ICAO MID IWXXM Implementation Webinar

EUR AMHS Manual EUR Doc 020

EUR AMHS Manual

Appendix H

Application/Service oriented AMHS Profiles	
Document Reference:	EUR AMHS Manual, Appendix H
Author:	Planning Group
Revision Number:	Version 15.0
Date:	12/11/2020
Filename:	EUR_AMHS_Manual-Appx_H_v15_0.docx

Why AMHS

- AFTN is famed for its low throughput and low capacity.
- AFTN has limited message length and limited addressee number.
- Certain Characters are allowed in AFTN (Letters: ABCDEFGHIJKLMNOPQRSTUVWXYZ, Figures: 1 2 3 4 5 6 7 8 9 0 other signs: -)
- Unsuitability for more demanding bit-oriented applications such as the transfer of binary information
- AFTN is more expensive because of the obsolescence of its standards.

AFTN technology is based on the Telex protocols (text only,7 or 5 bits)

- AFTN Replace prohibited character by ? And small letter by capital letter.

<iwxxm: trendForecast
<om:Om_observation gml :id =“trend-fcst-1”>
…

?IWXXM? TRENDFORECAST
?OM?OM?OBSERVATION GML? ID? ?TREND-FCST-1??

AFS Message Categories

Air traffic communications service essentially involves the processing, storage and exchange of a wide variety of aeronautical and other messages, including:

- Aeronautical information service (AIS) information such as Notices to Airmen (NOTAMs);
- Meteorological messages;
- distress and urgent messages;
- Flight safety messages (flight plans, etc);
- Aeronautical administrative messages; and
- Service messages.

ICAO DOC for AMHS

1. ICAO Annex 10, Vol. III
   Digital communication systems
2. ICAO Doc 9880:
   Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols

3. ICAO Doc 9896:
   Manual on the Aeronautical Telecommunication Network (ATN) using Internet Protocol suite (IPS) Standards and Protocols.

4. ICAO EUR Doc 020

ICAO DOC for AMHS

4. ICAO EUR Doc 020

Appendix A – Abbreviation & Definitions
Appendix B – European ATS Messaging Service Profile
Appendix C- AMHS Testing Requirements
Appendix D – AMHS Conformance Test
Appendix D-UA: Conformance Test for UserAgent
Appendix E – AMHS Interoperability Test
Appendix F – AMHS Pre-Operational Test
Appendix G- European Directory Service (EDS)
Appendix H – Application/ Service oriented AMHS Profile

ATS Service Levels

1- Basic ATS Service

Compared to the service of the AFTN, the Basic ATS Message Handling Service offers some significant improvements such as:

1. Practically unlimited message length
2. Virtually no limit on the number of addressees of a message
3. Provision of non-delivery reports
4. Indication of the subject of a message

Extended ATS Service Levels

1) File Transfer Body Part (FTBP)
The extended ATS message service supports conveyance of binary data.

2) IPM Heading Extensions (IHE)

3) Security

4) Directory Service: The ATN Directory is an Electronic Directory to support Air Traffic Communications systems. It is based on the ITU-T X.500 Series Recommendations, and has been extended to support the Aeronautical Telecommunications Network, its users and applications.

Extended ATS Service Levels (IWXXM Profile)

1) File Transfer Body Part (FTBP)
The extended ATS message service supports conveyance of binary data.

2) IPM Heading Extensions (IHE)

~~3) Security~~

~~4) Directory Service: The ATN Directory is an Electronic Directory to support Air Traffic Communications systems. It is based on the ITU-T X.500 Series Recommendations, and has been extended to support the Aeronautical Telecommunications Network, its users and applications.~~

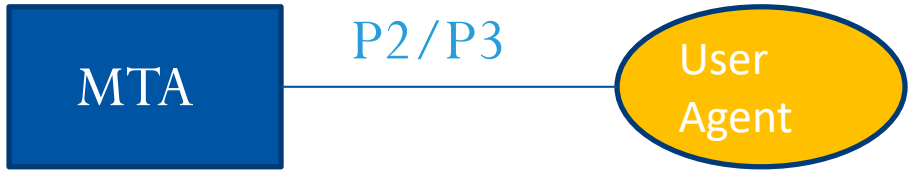
AMHS Profile for IWXXM

- The ATS Message Handling Service already provides appropriate means for exchanging XML based data types. Furthermore, proper refinement of the specification has been foreseen and incorporated in Appendix H of EUR DOC 020, suitable for conveyance of known binary data formats.

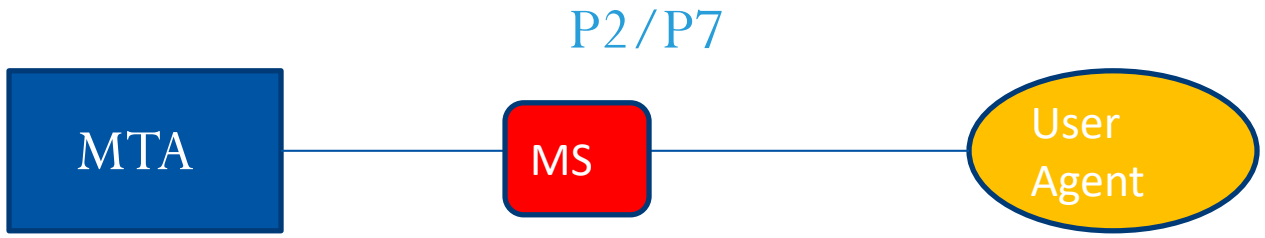
- UAs complying with ICAO Doc 9880, Part II, and with the additional provisions of the EUR AMHS Manual and of the European ATS Messaging Service Profile are capable to originate and receive AMHS messages containing IWXXM data. The support by UAs of IPM Heading Extensions (IHE), defined in ICAO Doc 9880, 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.

AMHS Profile for IWXXM

a- P3 User Agent



b- P7 User Agent



The 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

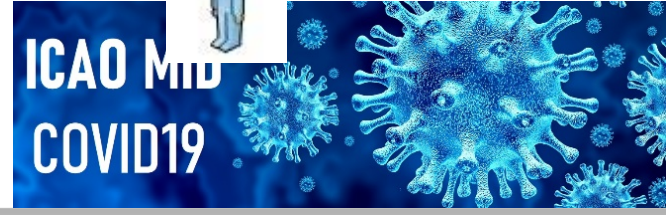
AMHS Profile for IWXXM

- 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).

- The IWXXM Profile can be implemented as part of the following centres or systems :
  - 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

AMHS Profile for IWXXM

- 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 IPM-Heading-extensions (IHE) need to be used to carry the ATS priority, Filing time and Optional Heading Information.
- The profile does not require support of AMHS security.
- The IPM body shall contain exactly one body-part which is an FTBP
- The IPM Heading parameter, body part selection and File Transfer parameters are listed in three tables in Appendix H.



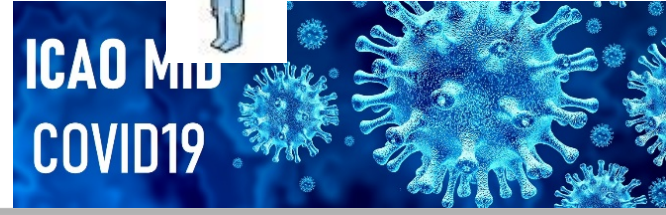
Informational Model

1. Message (IPM, IPN)

1.1 Interpersonal Message (IPM):

IPM conveys user data to the intended user(s), the IPM consists of two parts:

1) The Heading.
2) The body.



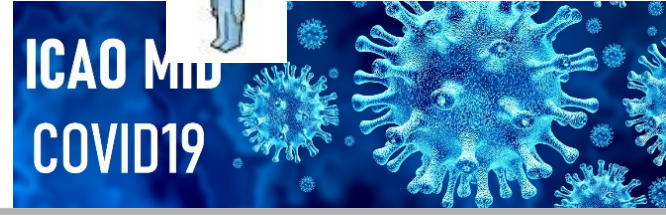
Informational Model

1. Message (IPM, IPN)

1.2 Interpersonal Notification (IPN):

Interpersonal Notification (IPN) is sent to the message originator, when the originator requires an IPN (RN or NRN).

RN: Receipt Notification
NRN: Non Receipt Notification



Informational Model

2.Report

Two types of Report are used in AMHS, Delivery Report (DR) and non delivery report (NDR).

The AMHS reports shall be delivered only to direct AMHS users.

Correspondence between IPM precedence and ATS message priority indicator

ATS message priority indicator	Precedence value (integer)
SS	107
DD	71
FF AIRMET, SIGMET, VAA, TCA	57
GG TAF, METAR/SPECI	28
KK	14

AMHS Address

Originator/Recipient Address

MHS		AMHS O/R Address	
Attribute	Name of Attribute	CAAS Value	XF Value
C		"XX"	
A	Administration Domain Name	"ICAO"	
P	Private Domain Name		
O			"AFTN"
OU	Organizational unit name 1	4-character ICAO location Indicator	8- letter AFTN Address
CN	Common Name	8- letter AFTN Address	

EX: XF Address

AFTN Address: OLBAZTZX

C=XX/A=ICAO/P=OL/O=AFTN/OU=OLBAZTZX

EX: CAAS Address

AFTN Address: OEDFZTZX

C=XX/A=ICAO/P=Saudi Arabia/O=OEJD/OU=OEDF/CN=OEDFZTZX

Conformance Test

- Objective:

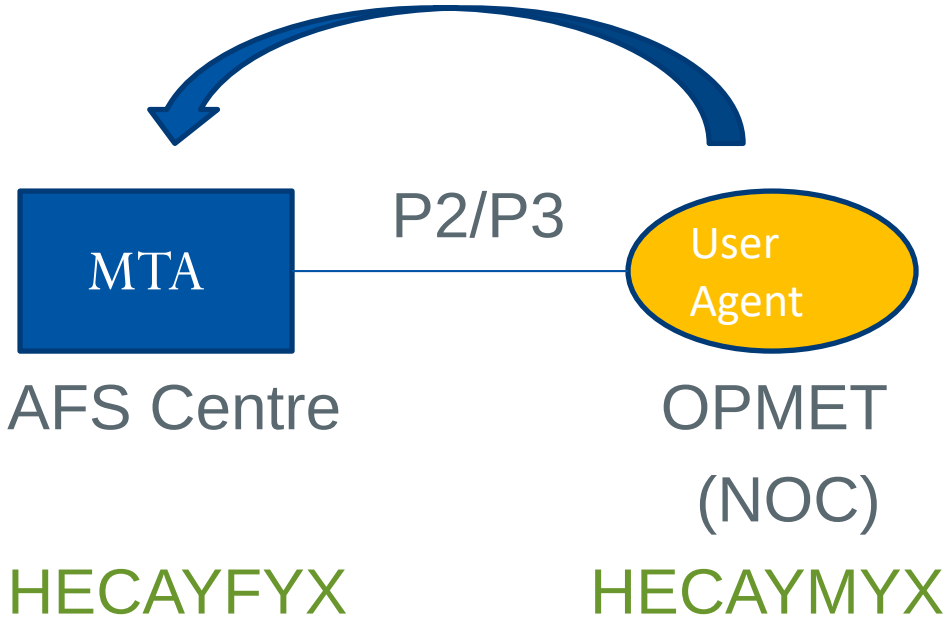
To verify conformance of UA implementations dedicated for OPMET IWXXM data exchange

- conformance tests are divided to three categories:
  - profile specific submission tests; 5 Tests
  - profile specific delivery tests (5 Tests);
  - submission and delivery tests according to Appendix D-UA

- A test identification scheme of the form WXMxnn has been used
  - x=1 is used for submission tests
  - x=2 for delivery tests

Test WXM101

Submission of an IPM including a bulletin consisting of METAR



Test WXM101

Submission of an IPM including a bulletin consisting of METAR

- Scenario Description:

Submit from the UA under test an IPM (Message) including a bulletin consisting of METAR

The test is considered passed if the P3 submission-envelope includes the following parameters with the correct values:

- originator-name: OR-name of the originator (HECAYMYX) in OR-name Scheme (C=XX/A=ICAO/P=HE/O=HECA/OU/HECA/CN=HECAYMYX)
- recipient-name: OR-name of each recipient of the message (HECAZTZX, HESHZTZX, HSSSZTZX)
- content-type: 22
- encoded-information-types: OID 2.6.1.12.0

(the OID value specified for FTBP (see ITU-T X.420:1999 7.4.12.8, 20.4.c and Annex C), i.e. OID {joint-iso-itu-t(2) mhs(6) ipms(1) eit(12) file-transfer(0))

- priority: non urgent

Test WXM101 (Contd)

- The following IPM heading fields are present with the correct values:

  – originator: address of the originating OPMET system (MET switch) HECAYMYX
  – primary-recipients: recipient addresses as populated by the MET switch
  – subject: TTAAiiCCCCYYGGggBBB part of the filename of FTBP
  – importance: normal, (DEFAULT VALUE)
  – authorization-time of the IPM heading extensions field: equivalent to filing time (27110855)
  – precedence-policy-identifier of the IPM heading extensions field: OID 1.3.27.8.0.0

  (*OID value {iso (1) identified-organisation (3) icao (27) atn-amhs (8) parameters (0) amhs-precedence-policy (0)}*

  - originators-reference of the IPM heading extensions field: absent

  (To avoid confusion with the use of this field in the IHE context (where it is carrying data converted to/from AFTN OHI)

  -Precedence:28 (equivalent to GG)

Correspondence between IPM precedence and ATS message priority indicator

ATS message priority indicator	Precedence value (integer)
SS	107
DD	71
FF AIRMET, SIGMET, VAA, TCA	57
GG TAF, METAR/SPECI	28
KK	14

Test WXM101 (Contd)

- The following IPM heading fields are present with the correct values:

- the elements rn and nrn in the common data types are absent, IWXXM never use priority SS

- 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:

-document-type-name: OID 1.0.8571.5.3

-registered-identifier: OID 1.3.27.8.1.2

-user-visible-string: ‘Digital MET’

Test WXM101 (Contd)

- The following IPM heading fields are present with the correct values:

-incomplete-pathname: bulletin file name,
A_LAFR31LFPW171500_C_LFPW_20210527080311.xml.[compression_suffix]

- the elements related-stored-file, compression and extensions of the FTBP parameters are absent , *Compression of the data to be transferred, if needed, shall be performed in the MET domain before creating the FTBP. This avoids using the "compression" field of FTBP, reduces the complexity and limits the FTBP functionality to message exchange mechanisms.*

- The IWXXM data itself are included in the FileTransferData element of the file-transfer-body-part; the octet-aligned encoding should be used.

Test WXM102
Submission of an IPM including a bulletin of different file size consisting of METAR

- Scenario Description:

Submit from the UA under test a sequence of several IPMs including each time a bulletin of different file size consisting of METAR.

The test is considered passed if all parameters have the correct values as in previous test WXM101 in addition to the correct value of the element *actual-values* if generated, which represents the size of the Attachment data in bytes.

Test WXM103

Submission of an IPM including a bulletin consisting of SPECI or TAF

- Scenario Description:

- Submit from the UA under test an IPM including a bulletin consisting of SPECI

The test is considered passed if all parameters have the correct values as in test WXM101 in addition to the correct value of the element *incomplete-pathname* is according to the bulletin file name as specified in section 5.1.4 of EUR Doc 033.

- The test is repeated with the submission of an IPM including bulletin consisting of TAF.

Test WXM104 & WXM105
Submission of an IPM including a bulletin including a bulletin consisting of AIRMET

- Scenario Description:

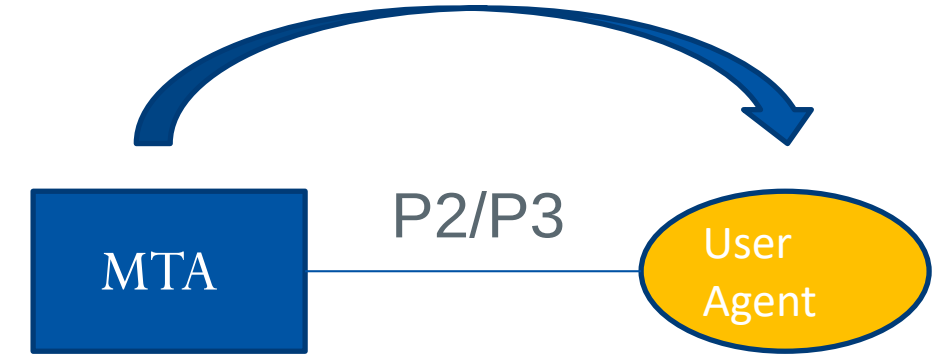
Submit from the UA under test an IPM including a bulletin consisting of AIRMET.

- The test is considered passed if all parameters have the correct values as in test WXM101, except that:

  - the priority abstract value of the P3 submission-envelope is normal
  - the value of the element precedence is 57
  - the value of the element incomplete-pathname is according to the bulletin file name as specified in section 5.1.4 of EUR Doc 033.

- WXM105 test Submission of an IPM including a bulletin consisting of SIGMET or VAA or TCA

Delivery Tests WXM2nn



Profile Specific Delivery Tests

WXM201: Delivery of an IPM including a bulletin consisting of METAR

WXM202: Delivery of IPMs including bulletins of different file size consisting of METAR

WXM203: Delivery of an IPM including a bulletin consisting of SPECI or TAF

WXM204: Delivery of an IPM including a bulletin consisting of AIRMET

WXM205: Delivery of an IPM including a bulletin consisting of SIGMET or VAA or TCA

Submission & Delivery Tests according to D-UA

- Tests 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 IWXXM profile.
- The main objective is to realize the behaviour of these specific UA implementations upon reception of such messages, fields or elements.
- EUR DOC 020, Appendix D- UA (AMHS UA Conformance Tests)
- The execution of the delivery tests defined in Appendix D-UA is encouraged. However if this is not possible, Appendix H listed 15 suggested tests.

