: would your State incur travel costs of an expert from another ROC in another	I have no clear response on this issue, but it will be considered by top management of IRIMO and Civil	No	Not answered

Region in the development of a ROC (estimate of 2 trips from Vienna on week at a time)?	Aviation Organization and for the time being, most probably the cost can be shared.		
Other comments	In email…dated 18 Aug 2012 IR of IRIMO is in the process of being accepted as a Global Information System Center – GISC in the WMO Information System – WIS in the region and it is a programme of IRIMO with priority to develop its capacities in order to be endorsed as a GISC in the next auditing by WMO GISC's primary role is to collect and disseminate data and information used in the use of the provision of weather, climate and water services and research regionally and globally as quickly and efficiently as possible. GISC centers collect data and information from WIS contributing centres in their area of responsibility and pass information to centres in their area and to send information meant for global distribution to other GISCs. GISCs also ensure information from other regions is distributed or at least, available to, centres within the GISCs area of responsibility.		With reference to a facility in State capable of providing quality control of bulletins in the AoR 24 hours / 7 days a week – (maybe from a legacy question in the BMG/2 meeting) – UAE response: Currently no, could be done with the purchase of an enhanced IBL Comms, addition of 5 technicians and probable new AFTN servers then this could be accomplished. In email dated 26 aug 2012: We apologize for not being able to host the OPMET ROC.

	Considering similarity of responsibilities and works for the anticipated OPMET Office and a GISC, and IRIMO's steps in this regard, IRIMO will have the required capacities in implementing and developing of an OPMET Centre in the region.		

APPENDIX B

ROC Requirements (30 May 2013)

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*ROC; **IROG; ***RODB
(*note that acronym list is provided on third page*)

*Collect, validate and disseminate OPMET data from NOCs in the Area of Responsibility (AoR) as well as from the national NOC. The national NOC and the ROC will usually be the same centre.

*Collect OPMET data from other ROCs in the region.

*Disseminate bulletins received from NOCs in the AoR to
  * other ROCs according to predefined distribution lists;
  * MID RODBs; and
  * other NOCs in their AoR as agreed between the ROC and NOC and the States' authorities concerned

*Disseminate bulletins received from the other ROCs to
  * NOCs in their AoR as agreed between the ROC and NOC and the States' authorities concerned

*Quality control of the bulletins in their AoR 24 hours / 7 days a week.

*Minimize the duplication of OPMET data from within their AoR.

*Handle efficiently the volume of traffic anticipated (*Note that the EUR Data Management Group attempted to provide more details with reference to manpower and equipment, however, this group determined that it depended on how a State managed their communications and human resources and therefore could not prescribe a general requirement of manpower and equipment necessary to host a ROC*) (AFS relay centres).

*Handle efficiently all OPMET data types as described in the **Attachment 1**.

*Develop and maintain detailed OPMET distribution arrangements based on FASID Table MET 2A (SADIS User Guide Annex 1) and the notified addressing by the other regions.

*Split OPMET bulletin received by GTS if longer than 1800 characters for further distribution via AFTN links (*Note that the CCCC of the header is changed into the indicator of the recompiling ROC*).

*Distribute SIGMET messages, tropical cyclone and volcanic ash advisories to other ICAO Regions, VAACs and TCACs as appropriate, and SADIS and ISCS Gateways. *Note that by providing the data to IROG Vienna the further distribution to ROC/SADIS Gateway London is guaranteed. In this case, no extra routing is necessary as this would only lead to double transmission.*

*Disseminate OPMET information at no cost (desired)

**Collect the required OPMET data from the ICAO Region(s) it is responsible for

**Utilize ground segment of the AFS (AFTN) for Inter-Regional OPMET exchange.

**As the IROG will usually host the ROC functionality it should disseminate the collected data to the other ROCs in the region (to be determined) and to the NOCs in the AoR with transit times that satisfy Annex 3, Appendix 10, 1.1.

