EUR AMHS Manual

Appendix F

AMHS Pre-operational 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 Service (ATSMHS), Second Edition – 2016

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

[4] EUR Doc 020 – EUR AMHS Manual, Appendix B, European ATS Messaging Service Profile

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

[6] EUR Doc 020 – EUR AMHS Manual, Appendix D, AMHS Conformance Tests

[7] EUR Doc 020 – EUR AMHS Manual, Appendix E, AMHS Interoperability Tests

[8] EUR Doc 021 – ATS Messaging Management Manual

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1. Introduction

1.1 Purpose of the Document

The purpose of the document is to define AMHS Pre-operational Tests in order to ensure the interoperability between AMHS systems prepared for going into operation. The document defines the objectives and prerequisites as well as the tests themselves.

The AMHS Pre-operational Tests are interoperability type tests. They are the last tests between Operational Systems and should be performed within the operational network environment before the "AMHS cut-over".

After "AMHS cut-over" the AMHS relation between the two systems is operational. That means: the exchange of the complete operational traffic (or a part of that) is performed by means of AMHS only. For this traffic no other means (AFTN or CIDIN) are used.

1.2 Objectives of the Pre-operational Tests

The objectives of the AMHS Pre-operational Tests are:

1. To test the interoperability between the AMHS systems in an operational environment.

2. To test the integrity of the messages exchanged.

3. To test the message exchange after a disturbance (e.g. queued messages).

The prerequisites of the AMHS Pre-operational Tests are:

- Successful performance of AMHS Conformance Tests as specified in [6], through which the compliance of all systems under test to the [2] has been demonstrated, and

- Successful performance of AMHS Interoperability Tests as specified in [7], through which the interoperability of these AMHS systems in a test (bed) environment has been demonstrated, and

  Note. – Under specific conditions and upon mutual agreement between the involved parties, Interoperability Tests could be skipped as specified in section 7.3.2.2 of [3].

- Successful performance of Underlying Network Tests, through which is demonstrated that the underlying (IP) network is available and stable, and

- System configuration on both systems (The agreed set is loaded and established.)

The messages used in the AMHS Pre-operational Tests are generated either:

- manually; or

- using operational bilateral or parallel duplicated traffic;

1.3   Test Overview

The following tests have to be performed:

1. PRE001: Go-NoGo Test, Establishment of MTA associations;
    A simple test which checks that MTA associations are properly configured and established. It is a prerequisite for the subsequent tests.

2. PRE002: Go-NoGo Test, Preliminary message exchange;
    Exchange of two test messages (from Direct User A to Direct User B and from Direct User B to Direct User A) to check systems configuration and proper underlying network functions. It is a prerequisite for the subsequent tests.

3. PRE003 (Conditional): Direct User A to Direct User B and Indirect User B;
    Series of three test messages sent from Direct User A to Direct User B and Indirect User B, using different message characteristics.

4. PRE004 (Conditional): Direct User B to Direct User A and Indirect User A;
    Series of three test messages sent from Direct User B to Direct User A and Indirect User A, using different message characteristics.

5. PRE005 (Conditional): Indirect User A to Direct User B and Indirect User B;
    Series of three test messages sent from Indirect User A to Direct User B and Indirect User B, using different message characteristics.

6. PRE006 (Conditional): Indirect User B to Direct User A and Indirect User A;
    Series of three test messages sent from Direct User B to Direct User A and Indirect User A, using different message characteristics.

7. PRE007 (Conditional): Direct User A to Direct User B with FTBP;
    One message sent from Direct User A to Direct User B with FTBP.

8. PRE008 (Conditional): Direct User B to Direct User A with FTBP;
    One message sent from Direct User B to Direct User A with FTBP.

9. PRE009 (Conditional): Re-routing arrangement from system A to system B, via system C;
    One test message sent from Direct User A to Direct User B, via a relay third system C.

10. PRE010 (Conditional): Re-routing arrangement from system B to system A, via system C;
    One test message sent from Direct User B to Direct User A, via a relay third system C.

11. PRE011: Go-NoGo Test for message integrity;
    One message with the text "THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG" (ICAO Annex 10 Vol. III 8.2.8 Recommendation 8.2.8) is sent from Direct User A to Direct User B and Indirect User B. The same text is sent from Direct User B to Direct User A and Indirect User A.

12. PRE012: Load Tests;
    A message queue is created in both systems. The amount of queued messages should correspond to the expected traffic during a determined period. The queue is flushed and the time needed to restore the normal traffic flow is measured.
    PRE012/TC01: Load Test using IPMs with a single text body part;

PRE012/TC02 (Conditional): Load Test using a) IPMs with a single text body part (optional) and b) IPMs with a file transfer body part and optionally a text body part;

13. PRE013a: Go-NoGo Test with operational bilateral traffic;
    Exchange of operational bilateral traffic without duplication.
    Or,
    PRE013b: Go-NoGo Test with duplicated operational traffic;
    Exchange of duplicated operational traffic.

14. (Optional) Selected test cases from the AMHS Interoperability Tests:
    Due to the fact that in the pre-operational test phase the operational systems include the complete operational setup, a selection of interoperability tests may be repeated.

