



International Civil Aviation Organization

MID ATS Messaging Management Centre Steering Group

Fourth Meeting (MIDAMC STG/4)
(Cairo, Egypt, 18 – 19 March 2019)

Agenda Item 3: AFS Issues

IWXXM IMPLEMENTATION AND ROC CONNECTIVITY

(Presented by the Secretariat)

SUMMARY

This paper presents the Communication requirements to exchange OPMET data in IWXXM format in 2020.

Action by the meeting is at paragraph 3.

REFERENCES

- ANC/13 Report
- MSG/6 Report

1. INTRODUCTION

1.1 The Thirteen ICAO Air Navigation Conference (ANC/13) through recommendation 2.3/2, urged States provide ICAO with their ICAO Meteorological Information Exchange Model (IWXXM) implementation plans before 2020, and requested ICAO to ensure that the IWXXM format is the only standard exchange format by 2026.

2. DISCUSSION

2.1 The Aeronautical Fixed Service (AFS) handle eight message categories as defined by Annex 10, Volume II. The users of these message categories are the ATS as well as the AIS, ATFM, MET and SAR Services. Several ATM applications such as Digital NOTAM and Digital Flight Plan deploy new data requirements and information exchange models. These common information exchange models, i.e. AIXM and FIXM, IWXXM. These models make use of the Extensible Markup Language (XML).

2.2 The meeting may wish to note that MIDANPIRG/16 reviewed the AMHS plan of the MID ROC connectivity Jeddah-Vienna and Bahrain-Vienna (enabling exchange of OPMET data in new format between the MID and EUR Regions), the plan is at **Appendix A**. However, during the IWXXM Workshop held in Cairo, it became clear that the requirement is to exchange OPMET messages in XML format with attachment, which necessitate the implementation of ATS Extended Services.

2.3 The meeting may recall that the World Meteorological Organization (WMO) initially decided to migrate from alphanumeric codes to BUFR for the representation of Meteorological data; therefore, ATS Extended service was introduced to meet the Metrological requirement. At a later stage, the WMO decided to use XML. Specifically, the exchange of OPMET data in the format defined by the ICAO Meteorological Information Exchange Model (IWXXM).

2.4 It is worth to mention that most of the AMHS systems in the MID Region are capable to run the extended services and in particular the File Transfer Body Part (FTBP). The AMHS capability as reported by MIDAMC is at **Appendix B**.

2.5 The meeting may wish to note that MSG/6 meeting agreed to the Conclusions 6/29 and 6.30, in order to enable exchange IWXXM messages:

MSG CONCLUSION 6/29: IMPLEMENTATION OF FILE TRANSFER BODY PART (FTBP)

That, States are urged to:

- a) *implement FTBP capability at National COM Centres (AMHS is a prerequisite);*
- b) *implement P3/P7 with FTBP capability at the National OPMET Centre (NOC); and*
- c) *set the maximum overall AMHS Message size to 4 MB.*

MSG CONCLUSION 6/30: THE COMMUNICATION NETWORK FOR IWXXM DATA EXCHANGE

That, the Main and Backup Regional OPMET Centres (Bahrain and Saudi Arabia) and the Main COM Centres in the MID Region be urged to join the CRV Project in order to enable the exchange of OPMET information in IWXXM format.

2.6 The meeting may wish to note that ICAO AFSG PG developed EUR AMHS Manual, Appendix H which is at **Appendix C**; contains the AMHS Profile for OPMET IWXXM data exchange as well as guidance material for conducting conformance testing of the involved implementations. In the same context, the meeting may recall that MIDANPIRG/16 endorsed the first edition of FTBP Testing Document. The FTBP Testing Document is at **Appendix D**.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) review and update, as appropriate, the ROC Connectivity Plan at **Appendix A**;
- b) review and update, as appropriate, the AMHS capabilities at **Appendix B**; and
- c) discuss the means to monitor and support the implementation of required Network infrastructure to enable the exchange of OPMET information in IWXXM format.

APPENDIX A

<i>AMHS Plan for ROC in Jeddah and Bahrain</i>					
	Task	Timeframe	Assigned to	Champion	Status
<i>AMHS Intra-regional Trunk Connections</i>					
1	Establish Jeddah – Beirut IP Network.	Jul 2015	Saudi Lebanon	IM MS	Completed
2	Establish Bahrain – Beirut IP Network.	Feb 2016	Bahrain Lebanon	YH MS	Completed
3	Establish Cairo – Beirut IP Network.	July 2016	Egypt Lebanon	AF//MR MS	Completed
4	Establish Bahrain – Jeddah IP Network.	Mar 2016	Bahrain Saudi	IM YH	
5	Perform the Interoperability test between Jeddah and Beirut COM Centers.	July 2015	Saudi Lebanon	IB MS	Completed
6	Perform the Interoperability test between Bahrain and Beirut COM Centers.	July 2016	Bahrain Lebanon	MS YH	Completed
7	Perform the Interoperability test between Cairo and Beirut COM Centers	July 2016	Egypt Lebanon	AF/TZ/MR MS/EK	Depends on IP network availability Ongoing
8	Perform the Interoperability test between Bahrain and Jeddah COM Centers.	July 2016	Bahrain Saudi	YH IM	
9	Perform the Pre-operational test between Jeddah and Beirut COM Centers.	July 2015	Saudi Lebanon	IM MS	Completed
10	Perform the Pre-operational test between Bahrain and Beirut COM Centers.	July 2016	Bahrain Lebanon	YH MS	Completed
11	Perform the Pre-operational test between Cairo and Beirut COM Centers.	July 2016 March 2017	Egypt Lebanon	AF/ /MR MS/EK	Planned
12	Perform the Pre-operational test between Bahrain and Saudi COM Centers.	July 2016	Bahrain Saudi	YH IM	
13	Place the AMHS link into operation between Jeddah and Beirut COM centers, and updating the Routing tables.	July 2015	Saudi Lebanon MID AMC	IM MS/EK MN	Completed July, 2015
14	Place the AMHS link into operation between Bahrain and Beirut COM centers, and updating the Routing tables.	July 2016	Bahrain Lebanon MID AMC	YH MS/EK MN	Completed On 3/5/2016
15	Place the AMHS link into operation between Cairo and Beirut COM centers, and updating the Routing tables.	Aug 2016 April 2017	Egypt Lebanon MID AMC	AF/TZ/MR MS/EK MN	Planned

16	Evaluate the Trunks connections bandwidth and increase it if required between (Bahrain, Beirut, Cairo and Jeddah).	July 2016	Bahrain Beirut Cairo Jeddah	YH MS/EK AF/TZ IM	Depends on testing of digital data exchanged Beirut and Cairo increased the bandwidth to 128 kbps
<i>The AMHS Interconnection with EUR Region Depends on Nicosia and Athens</i>					
17	Establish Cairo – Tunis IP Network.	<i>March2016 July 2016</i>		AF/TZ/MR IB/MA	Both Egypt and Tunisia Ready Coordination in process to implement Completed
18	Establish Nicosia – Beirut IP Network.	<i>Awaiting reply from EUR</i>		MS/EK	Lebanon ready Ongoing
19	Establish Nicosia – Jeddah IP Network.	Dec 2016		IM	Saudi Arabia ready
20	Establish Bahrain – Nicosia IP Network.	Dec 2016		YH	
21	Establish Cairo – Athens IP Network.	Dec 2016		AF/TZ/MR	Egypt Ready Link is ready as same CIDIN link will be used
22	Perform the Interoperability test between Cairo and Tunis COM Centers.	<i>April 2016 August 2016</i>		AF/ /MR IB/MA	Both Egypt and Tunisia Ready Coordination in process to implement Completed
23	Perform the pre operational test between Cairo and Tunis COM Centers.	<i>Q3 2016</i>		AF/ /MR IB/MA	Both Egypt and Tunisia Ready Coordination in process to implement Completed
24	Place the AMHS link into operation between Cairo and Tunis COM Centers, and updating the Routing tables.	<i>Aug 2016</i>		AF/ /MR IB/MA	Both Egypt and Tunisia Ready Coordination in process to implement THYE LINK IN OPERATION SINCE
25	Perform the Interoperability test between Athens and Cairo COM Centers.	Mar 2017		AF/TZ/MR IB/MA	Athens advised that their system will be installed by Dec. 2016
26	Perform the Interoperability test between Bahrain and Nicosia COM Centers.	Q1 2017		YH	

27	Perform the Interoperability test between Nicosia and Jeddah COM Centers.	Q1 2017		IM	
28	Perform the Interoperability test between Nicosia and Beirut COM Centers.	Q1 2017		MS/EK	Nicosia in tender process
29	Perform the Pre-operational test between Athens and Cairo COM Centers.	Mar 2017		AF/TZ/MR	Athens advised that their system will be installed by Dec. 2016
30	Perform the Pre-operational test between Bahrain and Nicosia COM Centers.	Q1 2017		YH	
31	Perform the Pre-operational test between Nicosia and Beirut COM Centers.	Q1 2017		MS/EK	
32	Perform the Pre-operational test between Nicosia and Jeddah COM Centers.	Q1 2017		IM	
33	Place the AMHS link into operation between Athens and Cairo COM Centers, and updating the Routing tables.	Q1 2017		MIDAMC AF/ /MR	same
34	Place the AMHS link into operation between Bahrain and Nicosia COM Centers, and updating the Routing tables.	Q1 2017		MID AMC YH	
35	Place the AMHS link into operation between Nicosia and Jeddah COM Centers, and updating the Routing tables.	Q1 2017		MID AMC IM	
36	Place the AMHS link into operation between Nicosia and Beirut COM Centers, and updating the Routing tables.	Q1 2017		MS/EK	
37	Evaluate the inter-region connections bandwidth and increase it if required.	Q1 2017		MID AMC	
38	Transition of all regional AFTN/CIDIN Connections to AMHS.	Q2 2017	All MID States		Beirut and Cairo removed all Regional CIDIN connections

Champions:

Bahrain: (YH: Yaseen Hasan)

Egypt: (AF:Ahmed Farghally/TZ:Tarek Zaki/MR: Mohamed Ramzi/Essam Helmi: EH)

Lebanon: (MS: Mohamad Saad / EK: Elias El-Khoury)

Saudi Arabia: (IM: Mr. Ibraheem Mohamed Basheikh)

Tunis: (IB: Issam Bouzid / MA: Mr. Mohamed Ali)

MID AMC/Jordan: (MN: Muna Ribhi Alnadaf)

APPENDIX B



EUR Doc 020

EUR AMHS Manual

Appendix H

Application/Service oriented AMHS Profiles	
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References

- [1] ICAO EUR Doc 033, Guidelines for the Implementation of OPMET Data Exchange using IWXXM in the EUR Region, Second Edition, 2016
- [2] ICAO EUR DOC 020, EUR AMHS Manual, latest version
- [3] EUR ATS Messaging Service Profile, EUR AMHS Manual Appendix B, latest version
- [4] ISO/IEC International Standardized Profile ISP 12062-2 (2003): AMH21 – IPM Content
- [5] (Advance Release) ICAO Doc 9880-AN/466, Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols, Part II – Ground-Ground Applications - Air Traffic Services Messaging Handling Services (ATSMHS), Second Edition, 2016
- [6] ISO/IEC 10021-7 (2003) / ITU-T X.420 (1999): Information technology – Message Handling Systems (MHS) – Interpersonal Messaging System

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1. Introduction

1.1 Purpose of the Document

1.1.1 This document defines specific AMHS profiles for the support of given applications/services, acting in limited environments, using ATS Message Handling Service. Such profiles provide detailed specification of X.400 and AMHS parameters to be adopted depending on the needs of each identified application/service. The profiles are explicitly and exclusively applicable to the application/service which they have been defined to serve.