Submission & Delivery Tests according to D-UA

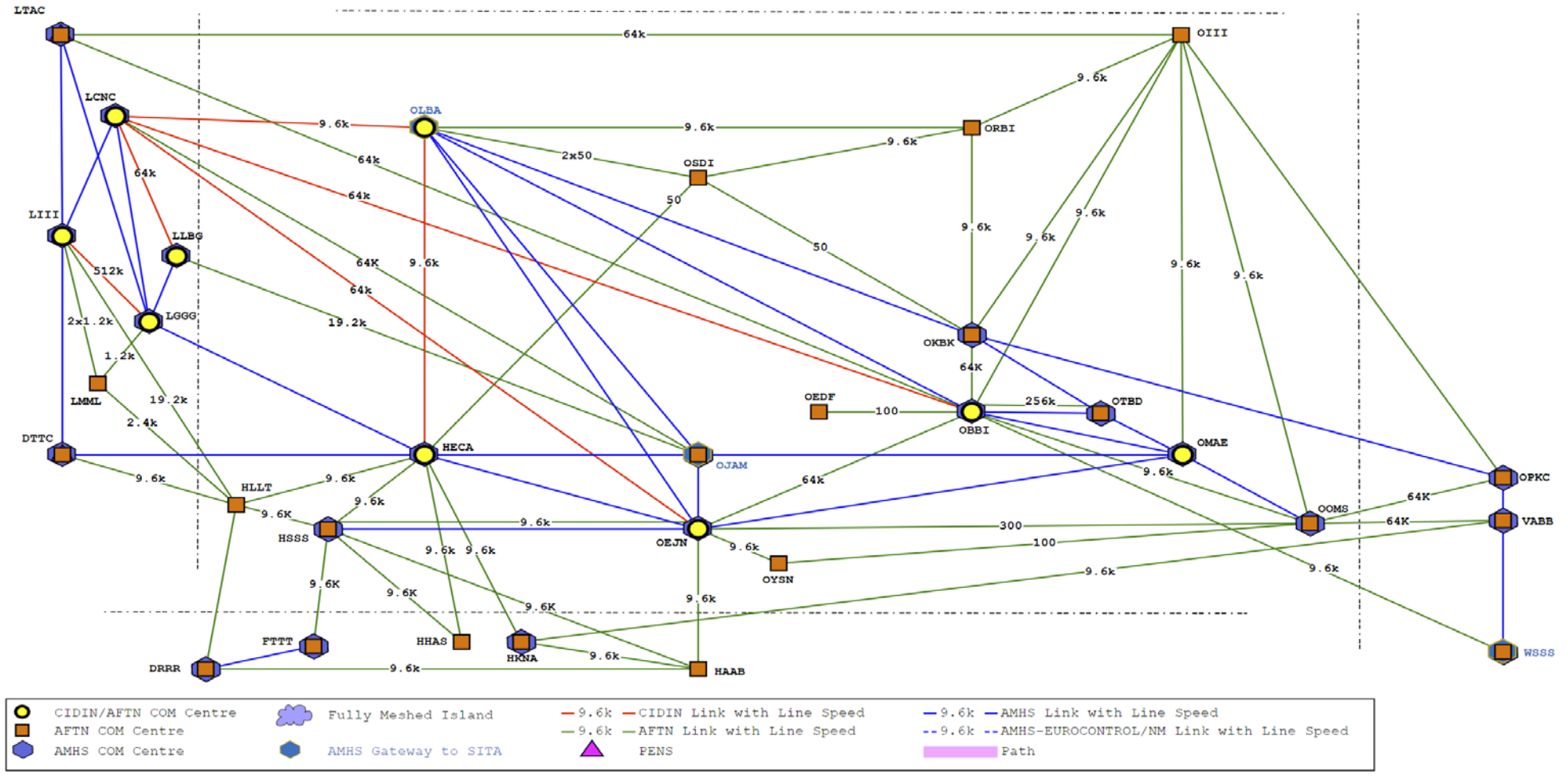
- **CTUA1204**: Deliver an IPM with IHE, containing different kinds of recipient addresses
- Scenario description:

From the AMHS UA Test Tool send a sequence of ATS messages (IPMs) with IHE, addressing the IUT-UA in different ways.

  - The first ATS message shall have the IUT-UA address as primary recipient;
  - The second ATS message shall have the IUT-UA address as copy recipient;
  - The third ATS message shall have the IUT-UA address as blind-copy recipient.

- The test is passed if all messages (IPMs) are displayed at the IUT-UA correctly and that the recipient address is correctly indicated as:
  - □ primary recipient (first message),
  - □ copy recipient (CC) (second message), and
  - □ blind-copy recipient (BCC) (third message)

MID COM Chart (20/05/2021)



MONTRÉAL
(HEADQUARTERS)

PARIS
(EUROPEAN AND
NORTH ATLANTIC)

BEIJING
(ASIA-PACIFIC
SUB-OFFICE)

MEXICO CITY
(NORTH AMERICA AND CARIBBEAN)

DAKAR
(WESTERN AFRICA)

CAIRO
(MIDDLE EAST)

BANGKOK
(ASIA-PACIFIC)

NAIROBI
(EASTERN AFRICA)

LIMA
(SOUTH AMERICA)

Thank you for your Attention

EUR AMHS Manual

Appendix D-UA

AMHS UA Conformance Tests	
Document Reference:	EUR AMHS Manual, Appendix D-UA
Author:	Planning Group
Revision Number:	Version 15.0
Date:	12/11/2020
Filename:	EUR_AMHS_Manual-Appx_D-UA_v15_0.doc

Document Control Log

Edition	Date	Comments	section/pages affected
0.1	01/12/2014	Creation of the document.	all
0.2	27/01/2015	Strict separation of submission and delivery operations, modified assignment to test groups, Introduction of IHE test procedures, Place holder for DIR and SEC test procedures	Chapter 4, Chapter 5, Chapters 6 and 7
0.3	04/02/2015	Editorial and technical corrections / refinements based on comments and discussion with experts	all
0.4	16/02/2015	CTUA205/1205 update cf. CP-AMHSM-14-008, refinement of CTUA302/1302, CTUA303/1303, CTUA304/1304, CTUA405/1405	4.2.5/5.2.5, 4.3.2/5.3.2, 4.3.3/5.3.3, 4.3.4/5.3.4, 4.4.5/5.4.5
0.5	03/03/2015	Editorial and technical corrections / refinements	all
0.6	20/03/2015	Incorporation of the comments of Greece and the Planning Group, refinements for presentation at AFSG/19	all
		No other versions created	
10.0	23/04/2015	Adopted version (AFSG/19)	
10.1	04/04/2016	Incorporation of CP-AMHSM-15-008	CTUA206, CTUA207, CTUA1206, CTUA1207
11.0	26/04/2016	Adopted version (AFSG/20)	
12.0	28/04/2017	Adopted version (AFSG/21) – without changes	
12.1	23/04/2018	Incorporation of CP-AMHSM-17-004	References
13.0	27/04/2018	Adopted version (AFSG/22)	
14.0	05/03/2019	Adopted version (AFSG/23) – without changes	

14.1	26/11/2019	Incorporation of CP-AMHS-19-002 Adaption: According to COG/74&RCOG/11 Decision /4, Approval of AFS to SWIM Transition Task Force (AST TF) Terms of Reference (ToR) and coherent Work Programme, the Author of EUR Doc 020 changed from "AFSG PG" to "AST PG".	all
14.2	30/09/2020	Incorporation of DR-AMHSM-19-002 Incorporation of DR-AMHSM-19-003	CTUA303, CTUA304, CTUA1303, CTUA1304, CTUA101, CTUA102, CTUA103, CTUA104, CTUA105, CTUA201, CTUA208, CTUA302, CTUA303, CTUA304, CTUA305, CTUA501, CTUA502, CTUA601, CTUA602, CTUA1101, CTUA1102, CTUA1103, CTUA1105, CTUA1201 CTUA1203, CTUA1208, CTUA1302, CTUA1303, CTUA1304, CTUA1305, CTUA1501, CTUA1502, CTUA1601, CTUA1602
15.0	12/11/2020	Adopted version (AST TF/01)	

Table of contents

References

[1] ICAO Annex 10 – Aeronautical Telecommunications, Volume II: Communication Procedures

[2] 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 Message Handling Services (ATSMHS), Second Edition – 2016

[3] EUR Doc 020, EUR AMHS Manual, Main Part

[4] EUR Doc 020, EUR AMHS Manual, Appendix C, AMHS Testing Requirements

[5] EUR Doc 020, EUR AMHS Manual, Appendix D, AMHS Conformance Test

[6] EUR Doc 020, EUR AMHS Manual, Appendix E, AMHS Interoperability Test

[7] EUR Doc 020, EUR AMHS Manual, Appendix G, European Directory Service

[8] EUR Doc 021, ATS Messaging Management Manual, Appendix D (AMHS User Capabilities)

Table of Figures

List of Tables

1. Introduction

1.1 Purpose of the Document

The purpose of the document is to define the functional tests for an AMHS UA Conformance Test, which allows checking any AMHS User Agent (UA) implementation against the AMHS Technical Specifications [2] as a primary step to ensure the end-to-end interoperability between compliant systems.

1.2 Document Structure

Chapter 2 presents the test environment used for AMHS User Agent conformance testing.

Chapter 3 defines the addressing plan implemented in the test environment and gives an overview about the user capabilities to be tested.

Chapter 4 contains the test procedures for the Basic AMHS Service with subsections for each AMHS functional area. Each test procedure is presented in a structured way consisting of:

- defined test criteria,
- a (brief) scenario description,
- reference to the relevant part of the standard specification (Doc 9880 section),
- reference to the pre-defined user capabilities (EUR Doc 021),
- reference to test classes (N, En).

Chapter 5 contains the test procedures of the Extended AMHS Service for the AMHS functional group: IPM heading extension (IHE) with subsections for each AMHS functional area as above in Chapter 4. Each test procedure is presented as well in the same structure as in Chapter 4.

Chapter 6 is intended to contain the test procedures of the Extended AMHS Service for the AMHS functional group: Use of Directory Services (DIR). These test procedures have to be developed.

Chapter 7 is intended to contain the test procedures of the Extended AMHS Service with subsections for the AMHS functional group: Security (SEC). These test procedures have to be developed.

1.3 Test Identification Scheme

Each test procedure has an identifier in the form

CTUAy*xnn*

where CTUA is an acronym for User Agent Conformance Test, *y* represents the number of a Functional Group (FG), *x* is a number identifying the test group[1] and *nn* is a consecutive number identifying the individual test procedure.

Functional Groups (FG) have been assigned numbers as follows:

- Basic AMHS Service – Test Procedures (y no value)
- Extended AMHS Service – Test Procedures with IHE (IPM heading extension) (y=1)
- Extended AMHS Service – Test Procedures with DIR (Use of Directory Services) (y=2)
- Extended AMHS Service – Test Procedures with SEC (Security) (y=3)

Test procedures are presented in six groups identified by numbers as follows:

- basic submission operations (x=1),
- basic delivery operations (x=2),
- specific submission operations (x=3),
- specific delivery operations (x=4),
- enhanced submission UA capabilities (x=5), and
- enhanced delivery UA capabilities (x=6).

[1] Test groups for general AMHS Conformance Tests have been identified in [4].

2. AMHS UA Conformance Test environment

The AMHS User Agent (UA) Implementation Under Test (IUT-UA) is embedded in a simulated operational environment formed by the AMHS UA Test Tool with an MTA instance (representing the ATS Message Servers serving the UA), an MTCU (representing one counterpart in indirect end-to-end communication) and one UA (representing one counterpart in direct end-to-end communication).

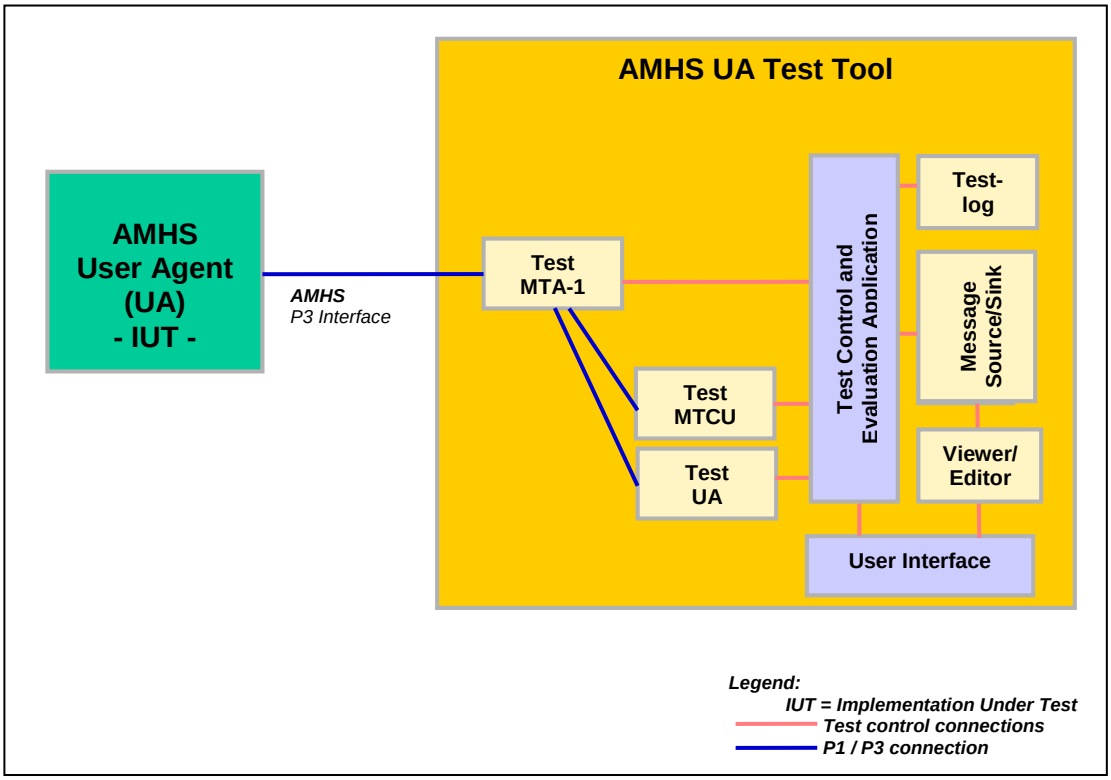


Figure 1: AMHS UA Conformance Test environment

Figure 1 shows the test environment used for AMHS UA Conformance Tests and the components of the AMHS UA Test Tool. The AMHS UA Test Tool will be interconnected with the IUT-UA's (standardized) external interface, i.e. an AMHS interface supporting the X.400/P3 protocol over a TCP/IP/LAN.

All test applications can be controlled independently via a user interface through the Test Control and Evaluation Application. The Test Control and Evaluation Application:

- maintains test samples in a repository (message source)
- executes test scripts,
- verifies the received messages (message sink),
- evaluates the result of each performed test step,
- stores every test step result in a test log, and
- keeps record of all sent and received messages during a test run.

Test scenarios involve the test components as depicted in Figure 1 in the following way:

Submission test procedure groups (x=1, 3, 5):

IUT-UA	=>	Test ATS Message Server	=>	Test MTCU
IUT-UA	=>	Test ATS Message Server	=>	Test UA

Delivery test procedure groups (x=2, 4, 6):

Test MTCU	=>	Test ATS Message Server	=>	IUT-UA
Test UA	=>	Test ATS Message Server	=>	IUT-UA

3. Addressing Plan and User capabilities for AMHS UA conformance testing

3.1 Remote addresses (Recipient or Originator addresses)

To meet the scope of testing, the test-address space used by the AMHS UA conformance testing should include AMHS addresses placed in different AMHS PRMDs and AFTN addresses located in different countries.

As a minimum, there is a need of three generic PRMDs and three generic AFTN countries which may be called: AMHSLAND-1, AMHSLAND-2, AMHSLAND-3, AFTNLAND-1, AFTNLAND-2 and AFTNLAND-3. If required, an extension of the address space should follow the same principles.

This allows covering of all cases of selected addressing schemes, including:

- CAAS with one single *organization-name* value for all location indicators within the PRMD,
- CAAS with multiple *organization-name* values for different sets of location indicators within the PRMD,
- XF.

The Nationality Letters AA, AB, AC, BA, BB and BC have been reserved for the purpose of AMHS testing. The PRMD names and addressing schemes used for AMHS conformance testing are indicated in Table 1:

Nationality Letter	Country-name (C)	ADMD-name (A)	PRMD-name (P)	Addressing Scheme
AA	**XX**	**ICAO**	**AMHSLAND-1**	**CAAS**
AB	**XX**	**ICAO**	**AMHSLAND-2**	**CAAS**
AC	**XX**	**ICAO**	**AMHSLAND-3**	**XF**
BA	**XX**	**ICAO**	**AFTNLAND-1**	**CAAS**
BB	**XX**	**ICAO**	**AFTNLAND-2**	**CAAS**
BC	**XX**	**ICAO**	**AFTNLAND-3**	**XF**

Table 1: PRMD names and addressing schemes

The user addresses of AMHSLAND-1 (Addressing scheme: CAAS – single "O" value)

*/C=***XX***/A=***ICAO***/P=***AMHSLAND-1***/*

*O=***AA-REGION** *OU1=***AAAA** **->** *CN=***AAAAMHAA** till **AAAAMHAZ**
and
*CN=***AAAAMHBA** till **AAAAMHBZ**

The user addresses of AMHSLAND-2 (Addressing scheme: CAAS – multiple "O" value)

*/C=***XX***/A=***ICAO***/P=***AMHSLAND-2***/*

*O=***AB-REGION1**	*OU1=***ABAA**	**->** *CN=***ABAAMHAA** till **ABAAMHAZ**
*O=***AB-REGION1**	*OU1=***ABAB**	**->** *CN=***ABABMHAA** till **ABABMHAZ**
*O=***AB-REGION2**	*OU1=***ABBA**	**->** *CN=***ABBAMHAA** till **ABBAMHAZ**
*O=***AB-REGION2**	*OU1=***ABBB**	**->** *CN=***ABBBMHAA** till **ABBBMHAZ**
*O=***AB-REGION3**	*OU1=***ABCA**	**->** *CN=***ABCAMHAA** till **ABCAMHAZ**
*O=***AB-REGION3**	*OU1=***ABCB**	**->** *CN=***ABCBMHAA** till **ABCBMHAZ**

Table 2: CAAS Table of AMHSLAND-2

The user addresses of AMHSLAND-3 (Addressing scheme: XF)

*/C=***XX***/A=***ICAO***/P=***AMHSLAND-3***/*

*O=***AFTN**	*OU1=***ACCCMHAA**	till	**ACCCMHAZ**	and
	*OU1=***ACCCMHBA**	till	**ACCCMHBZ**	

The user addresses of AFTNLAND-1 (Addressing scheme: CAAS – single "O" value)

*/C=***XX***/A=***ICAO***/P=***AFTNLAND-1***/*

*O=***BA-REGION** *OU1=***BAAA** **->** *CN=***BAAAFTAA** till **BAAAFTZZ**

The user addresses of AFTNLAND-2 (Addressing scheme: CAAS – multiple "O" value)

*/C=***XX***/A=***ICAO***/P=***AFTNLAND-2***/*

*O=***BB-REGION1**	*OU1=***BBAA**	**->** *CN=***BBAAFTAA** till **BBAAFTAZ**
*O=***BB-REGION1**	*OU1=***BBAB**	**->** *CN=***BBABFTAA** till **BBABFTAZ**
*O=***BB-REGION2**	*OU1=***BBBA**	**->** *CN=***BBBAFTAA** till **BBBAFTAZ**
*O=***BB-REGION2**	*OU1=***BBBB**	**->** *CN=***BBBBFTAA** till **BBBBFTAZ**
*O=***BB-REGION3**	*OU1=***BBCA**	**->** *CN=***BBCAFTAA** till **BBCAFTAZ**
*O=***BB-REGION3**	*OU1=***BBCB**	**->** *CN=***BBCBFTAA** till **BBCBFTAZ**