The estimated duration of the AMHS Pre-operational Tests is about 2 days and calculated as follows:

Test ID	Duration	Remark
PRE001 and PRE002	1 hour	inclusive set-up / co-ordination
From PRE003 to PRE006	2 hours	**Conditional** - IOT
PRE007 and PRE008	1 hour	**Conditional** - FTBP
PRE009 and PRE010	2 hours	**Conditional** - Re-routing arrangements, including set-up and co-ordination
PRE011 and PRE012	1 day	
PRE013a or PRE013b	1 day	
Optional (selected Interoperability Tests)	To be defined	Upon mutual agreement

Table 1: Estimated duration of the AMHS Pre-operational Tests

1.4 Document Structure

Chapter 1 presents the purpose, objectives and test overview.

Chapter 2 presents the test environment used for AMHS Pre-operational Testing.

Chapter 3 defines the set-up and configuration of the AMHS systems.

Chapter 4 defines the addressing plan for AMHS Pre-operational Testing.

Chapter 5 contains the description of the Pre-operational Tests.

2.   AMHS Pre-operational Test Environment

2.1   Application infrastructure

The AMHS systems prepared for going into operation are interconnected by means of the operational infrastructure (cf. Figure 1).
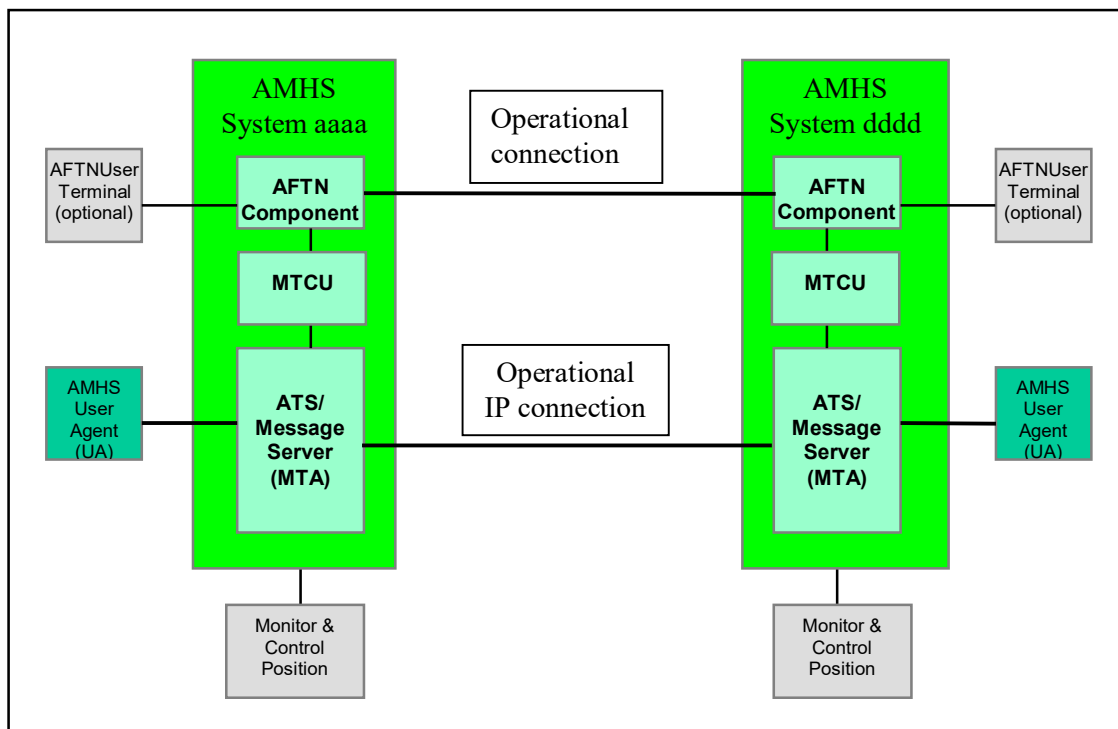
Figure 1: AMHS Pre-operational Test Environment

2.2   Transport infrastructure

In the EUR Region, the infrastructure to be used is based on the TCP/IP protocol (IPv4/IPv6). In line with existing recommendations[1], the operational IP connection should utilise IPv6 at the international level and should provide a redundant connectivity. The redundancy concept of the network ensures the reachability in any case between the MTAs, while the MTA uses single IP addresses only.

Figure 2 shows a generic example how a redundant IP connectivity can be designed. The real configuration and details shall be agreed between the test partners.

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[1] The EUROCONTROL Task Force for Aeronautical data exchange over IP (iPAX-TF) had recommended to use IPv6 on international level (between the member States) and had proposed an IPv6 addressing plan. In this context EUROCONTROL acts on behalf of the ANSPs as a "IPv6 provider" towards RIPE Network Coordination Centre (NCC) and is responsible for the registration and maintenance of the IPv6 addresses for the European (EUROCONTROL member) States. (The RIPE NCC is one of five Regional Internet Registries (RIRs) providing Internet resource allocations, registration services and co-ordination activities that support the operation of the Internet globally.)

Figure 2: Example for a redundant international IP connection (Operational and Test)