1.2 Structure of the Document

1.2.1 The first chapter describes the purpose and the structure of the document.

1.2.2 The second chapter provides an overview concerning profiling in general and it presents the rationale for defining specific application/service oriented AMHS profiles.

1.2.3 The third chapter includes the detailed specification of these profiles. Currently it contains the AMHS Profile for OPMET IWXXM data exchange as well as guidance material for conducting conformance testing of the involved implementations.

1.2.4 Upon identification of similar profiling tasks for other applications/services chapter 3 will be updated accordingly.

2. Profiles and Requirement Lists

2.1 Overview

2.1.1 A number of standards have been established by ISO for Message Handling Systems. In order to describe which standards or group of standards, together with options and parameters, are needed to accomplish a function, it is necessary to specify a profile. Such profiles have been standardized by ISO and are known as International Standardized Profiles (ISPs). Profiles standardize the use of options and other variations in the base standards and deal primarily with the use of implemented capabilities in order to meet requirements for interoperability and efficient interworking.

2.1.2 ICAO Doc 9880, Part II (ref. [5]) contains the detailed technical specifications for ATSMHS based on a number of international standards and ISPs, complemented by additional requirements. The basic and the extended ATSMHS services meet the basic requirements of the respective ISPs but additional features and supplementary functions are incorporated as necessary in ICAO Doc 9880, Part II. In order to express conformance requirements, i.e. static capability, ICAO Doc 9880, Part II uses the classification defined in the ISPs to include different levels of support (mandatory, optional, etc.). These requirements, applying to the related parameters or elements are specified in the form of Profile requirement lists (PRLs). In a limited number of cases, the PRLs may also include dynamic behaviour requirements, using another classification also defined in the ISPs.

2.1.3 In the same spirit, Appendix B of the EUR AMHS Manual describes the ‘European ATS Messaging Service Profile’. Its purpose is to provide a single, relatively short specification of protocols and system capabilities and it is intended to ensure end-to-end message transfer between International COM Centres over AMHS.

2.2 Relation between AMHS specification and ISO/IEC ISPs

2.2.1 It is noted that the classification of a feature as mandatory in the ISPs corresponds to a requirement regarding static capability, i.e. the ability to generate and/or receive, encode and/or decode a specific parameter, but not to use this parameter in every message sent or received. The same logic is applicable to ICAO Doc 9880, Part II and the EUR AMHS Manual.

2.2.2 Furthermore, it is recalled that in ICAO Doc 9880, Part II, for the Basic ATS Message Handling Service, the interface between the ATS Message User Agent and the ATS Message Server has been left open, since this is often an implementation matter local to each AMHS Management Domain. Conversely, for the Extended ATS Message Handling Service, implementation of a P2/P3 or P2/P7 profile compliant with the relevant MHS ISP (among ISP AMH23 to AMH26) is mandated. The main reason for this requirement was to enable reference to the Functional Group (FG) Security S0 defined in these ISPs, SEC S0 being the agreed solution for AMHS security.

2.2.3 The question of compliance with a P2/P3 or P2/P7 ISP for AMHS conformance has never been addressed in the context of an implementation making use of some functionalities

part of the Extended Service, but not of the whole of it. In particular, it is not specified whether a partial Extended Service implementation which does not include AMHS Security requires conformance with one of the AMH23 to AMH26 profiles or not.

2.3 Profiling per application/service

2.3.1 The European ATS Messaging Service Profile specifies a number of AMHS protocols and system capabilities for exchanging ATS messages between users through international Message Transfer Agents. It applies to Message Transfer Agents, Message Stores and User Agents. Dedicated sections of Appendix B include the requirements of each of the above mentioned AMHS System components.

2.3.2 The message categories handled by the AFS are defined by Annex 10, Volume II. The users of these message categories are the ATS as well as the AIS, ATFM, MET and SAR Services. Several ATM applications such as Digital NOTAM and Digital Flight Plan deploy new data requirements and information exchange models. These common information exchange models, i.e. AIXM and FIXM, are specifications designed to enable the encoding and the distribution of information in digital format, ensuring at the same time interoperability. These information exchange models make use of the Extensible Markup Language (XML) for encoding, representation and exchange of information. Similarly, ICAO Annex 3 foresees the exchange of OPMET data not only in the Traditional Alphanumeric Code format but also in the format defined by the ICAO Meteorological Information Exchange Model (IWXXM).

2.3.3 The ATS Message Handling Service already provides appropriate means for exchanging such data types. Furthermore, proper refinement of the specification has been foreseen and incorporated in Appendix B of this Manual, suitable for conveyance of known binary data formats.

2.3.4 However, it is obvious that a user agent in support of one of the above mentioned applications will not necessarily have to support the same set of features like a user agent in support of another application. On the contrary, implementing all of the requirements specified for UAs by ICAO Doc 9880, Part II, and Appendix B of the EUR AMHS Manual, independently of the served application/service and the type of the user agent, could be considered as an over-specification. For example it is not likely that a host user, which is a computer application running on ATN end systems and interacts with the ATS message service by means of APIs, would need to generate and submit probes.

2.3.5 Furthermore user agents may be implemented exclusively for the support of a specific application/service. Such dedicated user agents may not need to implement all the features defined by ICAO Doc 9880, Part II, and Appendix B of the EUR AMHS Manual. For example, dedicated user agents implemented for the exchange of OPMET data formatted based on the IWXXM model are not supposed to generate messages with SS priority. Similarly these user agents are not expected to receive messages with SS priority, although this could happen at the reception direction, at least by mistake.

2.3.6 Mandating implementation of features which are not required by the application/service served by certain user agents may generate additional complexity and impose implementation delay, effort and cost, without any operational benefit. In order to

eliminate such impediments and facilitate the adoption of the ATS Message Handling Service by end users, the need of defining application/service oriented AMHS profiles, which clarify requirements and may relax some of them by mandating less features than the current AMHS specification, has been recognized. These profiles are applicable to explicit, limited environments, e.g. submission of OPMET data, taking into consideration which features are useless for the specific application/service. The relaxed requirements concern message submission only.

2.3.7 Implementations complying with an application/service oriented AMHS profile are accepted for connection to the AMHS, although possibly not fully compliant from a formal standpoint, provided that conformance to the profile is verified. For this purpose, UA conformance testing, as specified in Appendix D-UA, needs to be tailored according to the given profile specification.

3. Application/Service oriented AMHS Profiles

3.1 General

3.1.1 The following sections present the AMHS profiles specified for implementations, for which support of all features mandated by ICAO Doc 9880 (ref. [5]) and Appendix B of the EUR AMHS Manual (ref. [3]) is not required.

3.1.2 The exchange of OPMET data based on IWXXM has been identified as the first application using AMHS, for which the definition of a profile would accommodate the implementation deployment.

3.1.3 This section needs to be updated each time a similar need appears for other applications/services.

3.2 AMHS Profile for OPMET IWXXM data exchange

3.2.1 Introduction

3.2.1.1 It has been commonly agreed by the MET and AFS ICAO EUR communities that AMHS is the intended communication means for MET IWXXM data exchanges in the EUR Region. More specifically, FTBP is to be used for IWXXM data. This agreement is reflected in the EUR Doc033 (ref. [1]).

3.2.1.2 UAs complying with ICAO Doc 9880, Part II, Draft Second Edition (ref. [5]) and with the additional provisions of the EUR AMHS Manual (ref. [2]) and of the European ATS Messaging Service Profile (ref. [3]) are capable to originate and receive AMHS messages containing such data. The support by UAs of IPM Heading Extensions (IHE), defined in ICAO Doc 9880, Part II as part of the Extended ATS Message Handling Service, is additionally required but represents a minor upgrade already available in several UA implementations.

3.2.1.3 However, to ensure unambiguous interpretation of messages upon reception, and to facilitate their origination, it is necessary to establish a detailed specification of X.400 and AMHS parameters to be adopted for conveyance of such messages, including those associated with the AMHS file-transfer-body-parts (FTBP). This task is a typical profiling activity, which is preferably performed before implementation deployment is started.

3.2.2 Scope of the profile

3.2.2.1 This profile specification is established for application by AMHS UAs submitting and/or receiving OPMET data in IWXXM format through a P2/P3 or a P2/P7 interface, implemented as part of the following centres or systems (as defined in EUR Doc033 [1], section 2):

- National OPMET Centre (NOC)
- Regional OPMET Centre (ROC)

-
- Interregional OPMET Gateway (IROG)
 - Regional OPMET Databank (RODB)
 - any terminal or system receiving or requesting OPMET data in IWXXM format from one of the above centres/systems

3.2.2.2 This specification is based on the following assumptions, which identify topics out of scope of the AMHS profile, which are addressed in the MET domain:

- The MET domain may add further data types to the IWXXM without affecting the AMHS profile. It is assumed that irrespective of the data format (bulletin or report), the MET domain will always pass an unstructured binary file with a defined file-name to the AMHS.
- Data compression will always be performed in the MET domain. The AMHS will not perform compression.
- The MET Domain will define procedures for the submission of RQX messages to RODBs.