**Send required OPMET data from the ICAO MID-Region to the ICAO Regions it is responsible for.

***Collect OPMET data from the ROCs as required in the respective FASID tables and store in database for use internally within the Region.

***Maximize amount of available OPMET data.

***Provide request/response facilities for authorized users to obtain non-regular or occasional information.

***Regularly monitor OPMET data in accordance to **Attachment 2** to check availability and timeliness of OPMET data and the possible misuse or abuse of the OPMET databanks; and report to the ICAO Office the results, where necessary.

***Make tropical cyclone and volcanic ash advisory messages available on request.

Any designation of ROCs/RODBs in the MID Region will also be expected to develop the ability to exchange METAR and SPECI, TAF and SIGMET (and eventually all MET data) in digital form (XML/GML) to support the ICAO Meteorological Exchange Model (IWXXM). The EUR DMG is developing a concept of operations on IWXXM with the support from WMO and Eurocontrol under the auspices of ICAO Meteorological Aeronautical Requirements and Information Exchange Project Team (MARIE-PT). This document was expected to address issues such as the source of data and storage, traceability including whether a transformation (XML to TAC or TAC to XML) took place and where it was transformed, who should make the transformations, how to treat non-standard data and conversions, compression, inter-regional exchange and many other issues identified by WMO, Eurocontrol and ICAO.

AFS – Aeronautical Fixed Service
AFTN – Aeronautical Fixed Telecommunication Network
AoR – Area of Responsibility
GTS – Global Telecommunication Network
IROG – Inter-regional OPMET Gateway
NOC – National OPMET Centre
ROC – Regional OPMET Centre
RODB – Regional OPMET Data Bank
TCAC – Tropical Cyclone Advisory Centre
VAAC – Volcanic Ash Advisory Centre

Attachment 1

Data type	Abbreviated name	WMO data type designator
Routine, also Scheduled OPMET data		
Aerodrome reports	METAR SPECI	SA SP
Aerodrome forecasts	TAF: up to 30-hours less than 12-hours	FT FC
Non-Routine, also Non-Scheduled OPMET data		
SIGMET information	SIGMET SIGMET for TC SIGMET for VA	WS WC WV
AIRMET information	AIRMET	WA
GAMET information	GAMET	FA
Volcanic ash and tropical cyclone advisories	VAA TCA	FV FK
Air-reports	AIREP	UA
Administrative	ADMIN	NO

Attachment 2

OPMET Data Monitoring Tool Specification

22 March 2012

TABLE OF CONTENTS

1   Introduction

This specification is organised into three sections. Each section builds upon the previous section in terms of what data is to be monitored from WMO format bulletins. The sections correspond to the monitoring of only the WMO bulletin, the monitoring of the transmission network envelope and real-time monitoring.

A monitoring application shall, as a minimum, fully implement the requirements in section 1 – WMO Monitoring. Optionally, applications may fully implement the requirements in sections 2 and/or 3. For existing, unmodified, applications it will be acceptable to fully implement the requirements in section 1 and partially implement the requirements in sections 2 and/or 3.

Tables 1 and 2 show the WMO message types that shall be monitored.

Type	Bulletin
FC	9 Hour TAF Short Term Forecast report
FT	24/30 TAF Hour Long Term Forecast report
SA	METAR observation
SP	SPECI, special METAR observation

Table 1: Routine Data Types

Type	Bulletin
FA	GAMET
FK	Tropical Cyclone Advisory
FV	Volcanic Ash SIGMET
NO	System administration message
WA	AIRMET
WC	Tropical Cyclone SIGMET
WS	SIGMET
WT	Tropical Cyclone (Typhoon/Hurricane)
WV	Volcanic Ash SIGMET
UA	Special AIREP

Table 2: Non-Routine Data Types

2   WMO Monitoring

2.1   General Requirements

The application shall operate in an offline mode using ASCII text files as the data source.