Note. – This figure has to be replaced by the real configured and used infrastructure.
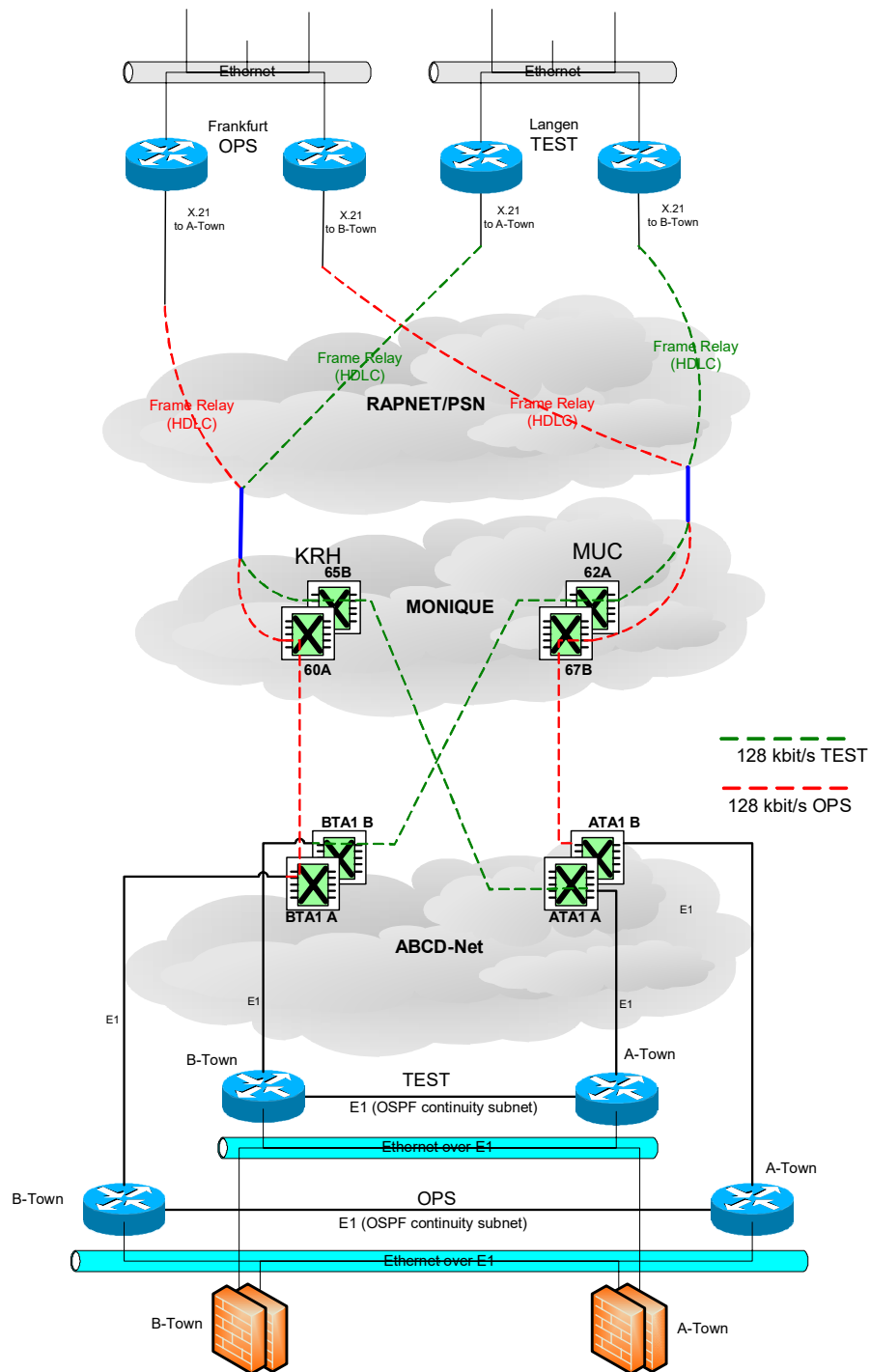
The RAPNET/MONIQUE/ABCD-Net infrastructure in this case should be replaced by PENS partly or completely later on if available.

3.   Operational system setup - Configuration

The AMHS Systems involved in the pre-operational tests are expected to be configured "as close" to the Operational Systems as possible (with respect to routing tables and look-up tables).

Special addresses needed for testing are listed in this document.

MTA names etc. shall follow the recommendations laid down in [3]. For completeness they are listed hereafter.

3.1   Configuration Lower Layers

Item	Test partner 1	Test partner 2	recommended values
TSAP	TBD	TBD	e.g. '544350' ("TCP") or '4D4853' ("MHS")
IPv6 Address	TBD	TBD	in line with the EUROCONTROL addressing plan
IP Port	TBD	TBD	102

Table 2: Configuration Lower Layers

3.2   Configuration Upper Layers

Item	Test partner 1	Test partner 2	recommended values
MTA Name	MTA-aaaa[2]-1	MTA-dddd[3]-1	cf. [3] section 8.2
Password	TBD	TBD	should be exchanged between involved partners
PSAP	not used	not used	not used
SSAP	not used	not used	not used
Number of incoming associations	TBD	TBD	should be equal to the outgoing number

---

[2] Where aaaa = the location indicator of the MTA location of the Test partner 1.

[3] Where dddd = the location indicator of the MTA location of the Test partner 2.

Item	Test partner 1	Test partner 2	recommended values
Number of outgoing associations	TBD	TBD	should be equal to the incoming number
Protocol type	X.400/1988	X.400/1988	cf. PDR M6080001 Phasing out of IPM 1984
Dialogue mode	Monologue	Monologue	see [4]

Table 3: Configuration Upper Layers

4.   Addressing Plan for AMHS Pre-operational Testing

4.1   User addresses

To meet the scope of testing, the test-address space used by AMHS Pre-operational Testing should include, at a minimum, one Direct User and one Indirect User for each test partner.