3.2.3 Definition of the profile

3.2.3.1 Level of service

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

3.2.3.2 Number of body parts

3.2.3.2.1 The IPM body shall contain exactly one body-part which is an FTBP. This is compliant with the following text (EUR AMHS Manual, Appendix B, ref. [3], section 3.3.2, para 2):

“In case of one body-part only, the IPM contains either:

[...]

c) a single file-transfer body part in support of binary data exchange.”

3.2.3.2.2 The body part selection shall be as represented using the following tabular description.

**Table 1: Body part selection for the IWXXM profile
(derived from ICAO Doc 9880 Part II Tables 3-1 and 3-2)**

<i>Ref</i>	<i>Element</i>	<i>Doc 9880 static support (Extended Service) Orig/Rec</i>	<i>Doc 9880 reference</i>	<i>Dynamic action upon generation of IWXXM message</i>	<i>Value and/or comments</i>
Part 2: AMH21/A.1.3 IPM body					
1	ia5-text	O/M		X	
1.2	data	M/M	3.3.3	X	
10	bilaterally-defined	O/M	3.3.5	X	
Part 3: AMH21/A.1.3.1 Extended body part support					
1	ia5-text-body-part	O/M		X	
9	bilaterally-defined-body-part	O/M	3.3.5.1	X	
11	general-text-body-part	M/M	3.3.3 and Part 4, Table 3-1	X	
12	file-transfer-body-part	M/M	3.3.5.1 and 3.3.5.2	G	AMH21/ A.1.3.3
M = mandatory support (static support) O = optional support (static support) or optionally generated (dynamic behaviour) G = generated X = not used					

3.2.3.3 Selection of IPM heading parameters and parameter values

3.2.3.3.1 The IPM Heading parameter selection and values are listed in Table 2 below.

**Table 2: IPM Heading parameters for the IWXXM profile
(derived from ICAO Doc 9880 Part II Table 3-2)**

<i>Ref</i>	<i>Element</i>	<i>Doc 9880 static support (Extended Service) Orig/Rec</i>	<i>Doc 9880 reference</i>	<i>Dynamic action upon generation of IWXXM message</i>	<i>Value and/or comments</i>
Part 1: AMH21/A.1.2 IPM heading fields					
1	this-IPM	M/M	3.1.2.2.1, 3.1.4.2.1 (AMH21 support)	G	Address of the originating OPMET system (MET switch)
2	originator	M/M		G	
3	authorizing-users	O/M		X	
4	primary-recipients	M/M		G	Recipient addresses are populated by the MET switch based on its routing table (EUR Doc 033, ref. [1] section 4.1.4)
5	copy-recipients	M/M		X	
6	blind-copy-recipients	O/M		X	
7	replied-to-IPM	M/M		X	
8	obsoleted-IPMs	O/M		X	

<i>Ref</i>	<i>Element</i>	<i>Doc 9880 static support (Extended Service) Orig/Rec</i>	<i>Doc 9880 reference</i>	<i>Dynamic action upon generation of IWXXM message</i>	<i>Value and/or comments</i>
9	related-IPMs	O/M		X	
10	subject	M/M		G	This field shall carry the TTA <i>Aii</i> CCCCYYGGgBBB part of the filename of FTBP. It is assumed that the subject field is easier to access for human operators in case of retrieval or analysis of transferred messages
11	expiry-time	O/M		X	
12	reply-time	O/M		X	
13	reply-recipients	O/M		X	
14	importance	O/M		X	The receiving UA shall assume that this field takes its default value ("normal")
15	sensitivity	O/M		X	
16	auto-forwarded	O/M		X	
17	extensions	M/M	3.3.4.1	G	
17.6	authorization-time	M/M	3.3.4.2	G	Equivalent to filing time
17.12	originators-reference	M/M	3.3.4.3	X	To avoid confusion with the use of this field in the IHE context (where it is carrying data converted to/from AFTN OHI)
17.13	precedence-policy-identifier	M/M	3.3.4.5, 3.3.4.6 and 3.3.4.7	G	OID value {iso(d) identified-organisation (3) icao (27) atn-amhs (8) parameters (0) amhs-precedence-policy (0)} (see Doc 9880, ref. [5], 3.3.4.7)
Part 4: AMH21/A.1.5 common data types					
1	RecipientSpecifier				
1.2	notification-requests	M/M	3.3.6	X	
1.2.1	rn	M/M	3.3.6	X	IWXXM never use priority SS
1.2.2	nrn	M/M		X	Doc 9880 does not foresee the presence of nrn-request
1.4	recipient-extensions	M/M	3.3.4.1	G	
1.4.3	precedence	M/M	3.3.4.8	G	Equivalent to priority GG: precedence value = 28 (TAF, METAR/SPECI, and also in case of AMD, COR or RTD reports/bulletins) Equivalent to priority FF: precedence value = 57 (AIRMET, SIGMET, VAA, TCA)
2	ORDescriptor				
2.1	formal-name	M1/M1		G	used for originator-address and recipient-addresses
M = mandatory support (static support) M1 = mandatory O/R name minimal support (static support) O = optional support (static support) or optionally generated (dynamic behaviour)					

<i>Ref</i>	<i>Element</i>	<i>Doc 9880 static support (Extended Service) Orig/Rec</i>	<i>Doc 9880 reference</i>	<i>Dynamic action upon generation of IWXXM message</i>	<i>Value and/or comments</i>
G = generated X = not used					

3.2.3.4 Content of body parts

3.2.3.4.1 The parameters composing the FTBP shall be in line with the specification of EUR ATS Messaging Profile, Appendix B to EUR AMHS Manual (ref. [3]), section A.2.4.2, and complemented with the details provided in Table 3 below.

**Table 3: File Transfer parameters for the IWXXM profile
(derived from European ATS Messaging Service Profile, section A.2.4.2)**

<i>Ref</i>	<i>Element</i>	<i>European ATS Messaging Service Profile - static support Orig/Rec</i>	<i>European ATS Messaging Service Profile - reference</i>	<i>Dynamic action upon generation of IWXXM message</i>	<i>Value and/or comments</i>
1	related-stored-file	-			
2	contents-type				
2.1	document-type				
2.1.1	document-type-name	M/M	A.2.4.2.1	G	default OID value: 1.0.8571.5.3 {iso(1) standard(0) 8571(8571) document- type(5) unstructured- binary(3)}
3	environment				
3.1	application-reference				
3.1.1	registered-identifier	O/M	A.2.4.2.2 and A.2.4.2.6	G	OID value: 1.3.27.8.1.2 {iso(3) identified- organisation (3) icao (27) atn-amhs (8) application (1) digital-met (2)}
3.4	user-visible-string	O/M	A.2.4.2.6	G	“Digital MET”
4	compression	-			See para 3.2.3.4.2 below
5	file-attributes				
5.1	pathname				
5.1.1	incomplete-pathname	O/M	A.2.4.2.3	G	bulletin file name as specified in EUR Doc 033, ref. [1], section 5.1.4
5.5	date-and-time-of-last-modification	O/M	A.2.4.2.4	O	

<i>Ref</i>	<i>Element</i>	<i>European ATS Messaging Service Profile - static support</i> <i>Orig/Rec</i>	<i>European ATS Messaging Service Profile - reference</i>	<i>Dynamic action upon generation of IWXXM message</i>	<i>Value and/or comments</i>
5.13	object-size				
5.13.2	actual-values	O/M	A.2.4.2.5	O	
6	extensions	-			
M = mandatory support (static support) O = optional support (static support) or optionally generated (dynamic behaviour) G = generated X = not used					

3.2.3.4.2 Compression of the data to be transferred, if needed, shall be performed in the MET domain before creating the FTBP, as assumed in section 3.2.2.2 above. This avoids using the “compression” field of FTBP, reduces the UA complexity and limits the FTBP functionality to message exchange mechanisms.

3.2.3.4.3 The IWXXM data itself shall be included in the FileTransferData element of the file-transfer-body-part. It should be noted that ISO/IEC 10021-7 / ITU-T X.420 (section 7.4.12) specifies the ASN.1 encoding to be used, and that ISO/IEC ISP 12062-2 (section A.1.3.1) expresses additional recommendations regarding this encoding, which should be “octet-aligned EXTERNAL”. Only one EXTERNAL component should be used.

3.2.3.5 Selection of used P3/P1 envelope parameter values

3.2.3.5.1 The mapping of P2 parameters onto P3 envelope parameters shall be as specified in ICAO Doc 9880 (ref. [5]) and X.420 (ref. [6]).

3.2.3.5.2 IPMs with a precedence value of 28 shall use the priority abstract-value “non-urgent”. IPMs with a precedence value of 57 shall use the priority abstract-value “normal”.

3.2.3.5.3 The encoded-information-types in the P3 submission-envelope shall be limited to the OID value specified for FTBP (see ITU-T X.420:1999 7.4.12.8, 20.4.c and Annex C), i.e. OID {joint-iso-itu-t(2)219hs(6) ipms(1) eit(12) file-transfer(0)}.

3.2.3.6 Relaxed requirements from complete AMHS specification

3.2.3.6.1 Implementers must be aware that due to the “relaxed” status of the requirements above, any of these requirements may be reverted back to a “mandatory” status in a future profile version, as soon as the need for the corresponding missing feature(s) appears operationally. Conformance with the profile implies a commitment to support such evolutions in the profile, which may be considered as “return-to-normal” in terms of AMHS conformance.

3.2.4 Proposed Conformance Tests

3.2.4.1 General description

3.2.4.1.1 This section proposes a list of functional tests that allows verification of conformance of UA implementations dedicated for OPMET IWXXM data exchange. UA conformance testing, as specified in Appendix D-UA, for such implementations needs to be adapted based on the profile specification defined in section 3.2.3.

3.2.4.1.2 The proposed conformance tests are divided to three categories:

- profile specific submission tests;
- profile specific delivery tests; and
- submission and delivery tests according to Appendix D-UA.

3.2.4.1.3 The scope of the profile specific submission and delivery tests is to ensure conformance of UA implementations specifically deployed for the conveyance of OPMET IWXXM data to the respective profile. A test identification scheme of the form WXMxnn has been used, where x=1 is used for submission tests and x=2 for delivery tests. Wherever applicable, reference to the respective Appendix D-UA test is made.