Table 3: CAAS Table of AFTNLAND-2

The user addresses of AFTNLAND-3 (Addressing scheme: XF)

*/C=***XX***/A=***ICAO***/P=***AFTNLAND-3***/*

*O=***AFTN**	*OU1=***BCAAFTAA**	till	**BCAAFTAZ**	and
	*OU1=***BCAAFTBA**	till	**BCAAFTBZ**	

3.2 IUT addresses (Recipient or Originator addresses)

For the IUT-UA itself the test addresses has to be selected from following alternatives:

CAAS	/C=XX/A=ICAO/P=IUTLAND/O=IUT-REGION/OU1=IUTA/CN=IUTAMHSA/
XF	/C=XX/A=ICAO/P=IUTLAND/O=AFTN/OU1=IUTAMHSA/

Table 4: Generic address spaces of the IUT User Agent

3.3 "Unknown" addresses used for "negative testing"

The following "unknown" or invalid addresses are used in UA conformance tests:

"Unknown" or invalid AMHS addresses used during delivery tests to IUT-UA
/C=XX/A=ICAO/P=AMHSLAND-1/O=AA-REGION/OU1=AAAA/CN=AAAAMHABC/
/C=XX/A=ICAO/P=AMHSLAND-1/O=AA-REGION/OU1=AAAA/CN=AAAAMH/
/C=XX/A=ICAO/P=AMHSLAND-1/O=AA-REGION/OU1=AAAA/CN=/
/C=XX/A=ICAO/P=AMHSLAND-1/O=AA-REGION/OU1= /CN=AAAAMHAA/
/C=XX/A=ICAO/P=AMHSLAND-1/O=AA-REGION/OU1=AAAX/CN=AAAAMHAA/
/C=XX/A=ICAO/P=AMHSLAND-1/O= /OU1=AAAA/CN=AAAAMHAA/
/C=XX/A=ICAO/P=AMHSLAND-3/O=AFTN/OU1=ACCCMHABC/
/C=XX/A=ICAO/P=AMHSLAND-3/O=AFTN/OU1=ACCCMH/
/C=XX/A=ICAO/P=AMHSLAND-3/O=AFTN/OU1=/
/C=XX/A=ICAO/P=AMHSLAND-3/O= /OU1=ACCCMHAA/
/C=XX/A=ICAO/P=AMHSLAND-3/O=UNKNOWN/OU1=ACCCMHAA/

Table 5: "Unknown" or invalid AMHS addresses for "negative" UA testing

3.4 AMHS User Capabilities for AMHS UA Conformance

The user capabilities were taken from Section D.5.2 of [8]:

D.5.2 Representation of the User Address related capabilities

D.5.2.1 The AMHS User Capabilities are represented by pre-defined capabilities and values. Additional capabilities and values may be defined in the future. The following Capability Classes and values could be selected at present:

Capability class	Capabilities	Value	Remark
body-parts	IA5 BP and GT BP (Repertoire A), up to 1800 characters	A2	(IA5 BP - ia5-text body-part, GT BP - general-text-body-part, FTBP - file-transfer-body-part)
	IA5 BP and GT BP (Repertoire A), up to 16k characters	A16	
	IA5 BP and GT BP (Repertoire A), up to 64k characters	A64[2]	
	IA5 BP and GT BP (Repertoire A and B), up to 1800 characters	B2	Only one of the entries is selectable
	IA5 BP and GT BP (Repertoire A and B), up to 16k characters	B16	
	IA5 BP and GT BP (Repertoire A and B), up to 64k characters	B64[3]	
	Text-body-part type A and FTBP	A64+F2048[4]	
	Text-body-part type B and FTBP	B64+F2048	
	FTBP, up to 1M bytes	F1024[5]	Only selectable if A64+F2048 or B64+F2048 is not selected
	FTBP, up to 2M bytes	F2048	
	FTBP, up to 4M bytes	F4096	For later use
	FTBP, up to 8M bytes	F8192	For later use
Address type	Distribution List	DL	Exactly one of the four is selectable
	Elementary Address (direct AMHS User Address)	EA	
	Elementary Address (indirect AMHS User Address)	EI	
	Group of Addresses	GA	
IPM heading extensions	Support of IPM heading extension information	IHE	
Directory	Use of Directory Services	DIR	
AMHS Security	Use of AMHS Security features	SEC	

Table 6: Capability classes and capability values

[2] If higher values are required the use of file-transfer-body-part is recommended.

[3] same note as above

[4] Other values not recommended.

[5] Lower values not recommended

In order to test the conformance of a User Agent the capability classes “body-parts” and “IPM heading extensions” are relevant. The capability classes “Directory” and “AMHS Security” could be considered later, if necessary.

The above overview leads to the conclusion that the minimum capability of an UA is: **A2**.

All other capabilities should be seen as enhanced capabilities.

3.5 Required settings in the AMHS UA Test Tool

To fulfil the requirements of the “unknown” addresses the following setting of the MD Lookup/CAAS Tables of the Test-MTCU of the AMHS UA Test Tool is requested:

Nationality Letters, Location Indicator	Mapped to	Used addressing scheme
AAAA	/C=**XX**/A=**ICAO**/P=**AMHSLAND-1**/	CAAS
ABAA	/C=**XX**/A=**ICAO**/P=**AMHSLAND-2**/	CAAS
ABBA	/C=**XX**/A=**ICAO**/P=**AMHSLAND-2**/	CAAS
ABCA	/C=**XX**/A=**ICAO**/P=**AMHSLAND-2**/	CAAS
ACCC	/C=**XX**/A=**ICAO**/P=**AMHSLAND-3**/	XF
BAAA	/C=**XX**/A=**ICAO**/P=**AFTNLAND-1**/	CAAS
BBAA	/C=**XX**/A=**ICAO**/P=**AFTNLAND-2**/	CAAS
BBBA	/C=**XX**/A=**ICAO**/P=**AFTNLAND-2**/	CAAS
BBCA	/C=**XX**/A=**ICAO**/P=**AFTNLAND-2**/	CAAS
BCAA	/C=**XX**/A=**ICAO**/P=**AFTNLAND-3**/	XF
IUTA	/C=**XX**/A=**ICAO**/P=**IUTLAND**/	CAAS/XF

Table 7: MD Lookup Table settings of the Test MTCU

country-name/ADMD-name/PRMD-name	organization-name	organizational-unit-name
/C=**XX**/A=**ICAO**/P=**AMHSLAND-1**/	O=**AA-REGION**	OU1=**AAAA**
/C=**XX**/A=**ICAO**/P=**AMHSLAND-2**/	O=**AB-REGION1**	OU1=**ABAA**
/C=**XX**/A=**ICAO**/P=**AMHSLAND-2**/	O=**AB-REGION2**	OU1=**ABBA**
/C=**XX**/A=**ICAO**/P=**AMHSLAND-2**/	O=**AB-REGION3**	OU1=**ABCA**
/C=**XX**/A=**ICAO**/P=**AFTNLAND-1**/	O=**BA-REGION**	OU1=**BAAA**
/C=**XX**/A=**ICAO**/P=**AFTNLAND-2**/	O=**BB-REGION1**	OU1=**BBAA**
/C=**XX**/A=**ICAO**/P=**AFTNLAND-2**/	O=**BB-REGION2**	OU1=**BBBA**

country-name/ADMD-name/PRMD-name	organization-name	organizational-unit-name
/C=XX/A=ICAO/P=AFTNLAND-2/	O=BB-REGION3	OU1=BBCA
/C=XX/A=ICAO/P=IUTLAND/	O=IUT-REGION	OU1=IUTA

Table 8: CAAS Table settings of the Test MTCU

3.6 User Address Look-up table

Within the AMHS/AFTN address conversion tests in Chapter 6 (Use of Directory Services) the following AMHS addresses are used to demonstrate the address conversion by means of the User Address look-up table:

AFTN address	Corresponding O/R address
ABAAMHAM	/C=XX/A=ICAO/P=TESTA/O=TEST-A/OU1=ABAA/CN=ABAAMHAM/
BCAAFTBM	/C=XX/A=ICAO/P=TESTB/O=AFTN/OU1=BCAAFTBM/

Table 9: User Address look-up table entries for address conversion tests

4. Basic AMHS Service – Test Procedures

Note.– Unless otherwise specified in the test case description, the AMHS UA Test Tool generates IPMs containing ia5-text. Definition of the various body part types used in the following test cases is included in section 2 'Glossary and Definitions' of Appendix A of this Manual.

4.1 Basic Submission Operations (A2)

4.1.1 CTUA101 – Submit an IPM – basic capability (A2)

Note.– The conformance test CTUA101 is passed successfully by the IUT if at least one of the tests CTUA101a, CTUA101b or CTUA101c is passed successfully

CTUA101a	**Submit an IPM containing an ia5-text**
Test criteria	This test is successful, if the IUT submits ATS messages (IPMs) containing an **ia5-text** to a peer UA correctly.
Scenario description	From the IUT-UA send a sequence of five ATS messages (IPMs) addressing a remote AMHS user. • Message 1 (CT101aM01) shall have ATS-message-priority KK; • Message 2 (CT101aM02) shall have ATS-message-priority GG; • Message 3 (CT101aM03) shall have ATS-message-priority FF; • Message 4 (CT101aM04) shall have ATS-message-priority DD; • Message 5 (CT101aM05) shall have ATS-message-priority SS. Each message shall contain an **ia5-text** and have different ATS-filing-time and ATS-message-text. The *optional-heading-information* element shall be empty. Verify the messages received by the AMHS UA Test Tool at the AMHS interface. Check the format and contents of the submission envelope, IPM heading and body. Verify in particular, the priority value contained in the submission envelope and the following elements contained in the message content: • body part type, • Repertoire, • ATS-Message-Header syntax, • ATS-message-priority, • ATS-message-filing-time, • ATS-message-text.
AMHS ref: Doc 9880, Part II	3.1 (ATS Message User Agent) and Table 3-1, 3.3.3.7 (ATS-Message-Header)

Test class	Normal AMHS communications (N)

CTUA101b	**Submit an IPM containing an ia5-text-body-part**
Test criteria	This test is successful, if the IUT submits ATS messages (IPMs) containing an **ia5-text-body-part** to a peer UA correctly.
Scenario description	From the IUT-UA send a sequence of five ATS messages (IPMs) addressing a remote AMHS user. • Message 1 (CT101bM01) shall have ATS-message-priority KK; • Message 2 (CT101bM02) shall have ATS-message-priority GG; • Message 3 (CT101bM03) shall have ATS-message-priority FF; • Message 4 (CT101bM04) shall have ATS-message-priority DD; • Message 5 (CT101bM05) shall have ATS-message-priority SS. Each message shall contain an **ia5-text-body-part** and have different ATS-filing-time and ATS-message-text. The optional-heading-information element shall be empty. Verify the messages received by the AMHS UA Test Tool at the AMHS interface. Check the format and contents of the submission envelope, IPM heading and body. Verify in particular, the priority value contained in the submission envelope and the following elements contained in the message content: • body part type, • Repertoire, • ATS-Message-Header syntax, • ATS-message-priority, • ATS-message-filing-time, • ATS-message-text.
AMHS ref: Doc 9880, Part II	3.1 (ATS Message User Agent) and Table 3-1, 3.3.3.7 (ATS-Message-Header)
Test class	Normal AMHS communications (N)

CTUA101c	**Submit an IPM containing a general-text-body-part with ISO 646 repertoire**
Test criteria	This test is successful, if the IUT submits ATS messages (IPMs) containing a **general-text-body-part with ISO 646 repertoire** to a peer UA correctly.
Scenario description	From the IUT-UA send a sequence of five ATS messages (IPMs) addressing a remote AMHS user. • Message 1 (CT101cM01) shall have ATS-message-priority KK; • Message 2 (CT101cM02) shall have ATS-message-priority GG; • Message 3 (CT101cM03) shall have ATS-message-priority FF; • Message 4 (CT101cM04) shall have ATS-message-priority DD; • Message 5 (CT101cM05) shall have ATS-message-priority SS. Each message shall contain a **general-text-body-part with ISO 646 repertoire** and have different ATS-filing-time and ATS-message-text. The optional-heading-information element shall be empty. Verify the messages received by the AMHS UA Test Tool at the AMHS interface. Check the format and contents of the submission envelope, IPM heading and body. Verify in particular, the priority value contained in the submission envelope and the following elements contained in the message content: • body part type, • Repertoire, • ATS-Message-Header syntax, • ATS-message-priority, • ATS-message-filing-time, • ATS-message-text.
AMHS ref: Doc 9880, Part II	3.1 (ATS Message User Agent) and Table 3-1, 3.3.3.7 (ATS-Message-Header)
Test class	Normal AMHS communications (N)

4.1.2 CTUA102 – Submit an IPM containing optional-heading-information in the ATS-message-header

CTUA102	**Submit an IPM containing optional-heading-information in the ATS-message-header with maximum A2 message length**
Test criteria	This test is successful, if the IUT submits IPMs containing optional-heading-information (OHI) in the ATS-message-header and A2 text length correctly.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) addressing a remote AMHS user. The message text length shall be 1800 characters. • The first ATS message shall have priority FF and contain OHI text of 40 characters; • The second ATS message shall have priority FF and contain OHI text of maximum possible length; • The third ATS message shall have priority SS and contain OHI text of 40 characters; • The fourth ATS message shall have priority SS and contain OHI text of maximum possible length. Each message shall contain one body part and have different ATS-filing-time and ATS-message-text. Check the ATS messages submitted by the IUT-UA and verify the correct contents of the message (text length 1800 characters) and in particular, check the format and contents of the OHI. Check the maximum length of the OHI in case of FF[6] and SS[7] messages.
AMHS ref: Doc 9880, Part II	4.5.2.2.10 (OHI), 3.3.3.7.4 – 3.3.3.7.6 (ATS Message Optional Heading Information)
Test class	Normal AMHS communications (N)

[6] OHI text of 53 characters is the maximum length for non-SS messages, if the total maximum line length is 69 characters. (Total line length = OHI text + space + 6 digit filing time + space + 8 characters originator indicator)

[7] OHI text of 48 characters is the maximum length for SS messages, if the total maximum line length is 69 characters. (Total line length = OHI text + space + 6 digit filing time + 8 characters originator indicator + 5 characters priority alarm)

4.1.3 CTUA103 – Submit an IPM containing recipient addresses of different addressing schemes

CTUA103	**Submit an IPM containing recipient addresses of different addressing schemes**
Test criteria	This test is successful, if the IUT submits IPMs addressing different addressing schemes of recipient addresses of remote AMHS and AFTN users correctly.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) addressing different kinds of remote AMHS and AFTN users. • The first ATS message shall have 3 recipient addresses of addressing scheme XF; • The second ATS message shall have 3 recipient addresses of addressing scheme CAAS (single O), • The third ATS message shall have 3 recipient addresses of addressing scheme CAAS (multiple O); • The fourth ATS message shall have 6 recipient addresses; 2 recipient addresses of each type of addressing scheme as above. Each message shall contain one body part and have different ATS-filing-time and ATS-message-text. The optional-heading-information element shall be empty. Each message shall have ATS-message-priority FF. Check the messages received at the AMHS UA Test Tool. Verify that: • each message contains in the submission envelope the respective number of AMHS recipient addresses and an IPM heading with the same number of AMHS and AFTN recipients. • the ATS-message-priority is FF
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

4.1.4 CTUA104 – Submit an IPM containing different numbers of recipient addresses

CTUA104	**Submit an IPM containing different numbers of recipient addresses**
Test criteria	This test is successful, if the IUT submits an IPM addressing different numbers of recipient addresses of remote AMHS and AFTN users correctly.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) addressing different numbers of remote AMHS and AFTN users. • The first ATS message shall have 7 recipient addresses (one shall be the Test User Agent) and ATS-message-priority KK; • The second ATS message shall have 14 recipient addresses (one shall be the Test User Agent) and ATS-message-priority GG; • The third ATS message shall have 21 recipient addresses (one shall be the Test User Agent) and ATS-message-priority FF; • (optional) The fourth ATS message shall have more than 21 recipient addresses, if possible (one shall be the Test User Agent) and ATS-message-priority DD. Each message shall contain one body part and have different ATS-filing-time and ATS-message-text. The optional-heading-information element shall be empty. Check the messages received at the AMHS UA Test Tool. Verify that: • each message contains in the submission envelope the respective number of AMHS recipient addresses (7, 14, 21, more) and an IPM heading with the same number of AMHS and AFTN recipients. • the ATS-message-priority is according to the message sent.
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

4.1.5 CTUA105 – Submit an IPM containing different kinds of recipient addresses

CTUA105	**Submit an IPM containing different kinds of recipient addresses**
Test criteria	This test is successful, if the IUT submits IPMs addressing different kinds of recipient addresses of remote AMHS and AFTN users correctly.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) addressing different kinds of remote AMHS and AFTN users. • The first ATS message shall have two primary recipients and two copy recipients (one shall be the Test User Agent); • The second ATS message shall have two primary recipients and two blind-copy recipients (one shall be the Test User Agent); • The third ATS message shall have two primary recipients, two copy recipients and two blind-copy recipients (one shall be the Test User Agent). Each message shall contain one body part and have different ATS-filing-time and ATS-message-text. The optional-heading-information element shall be empty. Each message shall have ATS-message-priority FF. Verify that the messages (IPMs) are submitted to the AMHS UA Test Tool. Check the messages received at the AMHS UA Test Tool. Verify that: • the first message contains in the submission envelope all recipient addresses (the 2 primary and the 2 copy) and an IPM heading with all AMHS and AFTN recipients, • the second message should be split into 3 messages by the IUT-UA: o two messages each of which has only one of the blind-copy recipient (Bcc) addresses in the submission envelope and all addresses except the other Bcc address or except both Bcc addresses in the IPM Heading, and o one message which has only the 2 primary recipients' addresses in the submission envelope and in the IPM Heading. Only this message shall have the originator-report-request flag set to "non-delivery-report", • the third message should be split into 3 messages by the IUT-UA: o two messages which have only one Bcc address in the submission envelope and all addresses except the other Bcc address or except both Bcc addresses in the IPM Heading, and o one message which has all other (the 2 primary and the 2 copy) addresses in the submission envelope and in the

	IPM Heading. Only this message shall have the originator-report-request flag set to "non-delivery-report". Check the messages received at the Test UA. Verify that: • the first message addressed to the Test UA contains all addresses (the 2 primary and the 2 copy) in the IPM Heading, • the second message addressed to the Test UA as Bcc contains the 2 primary addresses in the IPM Heading, • the third message addressed to the Test UA as Bcc contains all addresses (the 2 primary and the 2 copy) in the IPM Heading. *Note.– Depending on the implementation of the IUT-UA the IPM Heading of the second and third message contains additionally the blind-copy address belonging to the Test UA or no blind-copy address.*
AMHS ref: Doc 9880, Part II	3.1 (ATS Message User Agent), 4.5.2 (IPM conversion)
Test class	Normal AMHS communications (N)

4.2 Basic Delivery Operations (A2)

4.2.1 CTUA201 – Deliver an IPM to the IUT – basic capability (A2)

Note.– The conformance test CTUA201 is passed successfully by the IUT only if all tests CTUA201a, CTUA201b and CTUA201c are passed successfully.