The application shall be able to read AFTN, GTS and SADIS media. The definitions of these media are found in references 1, 2 and 3. Any message decomposition shall be undertaken in accordance with these documents.

All times shall be in UTC.

Bulletin boundaries shall be determined using one of the following criteria. The ability to select the criteria used at runtime may also be implemented.

> For AFTN formats:
> > *SOH -> ETX* control characters.

> For SADIS/GTS formats:
> > *NNN -> (NNN –2 chars)* character sequences; or
> > *STX -> ETX* control characters

2.2 Data Monitoring Requirements

Generally, data fields that can be retrieved but are not defined in references (0 or (0 shall be ignored (e.g. AFTN envelope fields).

Only routine and non-routine data types (specified in tables 1 and 2) shall be monitored.

For both types the WMO AHL shall be decomposed into the following fields. Each field shall be recorded in the corresponding field of the output file(s).

> TT: Type of record;
> AAii: Bulletin identifier;
> CCCC: Compiling station;
> YYGGgg: AHL date/time group;
> BBB: Optional remark group.

A NIL bulletin (i.e. a bulletin that contains the single word 'NIL') shall be recorded with one entry with the word 'NIL' in the NIL output field and the characters '   ' (four blanks) recorded in the station/FIR field.

2.3 AFTN Data Requirements

The WMO AHL shall be defined as the line containing the STX control character.

The word 'AFTN' followed by 4 spaces ('AFTN   ') shall be recorded in the NetworkType field.

2.4 GTS/SADIS Data Requirements

The WMO AHL shall be defined as the first non-blank line following the sequence number (NNN).

The word of 8 characters '*SADIS* ' or 'GTS   ' shall be recorded in the NetworkType output field.

2.5   Routine Data Requirements

Routine OPMET bulletins (TT as defined in Table 1) shall be broken down into their constituent reports and registered at the station level.

Individual reports shall be separated by '=' or '==' followed by zero (or more) spaces, one (or more) CR and LF.

Each report shall be decomposed into the following fields. Each field shall be recorded in the corresponding field of the output file(s).

ReportBBB: If present any three letter BBB type identifier, e.g. COR or AMD. *(OPTIONAL).*
CCCC: The ICAO location identifier;
The report date/time group.

For TAF reports only (TT = 'FC' or 'FT') the report validity period shall also be recorded.

A NIL report (i.e. where the word 'NIL' appears after the station identifier) shall have the word 'NIL' recorded in the NIL field in addition to the other fields.

2.6   Non-routine Data Requirements

The FIR/UIR shall be obtained from non-routine OPMET bulletins (TT as defined in Table 2) where applicable. The FIR/UIR shall be recorded in the station field of the output file. If the FIR/UIR cannot be determined '   ' (four blanks) shall be recorded.

If the word 'TEST' is found within the body of the bulletin then the word 'TST ' shall be recorded in the NIL field of the output file.

2.7   Validation Requirements

Limited validation shall be performed upon the AHL:

- TT shall be two alphabetical characters;
- AAii shall be two alphabetical characters, excluding 'ZC', followed by 0, 1 or 2 digits and filled out with a blank character for every omitted digit;
- CCCC shall be four alphabetical characters excluding 'ZCZC' or 'NNNN';
- YYGGgg shall be six digits;
- BBB if present shall be three alphabetical characters. The first character shall be either 'A', 'C', 'P' or 'R'.

Individual routine reports shall be validated against the following:

- Station identifiers shall be four alphabetical characters excluding 'ZCZC' or 'NNNN';
- Report time shall be six digits optionally followed by 'Z';
- TAF Validity period shall be four, or six, or eight digits.

Bulletins that fail AHL validation shall be ignored.

Individual reports that fail validation shall be recorded with the erroneous fields filled with 'X' characters.

2.8   Output Format

The output from the application shall be a single ASCII file with an extension appropriate to the field delimitation.

