EUR AMHS Manual

Appendix D-UA

AMHS UA Conformance Tests	
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16.0	20/10/2021	Adopted version (AST TF/02)	
17.0	15/06/2023	Adopted version (AST TF/04)	

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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)

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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).

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[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).
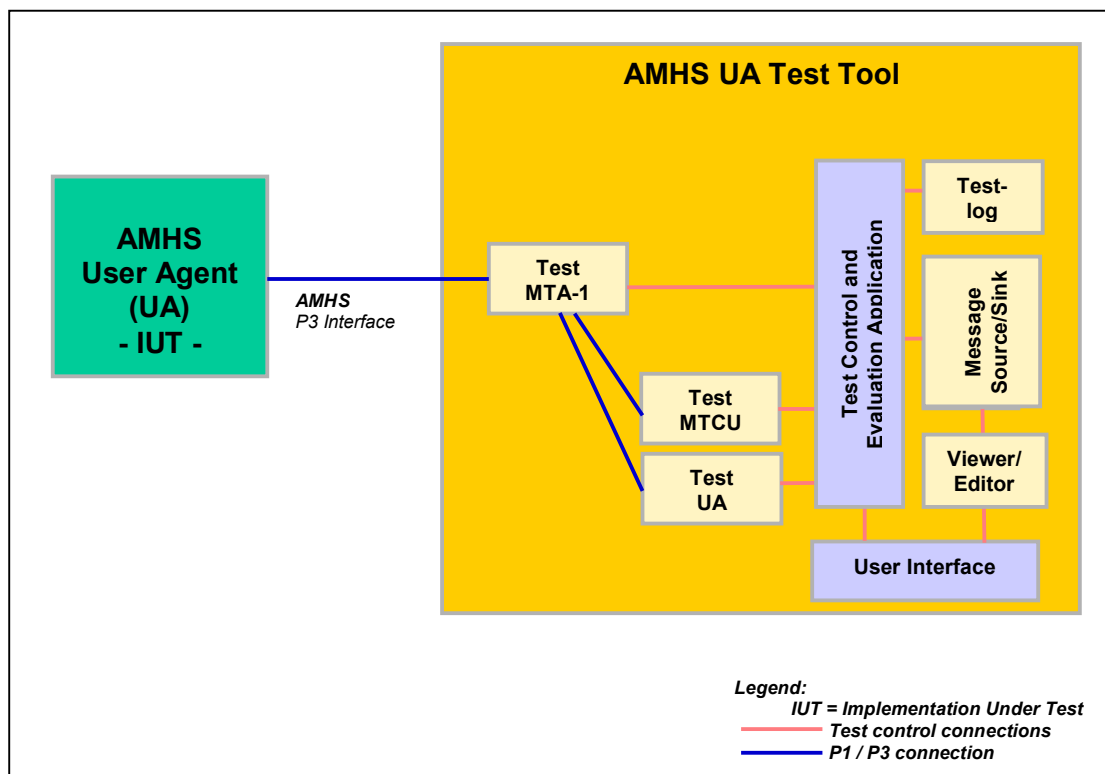
Figure 1: AMHS UA Conformance Test environment

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

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[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)

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[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 <u>CTUA202 – Deliver an IPM containing erroneous ATS-message-header or ATS-message-text format</u>

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)

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[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)

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[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: ○ *disclosure-of-other-recipients -requested(1)* ○ *implicit-conversion-prohibited(1)* ○ *alternate-recipient-allowed(1)* ○ *content-return-requested(1)* • The second IPM shall be submitted using extensions elements (only for those supported at the user interface) as follows: ○ *recipient-reassignment-prohibited(1)* ○ *dl-expansion-prohibited(1)* ○ *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)

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[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)

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[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)

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[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

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[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)

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[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,

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[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)

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[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)

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[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:
	
	   ○ 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
	
	   ○ 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:
	
	   ○ 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
	
	   ○ 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)

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[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)

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[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)

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[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 <u>CTUA1302 – Submission of probes</u>

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	

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[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.

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[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)

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[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.

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[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)

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[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)

<mark>– To be developed –</mark>

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)

<mark>– To be developed –</mark>

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