CTUA201a	**Deliver an IPM containing an ia5-text to the IUT-UA**
Test criteria	This test is successful, if the IUT receives ATS messages (IPMs) containing an **ia5-text** delivered from the Test MTA.
Scenario description	From the AMHS UA Test Tool send a sequence of five ATS messages (IPMs) containing an **ia5-text** to the IUT-UA. • The first ATS message shall have ATS-message-priority KK: • The second ATS message shall have ATS-message-priority GG; • The third ATS message shall have ATS-message-priority FF; • The fourth ATS message shall have ATS-message-priority DD; • The fifth ATS message shall have ATS-message-priority SS. Each message shall have different ATS-filing-time and ATS-message-text. The optional-heading-information element shall be empty. Verify the messages received at the AMHS User Agent. Verify in particular, the following elements displayed at the AMHS User Agent: • ATS-message-priority, • ATS-message-filing-time, • ATS-message-text.
AMHS ref: Doc 9880, Part II	3.1 (ATS Message User Agent) and Table 3-1, 3.3.3.7 (ATS-Message-Header)
Test class	Normal AMHS communications (N)

CTUA201b	**Deliver an IPM containing an ia5-text-body-part to the IUT-UA**
Test criteria	This test is successful, if the IUT receives ATS messages (IPMs) containing an **ia5-text-body-part** delivered from the Test MTA.
Scenario description	From the AMHS UA Test Tool send a sequence of five ATS messages (IPMs) containing an **ia5-text-body-part** to the IUT-UA. • The first ATS message shall have ATS-message-priority KK; • The second ATS message shall have ATS-message-priority GG; • The third ATS message shall have ATS-message-priority FF; • The fourth ATS message shall have ATS-message-priority DD; • The fifth ATS message shall have ATS-message-priority SS. Each message shall have different ATS-filing-time and ATS-message-text. The optional-heading-information element shall be empty. Verify the messages received at the AMHS User Agent. Verify in particular, the following elements displayed at the AMHS User Agent: • ATS-message-priority, • ATS-message-filing-time, • ATS-message-text.
AMHS ref: Doc 9880, Part II	3.1 (ATS Message User Agent) and Table 3-1, 3.3.3.7 (ATS-Message-Header)
Test class	Normal AMHS communications (N)

CTUA201c	**Deliver an IPM containing a general-text-body-part with ISO 646 repertoire to the IUT-UA**
Test criteria	This test is successful, if the IUT correctly receives ATS messages (IPMs) containing a **general-text-body-part with ISO 646 repertoire** delivered from the Test MTA.
Scenario description	From the AMHS UA Test Tool send a sequence of five ATS messages (IPMs) containing a **general-text-body-part with ISO 646 repertoire** to the IUT-UA. • The first ATS message shall have ATS-message-priority KK; • The second ATS message shall have ATS-message-priority GG; • The third ATS message shall have ATS-message-priority FF; • The fourth ATS message shall have ATS-message-priority DD; • The fifth ATS message shall have ATS-message-priority SS. Each message shall have different ATS-filing-time and ATS-message-text. The optional-heading-information element shall be empty. Verify the messages received at the AMHS User Agent. Verify in particular, the following elements displayed at the AMHS User Agent: • ATS-message-priority, • ATS-message-filing-time, • ATS-message-text.
AMHS ref: Doc 9880, Part II	3.1 (ATS Message User Agent) and Table 3-1, 3.3.3.7 (ATS-Message-Header)
Test class	Normal AMHS communications (N)

4.2.2 CTUA202 – Deliver an IPM containing erroneous ATS-message-header or ATS-message-text format

CTUA202	**Deliver an IPM containing erroneous ATS-message-header or ATS-message-text format**
Test criteria	This test is successful, if the IUT, when receiving IPMs containing erroneous ATS-message-header or ATS-message-text from a peer MTA: • displays the message to its local AMHS user regardless of the contained error, or • indicates the error situation
Scenario description	From the AMHS UA Test Tool send a sequence of seven messages (IPMs) to the IUT addressed to the local UA. • The first message (IPM) shall contain an empty ATS-message-priority; • The second message (IPM) shall contain an invalid ATS-message-priority; • The third message (IPM) shall contain an empty ATS-message-filing-time; • The fourth message (IPM) shall contain an invalid ATS-message-filing-time; • The fifth message (IPM) shall contain an empty ATS-message-header; • The sixth message (IPM) shall contain an empty ATS-message-text. Verify that the messages are received at the UA. Check the contents of each received ATS message and verify the ATS-message-priority, ATS-message-filing-time and ATS-message-text displayed at the UA or note the error indications[8].
AMHS ref: Doc 9880, Part II	3.3.3 (IPM text)
Test class	Erroneous AMHS parameters (E1)

[8] The displayed message depends on the UA capabilities

4.2.3 CTUA203 – Deliver an IPM containing optional-heading-information in the ATS-message-header

CTUA203	**Deliver an IPM containing optional-heading-information in the ATS-message-header with maximum A2 message length**
Test criteria	This test is successful, if the IUT displays IPMs containing optional-heading-information (OHI) in the ATS-message-header correctly or indicates an error if the OHI text is too long. Additionally, the reception of the A2 message length capability shall be checked.
Scenario description	From the AMHS UA Test Tool send a sequence of ATS messages (IPMs) to the IUT-UA. • The first ATS message shall have priority FF and contain OHI text of less than 53 characters[9]; • The second ATS message shall have priority FF and contain OHI text of exactly 53 characters; • The third ATS message shall have priority FF and contain OHI text of more than 53 characters; • The fourth ATS message shall have priority SS and contain OHI text of less than 48 characters[10]; • The fifth ATS message shall have priority SS and contain OHI text of exactly 48 characters; • The sixth ATS message shall have priority SS and contain OHI text of more than 48 characters. Each message shall have different ATS-filing-time and ATS-message-text. The message text length shall be 1800 characters. Check the ATS messages received at IUT-UA and verify the correct contents of the messages (text length 1800 characters) and in particular, check the format and contents of the OHI. Verify that the IUT-UA indicates an error for the third and sixth ATS message if it could not be displayed.
AMHS ref: Doc 9880, Part II	4.5.2.2.10 (OHI), 3.3.3.7.4 – 3.3.3.7.6 (ATS Message Optional Heading Information)
Test class	Normal AMHS communications (N), Erroneous AMHS parameters (E1)

[9] OHI text of 53 characters is the maximum length for non-SS messages, if the total maximum line length is 69 characters. (Total line length = OHI text + space + 6 digit filing time + space + 8 characters originator indicator)

[10] OHI text of 48 characters is the maximum length for SS messages, if the total maximum line length is 69 characters. (Total line length = OHI text + space + 6 digit filing time + 8 characters originator indicator + 5 characters priority alarm)

4.2.4 CTUA204 – Deliver an IPM containing different kinds of recipient address

CTUA204	**Deliver an IPM containing different kinds of recipient addresses**
Test criteria	This test is successful, if the IUT displays IPMs containing different kinds of recipient address of the IUT-UA correctly.
Scenario description	From the AMHS UA Test Tool send a sequence of ATS messages (IPMs) addressing the IUT-UA in different ways. • The first ATS message shall have the IUT-UA address as primary recipient; • The second ATS message shall have the IUT-UA address as copy recipient; • The third ATS message shall have the IUT-UA address as blind-copy recipient. Each message shall have ATS-message-priority FF, different ATS-filing-time and different ATS-message-text. The optional-heading-information element shall be empty. Verify that all messages (IPMs) are displayed at the IUT-UA correctly. Check that the recipient address is correctly indicated as: • primary recipient (first message) • copy recipient (second message), and • blind-copy recipient (third message).
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

4.2.5 CTUA205 – Deliver an IPM with empty or missing IPM heading address fields

CTUA205	**Deliver an IPM with empty or missing IPM heading address fields**
Test criteria	This test is successful if the IUT, when receiving an ATS message (IPM) from a peer MTA with empty or missing IPM heading address fields, delivers this message to its local AMHS user regardless of the empty or missing IPM heading address fields.
Scenario description	From the AMHS UA Test Tool send a sequence of messages (IPMs) to the IUT-UA. The delivery envelope shall contain correct addresses whereas address fields are missing or empty in the IPM heading. • The first message shall contain no originator address in the IPM heading. • The second message shall contain no primary, copy or blind copy recipient addresses in the IPM heading. Each message shall have ATS-message-priority FF, different ATS-filing-time and different ATS-message-text. The optional-heading-information element shall be empty. Check any messages received and displayed at the UA[11]. Check the IUT-UA's log files with respect to delivered messages and reported errors, if any.
AMHS ref: Doc 9880, Part II	3.1 (ATS Message User Agent – AMH21)
Test class	Normal AMHS communications (N)

[11] The displayed message depends on the UA capabilities.

4.2.6 CTUA206 – Deliver an IPM with invalid originator address similar to CAAS

CTUA206	**Deliver an IPM with invalid originator address similar to CAAS**
Test criteria	This test is successful, if the IUT is able to receive ATS messages (IPMs) that contain originator addresses looking like CAAS type ones but being invalid.
Scenario description	From the AMHS UA Test Tool send to the IUT-UA a sequence of ATS messages (IPMs) being originated from the PRMD "AMHSLAND-1" which uses CAAS. The messages shall have a valid recipient address, but an erroneous originator address in the IPM heading. • The 1st ATS message shall contain an originator address with an invalid *common-name* attribute that consists of 9 letters, e.g. "AAAAMHABC"; • The 2nd ATS message shall contain an originator address with an invalid *common-name* attribute that consists of only 6 letters, e.g. "AAAAMH"; • The 3rd ATS message shall contain an originator address with a valid *organizational-unit-names* attribute "AAAA", but an empty *common-name* attribute; • The 4th ATS message shall contain an originator address with a valid *common-name* attribute "AAAAMHAA", but an empty *organizational-unit-names* attribute; • The 5th ATS message shall contain an originator address with a valid *common-name* attribute "AAAAMHAA", but an *organizational-unit-names* attribute that is different from the first 4 letters of the *common-name* attribute, e.g. "AAAX"; • The 6th ATS message shall contain an originator address with a valid *common-name* attribute "AAAAMHAA" and correct *organizational-unit-names* attribute "AAAA", but an empty *organization-name* attribute. Verify that the IUT-UA displays the messages with invalid originator O/R address or indicates an error.
AMHS ref: Doc 9880, Part II	
Test class	Erroneous AMHS parameters (E1)

4.2.7 CTUA207 – Deliver an IPM with invalid originator address similar to XF

CTUA207	**Deliver an IPM with invalid originator address similar to XF**
Test criteria	This test is successful if the IUT is able to receive ATS messages (IPMs) that contain originator addresses looking like XF type ones but being invalid.
Scenario description	From the AMHS UA Test Tool send to the IUT-UA a sequence of ATS messages (IPMs) being originated from the PRMD "AMHSLAND-3" which uses XF. The messages shall have a valid recipient address, but an erroneous originator address in the IPM heading. • The 1st ATS message shall contain an originator address with the value "AFTN" in the *organization-name* attribute, but an invalid *organizational-unit-names* attribute that consists of 9 letters, e.g. value "ACCCMHABC"; • The 2nd ATS message shall contain an originator address with the value "AFTN" in the *organization-name* attribute, but an invalid *organizational-unit-names* attribute that consists of only 6 letters, e.g. value "ACCCMH"; • The 3rd ATS message shall contain an originator address with the value "AFTN" in the *organization-name* attribute, but an empty *organizational-unit-names* attribute; • The 4th ATS message shall contain an originator address with an empty *organization-name* attribute and a valid *organizational-unit-names* attribute, e.g. value "ACCCMHAA"; • The 5th ATS message shall contain an originator address with an invalid *organization-name* attribute, e.g. "UNKNOWN" and a valid *organizational-unit-names* attribute, e.g. value "ACCCMHAA". Verify that the IUT-UA displays the messages with invalid originator O/R address or indicates an error.
AMHS ref: Doc 9880, Part II	
Test class	Erroneous AMHS parameters (E1)

4.2.8 CTUA208 – Deliver a redirected IPM to the IUT

CTUA208	**Deliver a redirected IPM to the IUT-UA**
Test criteria	This test is successful, if the IUT receives redirected ATS messages (IPMs) containing one body part and delivered from the Test MTA.
Scenario description	Redirect an AMHS O/R address different from the address of the IUT-UA to the address of the IUT-UA. From the AMHS UA Test Tool send a sequence of five ATS messages (IPMs) containing an ia5-text to the redirected address. • The first ATS message shall have ATS-message-priority KK; • The second ATS message shall have ATS-message-priority GG; • The third ATS message shall have ATS-message-priority FF; • The fourth ATS message shall have ATS-message-priority DD; • The fifth ATS message shall have ATS-message-priority SS. Each message shall have different ATS-filing-time and ATS-message-text. The optional-heading-information element shall be empty. Verify the messages received at the AMHS User Agent. Verify in particular, the following elements displayed at the AMHS User Agent: • recipient address(es), all recipient addresses in the IPM Heading as originally sent by the AMHS UA Test Tool. • ATS-message-priority, • ATS-message-filing-time, • ATS-message-text. Check, if the user gets any indication that the message was subject to redirection, for example, a display of the redirection-history or the originally-intended-recipient-name. Verify for the received priority SS message, that the user gets a request to return a receipt notification.
AMHS ref: Doc 9880, Part II	3.1 (ATS Message User Agent) and Table 3-1, 3.3.3.7 (ATS-Message-Header)
Test class	Normal AMHS communications (N)

4.3 Specific Submission Operations

4.3.1 CTUA301 – Submission of acknowledgements to messages with ATS-message-priority "SS"

CTUA301	**Submission of acknowledgements to messages with ATS-message-priority "SS"**
Test criteria	This test is successful, if the IUT submits the acknowledgement to a message with ATS-Message-priority "SS" as receipt notification and/or as IPM correctly.
Scenario description	From the AMHS UA Test Tool send a sequence of ATS messages (IPMs) with *ATS-message-priority* "SS" and the *receipt-notification* request flag set to 'true' to the IUT-UA. Each message shall have different ATS-filing-time and ATS-message-text. The optional-heading-information element shall be empty. The first and the second ATS messages are addressed to the IUT-UA directly. The third and the fourth ATS messages are addressed to users other than the IUT-UA but are redirected to the IUT-UA. The IUT-UA shall return after user action (manual intervention) acknowledgements for the first and the third message as AMHS receipt notifications, and for the second and the fourth message as IPMs containing the respective AFTN acknowledgement messages. Verify that the received receipt notifications have been generated correctly, in particular, that: • the *ipn-originator* (IPN) represents the IUT-UA, • the *receipt-time* of the IPN is generated from the time at which the IUT-UA received the subject IPM, • the value of the *priority* element of the IPN is set to "urgent", • the values of *subject-ipm* and *recipient-name* are inserted correctly from log entries. Verify that the received IPMs have been generated correctly, in particular, that: • the *originator-name* of the IPM is used as originator indicator in the text (R <filing time> <originator>) and as recipient address of the AFTN acknowledgement message, • the **filing time** in the text of the AFTN acknowledgement message is taken from the *ATS-message-filing-time* of the IPM, • the value of the *priority* element of the IPM is set to "urgent".

AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

4.3.2 CTUA302 – Submission of probes

CTUA302	**Submission of probes**
Test criteria	This test is successful, if the IUT submits probes testing the capability of a remote AMHS user correctly and displays the result of any returned AMHS report.
Scenario description	From the IUT-UA send a sequence of probes to the AMHS UA Test Tool containing an intended recipient address (Test UA). • The first probe shall contain a content-length value up to 16k (octets); • Optional: If the IUT-UA supports the selection of different types of text body parts the submission of the first probe with a content-length value up to 16k (octets) should be repeated with the possible selections. • The second probe shall contain a content-length value of at least 64 k (octets). • Optional: If the IUT-UA supports the selection of different types of text body parts the submission of the second probe with a content-length value of at least 64 k (octets) should be repeated with the possible selections. • Optional: The third probe shall contain a content-length value up to 2 Mbytes and original-encoded-information-type with OID id-eit-file-transfer which is related to the file-transfer-body-part; • Optional: The fourth probe shall contain a content-length value up to 2 Mbytes and original-encoded-information-types related to the text body part and the file-transfer-body-part; • Optional: If the IUT-UA supports the selection of different types of text body parts the submission of the fourth probe with two body parts should be repeated with the possible selections. The AMHS UA Test Tool shall return DRs for the first probe as well as for the first optional probes, if generated. The other probes shall be responded by NDRs. Verify that the probes are correctly composed in all elements. Verify that in all submitted probes the originator-report-request argument is set to “report”. Verify in particular, that the values contained in the content-length and original-encoded-information-types correspond to the input of the user. Verify that the returned AMHS reports are correctly received and displayed at the IUT-UA.
AMHS ref: Doc 9880, Part II	2.2.2 (AMHS information model)
Test class	Normal AMHS communications (N)

4.3.3 CTUA303 – Checking of default envelope elements (flag setting) in submitted IPMs

CTUA303	**Checking of default envelope elements (flag setting) in submitted IPMs**
Test criteria	This test is successful, if the IUT submits IPMs with the correct default envelope elements ("flags").
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) to the AMHS UA Test Tool. • The first message shall be addressed to an AMHS Direct User (the Test UA) with normal (default) flag setting; • The second message shall be addressed to an AMHS Indirect User (Test MTCU) with normal (default) flag setting, • The third message shall be addressed to an AMHS distribution list. Each message shall contain one text body part and have different ATS-filing-time and ATS-message-text. The optional-heading-information element shall be empty. Each message shall have ATS-message-priority FF. Verify the setting of the following envelope elements (flags). As default values the following settings are expected: Per-message-indicators: The per-message-indicators shall be absent or set to the default values as follows: • *disclosure-of-other-recipients -prohibited (0)* • *implicit-conversion -allowed (0)* • *alternate-recipient-prohibited (0)* • *content-return -not-requested (0)* Originator-report-request element (for all recipients): The originator-report-request element shall be set to: *non-delivery-report.* Extensions elements: The following extensions elements shall not be used or take their default values: • *recipient-reassignment-allowed (0)* • *dl-expansion- allowed (0)* • *conversion-with-loss-allowed (0)* *Note.– Default values are those as defined in ISO/IEC 10021-4 (ITU-T X.411).*
AMHS ref: Doc 9880, Part II	4.4.2.3.17, 4.4.2.3.18 and 4.4.2.3.20 (per-message-indicators), 4.4.2.3.8.1 (extension elements)
Test class	Normal AMHS communications (N)

4.3.4 CTUA304 – Checking of user settings in the envelopes of submitted IPMs (optional)

CTUA304	**Checking of user settings in the envelopes of submitted IPMs (optional)**
Test criteria	This test is successful, if the IUT submits IPMs with the expected settings of the different **envelope elements (**"flags") as set by the user if such a feature is implemented.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) to the AMHS UA Test Tool with different possible flags set by the user if implemented. • The first IPM shall be submitted with per-message-indicators (only for those supported at the user interface) set as follows: o *disclosure-of-other-recipients -requested(1)* o *implicit-conversion-prohibited(1)* o *alternate-recipient-allowed(1)* o *content-return-requested(1)* • The second IPM shall be submitted using extensions elements (only for those supported at the user interface) as follows: o *recipient-reassignment-prohibited(1)* o *dl-expansion-prohibited(1)* o *conversion-with-loss-prohibited(1)* Each message shall contain one body part and have different ATS-filing-time and ATS-message-text. The optional-heading-information element shall be empty. Each message shall have ATS-message-priority FF. Verify the setting of the envelope elements (flags) in accordance with the performed user actions.
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

4.3.5 CTUA305 – Checking of user settings, especially report request, in submitted IPMs (optional)

CTUA305	**Checking of user settings, especially report request, in submitted IPMs (optional)**
Test criteria	This test is successful, if the IUT submits IPMs with the expected report request settings in the message submission envelope.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) to the AMHS UA Test Tool with the originator-report-request element either set to a default (pre-configured) value or set to a value which corresponds to a selection made by the user (if such function is implemented). • The first IPM shall be submitted to two recipients (A and B) with **default** report requests (no selection made by the user); • Optional: The second IPM shall be submitted to two recipients (A and B) with **non-delivery report** requested for recipient A and **report** requested for recipient B; • Optional: The third IPM shall be submitted to two recipients (A and B) with **report** requested for recipient A and **non-delivery report** requested for recipient B; • Optional: The fourth IPM shall be submitted to two recipients (A and B) with **report** requested for both recipients. Each message shall contain one body part and have different ATS-filing-time and ATS-message-text. The optional-heading-information element shall be empty. Each message shall have ATS-message-priority FF. Check the report request settings in the first IPM. The expected value of the report request elements for both recipients is: **"non-delivery report**". Verify that in all other IPMs the report request elements contained in the message submission envelopes correspond to the selection performed by the user. *Note.– It is recommended that the setting "no-report" is prevented at the UA (operational requirements dictate that upon reception of an NDR the responsibility for the message remains at the UA user site, therefore the generation of NDRs should not be preventable by the UA settings).*
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

4.4 Specific Delivery Operations

4.4.1 CTUA401 – Deliver a non-delivery report (NDR) to an AMHS user

CTUA401	**Deliver a non-delivery report (NDR) to an AMHS user**
Test criteria	This test is successful, if the IUT displays non-delivery reports containing the standardized reason and diagnostic codes to an AMHS user correctly.
Scenario description	From the AMHS UA Test Tool send a set of non-delivery reports to the IUT-UA directly attached. The set of NDRs shall cover the full scope of reason and diagnostic codes standardized in ISO/IEC 10021-4 (ITU-T Rec. X.411), section 8.3.1.2.1.11 and section 8.3.1.2.1.12, respectively (see Table 10). The report delivery envelope shall contain the report-destination of the IUT-UA. The reports may contain fictitious values for those elements which are normally related to a subject message, like subject-identifier, original-encoded-information-types and originally-intended-recipient-name. Monitor that the reports are received at the IUT-UA and displayed. Verify that: • the reported recipient(s) in report content is/are displayed, • the reason and diagnostic codes of the delivered reports are identical to those contained in the reports sent from the AMHS UA Test Tool. • the text associated with the reason and diagnostic codes is displayed correctly, i.e. as standardized in ISO/IEC 10021-4 or ITU-T Rec. X.411 (Abstract Syntax Definition in Figure 2 - Part 16).
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

AMHS Report ID	*number of Per-Recipient-Fields*	reason code	diagnostic codes (range)
CTUA401M01	*16*	0	0 - 15
CTUA401M02	*31*	0	0 - 30
CTUA401M03	*31*	1	0 - 30
CTUA401M04	*5*	1	46 - 50
CTUA401M05	*3*	2	8 - 10
CTUA401M06	*7*	2	19 - 25
CTUA401M07	*1*	3	31
CTUA401M08	*14*	4	32 - 45
CTUA401M09	*1*	5	not used
CTUA401M10	*1*	6	not used
CTUA401M11	*1*	7	not used
CTUA401M12	*28*	8	51 - 78

Table 10: Non-delivery-reason-codes and non-delivery-diagnostic-codes used in CTUA401

Note.– The non-delivery-diagnostic-code is an optional element and, for example, not contained in test messages CTUA401M09, CTUA401M10 and CTUA401M11.

4.4.2 CTUA402 – Deliver an NDR containing non-standard reason or diagnostic codes

CTUA402	**Deliver an NDR containing non-standard reason or diagnostic codes**
Test criteria	This test is successful, if the IUT displays non-delivery reports containing reason and diagnostic codes which are syntactically correct, but different from those defined in section 8.3.1.2.1.11 and section 8.3.1.2.1.12 of ISO/IEC 10021-4 (ITU-T Rec. X.411).
Scenario description	From the AMHS UA Test Tool send several NDRs to the IUT-UA. The NDRs may contain fictitious values for those fields which are normally related to a subject message. Six NDRs shall be sent containing the following reason and diagnostic codes: • CTUA402M01 contains "9" for the *non-delivery-reason-code* and "invalid-arguments" for the *non-delivery-diagnostic-code*; • CTUA402M02 contains "255" for the *non-delivery-reason-code* and "invalid-arguments" for the *non-delivery-diagnostic-code*; • CTUA402M03 contains "32767" for the *non-delivery-reason-code* and "invalid-arguments" for the *non-delivery-diagnostic-code*; • CTUA402M04 contains "unable-to-transfer" for the *non-delivery-reason-code* and "79" for the *non-delivery-diagnostic-code*; • CTUA402M05 contains "unable-to-transfer" for the *non-delivery-reason-code* and "255" for the *non-delivery-diagnostic-code*; • CTUA402M06 contains "unable-to-transfer" for the *non-delivery-reason-code* and "32767" for the *non-delivery-diagnostic-code*. Verify that all NDRs are delivered to the IUT-UA. Check the contained reason and diagnostic codes (if any). Verify that no misleading information is presented to the AMHS user.
AMHS ref: Doc 9880, Part II	
Test class	Erroneous AMHS parameters (E1)

4.4.3 CTUA403 – Deliver IPNs containing receipt (RN) or non-receipt (NRN) notification

CTUA403	**Deliver IPNs containing receipt notification (RN) or non-receipt notification (NRN)**
Test criteria	This test is successful, if the IUT displays IPNs containing receipt notification (RN) and/or non-receipt notification (NRN) to an AMHS user correctly.
Scenario description	From the AMHS UA Test Tool send a sequence of IPNs to the IUT-UA. • The first IPN shall contain one receipt notification (RN); • The second IPN shall contain another receipt notification (RN); • The third IPN shall contain one non-receipt notification (NRN); • The fourth IPN shall contain another non-receipt notification (NRN). Monitor the IPNs received at the IUT-UA. Verify that: • all IPNs are delivered to the IUT-UA, and • the receipt (RN) or non-receipt (NRN) notifications are displayed correctly.
AMHS ref: Doc 9880, Part II	IPN
Test class	Normal AMHS communications (N)

4.4.4 CTUA404 – Deliver a report containing delivery (DR) and/or non-delivery (NDR) information

CTUA404	**Deliver a report containing delivery (DR) and/or non-delivery (NDR) information**
Test criteria	This test is successful, if the IUT displays delivery and non-delivery reports to an AMHS user correctly.
Scenario description	From the AMHS UA Test Tool send a set of reports to the IUT-UA directly attached. • The first report shall contain one delivery (DR) information; • The second report shall contain two delivery (DR) information; • The third report shall contain ten delivery (DR) information; • The fourth report shall contain one non-delivery (NDR) information; • The fifth report shall contain two non-delivery (NDR) information; • The sixth report shall contain ten non-delivery (NDR) information; • The seventh report shall contain one delivery (DR) and one non-delivery (NDR) information, • The eighth report shall contain two delivery (DR) and two non-delivery (NDR) information; • The ninth report shall contain ten delivery (DR) and ten non-delivery (NDR) information. Monitor the reports received at the IUT-UA. Verify that: • all reports are delivered to the IUT-UA, and • all the delivery (DR) and non-delivery (NDR) information is displayed correctly.
AMHS ref: Doc 9880, Part II	DR
Test class	Normal AMHS communications (N)

4.4.5 CTUA405 – Deliver IPMs containing optional arguments in the delivery envelope

CTUA405	**Deliver IPMs containing optional arguments in the delivery envelope**
Test criteria	This test is successful, if the IUT receives IPMs containing optional delivery envelope arguments and displays the values correctly for those elements supported at the user interface.
Scenario description	From the AMHS UA Test Tool send a sequence of ATS messages (IPMs) to the IUT-UA. • The first message shall contain only the mandatory delivery envelope arguments, i.e. message-delivery-identifier, message-submission-time, message-delivery-time, originator-name, this-recipient-name and content-type. The priority argument shall be absent or take its default value (normal); • The second message shall contain the following optional delivery envelope element: other-recipient-names; • The third message shall contain the following optional delivery envelope element: original-encoded-information-types; • The fourth message shall contain the following optional delivery envelope element: content-identifier; • The fifth message shall contain the following delivery envelope extension element: trace-information; • The sixth message shall contain the following delivery envelope extension element: dl-expansion-history; • The seventh message shall contain the following delivery envelope extension element: redirection-history; Each message shall contain one general-text-body-part[12] and have different ATS-filing-time and ATS-message-text. The optional-heading-information element shall be empty. Verify that: • all messages are received at the IUT-UA, and • the values of the mandatory and optional delivery envelope arguments, which are supported at the user interface, are displayed correctly.
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

[12] The general-text-body-part is used to check the original-encoded-information-types (see 3rd message.

4.5 Enhanced Submission UA Capability

Note.– Only those messages shall be used which meet the AMHS User Capability of the IUT.

4.5.1 CTUA501 – Submit an IPM with the implemented capability of one body part

CTUA501	**Submit an IPM with the implemented capability of one body part**
Test criteria	This test is successful, if the IUT submits ATS messages (IPMs) containing **one body part with length equal to that defined for the respective capability class** to a peer UA correctly.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) addressing the AMHS UA Test Tool and meeting the defined user capability. • Capability A16: This Message shall have one body part with message text length of 16 k characters; • Capability A64: This Message shall have one body part with message text length of 64 k characters; • Capability B2: This Message shall have one general-text-body-part with Repertoire B and with message text length of 1800 characters; • Capability B16: This Message shall have one general-text-body-part with Repertoire B and with message text length of 16 k characters; • Capability B64: This Message shall have one general-text-body-part with Repertoire B and with message text length of 64 k characters; • Capability F1024[13]: This Message shall have one file-transfer-body-part with body part size of 1 M bytes; • Capability F2048: This Message shall have one file-transfer-body-part with body part size of 2 M bytes. Each ATS message (except those with FTBP) shall have ATS-message-priority GG and a different ATS-filing-time. The *optional-heading-information* element shall be empty. Verify the messages received by the AMHS UA Test Tool. Check the format and contents of the submission envelope, IPM heading and body. Verify in particular, the respective message length and body part type.
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

[13] Lower values not recommended

4.5.2 CTUA502 – Submit an IPM with the implemented capability of two body parts

CTUA502	**Submit an IPM with the implemented capability of two body parts**
Test criteria	This test is successful, if the IUT submits ATS messages (IPMs) containing **two body parts with values equal to those defined for the respective capability class** to a peer UA correctly.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) addressing the AMHS UA Test Tool and meeting the defined user capability. • Capability A64+F2048[14]: This Message shall have two body parts; one body part with message text length of 64 k characters and one file-transfer-body-part with body part size of 2 M bytes; • Capability B64+F2048: This Message shall have two body parts; one general-text-body-part with Repertoire B and with message text length of 64 k characters and one file-transfer-body-part with body part size of 2 M bytes. For each user capability an ATS message shall be generated with ATS-message-header in the text body-part (having the ATS-message-priority GG, different ATS-filing-time and an empty *optional-heading-information* element). Verify the messages received by the AMHS UA Test Tool. Check the format and contents of the submission envelope, IPM heading and body (two body-parts). Verify in particular, • the respective message length/body part size and body part types of bothbody parts, • the ATS-message header.
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

[14] Other values not recommended.

4.6 Enhanced Delivery UA Capability

Note.– Only those messages shall be used meeting the AMHS User Capability of the IUT.

4.6.1 CTUA601 – Deliver an IPM with the implemented capability of one body part

CTUA601	**Deliver an IPM with the implemented capability of one body part**
Test criteria	This test is successful, if the IUT displays ATS messages (IPM) containing **one body part with length equal to that defined for the respective capability class** correctly.
Scenario description	From the AMHS UA Test Tool send a sequence of ATS messages (IPMs) addressing the IUT-UA and meeting the defined user capability. • Capability A16: This Message shall have one body part with message text length of 16 k characters. • Capability A64: This Message shall have one body part with message text length of 64 k characters. • Capability B2: This Message shall have one general-text-body-part with Repertoire B and with message text length of 1800 characters. • Capability B16: This Message shall have one general-text-body-part with Repertoire B and with message text length of 16 k characters. • Capability B64: This Message shall have one general-text-body-part with Repertoire B and with message text length of 64 k characters. • Capability F1024[15]: This Message shall have one file-transfer-body-part with body part size of 1 M bytes. • Capability F2048: This Message shall have one file-transfer-body-part with body part size of 2 M bytes. Each ATS message (except those with FTBP) shall have ATS-message-priority FF and different ATS-filing-time. The *optional-heading-information* element shall be empty. Verify that all messages, which are supported by the IUT-UA, are correctly received. Verify in particular, that • the message text (in full length) and ATS-message-header elements are displayed correctly. • the respective body part size and content for messages with FTBP

[15] Lower values not recommended

	are correct.
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

4.6.2 CTUA602 – Deliver an IPM with the implemented capability of two body parts

CTUA602	**Deliver an IPM with the implemented capability of two body parts**
Test criteria	This test is successful, if the IUT displays ATS messages (IPMs) containing **two body parts with values equal to those defined for the respective capability class** correctly.
Scenario description	From the AMHS UA Test Tool send a sequence of ATS messages (IPMs) addressing the IUT-UA and meeting the defined user capability. • Capability A64+F2048[16]: This Message shall have two body parts; one body part with message text length of 64 k characters and one file-transfer-body-part with body part size of 2 M bytes. • Capability B64+F2048: This Message shall have two body parts; one general-text-body-part with Repertoire B and with message text length of 64 k characters and one file-transfer-body-part with body part size of 2 M bytes. For each user capability an ATS message shall be generated with ATS-message-header in the text body part (having the ATS-message-priority GG, different ATS-filing-time and an empty *optional-heading-information* element). Verify that all messages, which are supported by the IUT-UA, are correctly received. Verify in particular, that • the message text (in full length) and ATS-message-header elements (if present) are displayed correctly; and • the respective body part size and content are correct.
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

[16] Other values not recommended.

5. Extended AMHS Service – Test Procedures with IHE (IPM heading extension)

Note.– Unless otherwise specified in the test case description, the AMHS UA Test Tool generates IPMs containing an ia5-text. Definition of the various body part types used in the following test cases is included in section 2 'Glossary and Definitions' of Appendix A of this Manual.

5.1 Submission Operations (A2-IHE)

5.1.1 CTUA1101 – Submit an IPM with IHE – basic capability (A2-IHE)

Note.– The conformance test CTUA1101 is passed successfully by the IUT if at least one of the tests CTUA1101a, CTUA1101b or CTUA1101c is passed successfully

CTUA1101a	**Submit an IPM with IHE, containing an ia5-text**
Test criteria	This test is successful, if the IUT submits an ATS message (IPM) with IHE, containing an **ia5-text** to a peer UA correctly.
Scenario description	From the IUT-UA send a sequence of five ATS messages (IPMs) with IHE addressing a remote AMHS user. • Message 1 (CT1101aM01) shall have priority KK; • Message 2 (CT1101aM02) shall have priority GG; • Message 3 (CT1101aM03) shall have priority FF; • Message 4 (CT1101aM04) shall have priority DD; • Message 5 (CT1101aM05) shall have priority SS. Each message shall contain an ia5-text and have different filing time and message text. The originators-reference (OHI) element shall be absent. Verify the messages received by the AMHS UA Test Tool at the AMHS interface. Check the format and contents of the submission envelope, IPM heading and body. Verify in particular, the priority value contained in the submission envelope and the following elements contained in the IPM: • body part type, • Repertoire, • absence of originators-reference (OHI), • precedence-policy-identifier set to value 1.3.27.8.0.0[17], • precedence equivalent to the ATS message priority,

[17] object-identifier value {iso (1) identifiedorganisation (3) icao (27) atn-amhs (8) parameters (0) amhs-precedence-policy (0)}.