4.1.1 AMHS Users for Test partner 1

User Name	MF-address	Remarks
aaaaAMHA	/C=XX/A=ICAO/P=bbbb/O=cccc/OU1=aaaa /CN=aaaaAMHA	Direct User or other than AMHA
aaaaAFTN	/C=XX/A=ICAO/P=bbbb/O=cccc/OU1=aaaa /CN=aaaaAFTN	Indirect User or other than AFTN
		or more

Table 4: Registered AMHS Users (Test partner 1)

Example:

User Name	MF-address	Remarks
LEEEAMHA	/C=XX/A=ICAO/P=SPAIN/O=LEEE/OU1=LEEE /CN=LEEEAMHA	Direct User
LEEEAFTN	/C=XX/A=ICAO/P=SPAIN/O=LEEE/OU1=LEEE/CN =LEEEAFTN	Indirect User

4.1.2 AMHS Users for Test partner 2

User Name	MF-address	Remarks
ddddAMHA	/C=XX/A=ICAO/P=eeee/O=ffff/OU1=dddd /CN=ddddAMHA	Direct User or other than AMHA
ddddAFTN	/C=XX/A=ICAO/P=eeee/O=ffff/OU1=dddd /CN=ddddAFTN	Indirect User or other than AFTN
		or more

Table 5: Registered AMHS Users (Test partner 2)

Example:

User Name	MF-address	Remarks
EDDDAMHA	/C=XX/A=ICAO/P=GERMANY/O=EDDD/OU1=EDDD /CN=EDDDAMHA	Direct User
EDDDAFTN	/C=XX/A=ICAO/P=GERMANY/O=EDDD/OU1=EDDD /CN=EDDDAFTN	Indirect User

4.1.3 <u>AMHS Users for Test partner 3</u>

User Name	MF-address	Remarks
ggggAMHA	/C=XX/A=ICAO/P=hhhh/O=iiii/OU1=gggg /CN=ggggAMHA	Direct User or other than AMHA
ggggAFTN	/C=XX/A=ICAO/P=hhhh/O=iiii/OU1=gggg /CN=ggggAFTN	Indirect User or other than AFTN
		or more

Table 6: Registered AMHS Users (Test partner 3)

Example:

User Name	MF-address	Remarks
LGGGAMHA	/C=XX/A=ICAO/P=GREECE/O=LGGG/OU1=LGGG /CN=LGGGAMHA	Direct User
LGGGAFTN	/C=XX/A=ICAO/P=GREECE/O=LGGG/OU1=LGGG /CN=LGGGAFTN	Indirect User

4.2 AFTN and X.400 Routing Tables

Systems already in AMHS operation and involved in the Pre-operational Tests are configured with the latest valid **AFTN and X400 Routing Table** available in the AMC, including the minor changes needed for the Pre-operational Tests themselves.

For systems not in AMHS operation, the following actions are recommended:

- The systems involved in the Pre-operational Tests are configured with the latest valid **AFTN Routing Table** available in the AMC, including the minor changes needed for the Pre-operational Tests themselves.

- Only for the selected traffic (bilaterally agreed addresses) shall AFTN routing paths through the MTCU be set up.

- The systems are configured with the **complete X.400 Routing Table** covering all existing PRMD names. For all PRMD names which are not involved in the Pre-operational Tests, a default routing to a "Dummy MTA direction" shall be defined in order to handle exceptional situations within the Pre-operational Tests as well as for future operations.

- Only for the selected traffic (bilaterally agreed addresses) shall respective X.400 routing paths through the MTCU or to the adjacent MTA be set up.

- The recommended complete setup of the X.400 Routing table allows the responsible international COM Centre to ensure that each message entered into an international Network (AFTN, CIDIN as well as AMHS) is correct in format and addressing. When using a reduced X.400 routing table (use of general default routing entries), such checking of addressing cannot be performed, especially if domestic UAs are connected. Only with the full set of PRMD routing entries a minimum checking of address validity is possible.

4.3   Look-up Tables

4.3.1   Generic look-up Tables

It is recommended that the systems are configured with the complete set of information required for the address translation.

The tables needed are reflected in the Intra MD Addressing function of the ATS Messaging Management Centre (AMC). From the AMC the complete **MD Look-up Table** (AmhsMdRegister_OPER...csv), the complete **CAAS Look-up Tables** (AmhsCaasTable_OPER….csv) and the complete **User Address Look-Up Table** (UserAdresses_OPER….csv) can be downloaded.

Loading of the complete tables is recommended to ensure that the AMHS application is able to handle the extensive content of the tables covering the address translation of all existing AFTN addresses into AMHS O/R addresses (XF as well as CAAS) and vice versa.

5. Test Description

5.1 Test Scenarios

The tests are described in the following test scenarios:

PRExxx   where xxx is the scenario number.

The following table contains an overview of the test scenarios:

Test-case id	Test function
PRE001 Go-NoGo	Establishment of MTA associations, Test partner 1 to Test partner 2 and Test partner 2 to Test partner 1
PRE002 Go-NoGo	Preliminary message exchange, Test partner 1 to Test partner 2 and Test partner 2 to Test partner 1
PRE003 Conditional	Messages from Direct User A to Direct User B and Indirect User B
PRE004 Conditional	Messages from Direct User B to Direct User A and Indirect User A
PRE005 Conditional	Messages from Indirect User A to Direct User B and Indirect User B
PRE006 Conditional	Messages from Indirect User B to Direct User A and Indirect User A
PRE007 Conditional	Messages with FTBP from Direct User A to Direct User B
PRE008 Conditional	Messages with FTBP from Direct User B to Direct User A
PRE009 Conditional	Message from Direct User A to Direct User B, via a relay Centre C
PRE010 Conditional	Message from Direct User B to Direct User A, via a relay Centre C
PRE011 Go-NoGo	Integrity test with a reference message from Test partner 1 to Test partner 2 and from Test partner 2 to Test partner 1
PRE012	Load Test, exchange of queue data of the size of the expected amount of operational messages exchanged
PRE013a or, PRE013b Go-NoGo	Integrity test with operational bilateral traffic (a) or duplicated operational traffic (b)

Table 7: Test Scenario overview

5.2 Pre-operational AMHS Tests

This section contains the test-cases. Each test-case is written on a test sheet, which should be completed during testing.