3.2.4.1.4 Reference to specific UA conformance tests as specified in Appendix D-UA is included in section 3.2.4.4, especially for the reception direction. The scope of these tests is to ensure that UA implementations dedicated for OPMET IWXXM data exchange will not malfunction upon reception of a field or element not defined by the specific profile, but classified as mandatory in the ISPs and thus also mandatory in AMHS.

3.2.4.2 Profile specific submission tests

WXM101	Submission of an IPM including a bulletin consisting of METAR
Test criteria	The test is successful if the UA submits an IPM including a bulletin consisting of METAR according to the profile defined in section 3.2.3.
Scenario description	Submit from the UA under test an IPM including a bulletin consisting of METAR. Check that: <ul style="list-style-type: none">- the P3 submission-envelope includes the following parameters with the correct values:<ul style="list-style-type: none">○ <i>originator-name</i>: OR-name of the originator○ <i>recipient-name</i>: OR-name of each recipient of the message○ <i>content-type</i>: 22○ <i>encoded-information-types</i>: OID 2.6.1.12.0○ <i>priority</i>: non urgent- the following IPM heading fields are present with the correct values:<ul style="list-style-type: none">○ <i>originator</i>: address of the originating OPMET system (MET switch)○ <i>primary-recipients</i>: recipient addresses as populated by the MET switch○ <i>subject</i>: TTAAiiCCCCYYGGggBBB part of the filename of FTBP

	<ul style="list-style-type: none"> ○ <i>importance</i>: normal, if present ○ <i>authorization-time</i> of the IPM heading extensions field: equivalent to filing time ○ <i>precedence-policy-identifier</i> of the IPM heading extensions field: OID 1.3.27.8.0.0 ○ <i>originators-reference</i> of the IPM heading extensions field: absent - the following elements in the common data types are present with the corresponding values: <ul style="list-style-type: none"> ○ <i>precedence</i>: 28 ○ <i>formal-name</i>: originator address and recipient addresses - the elements <i>rn</i> and <i>nrn</i> in the common data types are absent - the message has exactly one file-transfer-body-part - the parameters composing FTBP are according to section A.2.4.2 of the EUR AMHS Manual Appendix B and the following elements are present with the correct values: <ul style="list-style-type: none"> ○ <i>document-type-name</i>: OID 1.0.8571.5.3 ○ <i>registered-identifier</i>: OID 1.3.27.8.1.2 ○ <i>user-visible-string</i>: 'Digital MET' ○ <i>incomplete-pathname</i>: bulletin file name as specified in section 5.1.4 of EUR Doc 033, for example: A_LAFR31LFPW171500_C_LFPW_20151117150010.xml.[compression_suffix] ○ If generated, check the element <i>date-and-time-of-last-modification</i> ○ If generated, check the element <i>actual-values</i>, the value of which represents the size of the Attachment data in bytes - the elements <i>related-stored-file</i>, <i>compression</i> and <i>extensions</i> of the FTBP parameters are absent - The IWXXM data itself are included in the FileTransferData element of the file-transfer-body-part; the octet-aligned encoding should be used.
Appendix D-UA ref:	CTUA1501, FTBP Capability

WXM102	Submission of IPMs including bulletins of different file size consisting of METAR
Test criteria	The test is successful if the UA submits several IPMs including bulletins of different file size consisting of METAR according to the profile defined in section 3.2.3.
Scenario description	<p>Submit from the UA under test a sequence of several IPMs including each time a bulletin of different file size consisting of METAR.</p> <p>The size of the message should not exceed the limit defined in Appendix B, F.2.4.3</p> <p>Check all parameters listed in test case WXM101, with the corresponding values.</p> <p>If the element <i>actual-values</i> is generated check each time the respective value, which represents the size of the Attachment data in bytes.</p>
Appendix D-UA ref:	CTUA1501, FTBP Capability with different body-part size

WXM103	Submission of an IPM including a bulletin consisting of SPECI or TAF
Test criteria	The test is successful if the UA submits an IPM including a bulletin consisting of SPECI or TAF according to the profile defined in section 3.2.3.
Scenario description	<p>Submit from the UA under test an IPM including a bulletin consisting of SPECI.</p> <p>Check that all parameters and their respective values are in accordance to test case WXM101, except that the value of the element <i>incomplete-pathname</i> is according to the bulletin file name as specified in section 5.1.4 of EUR Doc 033.</p> <p>The test is repeated with the submission of an IPM including bulletin consisting of TAF.</p>
Appendix D-UA ref:	CTUA1501, FTBP Capability

WXM104	Submission of an IPM including a bulletin consisting of AIRMET
Test criteria	The test is successful if the UA submits an IPM including a bulletin consisting of AIRMET according to the profile defined in section 3.2.3.
Scenario description	<p>Submit from the UA under test an IPM including a bulletin consisting of AIRMET.</p> <p>Check that all parameters and their respective values are in accordance to test case WXM101, except that:</p> <ul style="list-style-type: none"> - the <i>priority</i> abstract value of the P3 submission-envelope is normal - the value of the element <i>precedence</i> is 57 - the value of the element <i>incomplete-pathname</i> is according to the bulletin file name as specified in section 5.1.4 of EUR Doc 033.
Appendix D-UA ref:	CTUA1501, FTBP Capability

WXM105	Submission of an IPM including a bulletin consisting of SIGMET or VAA or TCA
Test criteria	The test is successful if the UA submits an IPM including bulletin consisting of SIGMET or VAA or TCA according to the profile defined in section 3.2.3.
Scenario description	<p>Submit from the UA under test an IPM including a bulletin consisting of SIGMET.</p> <p>Check that all parameters and their respective values are in accordance to test case WXM101, except that:</p> <ul style="list-style-type: none"> - the <i>priority</i> abstract value of the P3 submission-envelope is normal - the value of the element <i>precedence</i> is 57 - the value of the element <i>incomplete-pathname</i> is according to the bulletin file name as specified in section 5.1.4 of EUR Doc 033. <p>The test is repeated with the submission of an IPM including bulletin consisting of VAA.</p>

	The test is repeated with the submission of an IPM including bulletin consisting of TCA.
Appendix D-UA ref:	CTUA1501, FTBP Capability

3.2.4.3 Profile specific delivery tests

WXM201	Delivery of an IPM including a bulletin consisting of METAR
Test criteria	The test is successful if an IPM, including a bulletin consisting of METAR, sent by an MTA is received by the UA under test and the parameters specified by the profile defined in section 3.2.3 are properly received.
Scenario description	<p>The MTA sends an IPM including a bulletin consisting of METAR.</p> <p>Check that the UA under test receives the IPM with the following parameters:</p> <ul style="list-style-type: none"> - the message delivery envelope includes the following parameters with the correct values: <ul style="list-style-type: none"> ○ <i>originator-name</i>: OR-name of the originator ○ <i>this-recipient-name</i>: OR-name of the recipient to whom the message is delivered ○ <i>content-type</i>: 22 ○ <i>encoded-information-types</i>: OID 2.6.1.12.0 ○ <i>priority</i>: non urgent ○ <i>message-delivery-identifier</i>: it shall have the same value as the message-submission-identifier supplied to the originator of the message when the message was submitted (X.411, section 8.3.1.1.1.1) ○ <i>message-delivery-time</i>: it contains the time at which delivery occurs and at which the MTS is relinquishing responsibility for the message (X.411, section 8.3.1.1.1.2) - the following IPM heading fields are present with the correct values: <ul style="list-style-type: none"> ○ <i>originator</i> ○ <i>primary-recipients</i> ○ <i>subject</i>: TTAAiiCCCCYYGGggBBB part of the filename of FTBP ○ <i>importance</i>: normal, if present ○ <i>authorization-time</i> of the IPM heading extensions field: equivalent to filing time ○ <i>precedence-policy-identifier</i> of the IPM heading extensions field: OID 1.3.27.8.0.0 ○ <i>originators-reference</i> of the IPM heading extensions field: absent - the following parameters in the common data types are present with the corresponding values: <ul style="list-style-type: none"> ○ <i>precedence</i>: 28 - the elements <i>rn</i> and <i>nrrn</i> in the common data types are absent - the message has exactly one file-transfer-body-part - the parameters composing the FTBP are according to section A.2.4.2 of the EUR AMHS Manual Appendix B and the following elements are present with the correct values: <ul style="list-style-type: none"> ○ <i>document-type-name</i>: OID 1.0.8571.5.3

	<ul style="list-style-type: none"> ○ <i>registered-identifier</i>: OID 1.3.27.8.1.2 ○ <i>user-visible-string</i>: ‘Digital MET’ ○ <i>incomplete-pathname</i>: bulletin file name as specified in section 5.1.4 IWXXM Guidelines, for example: A_LAFR31LFPW171500_C_LFPW_ 20151117150010.xml.[compression_suffix] ○ If generated, check the element <i>date-and-time-of-last-modification</i> ○ If generated, check the element <i>actual-values</i>, the value of which represents the size of the Attachment data in bytes <ul style="list-style-type: none"> - the elements <i>related-stored-file</i>, <i>compression</i> and <i>extensions</i> of the FTBP parameters are absent - The IWXXM data itself are included in the FileTransferData element of the file-transfer-body-part; the octet-aligned encoding should be used.
Appendix D-UA ref:	CTUA1601, FTBP Capability

WXM202	Delivery of IPMs including bulletins of different file size consisting of METAR
Test criteria	The test is successful if several IPMs, including bulletins of different file size consisting of METAR, sent by an MTA are received by the UA under test and the parameters specified by the profile defined in section 3.2.3 are properly received.
Scenario description	<p>The MTA sends a sequence of several IPMs including each time a bulletin of different file size consisting of METAR.</p> <p>Check that the UA under test receives all IPMs and that the parameters described in test case WXM201 are received with the corresponding values.</p> <p>If the element <i>actual-values</i> is present check each time the respective value, which represents the size of the Attachment data in bytes.</p>
Appendix D-UA ref:	CTUA1601, FTBP Capability with different body-part size