	• authorization-time (filing time), • message text.
AMHS ref: Doc 9880, Part II	3.1 (ATS Message User Agent) and Table 3-2, 3.3.4 (Use of IPM elements in support of the extended ATSMHS)
Test class	Normal AMHS communications (N)

CTUA1101b	**Submit an IPM with IHE, containing an ia5-text-body-part**
Test criteria	This test is successful, if the IUT submits an ATS message (IPM) with IHE, containing an **ia5-text-body-part** to a peer UA correctly.
Scenario description	From the IUT-UA send a sequence of five ATS messages (IPMs) with IHE addressing a remote AMHS user. • Message 1 (CT1101bM01) shall have priority KK; • Message 2 (CT1101bM02) shall have priority GG; • Message 3 (CT1101bM03) shall have priority FF; • Message 4 (CT1101bM04) shall have priority DD; • Message 5 (CT1101bM05) shall have priority SS. Each message shall contain an **ia5-text-body-part** and have different filing time and message text. The originators-reference (OHI) element shall be absent. Verify the messages received by the AMHS UA Test Tool at the AMHS interface. Check the format and contents of the submission envelope, IPM heading and body. Verify in particular, the priority value contained in the submission envelope and the following elements contained in the message content: • body part type, • Repertoire, • absence of originators-reference (OHI), • precedence-policy-identifier set to value 1.3.27.8.0.0[18], • precedence equivalent to the ATS message priority, • authorization-time (filing time), • message text.
AMHS ref: Doc 9880, Part II	3.1 (ATS Message User Agent) and Table 3-2, 3.3.4 (Use of IPM elements in support of the extended ATSMHS)
Test class	Normal AMHS communications (N)

[18] See CTUA1101a

CTUA1101c	**Submit an IPM with IHE, containing a general-text-body-part with ISO 646 repertoire**
Test criteria	This test is successful, if the IUT submits an ATS message (IPM) with IHE, containing a **general-text-body-part with ISO 646 repertoire** to a peer UA correctly.
Scenario description	From the IUT-UA send a sequence of five ATS messages (IPMs) with IHE addressing a remote AMHS user. • Message 1 (CT1101cM01) shall have priority KK; • Message 2 (CT1101cM02) shall have priority GG; • Message 3 (CT1101cM03) shall have priority FF; • Message 4 (CT1101cM04) shall have priority DD; • Message 5 (CT1101cM05) shall have priority SS. Each message shall contain a **general-text-body-part with ISO 646 repertoire** and have different filing time and message text. The originators-reference (OHI) element shall be absent. Verify the messages received by the AMHS UA Test Tool at the AMHS interface. Check the format and contents of the submission envelope, IPM heading and body. Verify in particular, the priority value contained in the submission envelope and the following elements contained in the message content: • body part type, • Repertoire, • absence of originators-reference (OHI); • precedence-policy-identifier set to value 1.3.27.8.0.0[19], • precedence equivalent to the ATS message priority, • authorization-time (filing time), • message text.
AMHS ref: Doc 9880, Part II	3.1 (ATS Message User Agent) and Table 3-2, 3.3.4 (Use of IPM elements in support of the extended ATSMHS)
Test class	Normal AMHS communications (N)

[19] See CTUA1101a

5.1.2 CTUA1102 – Submit an IPM with IHE, containing optional heading information

CTUA1102	**Submit an IPM with IHE, containing optional heading information**
Test criteria	This test is successful, if the IUT submits an IPM with IHE, containing originators-reference (OHI) element and A2 text length correctly.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) addressing a remote AMHS user. The message text length shall be 1800 characters. • The first ATS message shall have priority FF and contain originators-reference (OHI) text of 40 characters; • The second ATS message shall have priority FF and contain originators-reference (OHI) text of maximum possible length; • The third ATS message shall have priority SS and contain originators-reference (OHI) text of 40 characters; • The fourth ATS message shall have priority SS and contain originators-reference (OHI) text of maximum possible length. Each message shall contain one body part with maximum A2 message length and have a different filing time and message text. Check the ATS messages submitted by the IUT-UA and verify the correct contents of the message (text length 1800 characters) and in particular, check the format and contents of the originators-reference (OHI). Check the maximum length of the originators-reference (OHI) in case of FF[20] and SS[21] messages.
AMHS ref: Doc 9880, Part II	4.5.2.2.10 (OHI), 3.3.4.3 – 3.3.4.4 (Originators-reference)
Test class	Normal AMHS communications (N)

[20] OHI text of 53 characters is the maximum length for non-SS messages, if the total maximum line length is 69 characters. (Total line length = OHI text + space + 6 digit filing time + space + 8 characters originator indicator)

[21] OHI text of 48 characters is the maximum length for SS messages, if the total maximum line length is 69 characters. (Total line length = OHI text + space + 6 digit filing time + 8 characters originator indicator + 5 characters priority alarm)

5.1.3 CTUA1103 – Submit an IPM with IHE, containing recipient addresses of different addressing schemes

CTUA1103	**Submit an IPM with IHE, containing recipient addresses of different addressing schemes**
Test criteria	This test is successful, if the IUT submits an IPM with IHE, addressing recipient addresses of remote AMHS and AFTN users of different addressing schemes of correctly.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) with IHE, addressing different kinds of remote AMHS and AFTN users. • The first ATS message shall have 3 recipient addresses of addressing scheme XF; • The second ATS message shall have 3 recipient addresses of addressing scheme CAAS (single O); • The third ATS message shall have 3 recipient addresses of addressing scheme CAAS (multiple O); • The fourth ATS message shall have 6 recipient addresses; 2 recipient addresses of each type of addressing scheme as above. Each message shall contain one body part and have a different filing time and message text. The originators-reference (OHI) element shall be absent. Each message shall have priority FF. Check the messages received at the AMHS UA Test Tool. Verify that: • each message contains in the submission envelope the respective number of AMHS recipient addresses and an IPM heading with the same number of AMHS and AFTN recipients. • the precedence value is equivalent to the ATS message priority FF and associated to each recipient address.
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

5.1.4 CTUA1104 – Submit an IPM with IHE, containing different numbers of recipient addresses

CTUA1104	**Submit an IPM with IHE, containing different numbers of recipient addresses**
Test criteria	This test is successful, if the IUT submits an IPM with IHE, addressing different numbers of recipient addresses of remote AMHS and AFTN users correctly.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) with IHE, addressing different numbers of remote AMHS and AFTN users. • The first ATS message shall have 7 recipient addresses (one shall be the Test User Agent) and priority KK; • The second ATS message shall have 14 recipient addresses (one shall be the Test User Agent) and priority GG; • The third ATS message shall have 21 recipient addresses (one shall be the Test User Agent) and priority FF; • (optional) The fourth ATS message shall have more than 21 recipient addresses, if possible (one shall be the Test User Agent) and priority DD. Each message shall contain one body part and have a different filing time and message text. The originators-reference (OHI) element shall be absent. Check the messages received at the AMHS UA Test Tool. Verify that: • each message contains in the submission envelope the respective number of AMHS recipient addresses (7, 14, 21, more) and an IPM heading with the same number of AMHS and AFTN recipients. • the precedence value is equivalent to the respective ATS message priority and associated to each recipient address.
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

5.1.5 CTUA1105 – Submit an IPM with IHE, containing different kinds of recipient addresses

CTUA1105	**Submit an IPM with IHE, containing different kinds of recipient addresses**
Test criteria	This test is successful, if the IUT submits an IPM with IHE, addressing different kinds of recipient addresses of remote AMHS and AFTN users correctly.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) with IHE, addressing different kinds of remote AMHS and AFTN user. • The first ATS message shall have two primary recipients and two copy recipients (one shall be the Test User Agent); • The second ATS message shall have two primary recipients and two blind-copy recipients (one shall be the Test User Agent); • The third ATS message shall have two primary recipients, two copy recipients and two blind-copy recipients (one shall be the Test User Agent). Each message shall contain one body part and have different filing time and message text. The originators-reference (OHI) element shall be absent. Each message shall have priority FF. Verify that the messages (IPMs) are submitted to the AMHS UA Test Tool. Check the messages received at the AMHS UA Test Tool. Verify that: • the first message contains in the submission envelope all recipient addresses (the 2 primary and the 2 copy) and an IPM heading with all AMHS and AFTN recipients, • the second message should be split into 3 messages by the IUT-UA: o two messages each of which has only one of the blind-copy recipient (Bcc) addresses in the submission envelope and all addresses except the other Bcc address or except both Bcc addresses in the IPM Heading, and o one message which has only the 2 primary recipients' addresses in the submission envelope and in the IPM Heading. Only this message shall have the originator-report-request flag set to "non-delivery-report", • the third message should be split into 3 messages by the IUT-UA: o two messages which have only one Bcc address in the submission envelope and all addresses except the other Bcc address or except both Bcc addresses in the IPM Heading, and o one message which has all other (the 2 primary and the 2

	copy) addresses in the submission envelope and in the IPM Heading. Only this message shall have the originator-report-request flag set to "non-delivery-report". Check the messages received at the Test UA. Verify that: • the first message addressed to the Test UA contains all addresses (the 2 primary and the 2 copy) in the IPM Heading, • the second message addressed to the Test UA as Bcc contains the 2 primary addresses in the IPM Heading, • the third message addressed to the Test UA as Bcc contains all addresses (the 2 primary and the 2 copy) in the IPM Heading. *Note.– Depending on the implementation of the IUT-UA the IPM Heading of the second and third message contains additionally the blind-copy address belonging to the Test UA or no blind-copy address.*
AMHS ref: Doc 9880, Part II	3.1 (ATS Message User Agent) and Table 3-2, 4.5.2 (IPM conversion)
Test class	Normal AMHS communications (N)

5.2 Delivery Operations (A2-IHE)

5.2.1 CTUA1201 – Deliver an IPM with IHE to the IUT – basic capability (A2-IHE)

Note.– The conformance test CTUA1201 is passed successfully by the IUT only if all tests CTUA1201a, CTUA1201b and CTUA1201c are passed successfully.

CTUA1201a	**Deliver an IPM with IHE, containing an ia5-text to the IUT-UA**
Test criteria	This test is successful, if the IUT receives an ATS message (IPM) with IHE, containing an **ia5-text** delivered from the Test MTA.
Scenario description	From the AMHS UA Test Tool send a sequence of five ATS messages (IPMs) with IHE, containing an **ia5-text** to the IUT-UA. • The first ATS message shall have priority KK; • The second ATS message shall have priority GG; • The third ATS message shall have priority FF; • The fourth ATS message shall have priority DD; • The fifth ATS message shall have priority SS. Each message shall have a different filing time and message text. The originators-reference (OHI) element shall be absent. Verify the messages received at the AMHS User Agent. Verify in particular, the following elements displayed at the AMHS User Agent: • precedence equivalent to the ATS message priority, • authorization-time (filing time), • message text.
AMHS ref: Doc 9880, Part II	3.1 (ATS Message User Agent) and Table 3-2, 3.3.4 (Use of IPM elements in support of the extended ATSMHS)
Test class	Normal AMHS communications (N)

CTUA1201b	**Deliver an IPM with IHE, containing an ia5-text-body-part to the IUT-UA**
Test criteria	This test is successful, if the IUT receives an ATS message (IPM) with IHE, containing an **ia5-text-body-part** delivered from the Test MTA.
Scenario description	From the AMHS UA Test Tool send a sequence of five ATS messages (IPMs) with IHE, containing an **ia5-text-body-part** to the IUT-UA. • The first ATS message shall have priority KK; • The second ATS message shall have priority GG; • The third ATS message shall have priority FF; • The fourth ATS message shall have priority DD; • The fifth ATS message shall have priority SS. Each message shall have a different filing time and message text. The originators-reference (OHI) element shall be absent. Verify the messages received at the AMHS User Agent. Verify in particular, the following elements displayed at the AMHS User Agent: • precedence equivalent to the ATS message priority, • authorization-time (filing time), • message text.
AMHS ref: Doc 9880, Part II	3.1 (ATS Message User Agent) and Table 3-2, 3.3.4 (Use of IPM elements in support of the extended ATSMHS)
Test class	Normal AMHS communications (N)

CTUA1201c	**Deliver an IPM with IHE, containing a general-text-body-part with ISO 646 repertoire to the IUT-UA**
Test criteria	This test is successful, if the IUT correctly receives an ATS message (IPM) with IHE, containing a **general-text-body-part with ISO 646 repertoire** delivered from the Test MTA.
Scenario description	From the AMHS UA Test Tool send a sequence of five ATS messages (IPMs) with IHE, containing a **general-text-body-part with ISO 646 repertoire** to the IUT-UA. • The first ATS message shall have priority KK; • The second ATS message shall have priority GG; • The third ATS message shall have priority FF; • The fourth ATS message shall have priority DD; • The fifth ATS message shall have priority SS. Each message shall have a different filing time and message text. The originators-reference (OHI) element shall be absent. Verify the messages received at the AMHS User Agent. Verify in particular, the following elements displayed at the AMHS User Agent: • precedence equivalent to the ATS message priority, • authorization-time (filing time), • message text.
AMHS ref: Doc 9880, Part II	3.1 (ATS Message User Agent) and Table 3-2, 3.3.4 (Use of IPM elements in support of the extended ATSMHS)
Test class	Normal AMHS communications (N)

5.2.2 CTUA1202 – Deliver an IPM with erroneous IHE elements

CTUA1202	**Deliver an IPM with erroneous IHE elements**
Test criteria	This test is successful, if the IUT, when receiving an IPM containing erroneous IHE elements, displays this message to its local AMHS user regardless of the contained error, or indicates the error situation
Scenario description	From the AMHS UA Test Tool send a sequence of messages (IPMs) to the IUT addressed to the local UA. • The first message (IPM) shall contain no *precedence-policy-identifier* extension element; • The second message (IPM) shall contain an invalid OID in the *precedence-policy-identifier* extension element*;* • The third message (IPM) shall contain no *precedence* extension element associated with the recipient; • The fourth message (IPM) shall contain an invalid *precedence* value (ATS message priority indicator); • The fifth message (IPM) shall contain no *authorization-time* (filing time) extension element; • The sixth message (IPM) shall contain an invalid *authorization-time* (filing time); • The seventh message (IPM) shall contain (valid) IPM heading extension elements and additionally an ATS-message-header containing equivalent values; • The eighth message (IPM) shall contain (valid) IPM heading extension elements and additionally an ATS-message-header containing values which are different from those contained in the IPM heading extensions. The originators-reference (OHI) element shall not be used. Verify that the messages are received at the UA. If they are displayed at the UA, check the contents of each received ATS message and verify the precedence (ATS message priority), authorization-time (filing time) and message text displayed[22]. If they are not displayed at the UA, check that the error situation is indicated.
AMHS ref: Doc 9880, Part II	3.1 (ATS Message User Agent) and Table 3-2
Test class	Erroneous AMHS parameters (E1)

[22] The displayed message depends on the UA capabilities

5.2.3 CTUA1203 – Deliver an IPM with IHE, containing optional heading information

CTUA1203	**Deliver an IPM with IHE, containing optional heading information**
Test criteria	This test is successful, if the IUT displays IPMs with IHE, containing the optional heading information (OHI) in the originators-reference element correctly or indicates an error, if the OHI text is too long. Under this condition, the reception of the A2 message length capability shall be checked.
Scenario description	From the AMHS UA Test Tool send a sequence of ATS messages (IPMs) with IHE to the IUT-UA. • The first ATS message shall have priority FF and contain OHI text of less than 53 characters in the originators-reference [23]; • The second ATS message shall have priority FF and contain OHI text of exactly 53 characters in the originators-reference; • The third ATS message shall have priority FF and contain OHI text of more than 53 characters in the originators-reference; • The fourth ATS message shall have priority SS and contain OHI text of less than 48 characters[24] in the originators-reference; • The fifth ATS message shall have priority SS and contain OHI text of exactly 48 characters in the originators-reference; • The sixth ATS message shall have priority SS and contain OHI text of more than 48 characters in the originators-reference. Each message shall have different filing time and message text. The message text length in the body part shall be 1800 characters. Check the ATS messages received at IUT-UA and verify the correct contents of the messages (text length 1800 characters) and in particular, check the format and contents of the OHI being displayed. Verify that the IUT-UA indicates an error for the third and sixth ATS message if they are not displayed.
AMHS ref: Doc 9880, Part II	4.5.2.2.10 (OHI), 3.3.4.3 – 3.3.4.4 (Originators-reference)
Test class	Normal AMHS communications (N), Erroneous AMHS parameters (E1)

[23] OHI text of 53 characters is the maximum length for non-SS messages, if the total maximum line length is 69 characters. (Total line length = OHI text + space + 6 digit filing time + space + 8 characters originator indicator)

[24] OHI text of 48 characters is the maximum length for SS messages, if the total maximum line length is 69 characters. (Total line length = OHI text + space + 6 digit filing time + 8 characters originator indicator + 5 characters priority alarm)

5.2.4 CTUA1204 – Deliver an IPM with IHE, containing different kinds of recipient address

CTUA1204	**Deliver an IPM with IHE, containing different kinds of recipient addresses**
Test criteria	This test is successful, if the IUT displays IPMs with IHE, containing different kinds of recipient address of the IUT-UA correctly.
Scenario description	From the AMHS UA Test Tool send a sequence of ATS messages (IPMs) with IHE, addressing the IUT-UA in different ways. • The first ATS message shall have the IUT-UA address as primary recipient; • The second ATS message shall have the IUT-UA address as copy recipient; • The third ATS message shall have the IUT-UA address as blind-copy recipient. Each message shall have a different filing time and message text. The originators-reference (OHI) element shall be absent and the priority shall be FF. Verify that all messages (IPMs) are displayed at the IUT-UA correctly. Check that the recipient address is correctly indicated as: • primary recipient (first message), • copy recipient (second message), and • blind-copy recipient (third message)
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

5.2.5 CTUA1205 – Deliver an IPM with IHE, containing empty or missing IPM heading fields

CTUA1205	**Deliver an IPM with IHE, containing empty or missing IPM heading address fields**
Test criteria	This test is successful, if the IUT, when receiving an ATS message (IPM) with IHE from a peer MTA with empty or missing IPM heading address fields, delivers this message to its local AMHS user regardless of the empty or missing IPM heading address fields.
Scenario description	From the AMHS UA Test Tool send a sequence of messages (IPMs) with IHE to the IUT-UA. The delivery envelope shall contain correct addresses whereas address fields are missing or empty in the IPM heading. • The first message shall contain no originator address in the IPM heading. • The second message shall contain no primary, copy, or blind copy recipient addresses in the IPM heading. Each message shall have different filing time and message text. The originators-reference (OHI) element shall be absent and the priority FF. Check any messages received and displayed at the UA[25]. Check the IUT-UA's log files with respect to delivered messages and reported errors, if any.
AMHS ref: Doc 9880, Part II	3.1 (ATS Message User Agent) and Table 3-2 (AMH21)
Test class	Normal AMHS communications (N)

[25] The displayed message depends on the UA capabilities.