The top of the test-sheet contains the **test-case id** and a description of the **tested functionality**.

The **Test description** contains the instructions for the tester, the addresses used and the test message used.

The **Test control** contains the expected reaction/observation of the Systems Under Test (SUTs).

The section **Test result** is used to log the test results.

The **Conditional test cases** listed in this document are **optional**, when the AMHS Interoperability Tests as specified in [7] have been successfully passed. However, when the involved parties have commonly agreed to skip the AMHS Interoperability Tests as specified in [7], the execution of the **conditional** test cases listed in this document is **strongly recommended**.

Test cases from PRE007 to PRE010 and PRE012/TC02 remain **conditional** but can only be performed if the user capabilities allow so (FTBP test cases) or if a third partner is available (re-routing test cases).

The characteristics of the test messages are represented in this document according to the AMHS User Capabilities, as listed in the ATS Messaging Management Manual [8], section D5 "AMHS User Capabilities related file (AMHS User Capabilities Management)".

- A2 : IA5 BP and GT BP (Repertoire A), up to 1800 characters

- A16: IA5 BP and GT BP (Repertoire A), up to 16k characters

- A64: IA5 BP and GT BP (Repertoire A), up to 64k characters

- B2: IA5 BP and GT BP (Repertoire A and B), up to 1800 characters

- B16: IA5 BP and GT BP (Repertoire A and B), up to 16k characters

- B64: IA5 BP and GT BP (Repertoire A and B), up to 64k characters

- F2048: FTBP, up to 2M Bytes

- EA: Elementary Address (direct AMHS User Address)

- EI : Elementary Address (indirect AMHS User Address)

5.2.1 Go-NoGo test cases

Test reference :	Tested functionality :
PRE001/TC01 Go-NoGo	Establish and administrate MTA associations. It is a prerequisite for subsequent tests.

Test description:

Test partner A shall establish an MTA association to test partner B.

Test control:

Based on the agreed MTA bind parameters the established association shall be monitored in order to verify that:

- In case of permanent connection the association(s) remains even if no messages are transferred.

- In case of dynamic connection the association(s) is closed after the specified timer.

- The partners do not establish more associations than agreed.

Test result:

PASS	FAILED	INCONCLUSIVE

Test reference : PRE001/TC02 Go-NoGo	Tested functionality : Establish and administrate MTA associations. It is a prerequisite for subsequent tests.

Test description:

Test partner B shall establish an MTA association to test partner A.

Test control:

Based on the agreed MTA bind parameters the established association shall be monitored in order to verify that:

- In case of permanent connection the association(s) remains even if no messages are transferred.

- In case of dynamic connection the association(s) is closed after the specified timer.

- The partners do not establish more associations than agreed.

Test result:

PASS	FAILED	INCONCLUSIVE

Test reference :	Tested functionality :
PRE002/TC01 Go-NoGo	This is a simple test with the purpose to check that the configuration and underlying network work correctly. It is a prerequisite for subsequent tests. Direct User A to Direct User B (A2 + EA) communication with priority FF.

Test description:

From aaaaAMHA send the following FF priority message to ddddAMHA:

```
PRE002/TC01
1234567890123456789012345678901234567890123456789012345678901234567890123456789
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

(and so on till)

ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
```

Check the correct reception at ddddAMHA and send the following acknowledgement if the message is received correctly.

From ddddAMHA send the following message to aaaaAMHA:

```
ACK001 PLS CONTINUE
```

Test control:

Check the correct reception of the message at ddddAMHA. No difference must exist between the message as defined above and the received message.

Test result:

PASS	FAILED	INCONCLUSIVE

Test reference :	Tested functionality :
PRE002/TC02 Go-No-Go	This is a simple test with the purpose to check that the configuration and underlying network work correctly. It is a prerequisite for subsequent tests.
	Direct User B to Direct User A (A2 + EA) communication with priority FF.

Test description:

From ddddAMHA send the following FF priority message to aaaaAMHA:

```
PRE002/TC02
1234567890123456789012345678901234567890123456789012345678901234567890123456789
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

(and so on till)

ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
```

Check the correct reception at aaaaAMHA and send the following acknowledgement if the message is received correctly.

From aaaaAMHA send the following message to ddddAMHA:

```
ACK002 PLS CONTINUE
```

Test control:

Check the correct reception of the message at aaaaAMHA. No difference must exist between the message as defined above and the received message.

Test result:

PASS	FAILED	INCONCLUSIVE

5.2.2 Conditional test cases

Test reference :	Tested functionality :
PRE003/TC01 Conditional	Distribution of IPM and conversion of IPM to AFTN format
	Direct User A to Direct User B (A2 + EA) and Indirect User B (A2 + EI) communication with priority FF.

Test description:

From aaaaAMHA send the following message to ddddAFTN and ddddAMHA:

```
PRI: FF
FT: <FT>
OHI:

TEST PRE003/TC01
```

Test control:

Check the correct reception of the message by ddddAFTN and ddddAMHA.