WXM203	Delivery of an IPM including a bulletin consisting of SPECI or TAF
Test criteria	The test is successful if an IPM, including a bulletin consisting of SPECI or TAF, sent by an MTA is received by the UA under test and the parameters specified by the profile defined in section 3.2.3 are properly received.
Scenario description	<p>The MTA sends an IPM including a bulletin consisting of SPECI.</p> <p>Check that the UA under test receives the IPM and the parameters described in test case WXM201 are received with the corresponding values, except the element <i>incomplete-pathname</i> which value is according to the bulletin file name as specified in section 5.1.4 of EUR Doc 033.</p> <p>The test is repeated with the delivery of an IPM including a bulletin consisting of TAF.</p>
Appendix D-UA ref:	CTUA1601, FTBP Capability

WXM204	Delivery of an IPM including a bulletin consisting of AIRMET
Test criteria	The test is successful if an IPM, including a bulletin consisting of AIRMET, sent by an MTA is received by the UA under test and the parameters specified by the profile defined in section 3.2.3 are properly received.
Scenario description	The MTA sends an IPM including a bulletin consisting of AIRMET. Check that the UA under test receives the IPM and the parameters described in test case WXM201 are received with the corresponding values, except that: <ul style="list-style-type: none"> - the <i>priority</i> abstract value of the P3 submission-envelope is normal - the value of the element <i>precedence</i> is 57 - the value of the element <i>incomplete-pathname</i> is according to the bulletin file name as specified in section 5.1.4 of EUR Doc 033.
Appendix D-UA ref:	CTUA1601, FTBP Capability

WXM205	Delivery of an IPM including a bulletin consisting of SIGMET or VAA or TCA
Test criteria	The test is successful if an IPM, including a bulletin consisting of SIGMET or VAA or TAF, sent by an MTA is received by the UA under test and the parameters specified by the profile defined in section 3.2.3 are properly received.
Scenario description	The MTA sends an IPM including a bulletin consisting of SIGMET. Check that the UA under test receives the IPM and the parameters described in test case WXM201 are received with the corresponding values, except that: <ul style="list-style-type: none"> - the <i>priority</i> abstract value of the P3 submission-envelope is normal - the value of the element <i>precedence</i> is 57 - the value of the element <i>incomplete-pathname</i> is according to the bulletin file name as specified in section 5.1.4 of EUR Doc 033. <p>The test is repeated with the delivery of an IPM including a bulletin consisting of VAA.</p> <p>The test is repeated with the delivery of an IPM including a bulletin consisting of TCA.</p>
Appendix D-UA ref:	CTUA1601, FTBP Capability

3.2.4.4 Submission and delivery tests according to Appendix D-UA

3.2.4.4.1 The scope of the tests included in the following list is to ensure that UAs implemented for the sake of the exchange of OPMET IWXXM data will not malfunction upon reception of AMHS messages, fields or elements according to the standards but not defined by the profile specified in section 3.2.3. The main objective is to realize the behaviour of these specific UA implementations upon reception of such messages, fields or elements.

3.2.4.4.2 The execution of the delivery tests defined in Appendix D-UA is encouraged. However if this is not possible the following test list is suggested.

Basic Delivery Operations (A2)	
CTUA201	Deliver an IPM to the IUT – basic capability (A2)
CTUA203	Deliver an IPM containing optional-heading-information in the ATS-message-header
CTUA204	Deliver an IPM containing different kinds of recipient addresses
CTUA206	Deliver an IPM with invalid originator address similar to CAAS
CTUA207	Deliver an IPM with invalid originator address similar to XF

Specific Delivery Operations	
CTUA401	Deliver a non-delivery report (NDR) to an AMHS user

Enhanced Delivery UA Capability	
CTUA601	Deliver an IPM with the implemented capability of one body-part
CTUA602	Deliver an IPM with the implemented capability of two body-parts

Delivery Operations (A2-IHE)	
CTUA1201	Deliver an IPM with IHE to the IUT – basic capability (A2-IHE)
CTUA1203	Deliver an IPM with IHE, containing optional heading information
CTUA1204	Deliver an IPM with IHE, containing different kinds of recipient address

Specific Submission Operations with IHE	
CTUA1303	Checking of default envelope elements (flag setting) in submitted IPMs with IHE

Specific Delivery Operations with IHE	
CTUA1401	Deliver a non-delivery report (NDR) to an AMHS user

Enhanced Delivery UA Capability with IHE	
CTUA1602	Deliver an IPM with IHE with the implemented capability of two body-parts

End of Appendix H

APPENDIX C

Network Inventory
Operational Area
[HELP]

Persons & Contacts
Com Centres
A.D. Sites
VOC's
Composites

Region	COM Centre	Location	Country		
MID	HECA	CAIRO/NTL	Egypt		HOME
SEARCH					
MD Common Name	Country-Name	ADMD-Name	PRMD-Name		
HE	XX	ICAO	HE		

MTA Name

Maximum Content Length

Extended Encoded Information Types in Support of:

IA5

FTBP

General Text Body Part(ISO 646)

General Text Body Part(ISO 8859-1)

ATS Message Server

Messages Lifetime (Minutes):

Urgent **Non Urgent**

Normal **Report**

AFTN/AMHS Gateway

Currently Authorized Message Length

Maximum Number of Addresses

Converted General-Text Body Parts

ISO 646 ISO 8859-1

Operational Status

Protocol Capabilities

Protocol	P-SEL	S-SEL	T-SEL	Network Address (NSAP or IP)	Active
Created by		Created on		Last Modified by	Last Modified on
jomrn1980		2014/08/21 12:03:50			

Network Inventory Operational Area [HELP]

Persons & Contacts
Com Centres
AFTN / CIDIN Capabilities
AMHS Capabilities
VCG's
Connections

Region: MID | COM Centre: HSSS | Location: KHARTOUM | Country: Sudan

MD Common Name: HS | Country-Name: XX | ADMD-Name: ICAO | PRMD-Name: HS

HOME
SEARCH

MTA Name: MTA-HSSS-1

Maximum Content Length: 2000000

Extended Encoded Information Types in Support of:

IA5
 FTBP
 General Text Body Part(ISO 646)
 General Text Body Part(ISO 8859-1)

ATS Message Server

Messages Lifetime (Minutes):

Urgent: 360 | Non Urgent: 8640
 Normal: 2880 | Report: 2880

AFTN/AMHS Gateway

Currently Authorized Message Length: 64000

Maximum Number of Addresses: 512

Converted General-Text Body Parts

ISO 646
 ISO 8859-1

Operational Status: OP

Protocol Capabilities

Protocol	P-SEL	S-SEL	T-SEL	Network Address (NSAP or IP)	Active
Created by	Created on		Last Modified by		Last Modified on
jomn1980	2014/08/21 12:36:42		mubark_g		2015/02/25 09:11:41

Network Inventory
Operational Area
[HELP]

Persons & Contacts
Com Centres
AFTN / CIDIN Capabilities
AMHS Capabilities
VCC's
Connections

Region	COM Centre	Location	Country	
MID	OEJN	JEDDAH/KING ABDULAZIZ	Saudi Arabia	HOME
SEARCH				

MD Common Name	Country-Name	ADMD-Name	PRMD-Name
SAUDI ARABIA	XX	ICAO	SAUDI ARABIA

MTA Name	[MTA-OEJN -1]	<input checked="" type="checkbox"/>	ATS Message Server	<input checked="" type="checkbox"/>	AFTN/AMHS Gateway
Maximum Content Length	[1048576]			Currently Authorized Message Length	[15700]
Extended Encoded Information Types in Support of:					
<input checked="" type="checkbox"/> IA5			Messages Lifetime (Minutes):		Maximum Number of Addresses
<input checked="" type="checkbox"/> FTBP			Urgent	[1440]	Non Urgent
<input checked="" type="checkbox"/> General Text Body Part (ISO 646)			Normal	[1440]	Report
<input checked="" type="checkbox"/> General Text Body Part (ISO 8859-1)				[1440]	
				<input checked="" type="checkbox"/> ISO 646	<input checked="" type="checkbox"/> ISO 8859-1
Operational Status					
[OP]					

Protocol Capabilities

Protocol	P-SEL	S-SEL	T-SEL	Network Address (IISAP or IP)	Active
Created by		Created on		Last Modified by	Last Modified on
Jomm1980		2014/08/21 13:21:31		sara20061	2015/02/10 13:57:28

Network Inventory
Operational Area
[HELP]

Persons & Contacts
Com Centres
AFTN / CIDIN Capabilities
AMHS Capabilities
VCG's
Connections

Region	COM Centre	Location	Country		
MD	OJAM	AMMAN/MARKA	Jordan		HOME
SEARCH					
MD Common Name	Country-Name	ADMD-Name	PRMD-Name		
OJ	XX	ICAO	OJ		

MTA Name	MTA-OJAM-1	<input checked="" type="checkbox"/> ATS Message Server	<input checked="" type="checkbox"/> AFTN/AMHS Gateway
Maximum Content Length	20000		Currently Authorized Message Length
			20000
Extended Encoded Information Types in Support of:		Messages Lifetime (Minutes):	Maximum Number of Addresses
<input checked="" type="checkbox"/> IA5		Urgent 44000 Non Urgent 44000	512
<input checked="" type="checkbox"/> FTBP		Normal 44000 Report 44000	Converted General-Text Body Parts
<input checked="" type="checkbox"/> General Text Body Part(ISO 646)			<input checked="" type="checkbox"/> ISO 646
<input checked="" type="checkbox"/> General Text Body Part(ISO 8859-1)			<input checked="" type="checkbox"/> ISO 8859-1
			Operational Status
			OP

Protocol Capabilities

Protocol	P-SEL	S-SEL	T-SEL	Network Address (NSAP or IP)	Active
AMHS/TCP-I				10.100.100.15	<input checked="" type="checkbox"/>

Created by	Created on	Last Modified by	Last Modified on
jomm1980	2014/06/30 13:14:40	jomm1980	2015/01/01 08:44:57

Network Inventory
Operational Area
[HELP]

Persons & Contacts
Com Centres
AFTN / CIDIN Capabilities
AMHS Capabilities
VCG's
Connections

Region	COM Centre	Location	Country	HOME	SEARCH
MID	OLBA	BEIRUT/BEIRUT INTL	Lebanon		