5.2.6 CTUA1206 – Deliver an IPM with IHE and invalid originator address similar to CAAS

CTUA1206	Deliver an IPM with IHE and invalid originator address similar to CAAS
Test criteria	This test is successful, if the IUT is able to receive ATS messages (IPMs) with IHE that contain originator addresses looking like CAAS type ones but being invalid.
Scenario description	From the AMHS UA Test Tool send to the IUT-UA a sequence of ATS messages (IPMs) with IHE being originated from the PRMD "AMHSLAND-1" which uses CAAS. The messages shall have a valid recipient address, but an erroneous originator address in the IPM heading. • The 1st ATS message shall contain an originator address with an invalid *common-name* attribute that consists of 9 letters, e.g. "AAAAMHABC"; • The 2nd ATS message shall contain an originator address with an invalid *common-name* attribute that consists of only 6 letters, e.g. "AAAAMH"; • The 3rd ATS message shall contain an originator address with a valid *organizational-unit-names* attribute "AAAA", but an empty *common-name* attribute; • The 4th ATS message shall contain an originator address with a valid *common-name* attribute "AAAAMHAA", but an empty *organizational-unit-names* attribute; • The 5th ATS message shall contain an originator address with a valid *common-name* attribute "AAAAMHAA", but an *organizational-unit-names* attribute that is different from the first 4 letters of the *common-name* attribute, e.g. "AAAX"; • The 6th ATS message shall contain an originator address with a valid *common-name* attribute "AAAAMHAA" and correct *organizational-unit-names* attribute "AAAA", but an empty *organization-name* attribute. Verify that the IUT-UA displays the messages with invalid originator O/R address or indicates an error.
AMHS ref: Doc 9880, Part II	
Test class	Erroneous AMHS parameters (E1)

5.2.7 CTUA1207 – Deliver an IPM with IHE and invalid originator address similar to XF

CTUA1207	**Deliver an IPM with IHE and invalid originator address similar to XF**
Test criteria	This test is successful, if the IUT is able to receive ATS messages (IPMs) that contain originator addresses looking like XF type ones but being invalid.
Scenario description	From the AMHS UA Test Tool send to the IUT-UA a sequence of ATS messages (IPMs) with IHE being originated from the PRMD "AMHSLAND-3" which uses XF. The messages shall have a valid recipient address, but an erroneous originator address in the IPM heading. • The 1st ATS message shall contain an originator address with the value "AFTN" in the *organization-name* attribute, but an invalid *organizational-unit-names* attribute that consists of 9 letters, e.g. value "ACCCMHABC"; • The 2nd ATS message shall contain an originator address with the value "AFTN" in the *organization-name* attribute, but an invalid *organizational-unit-names* attribute that consists of 6 letters, e.g. value "ACCCMH"; • The 3rd ATS message shall contain an originator address with the value "AFTN" in the *organization-name* attribute, but an empty *organizational-unit-names* attribute; • The 4th ATS message shall contain an originator address with an empty *organization-name* attribute and a valid *organizational-unit-names* attribute, e.g. value "ACCCMHAA"; • The 5th ATS message shall contain an originator address with an invalid *organization-name* attribute, e.g. "UNKNOWN" and a valid *organizational-unit-names* attribute, e.g. value "ACCCMHAA". Verify that the IUT-UA displays the messages with invalid originator O/R address or indicates an error.
AMHS ref: Doc 9880, Part II	
Test class	Erroneous AMHS parameters (E1)

5.2.8 CTUA1208 – Deliver a redirected IPM with IHE to the IUT

CTUA1208	**Deliver a redirected IPM with IHE to the IUT-UA**
Test criteria	This test is successful, if the IUT receives a redirected ATS message (IPM) with IHE, containing one body part delivered from the Test MTA.
Scenario description	Redirect an AMHS O/R address different from the address of the IUT-UA to the address of the IUT-UA. From the AMHS UA Test Tool send a sequence of five ATS messages (IPMs) with IHE, containing an ia5-text to the recipient address, which is subject to redirection. • The first ATS message shall have priority KK; • The second ATS message shall have priority GG; • The third ATS message shall have priority FF; • The fourth ATS message shall have priority DD; • The fifth ATS message shall have priority SS. Each message shall have different filing time and message text. The originators-reference (OHI) element shall be absent. Verify that all messages are received at the AMHS User Agent. Verify in particular, that the following elements are displayed at the AMHS User Agent: • the recipient address in the IPM Heading as originally sent by the AMHS UA Test Tool, • precedence equivalent to the ATS message priority, • authorization-time (filing time), • message text. Check, if the user gets any indication that the message was subject to redirection, for example, a display of the redirection-history or the originally-intended-recipient-name. Verify for the received priority SS message, that the user gets a request to return a receipt notification.
AMHS ref: Doc 9880, Part II	3.1 (ATS Message User Agent) and Table 3-2
Test class	Normal AMHS communications (N)

5.3 Specific Submission Operations with IHE

5.3.1 CTUA1301 – Submission of acknowledgements to messages with precedence equivalent to "SS"

CTUA1301	**Submission of acknowledgements to messages with precedence equivalent to "SS"**
Test criteria	This test is successful, if the IUT submits the acknowledgement to a message with *precedence equivalent to* "SS" as receipt notification and/or as IPM correctly.
Scenario description	From the AMHS UA Test Tool send a sequence of ATS messages (IPMs) with IHE with *precedence equivalent to* "SS" and the *receipt-notification* request flag set to 'true' to the IUT-UA. Each message shall have different filing time and message text. The originators-reference (OHI) element shall be absent. The first and the second ATS messages are addressed to the IUT-UA directly. The third and the fourth ATS messages are addressed to users other than the IUT-UA but are redirected to the IUT-UA. The IUT-UA shall return after user action (manual intervention) acknowledgements for the first and the third message as AMHS receipt notifications, and for the second and the fourth message as IPMs with IHE containing the respective AFTN acknowledgement messages. Verify that the receipt notifications have been generated correctly, in particular, that: • the *ipn-originator* (IPN) represents the IUT-UA, • the *receipt-time* of the IPN is generated from the time at which the IUT-UA received the subject IPM, • the value of the *priority* element of the IPN is set to "urgent", • the values of *subject-ipm* and *recipient-name* are inserted correctly from log entries. Verify that the IPMs with IHE have been generated correctly, in particular, that: • the *originator-name* of the incoming IPM is used as originator indicator in the text (R <filing time> <originator>) and as recipient address of the AFTN acknowledgement message, • the **filing time** in the text of the AFTN acknowledgement is taken from the *authorization-time* of the incoming IPM, • the value of the *priority* element in the message envelope is set to "urgent",

AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

5.3.2 CTUA1302 – Submission of probes

CTUA1302	**Submission of probes**
Test criteria	This test is successful, if the IUT submits probes testing the capability of a remote AMHS user correctly and displays the result of any returned AMHS report.
Scenario description	From the IUT-UA send a sequence of probes to the AMHS UA Test Tool containing an intended recipient address (Test UA). • The first probe shall contain a content-length value up to 16k (octets); • Optional: If the IUT-UA supports the selection of different types of text body parts the submission of the first probe with a content-length value up to 16k (octets) should be repeated with the possible selections; • The second probe shall contain a content-length value of at least 64 k (octets); • Optional: If the IUT-UA supports the selection of different types of text body parts the submission of the second probe with a content-length value of at least 64 k (octets) should be repeated with the possible selections; • Optional: The third probe shall contain a content-length value up to 2 Mbytes and original-encoded-information-type with OID id-eit-file-transfer which is related to the file-transfer-body-part; • Optional: The fourth probe shall contain a content-length value up to 2 Mbytes and original-encoded-information-types related to the text body part and the file-transfer-body-part; • Optional: If the IUT-UA supports the selection of different types of text body parts the submission of the fourth probe with two body parts should be repeated with the possible selections. The AMHS UA Test Tool shall return DRs for the first probe as well as for the first optional probes, if generated. The other probes shall be responded by NDRs. Verify that the probes are correctly composed in all elements. Verify that in all submitted probes the originator-report-request argument is set to “report”. Verify in particular, that the values contained in the content-length and original-encoded-information-types correspond to the input of the user. Verify that the returned AMHS reports are correctly received and displayed at the IUT-UA. *Note.– The test is identical to CTUA302 and the same results are expected (independent from the user capability IHE).*

AMHS ref: Doc 9880, Part II	2.2.2 (AMHS information model)
Test class	Normal AMHS communications (N)

5.3.3 CTUA1303 – Checking of default envelope elements (flag setting) in submitted IPMs with IHE

CTUA1303	**Checking of default envelope elements (flag setting) in submitted IPMs with IHE**
Test criteria	This test is successful, if the IUT submits IPMs with IHE, with the correct default envelope elements ("flags").
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) with IHE to the AMHS UA Test Tool. • The first message shall be addressed to an AMHS Direct User (the Test UA) with normal (default) flag setting; • The second message shall be addressed to an AMHS Indirect User (Test MTCU) with normal (default) flag setting; • The third message shall be addressed to an AMHS distribution list. Each message shall contain one body part and have different filing time and message text. The originators-reference (OHI) element shall be absent. Each message shall have precedence equivalent to FF. Verify the setting of the following envelope elements (flags). As default values the following settings are is expected: Per-message-indicators: The per-message-indicators shall be absent or set to the default values as follows: • *disclosure-of-other-recipients- prohibited (0)* • *implicit-conversion- allowed (0)* • *alternate-recipient- prohibited (0)* • *content-return- not-requested (0)* Originator-report-request element (for all recipients): The originator-report-request element shall be set to: *non-delivery-report.* Extensions elements: The following extensions elements shall not be used or take their default values: • *recipient-reassignment- allowed (0)* • *dl-expansion- allowed (0)* • *conversion-with-loss- allowed (0)* *Note.– Default values are those as defined in ISO/IEC 10021-4 (ITU-T X.411).*
AMHS ref: Doc 9880, Part II	4.4.2.3.17, 4.4.2.3.18 and 4.4.2.3.20 (per-message-indicators), 4.4.2.3.8.1 (extension elements)
Test class	Normal AMHS communications (N)

5.3.4 CTUA1304 – Checking of user settings in the envelopes of submitted IPMs with IHE (optional)

CTUA1304	**Checking of user settings in the envelopes of submitted IPMs with IHE (optional)**
Test criteria	This test is successful, if the IUT submits IPMs with IHE, with the expected settings of the different **envelope elements (**"flags") as set by the user if such a feature is implemented.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) with IHE to the AMHS UA Test Tool with different possible flags set by the user if implemented. • The first IPM shall be submitted with per-message-indicators (only for those supported at the user interface) set as follows: o *disclosure-of-other-recipients-requested (1)* o *implicit-conversion-prohibited (1)* o *alternate-recipient-allowed (1)* o *content-return-requested (1)* • The second IPM shall be submitted using extensions elements (only for those supported at the user interface) as follows: o *recipient-reassignment-prohibited (1)* o *dl-expansion-prohibited (1)* o *conversion-with-loss-prohibited (1)* Each message shall contain one body part and have different filing time and message text. The originators-reference (OHI) element shall be absent. Each message shall have precedence equivalent to FF. Verify the setting of the envelope elements (flags) in accordance with the performed user actions.
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

5.3.5 CTUA1305 – Checking of user settings, especially report request, in submitted IPMs with IHE (optional)

CTUA1305	**Checking of user settings, especially report request, in submitted IPMs with IHE (optional)**
Test criteria	This test is successful, if the IUT submits IPMs with IHE and with the expected report request settings in the message submission envelope.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) with IHE to the AMHS UA Test Tool with the originator-report-request element either set to a default (pre-configured) value or set to a value which corresponds to a selection made by the user (if such function is implemented). • The first IPM shall be submitted to two recipients (A and B) with **default** report requests (no selection made by the user); • Optional: The second IPM shall be submitted to two recipients (A and B) with **non-delivery report** requested for recipient A and **report** requested for recipient B; • Optional: The third IPM shall be submitted to two recipients (A and B) with **report** requested for recipient A and **non-delivery report** requested for recipient B; • Optional: The fourth IPM shall be submitted to two recipients (A and B) with **report** requested for both recipients; Each message shall contain one body part and have different filing time and message text. The originators-reference (OHI) element shall be unused. Each message shall have precedence equivalent to FF. Check the report request settings in the first IPM. The expected value of the report request elements for both recipients is: "**non-delivery report**". Verify that in all other IPMs the report request elements contained in the message submission envelopes correspond to the selection performed by the user. *Note.– It is recommended that the setting to "no-report" is prevented at the UA (operational requirements dictate that upon reception of an NDR the responsibility for the message remains at the UA user site, therefore the generation of NDRs should not be preventable by the UA settings).*
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

5.4 Specific Delivery Operations with IHE

5.4.1 CTUA1401 – Deliver a non-delivery report (NDR) to an AMHS user

CTUA1401	Deliver a non-delivery report (NDR) to an AMHS user
Test criteria	This test is successful, if the IUT displays non-delivery reports containing the standardized reason and diagnostic codes to an AMHS user correctly.
Scenario description	From the AMHS UA Test Tool send a set of non-delivery reports to the IUT-UA directly attached. The set of NDRs shall cover the full scope of reason and diagnostic codes standardized in ISO/IEC 10021-4 (ITU-T Rec. X.411), section 8.3.1.2.1.11 and section 8.3.1.2.1.12, respectively (see Table 11). The report delivery envelope shall contain the report-destination of the IUT-UA. The reports may contain fictitious values for those elements which are normally related to a subject message, like subject -identifier, original-encoded-information-types and originally-intended-recipient-name. Monitor that the reports are received at the IUT-UA and displayed. Verify that: • reported recipient(s) in report content is/are displayed, • the reason and diagnostic codes of the delivered reports are identical to those contained in the reports sent from the AMHS UA Test Tool. • the text associated with the reason and diagnostic codes is displayed correctly, i.e. as standardized in ISO/IEC 10021-4 or ITU-T Rec. X.411 (Abstract Syntax Definition in Figure 2 - Part 16). *Note.– The test is identical to CTUA401 and the same results are expected (independent from the user capability IHE).*
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

AMHS Report ID	*number of Per-Recipient-Fields*	reason code	diagnostic codes (range)
CTUA1401M01	*16*	0	0 - 15
CTUA1401M02	*31*	0	0 - 30
CTUA1401M03	*31*	1	0 - 30
CTUA1401M04	*5*	1	46 - 50
CTUA1401M05	*3*	2	8 - 10
CTUA1401M06	*7*	2	19 - 25
CTUA1401M07	*1*	3	31
CTUA1401M08	*14*	4	32 - 45
CTUA1401M09	*1*	5	not used
CTUA1401M10	*1*	6	not used
CTUA1401M11	*1*	7	not used
CTUA1401M12	*28*	8	51 - 78

Table 11: Non-delivery-reason-codes and non-delivery-diagnostic-codes used in CTUA1401

Note.– The non-delivery-diagnostic-code is an optional element and, for example, not contained in test messages CTUA1401M09, CTUA1401M10 and CTUA1401M11.

5.4.2 CTUA1402 – Deliver an NDR containing non-standard reason or diagnostic codes

CTUA1402	**Deliver an NDR containing non-standard reason or diagnostic codes**
Test criteria	This test is successful, if the IUT displays non-delivery reports containing reason and diagnostic codes which are syntactically correct, but different from those defined in section 8.3.1.2.1.11 and section 8.3.1.2.1.12 of ISO/IEC 10021-4 (ITU-T Rec. X.411).
Scenario description	From the AMHS UA Test Tool send several NDRs to the IUT-UA. The NDRs may contain fictitious values for those fields which are normally related to a subject message. Six NDRs shall be sent containing the following reason and diagnostic codes: • CTUA1402M01 contains "9" for the *non-delivery-reason-code* and "invalid-arguments" for the *non-delivery-diagnostic-code;* • CTUA1402M02 contains "255" for the *non-delivery-reason-code* and "invalid-arguments" for the *non-delivery-diagnostic-code*; • CTUA1402M03 contains "32767" for the *non-delivery-reason-code* and "invalid-arguments" for the *non-delivery-diagnostic-code*; • CTUA1402M04 contains "unable-to-transfer" for the *non-delivery-reason-code* and "79" for the *non-delivery-diagnostic-code*; • CTUA1402M05 contains "unable-to-transfer" for the *non-delivery-reason-code* and "255" for the *non-delivery-diagnostic-code*; • CTUA1402M06 contains "unable-to-transfer" for the *non-delivery-reason-code* and "32767" for the *non-delivery-diagnostic-code*. Verify that all NDRs are delivered to the IUT-UA. Check the contained reason and diagnostic codes (if any). Verify that no misleading information is presented to the AMHS user. *Note.– The test is identical to CTUA402 and the same results are expected (independent from the user capability IHE).*
AMHS ref: Doc 9880, Part II	
Test class	Erroneous AMHS parameters (E1)

5.4.3 CTUA1403 – Deliver IPNs containing receipt (RN) or non-receipt (NRN) notification

CTUA1403	**Deliver IPNs containing receipt notification (RN) or non-receipt notification (NRN)**
Test criteria	This test is successful, if the IUT displays IPNs containing receipt notification (RN) and/or non-receipt notification (NRN) to an AMHS user correctly.
Scenario description	From the AMHS UA Test Tool send a sequence of IPNs to the IUT-UA. • The first IPN shall contain one receipt notification (RN); • The second IPN shall contain another receipt notification (RN); • The third IPN shall contain one non-receipt notification (NRN); • The fourth IPN shall contain another non-receipt notification (NRN). Monitor the IPNs received at the IUT-UA. Verify that: • all IPNs are delivered to the IUT-UA, and • the receipt (RN) or non-receipt (NRN) notification are displayed correctly. *Note.– The test is identical to CTUA403 and the same results are expected (independent from the user capability IHE).*
AMHS ref: Doc 9880, Part II	IPN
Test class	Normal AMHS communications (N)

5.4.4 CTUA1404 – Deliver a report containing delivery (DR) and/or non-delivery (NDR) information

CTUA1404	**Deliver a report containing delivery (DR) and/or non-delivery (NDR) information**
Test criteria	This test is successful, if the IUT displays delivery and non-delivery reports to an AMHS user correctly.
Scenario description	From the AMHS UA Test Tool send a set of reports to the IUT-UA directly attached. • The first report shall contain one delivery (DR) information; • The second report shall contain two delivery (DR) information; • The third report shall contain ten delivery (DR) information; • The fourth report shall contain one non-delivery (NDR) information; • The fifth report shall contain two non-delivery (NDR) information; • The sixth report shall contain ten non-delivery (NDR) information; • The seventh report shall contain one delivery (DR) and one non-delivery (NDR) information; • The eighth report shall contain two delivery (DR) and two non-delivery (NDR) information; • The ninth report shall contain ten delivery (DR) and ten non-delivery (NDR) information. Monitor the reports received at the IUT-UA. Verify that: • all reports are delivered to the IUT-UA, and • all the delivery (DR) and non-delivery (NDR) information is displayed correctly. *Note.– The test is identical to CTUA404 and the same results are expected (independent from the user capability IHE).*
AMHS ref: Doc 9880, Part II	DR
Test class	Normal AMHS communications (N)

5.4.5 CTUA1405 – Deliver IPMs with IHE containing optional arguments in the delivery envelope

CTUA1405	**Deliver IPMs with IHE containing optional arguments in the delivery envelope**
Test criteria	This test is successful, if the IUT receives IPMs with IHE, containing optional delivery envelope arguments and displays the values correctly for those elements supported at the user interface.
Scenario description	From the AMHS UA Test Tool send a sequence of ATS messages (IPMs) with IHE to the IUT-UA. • The first message shall contain only the mandatory delivery envelope arguments, i.e. message-delivery-identifier, message-submission-time, message-delivery-time, originator-name, this-recipient-name and content-type. The priority argument shall be absent or take its default value (normal); • The second message shall contain the following optional delivery envelope element: other-recipient-names; • The third message shall contain the following optional delivery envelope element: original-encoded-information-types; • The fourth message shall contain the following optional delivery envelope element: content-identifier; • The fifth message shall contain the following delivery envelope extension element: trace-information; • The sixth message shall contain the following delivery envelope extension element: dl-expansion-history; • The seventh message shall contain the following delivery envelope extension element: redirection-history; Each message shall contain one general-text-body-part[26] and have different filing time and message text. The originators-reference (OHI) element shall be unused. Verify that: • all messages are received at the IUT-UA, and • the values of the mandatory and optional delivery envelope arguments, which are supported at the user interface, are displayed correctly.
AMHS ref: Doc 9880, Part II	

[26] The general-text-body-part is used to check the original-encoded-information-types (see 3rd message.