Test result:

PASS	**FAILED**	**INCONCLUSIVE**

SKIPPED	The functionality has been already tested during the AMHS Interoperability Tests (IT501/TC01)

Test reference :	Tested functionality :
PRE003/TC02 Conditional	Distribution of IPM and conversion of IPM to AFTN format
	Direct User A to Direct User B (A16 + EA) and Indirect User B (A16 + EI) communication with priority FF and text length of 8000 characters.

Test description:

From aaaaAMHA send the following message to ddddAFTN and ddddAMHA:

```
PRI: FF
FT: <FT>
OHI:

TEST PRE003/TC02
TEXT 8000 CHARACTERS
12345678901234567890123456789012345678901234567890
…
12345678901234567890123456789012345678901234567890
END
```

Test control:

Check the correct reception of the message by ddddAMHA.

Concerning the reception by ddddAFTN, the AMHS technical specifications define that the message can be rejected (case A) or split into several messages (case B). If the system provides "long AFTN message" capability, the message will be converted (case C).

If case A is implemented, the message is not conveyed to the AFTN component and a NDR is returned. Check the received NDR at aaaaAMHA and verify the following Per-Recipient-Report Non-Delivery information:

- Actual-recipient-name: MF-form address of ddddAFTN
- reason code 1 signifies "unable-to-transfer"
- diagnostic code 7 signifies "content-too-long".
- supplementary-information: "unable to convert to AFTN due to message text length".

If case B is implemented: Check that ddddAFTN receives several messages.

If case C is implemented: Check that ddddAFTN receives one message.

Test result:

PASS	FAILED	INCONCLUSIVE
a / b / c		
SKIPPED	The functionality has been already tested during the AMHS Interoperability Tests (IT501/TC01 and IT503/TC01)	

Test reference :	Tested functionality :
PRE003/TC03 Conditional	Distribution of IPM and conversion of IPM to AFTN format
	Direct User A to Direct User B (A2 + EA) and Indirect User B (A2 + EI) communication with priority SS.

Test description:

From aaaaAMHA send the following message to ddddAFTN and ddddAMHA:

```
PRI: SS
FT: <FT>
OHI:

TEST PRE003/TC03
```

Test control:

Check the correct reception of the SS message by ddddAFTN and ddddAMHA. Check the corresponding reception of a RN or an IPM containing the SS ACK message by aaaaAMHA sent by ddddAMHA.

When the SS Ack message is sent by ddddAFTN, check the corresponding reception of a RN or an IPM containing the SS ACK message by aaaaAMHA.

Test result:

PASS	FAILED	INCONCLUSIVE

SKIPPED	The functionality has been already tested during the AMHS Interoperability Tests (IT501/TC01, IT101/TC05 and IT301/TC05)

Test reference :	Tested functionality :
PRE004/TC01 Conditional	Distribution of IPM and conversion of IPM to AFTN format
	Direct User B to Direct User A (A2 + EA) and Indirect User A (A2 + EI) communication with priority FF.

Test description:

From ddddAMHA send the following message to aaaaAFTN and aaaaAMHA:

```
PRI: FF
FT: <FT>
OHI:

TEST PRE004/TC01
```

Test control:

Check the correct reception of the message by aaaaAFTN and aaaaAMHA.

Test result:

PASS	**FAILED**	**INCONCLUSIVE**

SKIPPED	The functionality has been already tested during the AMHS Interoperability Tests (IT501/TC02)

Test reference :	Tested functionality :
PRE004/TC02 Conditional	Distribution of IPM and conversion of IPM to AFTN format
	Direct User B to Direct User A (A16 + EA) and Indirect User A (A16 + EI) communication with priority FF and text length of 8000 characters.

Test description:

From ddddAMHA send the following message to aaaaAFTN and aaaaAMHA:

```
PRI: FF
FT: <FT>
OHI:

TEST PRE004/TC02
TEXT 8000 CHARACTERS
12345678901234567890123456789012345678901234567890123 4567890
…
12345678901234567890123456789012345678901234567890123 4567890
END
```

Test control:

Check the correct reception of the message by aaaaAMHA.

Concerning the reception by aaaaAFTN, the AMHS technical specifications define that the message can be rejected (case A) or split into several messages (case B). If the system provides "long AFTN message" capability, the message will be converted (case C).

If case A is implemented, the message is not conveyed to the AFTN component and a NDR is returned. Check the received NDR at ddddAMHA and verify the following Per-Recipient-Report Non-Delivery information:

- Actual-recipient-name: MF-form address of aaaaAFTN
- reason code 1 signifies "unable-to-transfer"
- diagnostic code 7 signifies "content-too-long".
- supplementary-information: "unable to convert to AFTN due to message text length".

If case B is implemented: Check that aaaaAFTN receives several messages.

If case C is implemented: Check that aaaaAFTN receives one message.

Test result:

PASS	FAILED	INCONCLUSIVE
a / b / c		

SKIPPED	
	The functionality has been already tested during the AMHS Interoperability Tests (IT501/TC02 and IT503/TC02)

Test reference :	Tested functionality :
PRE004/TC03 Conditional	Distribution of IPM and conversion of IPM to AFTN format
	Direct User B to Direct User A (A2 + EA) and Indirect User A (A2 + EI) communication with priority SS.

Test description:

From ddddAMHA send the following message to aaaaAFTN and aaaaAMHA:

```
PRI: SS
FT: <FT>
OHI:

TEST PRE004/TC03
```

Test control:

Check the correct reception of the SS message by aaaaAFTN and aaaaAMHA. Check the corresponding reception of a RN or an IPM containing the SS ACK message by ddddAMHA sent by aaaaAMHA.