MD Common Name	Country-Name	ADMD-Name	PRMD-Name
OL	XX	ICAO	OL

MTA Name	<input type="checkbox"/> ATS Message Server	<input checked="" type="checkbox"/> AFTN/AMHS Gateway
Maximum Content Length	<input type="checkbox"/> IA5	Currently Authorized Message Length <input type="text" value="64000"/>
Extended Encoded Information Types in Support of:	Messages Lifetime (Minutes):	Maximum Number of Addresses <input type="text" value="512"/>
<input checked="" type="checkbox"/> FTBP	Urgent <input type="text" value="360"/> Non Urgent <input type="text" value="8640"/>	Converted General-Text Body Parts
<input checked="" type="checkbox"/> General Text Body Part(ISO 646)	Normal <input type="text" value="2880"/> Report <input type="text" value="2880"/>	<input checked="" type="checkbox"/> ISO 646
<input checked="" type="checkbox"/> General Text Body Part(ISO 8859-1)		<input checked="" type="checkbox"/> ISO 8859-1
		Operational Status
		<input type="text" value="NON OP"/>

Protocol Capabilities

Protocol	P-SEL	S-SEL	T-SEL	Network Address (NSAP or IP)	Active
AMHS/TCP-I			0x544350		<input type="checkbox"/>

Created by	Created on	Last Modified by	Last Modified on
sara20061	2015/03/05 12:24:53	sara20061	2015/03/05 12:44:50

Network Inventory
Background Area
[HELP]

Persons & Contacts
Com Centres
AFTN / CIDIN Capabilities
AMHS Capabilities
VCG's
Connections

Region	COM Centre	Location	Country		
<input type="text" value="MID"/>	<input type="text" value="OMAE"/>	<input type="text" value="EMIRATES FIR"/>	<input type="text" value="United Arab Emirates"/>	<input type="button" value="HOME"/>	<input type="button" value="SEARCH"/>

MD Common Name	Country-Name	ADMD-Name	PRMD-Name
<input type="text" value="UAE"/>	<input type="text" value="XX"/>	<input type="text" value="ICAO"/>	<input type="text" value="UAE"/>

MTA Name	<input type="text" value="OMAE-MTA"/>	<input checked="" type="checkbox"/>	ATS Message Server	<input checked="" type="checkbox"/>	AFTN/AMHS Gateway
Maximum Content Length	<input type="text" value="15700"/>			Currently Authorized Message Length	<input type="text" value="1800"/>
Extended Encoded Information Types in Support of:		Messages Lifetime (Minutes):		Maximum Number of Addresses	<input type="text" value="512"/>
<input checked="" type="checkbox"/> IA5		Urgent	<input type="text" value="1440"/>	Non Urgent	<input type="text" value="1440"/>
<input checked="" type="checkbox"/> FTBP		Normal	<input type="text" value="1440"/>	Report	<input type="text" value="1440"/>
<input checked="" type="checkbox"/> General Text Body Part(ISO 646)					
<input checked="" type="checkbox"/> General Text Body Part(ISO 8859-1)					
				Converted General-Text Body Parts	<input checked="" type="checkbox"/> ISO 646 <input type="checkbox"/> ISO 8859-1
				Operational Status	<input type="text" value="OP"/>

Protocol Capabilities

Protocol	P-SEL	S-SEL	T-SEL	Network Address (NSAP or IP)	Active
AMHS/TCP-I			"P1" - 0x5031	192.168.131.93::102	<input type="checkbox"/>

Created by	Created on	Last Modified by	Last Modified on
<input type="text" value="sara20061"/>	<input type="text" value="2015/03/05 14:00:36"/>	<input type="text" value="sara20061"/>	<input type="text" value="2015/03/05 14:02:21"/>

Network Inventory
Operational Area
[HELP]

Persons & Contacts
Com Centres
AFTN / CIDIN Capabilities
AMHS Capabilities
VCG's
Connections

Region

COM Centre

Location

Country

HOME

SEARCH

MD Common Name

Country-Name

ADMD-Name

PRMD-Name

MTA Name

Maximum Content Length

Extended Encoded Information Types in Support of:

IA5

FTBP

General Text Body Part(ISO 646)

General Text Body Part(ISO 8859-1)

ATS Message Server

Messages Lifetime (Minutes):

Urgent Non Urgent

Normal Report

AFTN/AMHS Gateway

Currently Authorized Message Length

Maximum Number of Addresses

Converted General-Text Body Parts

ISO 646 ISO 8859-1

Operational Status

Protocol Capabilities

Protocol	P-SEL	S-SEL	T-SEL	Network Address (NSAP or IP)	Active
Created by		Created on		Last Modified by	Last Modified on
jpmn1980		2014/06/30 13:58:14		<input type="text"/>	<input type="text"/>



ATS Extended Services Trial
File Transfer Body Part (FTBP) Testing Document

Author: MIDAMC STG
Date: 5/1/2017
Version: 0.1 (First Version)

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References

- [1] **ICAO Annex 10 – Aeronautical Telecommunication; Vol.II, Communication Procedure**
- [2] **ICAO doc 9880- Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols, Part II – Ground-Ground Applications - Air Traffic Services Message Handling Services (ATSMHS), First Edition – 2010**
- [3] **EUR Doc 020 – AMHS Manual**

Acronyms

<i>ADMD</i>	<i>Administrative Management Domain</i>
<i>AFTN</i>	<i>Aeronautical Fixed Telecommunication Network</i>
<i>AMHS</i>	<i>ATS Message Handling Services</i>
<i>ASST</i>	<i>ATS Extended Services Trial Team</i>
<i>ATS</i>	<i>Air Traffic Services</i>
<i>DIR</i>	<i>Directory Service</i>
<i>DL</i>	<i>Distribution List</i>
<i>DR</i>	<i>Delivery Report</i>
<i>FTBP</i>	<i>File Transfer Body Part</i>
<i>IHE</i>	<i>IPM Heading extensions</i>
<i>IP</i>	<i>Internet Protocol</i>
<i>IPM</i>	<i>Interpersonal Message</i>
<i>IPN</i>	<i>Interpersonal Notification</i>
<i>MIDAMC</i>	<i>ATS Messages Management Center in the MID Region</i>
<i>MTA</i>	<i>Message Transfer Agent</i>
<i>MTCU</i>	<i>Message Transfer & Control Unit</i>
<i>NDR</i>	<i>Non Delivery Report</i>
<i>NRN</i>	<i>Non Receipt Notification</i>
<i>OR-address</i>	<i>Originator- recipient address</i>
<i>PRMD</i>	<i>Private Management Domain</i>
<i>RN</i>	<i>Receipt Notification</i>
<i>SEC</i>	<i>Security (X.500)</i>
<i>UA</i>	<i>User Agent</i>

1. Introduction

The Message Handling service provided in the ATN is called the ATS Message Handling Service (ATSMHS). This service is specified using X.400 standards. There are two levels of ATSMHS service: Basic ATS Message Service and Extended ATS Message Service.

The Basic ATS Message Service provides a nominal capability equivalent from a user perspective to those provided by AFTN. And Extended ATS Message Service provides enhanced features such as supporting transfer of more complex message structures (body parts), use of the directory service, and support for security. The Extended Service is a technical and functional superset of the Basic ATS service.

The MID Region has decided to implement the Basic ATS service as a first step. SARPS has defied various AMHS subset, the AMHS capabilities in MID states are elaborated in table (1).

The World Metrological Organization (WMO) initially decided to migrate from alphanumeric codes to BUFR for the representation of Metrological data, therefore, ATS Extended services was introduced to meet the Metrological requirement. However, most of ATS systems in the MID can run extended services and specially File Transfer body Part (FTBP). The MIDAMC STG has defined possible use of the FTBP in the MID such as:

a) Exchanging messages related to Flight Permission messages

When Airliner need to get overflying/landing permissions to/over an Aerodrome, they/ or the agent send a flight permission Request to the designated Authority, few messages exchanged to complete this process and it may include the need to send some document. In Current AFS Network, the Flight permission request and related messages are exchanged via AFTN/CIDIN, and other documents should be sent via FAX or email. Introduction of a User Agent at the originator side can make use of the FTBP service to exchange messages with attachment and any further enhancement.

b) Distribution of the Aeronautical Information Publications (AIP) amendments and supplements

The Aeronautical Information Services office distributes the updated AIP document via email, CD, or internet. Introduction of a User Agent with FTBP can make it possible to deliver updated data to a group of users at once.

State	Basic ATS Message Service	Enhancement with the Extended ATS Message Services			
		FTBP	IHE	DIR	SEC
Bahrain	✓				
Egypt	✓	✓			
Iran	✓	✓			
Iraq	✓				
Jordan	✓	✓		✓	
Kuwait	✓				
Lebanon	✓	✓			
Libya					

Oman	✓				
Saudi Arabia	✓	✓			
Sudan	✓	✓			
Syria					
Qatar	✓				
UAE	✓				
Yemen					

Table (1) AMHS Implementation Profile in the MID

2. Scope of Document

The purpose of this document is to define the functional tests for ATS Extended Service handling specially File Transfer body part (FTBP) in order to ensure the end- to-end capability of AMHS systems and network to exchange this type of messages. These tests are performed after the successful operation of AMHS basic services, through which the compliance of all systems to the AMHS technical specifications has been demonstrated and proved.

3. Test Environment

Both test systems should have operational AMHS link, and P1 connection setup. Two User Agents should be used to exchange traffic with File Transfer Body Part capability. The testing environment is as shown in the figure (1)

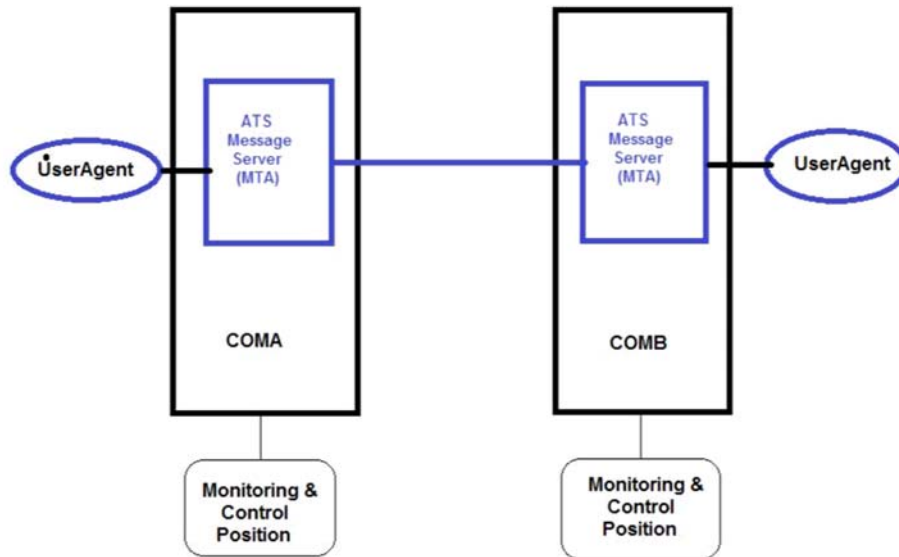


Figure (1) Testing Infrastructure

The test can be performed in AMHS Network and unnecessary to have direct AMHS link between the two COM centers, the traffic can be exchanged via intermediary(ies) COM center(s), which should be involved in the test activities.