Test class	Normal AMHS communications (N)

5.5 Enhanced Submission UA Capability with IHE

Note.– Only those messages shall be used which meet the AMHS User Capability of the IUT.

5.5.1 CTUA1501 – Submit an IPM with IHE with the implemented capability of one body part

CTUA1501	**Submit an IPM with IHE with the implemented capability of one body part**
Test criteria	This test is successful, if the IUT submits an ATS message (IPM) with IHE containing **one body part with length equal to that defined for the respective capability class** to a peer UA correctly.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) with IHE addressing the AMHS UA Test Tool and meeting the defined user capability. • Capability A16: This Message shall have one body part with message text length of 16 k characters; • Capability A64: This Message shall have one body part with message text length of 64 k characters; • Capability B2: This Message shall have one general-text-body-part with Repertoire B and with message text length of 1800 characters; • Capability B16: This Message shall have one general-text-body-part with Repertoire B and with message text length of 16 k characters; • Capability B64: This Message shall have one general-text-body-part with Repertoire B and with message text length of 64 k characters; • Capability F1024[27]: This Message shall have one file-transfer-body-part with body part size of 1 M bytes; • Capability F2048: This Message shall have one file-transfer-body-part with body part size of 2 M bytes. Each ATS message with IHE shall have *precedence equivalent to* GG (ATS priority) and a different *authorization-time* (filing time). The *originators-reference* (OHI) element shall be absent. Verify the messages received by the AMHS UA Test Tool. Check the format and contents of the submission envelope, IPM heading and body. Verify in particular, the respective message length and body part type.

[27] Lower values not recommended

AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

5.5.2 CTUA1502 – Submit an IPM with IHE with the implemented capability of two body parts

CTUA1502	**Submit an IPM with IHE with the implemented capability** of **two body parts**
Test criteria	This test is successful, if the IUT submits an ATS message (IPM) with IHE, containing **two body parts with values equal to those defined for the respective capability class** to a peer UA correctly.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) with IHE addressing the AMHS UA Test Tool and meeting the defined user capability. • Capability A64+F2048[28]: This Message shall have two body parts; one body part with message text length of 64 k characters and one file-transfer-body-part with body part size of 2 M bytes; • Capability B64+F2048: This Message shall have two body parts; one general-text-body-part with Repertoire B and with message text length of 64 k characters and one file-transfer-body-part with body part size of 2 M bytes. Each ATS message shall have *precedence equivalent to* GG (ATS priority) and different *authorization-time* (filing time). The *originators-reference* (OHI) element shall be absent. Verify the messages received by the AMHS UA Test Tool. Check the format and contents of the submission envelope, IPM heading and body (two body parts). Verify in particular: • the respective message length/body part size and body part types of both body parts, • *priority* element "non-urgent".
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

[28] Other values not recommended.

5.6 Enhanced Delivery UA Capability with IHE

Note.– Only those messages shall be used meeting the AMHS User Capability of the IUT.

5.6.1 CTUA1601 – Deliver an IPM with IHE with the implemented capability of one body part

CTUA1601	**Deliver an IPM with IHE with the implemented capability of one body part**
Test criteria	This test is successful, if the IUT displays ATS messages (IPMs) with IHE, containing **one body part with length equal to that defined for the respective capability class,** correctly.
Scenario description	From the AMHS UA Test Tool send a sequence of ATS messages (IPMs) with IHE addressing the IUT-UA and meeting the defined user capability. • Capability A16: This Message shall have one body part with message text length of 16 k characters; • Capability A64: This Message shall have one body part with message text length of 64 k characters; • Capability B2: This Message shall have one general-text-body-part with Repertoire B and with message text length of 1800 characters; • Capability B16: This Message shall have one general-text-body-part with Repertoire B and with message text length of 16 k characters; • Capability B64: This Message shall have one general-text-body-part with Repertoire B and with message text length of 64 k characters; • Capability F1024[29]: This Message shall have one file-transfer-body-part with body part size of 1 M bytes; • Capability F2048: This Message shall have one file-transfer-body-part with body part size of 2 M bytes. Each ATS message shall have *precedence equivalent to* GG (ATS priority) and different *authorization-time* (filing time). The *originators-reference* (OHI) element shall be absent. Verify that all messages, which are supported by the IUT-UA, are correctly received. Verify in particular, that • the message text (in full length) and IHE elements are displayed correctly.

[29] Lower values not recommended

	• the respective body part size and content for messages with FTBP are correct.
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

5.6.2 CTUA1602 – Deliver an IPM with IHE with the implemented capability of two body parts

CTUA1602	**Deliver an IPM with IHE with the implemented capability of two body parts**
Test criteria	This test is successful, if the IUT displays ATS messages (IPMs) with IHE, containing **two body parts with values equal to those defined for the respective capability class,** correctly.
Scenario description	From the AMHS UA Test Tool send a sequence of ATS messages (IPMs) with IHE addressing the IUT-UA and meeting the defined user capability. • Capability A64+F2048[30]: This Message shall have two body parts; one body part with message text length of 64 k characters and one file-transfer-body-part with body part size of 2 M bytes; • Capability B64+F2048: This Message shall have two body parts; one general-text-body-part with Repertoire B and with message text length of 64 k characters and one file-transfer-body-part with body part size of 2 M bytes. Each ATS message shall have *precedence equivalent to* GG (ATS priority) and different *authorization-time* (filing time). The *originators-reference* (OHI) element shall be absent. Verify that all messages, which are supported by the IUT-UA, are correctly received. Verify in particular, that • the message text (in full length) and IHE elements are displayed correctly; and • the respective body part size and content are correct. • *priority* element "non-urgent".
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

[30] Other values not recommended.

6. Extended AMHS Service – Test Procedures with DIR (Use of Directory Services)

6.1 Submission Operations (DIR)

6.1.1 CTUA2101 – Submission of an IPM with use of Directory Services (DIR)

CTUA2101	**Submission of an IPM with use of Directory Services (DIR)**
Test criteria	This test is successful, if the IUT submits … correctly.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) … • Verify …
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

– To be developed –

6.2 Delivery Operations (DIR)

6.2.1 CTUA2201 – Delivery of an IPM with use of Directory Services (DIR)

CTUA2201	**Delivery of an IPM with use of Directory Services (DIR)**
Test criteria	This test is successful, if the IUT displays … correctly.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) … • Verify …
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

– To be developed –

7. Extended AMHS Service – Test Procedures with SEC (Security)

7.1 Submission Operations (SEC)

7.1.1 CTUA3101 – Submission of an IPM with Security (SEC)

CTUA3101	**Submission of an IPM with Security (SEC)**
Test criteria	This test is successful, if the IUT submits … correctly.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) … • Verify …
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

– To be developed –

7.2 Delivery Operations (SEC)

7.2.1 CTUA3201 – Delivery of an IPM with Security (SEC)

CTUA3201	**Delivery of an IPM with Security (SEC)**
Test criteria	This test is successful, if the IUT displays … correctly.
Scenario description	From the IUT-UA send a sequence of ATS messages (IPMs) … • Verify …
AMHS ref: Doc 9880, Part II	
Test class	Normal AMHS communications (N)

– To be developed –

END of Appendix D-UA

EUR AMHS Manual

Appendix H

Application/Service oriented AMHS Profiles	
Document Reference:	EUR AMHS Manual, Appendix H
Author:	Planning Group
Revision Number:	Version 15.0
Date:	12/11/2020
Filename:	EUR_AMHS_Manual-Appx_H_v15_0.docx

Document Control Log

Edition	Date	Comments	section/pages affected
0.1	25/11/2016	Initial version	all
0.2	15/02/2017	Incorporation of provided comments by PG	all
0.3	23/02/2017	Incorporation of comments provided during PG66	all
1.0	23/03/2017	Final version for presentation to AFSG/21 as attachment to CP-AMHSM-16-012	all
12.0	28/04/2017	Adopted version (AFSG/21)	
12.1	23/04/2018	Incorporation of CP-AMHSM-17-004	References
13.0	27/04/2018	Adopted version (AFSG/22)	
14.0	05/03/2019	Adopted version (AFSG/23) – without changes	
14.1	26/11/2019	Incorporation of CP-AMHS-19-xxx Adaption: According to COG/74&RCOG/11 Decision /4, Approval of AFS to SWIM Transition Task Force (AST TF) Terms of Reference (ToR) and coherent Work Programme, the Author of EUR Doc 020 changed from “AFSG PG” to “AST PG”.	all
14.2	30/09/2020	Incorporation of DR-AMHSM-19-003	Section 3.2.3.2
15.0	12/11/2020	Adopted version (AST TF/01)	

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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

[7] ICAO Annex 10 – Aeronautical Telecommunications, Volume II: Communication Procedures

List of Tables

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, 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:
>
> […]
>
> d) 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)

Ref	*Element*	*Doc 9880 static support (Extended Service) Orig/Rec*	*Doc 9880 reference*	*Dynamic action upon generation of IWXXM message*	*Value and/or comments*
Part 2: AMH21/A.1.3 IPM body					
1	ia5-text	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)

Ref	*Element*	*Doc 9880 static support (Extended Service) Orig/Rec*	*Doc 9880 reference*	*Dynamic action upon generation of IWXXM message*	*Value and/or comments*
Part 1: AMH21/A.1.2 IPM heading fields					
1	this-IPM	M/M	3.1.2.2.1, 3.1.4.2.1 (AMH21 support)	G	
2	originator	M/M		G	Address of the originating OPMET system (MET switch)
3	authorizing-users	O/M		X	
4	primary-recipients	M/M		G	Recipient addresses are populated by the MET switch based on its routing table (EUR Doc 033, ref. [1] section5.1.4)
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	

Ref	*Element*	*Doc 9880 static support (Extended Service) Orig/Rec*	*Doc 9880 reference*	*Dynamic action upon generation of IWXXM message*	*Value and/or comments*
9	related-IPMs	O/M		X	
10	subject	M/M		G	This field shall carry the TTAAiiCCCCYYGGggBBB 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 (1) 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)					

Ref	*Element*	*Doc 9880 static support (Extended Service) Orig/Rec*	*Doc 9880 reference*	*Dynamic action upon generation of IWXXM message*	*Value and/or comments*
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)

Ref	*Element*	*European ATS Messaging Service Profile - static support Orig/Rec*	*European ATS Messaging Service Profile - reference*	*Dynamic action upon generation of IWXXM message*	*Value and/or comments*
1	related-stored-file	-			
2	contents-type				
2.1	document-type				
2.1.1	document-type-name	M/M	A.2.4.2.1	G	default OID value: 1.0.8571.5.3 {iso(1) standard(0) 8571(8571) document-type(5) unstructured-binary(3)}
3	environment				
3.1	application-reference				
3.1.1	registered-identifier	O/M	A.2.4.2.2 and A.2.4.2.6	G	OID value: 1.3.27.8.1.2 {iso (1) identified-organisation (3) icao (27) atn-amhs (8) application (1) digital-met (2)}
3.4	user-visible-string	O/M	A.2.4.2.6	G	"Digital MET"
4	compression	-			See para 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	

Ref	*Element*	*European ATS Messaging Service Profile - static support* *Orig/Rec*	*European ATS Messaging Service Profile - reference*	*Dynamic action upon generation of IWXXM message*	*Value and/or comments*
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) mhs(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: - the P3 submission-envelope includes the following parameters with the correct values: o *originator-name*: OR-name of the originator o *recipient-name*: OR-name of each recipient of the message o *content-type*: 22 o *encoded-information-types*: OID 2.6.1.12.0 o *priority*: non urgent - the following IPM heading fields are present with the correct values: o *originator*: address of the originating OPMET system (MET switch) o *primary-recipients*: recipient addresses as populated by the MET switch o *subject*: TTAAiiCCCCYYGGggBBB part of the filename of FTBP

	o *importance*: normal, if present o *authorization-time* of the IPM heading extensions field: equivalent to filing time o *precedence-policy-identifier* of the IPM heading extensions field: OID 1.3.27.8.0.0 o *originators-reference* of the IPM heading extensions field: absent - the following elements in the common data types are present with the corresponding values: o *precedence*: 28 o *formal-name*: originator address and recipient addresses - the elements *rn* and *nrn* in the common data types are absent - the message has exactly one file-transfer-body-part - the parameters composing FTBP are according to section A.2.4.2 of the EUR AMHS Manual Appendix B and the following elements are present with the correct values: o *document-type-name*: OID 1.0.8571.5.3 o *registered-identifier*: OID 1.3.27.8.1.2 o *user-visible-string*: 'Digital MET' o *incomplete-pathname*: bulletin file name as specified in section 5.1.4 of EUR Doc 033, for example: A_LAFR31LFPW171500_C_LFPW_20151117150010.xml.[compression_suffix] o If generated, check the element *date-and-time-of-last-modification* o If generated, check the element *actual-values*, the value of which represents the size of the Attachment data in bytes - the elements *related-stored-file*, *compression* and *extensions* of the FTBP parameters are absent - The IWXXM data itself are included in the FileTransferData element of the file-transfer-body-part; the octet-aligned encoding should be used.
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	Submit from the UA under test a sequence of several IPMs including each time a bulletin of different file size consisting of METAR. The size of the message should not exceed the limit defined in Appendix B, F.2.4.3 Check all parameters listed in test case WXM101, with the corresponding values. If the element *actual-values* is generated check each time the respective value, which represents the size of the Attachment data in bytes.
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	Submit from the UA under test an IPM including a bulletin consisting of SPECI. Check that all parameters and their respective values are in accordance to test case WXM101, except that the value of the element *incomplete-pathname* is according to the bulletin file name as specified in section 5.1.4 of EUR Doc 033. The test is repeated with the submission of an IPM including bulletin consisting of TAF.
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	Submit from the UA under test an IPM including a bulletin consisting of AIRMET. Check that all parameters and their respective values are in accordance to test case WXM101, except that: - the *priority* abstract value of the P3 submission-envelope is normal - the value of the element *precedence* is 57 - the value of the element *incomplete-pathname* is according to the bulletin file name as specified in section 5.1.4 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	Submit from the UA under test an IPM including a bulletin consisting of SIGMET. Check that all parameters and their respective values are in accordance to test case WXM101, except that: - the *priority* abstract value of the P3 submission-envelope is normal - the value of the element *precedence* is 57 - the value of the element *incomplete-pathname* is according to the bulletin file name as specified in section 5.1.4 of EUR Doc 033. The test is repeated with the submission of an IPM including bulletin consisting of VAA.

	The test is repeated with the submission of an IPM including bulletin consisting of TCA.
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	The MTA sends an IPM including a bulletin consisting of METAR. Check that the UA under test receives the IPM with the following parameters: - the message delivery envelope includes the following parameters with the correct values: o *originator-name*: OR-name of the originator o *this-recipient-name*: OR-name of the recipient to whom the message is delivered o *content-type*: 22 o *encoded-information-types*: OID 2.6.1.12.0 o *priority*: non urgent o *message-delivery-identifier*: it 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) o *message-delivery-time*: it contains the time at which delivery occurs and at which the MTS is relinquishing responsibility for the message (X.411, section 8.3.1.1.1.2) - the following IPM heading fields are present with the correct values: o *originator* o *primary-recipients* o *subject*: TTAAiiCCCCYYGGggBBB part of the filename of FTBP o *importance*: normal, if present o *authorization-time* of the IPM heading extensions field: equivalent to filing time o *precedence-policy-identifier* of the IPM heading extensions field: OID 1.3.27.8.0.0 o *originators-reference* of the IPM heading extensions field: absent - the following parameters in the common data types are present with the corresponding values: o *precedence*: 28 - the elements *rn* and *nrn* in the common data types are absent - the message has exactly one file-transfer-body-part - the parameters composing the FTBP are according to section A.2.4.2 of the EUR AMHS Manual Appendix B and the following elements are present with the correct values: o *document-type-name*: OID 1.0.8571.5.3

	○ *registered-identifier*: OID 1.3.27.8.1.2 ○ *user-visible-string*: 'Digital MET' ○ *incomplete-pathname*: 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 *date-and-time-of-last-modification* ○ If generated, check the element *actual-values*, the value of which represents the size of the Attachment data in bytes - the elements *related-stored-file*, *compression* and *extensions* of the FTBP parameters are absent - The IWXXM data itself are included in the FileTransferData element of the file-transfer-body-part; the octet-aligned encoding should be used.
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	The MTA sends a sequence of several IPMs including each time a bulletin of different file size consisting of METAR. Check that the UA under test receives all IPMs and that the parameters described in test case WXM201 are received with the corresponding values. If the element *actual-values* is present check each time the respective value, which represents the size of the Attachment data in bytes.
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	The MTA sends an IPM including a bulletin consisting of SPECI. Check that the UA under test receives the IPM and the parameters described in test case WXM201 are received with the corresponding values, except the element *incomplete-pathname* which value is according to the bulletin file name as specified in section 5.1.4 of EUR Doc 033. The test is repeated with the delivery of an IPM including a bulletin consisting of TAF.
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: - the *priority* abstract value of the P3 submission-envelope is normal - the value of the element *precedence* is 57 - the value of the element incomplete-pathname is according to the bulletin file name as specified in section 5.1.4 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: - the *priority* abstract value of the P3 submission-envelope is normal - the value of the element *precedence* is 57 - the value of the element incomplete-pathname is according to the bulletin file name as specified in section 5.1.4 of EUR Doc 033. The test is repeated with the delivery of an IPM including a bulletin consisting of VAA. The test is repeated with the delivery of an IPM including a bulletin consisting of TCA.
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