Each field shall be delimited with one of the following characters.

- ',': comma for use with a '.csv' extension; or
- ';': semicolon for use with a '.txt' extension.

The first line of the output file shall contain the field identifiers correctly delimited.

The output file shall contain one line per routine report, or one line per non-routine bulletin.

Every field shall have a fixed length and be named as indicated below.

Reports for which information fields cannot be determined, or not gathered, shall not be recorded. The missing field shall be padded with the correct number of spaces to preserve the correct field lengths. In the case of the ReportTime and ValidityPeriod fields it shall be assumed that four-digit groups are missing date information and shall be prefixed with two space characters.

The output file shall contain the following fields in the following order (but recorded left to right). The <reserved> fields are placeholders for information that is gathered by applications implementing the additional data gathering requirements of section 2. They shall be included, but left blank, to ensure a common output file format for all applications.

The NIL field shall contain either three space characters, 'NIL', or 'TST' as appropriate.

Field	Name	Length	Comment
TT	TT	2	
AAii	AAii	4	
CCCC	CCCC	4	
YYGGgg	YYGGgg	6	
BBB	BBB	3	
Report "BBB"	ReportBBB	3	OPTIONAL. Pad with 3 spaces if not implemented
Report Station /FIR	Locind	4	Pad with spaces for bulletins that do not contain this information
Report Time	ReportTime	6	Only for routine types
TAF Validity Period	ValidityPeriod	8	Only required for FT and FC bulletins
NIL or TEST	NIL	3	Either ' ', 'NIL' or 'TST'
Transmission Network	NetworkType	8	Either 'AFTN', 'SADIS' or 'GTS'
<reserved>		6	
<reserved>		3	
<reserved>		4	
<reserved>		2	
<reserved>		6	
<reserved>		8	
<reserved>		6	

Table 3: WMO Output Fields

3   Tranmission network monitoring

3.1   General Requirements

All requirements for this level are in addition to those specified for WMO Monitoring unless stated otherwise.

3.2   Data Monitoring Requirements

If available the received time of the bulletin may be recorded.

3.2.1   AFTN Data Requirements

The following fields shall be obtained and recorded from the AFTN envelope:

- Channel ID;
- Sequence number;
- Priority;
- Destination addresses;
- Filing time.

In addition to the above, the originator address shall be obtained and recorded in the Network Type field in place of the word 'AFTN   '.

The sequence number shall be padded with leading zeros to create a five digit number.

3.2.2   GTS/SADIS Data Requirements

The GTS/SADIS sequence number shall be retrieved and recorded. The number shall be padded with leading zeros to expand to 5 digits.

The Network Type field shall be completed as described in requirement 2.4.

3.2.3   Validation Requirements

AHL and report validation shall be as for WMO Monitoring.

Fields obtained from the AFTN envelope shall be validated against the following:

- Channel ID shall be three characters;
- Priority shall be two characters;
- Each Destination Addresses shall be eight characters. There shall be a maximum of twenty one addresses.
- Filing time shall be six digits.

The sequence number for both AFTN and SADIS/GTS shall be either three, four or five digits.

3.3   Output Format

Every field shall have a fixed length and be named as indicated below. The Destination Address field is the last field does not have a fixed length.

Fields where the information cannot be determined, or not gathered, shall be left blank and delimited as per the file type.

The output file shall contain the following fields in the following order (but recorded left to right).

Data where the length is less than the field length shall be padded with ' ' (blank spaces) to the correct length. The Destination Address field may optionally be padded to the maximum length (188 characters).