The User Agent address at COM A could be "COMAASTT", and at COM B "COMBASTT". The User Agent can be either P3 or P7 User Agent.

Network Analysis software can be used to monitor X.400 traffic and its effect on network Bandwidth. The software can be agreed on prior the test.

The exchange of binary files will have significant impact on the switches' storage, which should be monitored during the test. Several commands can display the memory status such as *top*, *free*, */proc/meminfo*, *vmstat*, ...etc, however, the memory monitoring tools varies depends on the operating system types and versions.

4. Test Procedure

Before the tests, the test partners should coordinate and document the type of body part used in IPMs submitted by their User Agents when submitting text messages, either as:

- IPMs containing a basic ia5-text body part, or
- IPMs containing an extended ia5-text body part, or
- IPMs containing a general-text body part with ISO646 repertoire.

The Delivery report (DR) is an enhancement feature of the AMHS, the default operation is to send non delivery report (NDR) when the delivery fails, to inform the originator. However, in this trial, the delivery report should always be requested with each message.

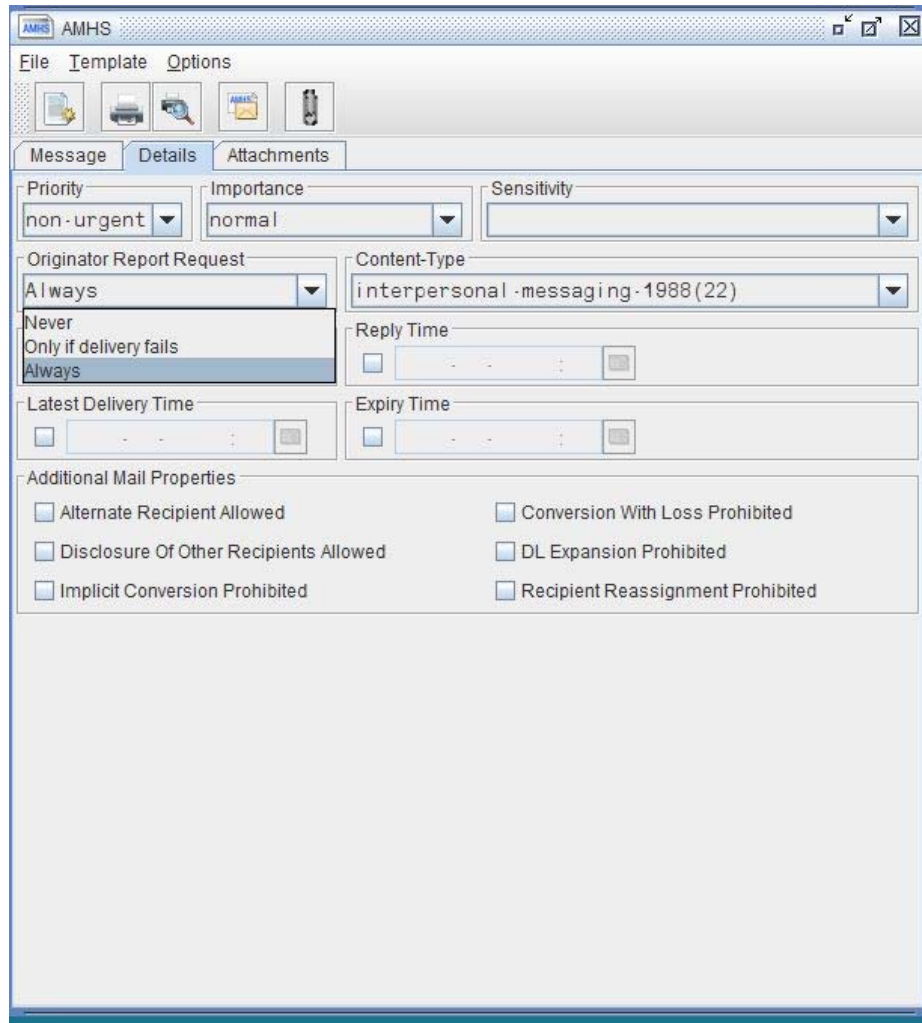


Figure (2) the option to request Report

4.1 Submission, Transfer and Delivery of a message including Binary file from UserAgent to UserAgent.

Test01	Submission of Binary file	
Test Criteria	The Test is successful if COMB receive the message with binary file attached with text message from COMA	
Test Scenario	<p>From COMA send two ATS Messages (IPMs) to COMB (COMBASST)</p> <ul style="list-style-type: none"> • Message 1 (Test11) shall have ATS priority non-urgent and binary file attached • Message 2 (Test12) shall have ATS priority normal and binary file attached <p>Verify the messages received by the remote UA. In particular, verify:</p> <ul style="list-style-type: none"> •ATS-message-priority, •ATS-message-filing-time, •ATS-message-text. •The Binary file • The message size <p>Verify that COMA receives a Delivery report.</p>	
Result	<input type="checkbox"/> PASS	<input type="checkbox"/> Failed

Test02	Submission of Binary file	
Test Criteria	The Test is successful if COMA receive the message with binary file attached with text message from COMB	
Test Scenario	<p>From COMB send two ATS Messages (IPMs) to COMA (COMAASST)</p> <ul style="list-style-type: none"> • Message 1 (Test21) shall have ATS priority non-urgent and binary file attached • Message 2 (Test22) shall have ATS priority normal and binary file attached <p>Verify the messages received by the remote UA. In particular, verify:</p> <ul style="list-style-type: none"> •ATS-message-priority, •ATS-message-filing-time, •ATS-message-text. •The Binary file <ul style="list-style-type: none"> • The message size <p>Verify that COMB receives a Delivery report.</p>	
Result	<input type="checkbox"/> PASS	<input type="checkbox"/> Failed

Example of DR

Reported Recipients:

OJTTMHSA	
Delivered:	2017-01-25 09:47:17
User type:	Private User Agent
Conv. encoding:	
Intended Recipient:	
Suppl. Information:	

Trace Information	
Global Domain ID:	/PRMD=OJ/ADMD=ICAO/C=XX/
Arrival Time:	2017-01-25 09:47:17
Routing Action:	relayed

Internal Trace Information	
Global Domain ID:	/PRMD=OJ/ADMD=ICAO/C=XX/
MTA Name:	MTA-OJAM-1
Arrival Time:	2017-01-25 09:47:17
Routing Action:	relayed

Figure (3) DR

Test031	Submission of Binary file	
Test Criteria	The Test is successful if COMA receive the SS ACK after sending urgent message with binary file attached from COMB	
Test Scenario	<p>From COMA send Urgent ATS Messages (IPMs) to COMB (COMBASST)</p> <ul style="list-style-type: none"> • Message 1 (Test31) shall have ATS priority urgent and binary file attached <p>Verify the messages received by the remote UA.</p> <p>In particular, verify:</p> <ul style="list-style-type: none"> •ATS-message-priority, •ATS-message-filing-time, •ATS-message-text. •The Binary file • The message size <p>COMA may receive SS ACK or RN depends on system configuration.</p> <p>Option 1 : SS Ack Option 2: RN</p>	
Result	<input type="checkbox"/> PASS	<input type="checkbox"/> Failed
	Option :	

Test032	Submission of Binary file	
Test Criteria	The Test is successful if COMB receive the SS ACK after sending urgent message with binary file attached from COMA	
Test Scenario	<p>From COMB send Urgent ATS Messages (IPMs) to COMA (COMAASST)</p> <ul style="list-style-type: none"> • Message 1 (Test32) shall have ATS priority urgent and binary file attached <p>Verify the messages received by the remote UA.</p> <p>In particular, verify:</p> <ul style="list-style-type: none"> •ATS-message-priority, •ATS-message-filing-time, •ATS-message-text. •The Binary file • The message size <p>COMB may receive SS ACK or RN depends on system configuration.</p> <p>Option 1 : SS Ack Option 2: RN</p>	
Result	<input type="checkbox"/> PASS	<input type="checkbox"/> Failed
	Option :	

4.2 Submission, Transfer and Delivery of a message including Binary file from UserAgent to AFTN User

Test041	Submission of Binary file to AFTN User	
Test Criteria	The Test is successful if COMA receive Non Delivery report from the MTCU of the switch at COMB	
Test Scenario	<p>From COMA send ATS Messages (IPM) to AFTN User at COMB (COMBZTZX)</p> <ul style="list-style-type: none"> • Message 1 (Test41) shall have ATS priority normal and binary file attached <p>Verify that the message is not received at the remote AFTN user</p> <p>Verify that COMA receive non-delivery report</p> <p>In particular, verify:</p> <ul style="list-style-type: none"> •Non-Delivery reason is <i>unable-to-transfer</i> •Diagnostics is <i>encoded-information-types-unsupported</i> •the NDR originated by the MTCU <p>For ex: MTA name: <i>HECA-MTA-MTCU</i></p>	
Result	<input type="checkbox"/> PASS	<input type="checkbox"/> Failed

Test042	Submission of Binary file to AFTN User	
Test Criteria	The Test is successful if COMB receive Non Delivery report from the MTCU of the switch at COMA	
Test Scenario	<p>From COMB send ATS Messages (IPM) to AFTN User at COMA (COMAZTZX)</p> <ul style="list-style-type: none"> • Message 1 (Test42) shall have ATS priority normal and binary file attached <p>Verify that the message is not received at the remote AFTN user</p> <p>Verify that COMB receive non-delivery report</p> <p>In particular, verify:</p> <ul style="list-style-type: none"> •Non-Delivery reason is <i>unable-to-transfer</i> •Diagnostics is <i>encoded-information-types-unsupported</i> •the NDR originated by the MTCU <p>For ex: MTA name: <i>HECA-MTA-MTCU</i></p>	
Result	<input type="checkbox"/> PASS	<input type="checkbox"/> Failed