When the SS Ack message is sent by aaaaAFTN, check the corresponding reception of a RN or an IPM containing the SS ACK message by ddddAMHA.

Test result:

PASS	FAILED	INCONCLUSIVE

SKIPPED	The functionality has been already tested during the AMHS Interoperability Tests (IT501/TC02, IT102/TC05 and IT302/TC05)

Test reference :	Tested functionality :
PRE005/TC01 Conditional	Distribution of AFTN message and conversion of an AFTN message to AMHS format
	Indirect User A to Direct User B (A2 + EA) and Indirect User B (A2 + EI) communication with priority FF.

Test description:

From aaaaAFTN send the following message to ddddAMHA and ddddAFTN:

```
FF ddddAMHA ddddAFTN
FT aaaaAFTN

TEST PRE005/TC01
```

Test control:

Check the correct reception of the message by ddddAMHA and ddddAFTN.

Test result:

PASS	FAILED	INCONCLUSIVE

SKIPPED	The functionality has been already tested during the AMHS Interoperability Tests (IT201/TC03, IT401/TC03)

Test reference :	Tested functionality :
PRE005/TC02 Conditional	Distribution of AFTN message and conversion an AFTN message to AMHS format
	Indirect User A to Direct User B (A16 + EA) and Indirect User B (A16 + EI) communication with priority FF and text length of 8000 characters.

Test description:

From aaaaAFTN send the following message to ddddAMHA and ddddAFTN:

Note.– If the SUT rejects or splits "long messages", then the number of characters may be reduced from 8000 to 1800 or the system configuration may be adapted in both SUTs to support "long AFTN message" capability.

```
FF ddddAMHA ddddAFTN
FT aaaaAFTN

TEST PRE005/TC02
TEXT 8000 CHARACTERS
12345678901234567890123456789012345678901234567890
…
12345678901234567890123456789012345678901234567890
END
```

Test control:

Check the correct reception of the message by ddddAMHA and by ddddAFTN.

Test result:

PASS	FAILED	INCONCLUSIVE

SKIPPED	The functionality has been already tested during the AMHS Interoperability Tests (IT201/TC03)

Test reference :	Tested functionality :
PRE005/TC03 Conditional	Distribution of AFTN message and conversion of an AFTN message to AMHS format
	Indirect User A to Direct User B (A2 + EA) and Indirect User B (A2 + EI) communication with priority SS.

Test description:

From aaaaAFTN send the following message to ddddAMHA and ddddAFTN:

```
SS ddddAMHA ddddAFTN
FT aaaaAFTN

TEST PRE005/TC03
```

Test control:

Check the correct reception of the message by ddddAMHA and ddddAFTN.

Check the correct reception by aaaaAFTN of the SS ACK message sent by ddddAMHA and ddddAFTN.

Note:
When an SS Ack message is sent by ddddAFTN, the MTCU of SUT-B converts it into a RN or an IPM containing the SS ACK message, the RN or IPM is re-converted to an SS Ack message in the MTCU of SUT-A.

Test result:

PASS	FAILED	INCONCLUSIVE

SKIPPED	The functionality has been already tested during the AMHS Interoperability Tests (IT201/TC05, IT401/TC05)

Test reference :	Tested functionality :
PRE006/TC01 Conditional	Distribution of AFTN message and conversion of an AFTN message to AMHS format
	Indirect User B to Direct User A (A2 + EA) and Indirect User A (A2 + EI) communication with priority FF.

Test description:

From ddddAFTN send the following message to aaaaAMHA and aaaaAFTN:

```
FF aaaaAMHA aaaaAFTN
FT ddddAFTN

TEST PRE006/TC01
```

Test control:

Check the correct reception of the message by aaaaAMHA and aaaaAFTN.

Test result:

PASS	FAILED	INCONCLUSIVE

SKIPPED	The functionality has been already tested during the AMHS Interoperability Tests (IT202/TC03, IT402/TC03)

Test reference :	Tested functionality :
PRE006/TC02 Conditional	Distribution of AFTN message and conversion of an AFTN message to AMHS format
	Indirect User B to Direct User A (A16 + EA) and Indirect User A (A16 + EI) communication with priority FF and text length of 8000 characters.

Test description:

From ddddAFTN send the following message to aaaaAMHA and aaaaAFTN:

Note.– If the SUT rejects or splits "long messages", then the number of characters may be reduced from 8000 to 1800 or the system configuration may be adapted in both SUTs to support "long AFTN message" capability.

```
FF aaaaAMHA aaaaAFTN
FT ddddAFTN

TEST PRE006/TC02
TEXT 8000 CHARACTERS
12345678901234567890123456789012345678901234567890
…
12345678901234567890123456789012345678901234567890
END
```

Test control:

Check the correct reception of the message by aaaaAMHA and by aaaaAFTN.

Test result:

PASS	FAILED	INCONCLUSIVE

SKIPPED	The functionality has been already tested during the AMHS Interoperability Tests (IT202/TC03, IT402/TC03)

Test reference :	Tested functionality :
PRE006/TC03 Conditional	Distribution of AFTN message and conversion of an AFTN message to AMHS format
	Indirect User B to Direct User A (A2 + EA) and Indirect User A (A2 + EI) communication with priority SS.

Test description:

From ddddAFTN send the following message to aaaaAMHA and aaaaAFTN:

```
SS aaaaAMHA aaaaAFTN
FT ddddAFTN

TEST PRE006/TC03
```

Test control:

Check the correct reception of the message by aaaaAMHA and aaaaAFTN.