If implemented, the RxTime field shall be six characters in length. The field shall be in the format HHMMSS

Field	Name	Length	Comment
TT	TT	2	
AAii	AAii	4	
CCCC	CCCC	4	
YYGGgg	YYGGgg	6	
BBB	BBB	3	
Report "BBB"	ReportBBB	3	OPTIONAL. Pad with 3 spaces if not implemented
Report Station /FIR	Locind	4	Pad with spaces for bulletins that do not contain this information
Report Time	ReportTime	6	Only for routine types
TAF Validity Period	ValidityPeriod	8	Only required for FT and FC bulletins
NIL or TEST	NIL	3	Either ' ', 'NIL' or 'TST'
Transmission Network	NetworkType	8	Either AFTN origin address, 'SADIS' or 'GTS'
Channel ID	ChannelId	3	AFTN only
Sequence Number	SeqNo	5	Pad with leading zeros to 5 digits
Priority	Priority	2	AFTN only
Filing Time	FileTime	6	AFTN only
Received Time	*RxTime*	*6*	*Only if logging software produces time as messages are logged. Use HHMMSS format*

Destination Addresses	DestAddr	(188)	AFTN only. No fixed length

<p align="center">Table 4: WMO and Channel Output Fields</p>

4 Real Time Montoring

4.1 General Requirements

All requirements for this level are in addition to those specified for WMO monitoring (and Transmission monitoring if implemented) unless stated otherwise.

The application shall monitor and analyse OPMET data in real-time. Offline analysis facilities may be provided. This requirement is in place of requirement 0.

4.2 Data Monitoring Requirements

4.2.1 AFTN Data Requirements

There are no additional requirements to gather extra AFTN information.

4.2.2 GTS/SADIS Data Requirements

There are no additional requirements to gather extra GTS/SADIS information.

4.2.3 Routine Data Requirements

The following statistical information shall be gathered and recorded for each bulletin in a separate statistical result file:

- Bulletin length: The bulletin length, in bytes, including the start and end of message characters.
- Format error counts: The number of fatal errors (defined below) and the number of non-fatal errors (defined below).
- Bulletin type counters: The total number of received bulletins by type (TT).
- Timeliness: For a specific set of stations the timeliness of each received observation can be calculated and recorded. The definitions of timeliness can be found in ref 0.

4.2.4 Non-routine Data Requirements

The following statistical information may be gathered and recorded for each bulletin in a separate statistical result file:

- Bulletin length.
- Bulletin type counters.

4.3   Validation Requirements

The AHL shall be validated in the same manner as for levels one and two.

Fatal errors shall be defined as validation errors or missing data within the following fields in the AHL:

- AAii.
- CCCC.
- YYGGgg

Non-fatal errors shall be defined as validation errors, or missing data within the BBB field of the AHL and the following report fields:

- Station location indicator.
- Report date/time.
- TAF validity period.

4.4   Output Format

The result files shall be generated in periods of twelve or twenty four hours.

The result files shall contain only validated data. Separate files may be used to log data that fails validation.

Statistical data shall be logged in a separate results file. The file will be delimitated in same manner as for the results files.

A separate results file per data type may be used. In this case the TT field may be omitted.

Fields where the information cannot be determined, or not gathered, shall be left blank and delimited as per the file type.

The results output file shall contain the same fields as for WMO and network monitoring. The statistical output file shall contain the fields from the following table.

Field	Name	Comment
TTAAii CCCC	Header	
Bulletin Length	BullLen	The length in bytes
Type Counter	TypeCnt	The cumulative bulletin count for the current bulletin type.
Format Error	FormErr	The cumulative number of format errors when this bulletin was received.
Timeliness	Timeliness	Yes or no field whether this bulletin is timely.

Table 5: Real Time Monitoring Output Fields

4.5   Real Time Display

The application shall display, in real time, at least the following:

- A count of the number of bulletins received by type since midnight;
- The last received header for each type.

5   References

International Standards, Recommended Practices and Procedures for Air Navigation Services; Annex 10, Volume II, Chapter 4.

Manual of the Global Telecommunication System; WMO – No. 386.

Manual on Codes, Volume I.1 – Part A; WMO – No. 306.

OPMET Data Monitoring (OPMET.doc); Belgocontrol.

- END -