Example of NDR

HECAYFYX	
Non-delivery Reason:	unable-to-transfer
Diagnostic:	encoded-information-types-unsupported
Conv. encoding:	
Intended Recipient:	
Suppl. Information:	

Trace Information	
Global Domain ID:	/PRMD=he/ADMD=icao/C=xx/
Arrival Time:	2017-01-25 09:36:02
Routing Action:	relayed

Trace Information	
Global Domain ID:	/PRMD=OJ/ADMD=ICAO/C=XX/
Arrival Time:	2017-01-25 09:36:04
Routing Action:	relayed

Internal Trace Information	
Global Domain ID:	/PRMD=he/ADMD=icao/C=xx/
MTA Name:	HECA-MTA-MTCU
Arrival Time:	2017-01-25 09:36:02
Routing Action:	relayed

Figure (4) NDR from MTCU

4.3 Submission, Transfer and Delivery of a message including Binary file from UserAgent to Distribution list

Test051	Submission of Binary file to AFTN User and UA	
Test Criteria	The Test is successful if COMA receive Non Delivery report from the MTCU of the switch at COMB, and DR from the UA	
Test Scenario	<p>From COMA configure DL (COMADLAB) with two addresses, one for UA and one for AFTN user of the COMB: COMBFTNA, COMBMHSA.</p> <p>From COMA send ATS Messages (IPM) to the address (COMADLAB)</p> <ul style="list-style-type: none"> • Message 1 (Test51) shall have ATS priority normal and binary file attached <p>Verify that the message is not received at the remote AFTN user, and received at the useragent</p> <p>Verify that COMA receive two reports; non-delivery report from the MTCU and DR from the UA</p> <p>In particular, verify the following for the NDR:</p> <ul style="list-style-type: none"> •Non-Delivery reason is <i>unable-to-transfer</i> •Diagnostics is <i>context-syntax-error</i> •the NDR originated by the MTCU <p>For ex: MTA name: <i>HECA-MTA-MTCU</i></p> <p>And verify that the DR from the UA and the supplementary information is <i>list expanded</i></p>	
Result	<input type="checkbox"/> PASS	<input type="checkbox"/> Failed

Example of DR after DL expanded

OJAMDLRE	
Delivered:	2017-01-25 09:56:59
User type:	Distribution List
Conv. encoding:	
Intended Recipient:	
Suppl. Information:	list expanded

Trace Information	
Global Domain ID:	/PRMD=OJ/ADMD=ICAO/C=XX/
Arrival Time:	2017-01-25 09:56:59
Routing Action:	relayed

Internal Trace Information	
Global Domain ID:	/PRMD=OJ/ADMD=ICAO/C=XX/
MTA Name:	MTA-OJAM-1
Arrival Time:	2017-01-25 09:56:59
Routing Action:	relayed

Figure (5) DR from UA after DL expanded

Test052	Submission of Binary file to AFTN User and UA	
Test Criteria	The Test is successful if COMB receive Non Delivery report from the MTCU of the switch at COMA, and DR from the UA	
Test Scenario	<p>From COMB configure DL (COMBDLAB) with two addresses, one for UA and one for AFTN user of the COMA: COMAFTNA, COMAMHSA.</p> <p>From COMB send ATS Messages (IPM) to the address (COMBDLAB)</p> <ul style="list-style-type: none"> • Message 1 (Test51) shall have ATS priority normal and binary file attached <p>Verify that the message is not received at the remote AFTN user, and received at the useragent</p> <p>Verify that COMB receive two reports; non-delivery report from the MTCU and DR from the UA</p> <p>In particular, verify the following for the NDR:</p> <ul style="list-style-type: none"> •Non-Delivery reason is <i>unable-to-transfer</i> •Diagnostics is <i>context-syntax-error</i> •the NDR originated by the MTCU <p>For ex: MTA name: <i>HECA-MTA-MTCU</i></p> <p>And verify that the DR from the UA and the supplementary information is <i>list expanded</i></p>	
Result	<input type="checkbox"/> PASS	<input type="checkbox"/> Failed

Test61	Submission of Binary file to AFTN User and UA while DL expansion is prohibited	
Test Criteria	The Test is successful if COMA receive Non Delivery report	
Test Scenario	<p>From COMA configure DL (COMADLAB) with two addresses, one for UA and one for AFTN user of the COMB: COMBFTNA, COMBMHSA.</p> <p>From COMA send ATS Messages (IPM) to the address (COMADLAB) and select option of "DL expansion Prohibited"</p> <ul style="list-style-type: none"> • Message 1 (Test61) shall have ATS priority normal and binary file attached <p>Verify that the message is not received at the remote AFTN user and the useragent</p> <p>Verify that COMA receive a non-delivery report from the COMB</p> <p>In particular, verify the following for the NDR:</p> <ul style="list-style-type: none"> •Non-Delivery reason is <i>unable-to-transfer</i> •Diagnostics is <i>dl-expansion-prohibited</i> 	
Result	<input type="checkbox"/> PASS	<input type="checkbox"/> Failed

Test62	Submission of Binary file to AFTN User and UA while DL expansion is prohibited	
Test Criteria	The Test is successful if COMB receive Non Delivery report	
Test Scenario	<p>From COMB configure DL (COMBDLAB) with two addresses, one for UA and one for AFTN user of the COMA: COMAFTNA, COMAMHSA.</p> <p>From COMB send ATS Messages (IPM) to the address (COMBDLAB) and select option of "DL expansion Prohibited"</p> <ul style="list-style-type: none"> • Message 1 (Test62) shall have ATS priority normal and binary file attached <p>Verify that the message is not received at the remote AFTN user and the useragent</p> <p>Verify that COMB receive a non-delivery report from the COMA</p> <p>In particular, verify the following for the NDR:</p> <ul style="list-style-type: none"> •Non-Delivery reason is <i>unable-to-transfer</i> •Diagnostics is <i>dl-expansion-prohibited</i> 	
Result	<input type="checkbox"/> PASS	<input type="checkbox"/> Failed

Example of NDR with diagnostics DL expansion prohibited

OJAMDLRE	
Non-delivery Reason:	unable-to-transfer
Diagnostic:	dl-expansion-prohibited
Conv. encoding:	
Intended Recipient:	
Suppl. Information:	DL expansion prohibited for this message

Trace Information	
Global Domain ID:	/PRMD=OJ/ADMD=ICAO/C=XX/
Arrival Time:	2017-01-25 09:53:36
Routing Action:	relayed

Internal Trace Information	
Global Domain ID:	/PRMD=OJ/ADMD=ICAO/C=XX/
MTA Name:	MTA-OJAM-1
Arrival Time:	2017-01-25 09:53:36
Routing Action:	relayed

Figure (6) NDR because DL expansion prohibited

4.4 Submission, Transfer and Delivery of a message including Binary file from UserAgent larger than the maximum size of remote COM center

The com center shall send message with binary file larger than the maximum capability of the remote COM center, the sender COM center shall receive NDR with *Reason: Unable-to-transfer, reject message larger than the maximum size.*

5. Test Summary

Use the Network Analysis software to analyze the traffic overhead occurred when sending binary files with the message. Also document the message size on system hard disks. Monitor any warning message or alarm during the tests.

Stress tests can be performed, by sending 20, 50 messages repeating test Test01 and Test02. Network and system response should be carefully monitored in order not affecting the life traffic.

6. ATS Extended Services Trial Team (ASTT)

State	Name	Title	Email	Tel. / Mobile
Bahrain	Mr. Mohamed Ali Saleh	Chief, Aeronautical Telecommunication	masaleh@caa.gov.bh	+973 17 321 187 +973 396220202
	Mr. Yaseen Hassan Al Sayed	Head ATN, Senior Computer Network Administrator	y.alsayed@caa.gov.bh	+97317329966/ +97339520025
Egypt	Mohamed Ramzy Mohamed	Director of AFTN/AMHS	mrma_eg@yahoo.com	+2022657981/ +201007736780
	Tarek Zaky Ahmed	Telecommunication Inspector	Tarekzaky6@gmail.com Tarekzaky5@yahoo.com	+201144207020
	Essam Helmy Mohamed Hassanin	Operations Manager for Cairo Com Center	Essamhelmi07@hotmail.com	+20222607946/ +201001122505
	Ahmed Mohamed Ahmed Farghaly	Telecommunication Officer	Ahmed_farghaly222@yahoo.com	+20222607946/ +201226371808
Iran	Aliakbar Salehi Valujerdi	Senior AFTN/AMHS Training Expert	aasalehi@airport.ir akbarsalehi@gmail.com	+982163146413/ +989124202775
	Alireza Mahdavisefat	Senior AFTN/AMHS Network Expert	mahdavi@airport.ir amahdavis@gmail.com	+982161022406/ +989203991356
Jordan	Mona Alnaddaf	Chief of the AFS Engineering	aftn_ais@carc.gov.jo	+9626 488 1473/ +96279 9876710
Kuwait	Hasan Abdul Redah Al-Attar	Comm Engineer	ha.alattar@dgca.gov.kw	+96524721279/ +96599449454
Oman	Abdullah Al Shaaili		alshaaili@paca.gov.om	+96824519492 / +96899334647
	Mashaal Abdul Aziz Al Balushi	AISO – PACA	Mashaal@paca.gov.om	+968 24519120/ +96899628244
Saudi Arabia	Ibraheem Mohammed Basheikh	Senior Software Engineer	Ibasheikh@gaca.gov.sa	+966 12671771/ +966505671231
Sudan	Mubark Galaleldin Abuzaid	System Engineer	Mubark_g@hotmail.com	+249 183770001/ +249123499394
Tunisia	Bouزيد Issam	AFTN/AMHS Opération Manager	issam.bouزيد@oaca.nat.tn	+216 58379979 +216583799795
U.A.E.	Yousif Al Awadi	Senior Research and Dataset Officer	yawadi@szc.gcaa.ae	+971 25996630 +971504188799

- END -