Check the correct reception by ddddAFTN of the SS ACK message sent by aaaaAMHA and aaaaAFTN.

Note:
When an SS Ack message is sent by aaaaAFTN, the MTCU of SUT-A converts it into a RN or an IPM containing the SS ACK message, the RN or IPM is re-converted to an SS Ack message in the MTCU of SUT-B.

Test result:

PASS	**FAILED**	**INCONCLUSIVE**

SKIPPED	The functionality has been already tested during the AMHS Interoperability Tests (IT202/TC05, IT402/TC05)

Test reference :	Tested functionality :
PRE007 Conditional	AMHS Extended Service - FTBP
	Direct User A to Direct User B (A2 + F2048 + EA) communication with normal priority and two body parts (one FTBP up to 2M bytes and one text-body-part)

Test description:

From aaaaAMHA send the following message to ddddAMHA:

```
PRI: FF
FT: <FT>
OHI:

TEST PRE007
```


Test control:

Check the correct reception of the message and of the associated FTBP by ddddAMHA.

Test result:

PASS	FAILED	INCONCLUSIVE

SKIPPED	The functionality cannot be tested due to unsupported operational functionality, AMHS Extended Service – FTBP.

Test reference :	Tested functionality :
PRE008 Conditional	AMHS Extended Service – FTBP
	Direct User B to Direct User A (A2 + F2048 + EA) communication with normal priority and two body parts (one FTBP up to 2M bytes and one text-body-part)

Test description:

From ddddAMHA send the following message to aaaaAMHA:

```
PRI: FF
FT: <FT>
OHI:

TEST PRE008
```


Test control:

Check the correct reception of the message and of the associated FTBP by aaaaAMHA.

Test result:

PASS	**FAILED**	**INCONCLUSIVE**

SKIPPED	The functionality cannot be tested due to unsupported operational functionality, AMHS Extended Service – FTBP.

Test reference :	Tested functionality :
PRE009 Conditional	Alternate routing capability
	Re-routing arrangements with a third COM Centre C as relay between COM Centre A and COM Centre B.

Test description:

An ATS message (IPM) is queued in MTA-A (SUT-A). Due to outage of the primary X.400 routing path with MTA-B (SUT-B), the message is routed via alternate MTA-C (SUT-C).

- Verify that the X.400 routing table of SUT-A routes PRMD=eeee to SUT-B and PRMD=hhhh to SUT-C.

- Verify that the X.400 routing table of SUT-C routes PRMD=bbbb to SUT-A and PRMD=eeee to SUT-B.

- Cut the direct connection between SUT-A and SUT-B

- From aaaaAMHA send the following message to ddddAMHA:

```
PRI: FF
FT: <FT>
OHI:

TEST PRE009
```

If alternate MTA routing functionality is implemented and configured in SUT-A, the message will be transferred automatically via the "alternate" connection. Otherwise, reroute the queued message manually (according to partner's operational procedures).

Test control:

Verify that the message has passed through SUT-C in between (if possible) and verify that the message is received by ddddAMHA.

Test result:

PASS	FAILED	INCONCLUSIVE

SKIPPED	The functionality has been already tested during the AMHS Interoperability Tests (IT801/TC01).
	The functionality cannot be tested or the test case is not agreed between the involved parties.

Test reference :	Tested functionality :
PRE010 Conditional	Alternate routing capability
	Re-routing arrangements with a third COM Centre C as relay between COM Centre B and COM Centre A.

Test description:

An ATS message (IPM) is queued in MTA-B (SUT-B). Due to outage of the primary X.400 routing path with MTA-A (SUT-A) the message is routed via alternate MTA-C (SUT-C).

- Verify that the X.400 routing table of SUT-B routes PRMD=bbbb to SUT-A and PRMD=hhhh to SUT-C.

- Verify that the X.400 routing table of SUT-C routes PRMD=bbbb to SUT-A and PRMD=eeee to SUT-B.

- Cut the direct connection between SUT-A and SUT-B

- From ddddAMHA send the following message to aaaaAMHA:

```
PRI: FF
FT: <FT>
OHI:

TEST PRE010
```

If alternate MTA routing functionality is implemented and configured in SUT-B, the message will be transferred automatically via the "alternate" connection. Otherwise, reroute the queued message manually (according to partner's operational procedures).

Test control:

Verify that the message has passed through SUT-C in between (if possible) and verify that the message is received by aaaaAMHA.

Test result:

PASS	FAILED	INCONCLUSIVE

SKIPPED	The functionality has been already tested during the AMHS Interoperability Tests (IT702/TC02).
	The functionality cannot be tested or the test case is not agreed between the involved parties.

5.2.3 <u>Go-No Go test cases for preliminary message integrity verification</u>

Test reference :	Tested functionality :
PRE011/TC01 Go-NoGo	Message integrity.
	Direct User A to Direct User B and Indirect User B with the reference text "THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG" sent with FF priority.

<u>Test description:</u>

From aaaaAMHA send the following message to ddddAFTN and ddddAMHA:

```
PRI: FF
FT: <FT>
OHI:

TEST PRE011/TC01

THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG
```

<u>Test control:</u>

Check the correct reception of the message as well as the reference text by ddddAFTN and ddddAMHA.

<u>Test result:</u>

PASS	FAILED	INCONCLUSIVE

Test reference :	Tested functionality :
PRE011/TC02 Go-NoGo	Message integrity. Direct User B to Direct User A and Indirect User A with the reference text "THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG" sent with FF priority.

Test description:

From ddddAMHA send the following message to aaaaAFTN and aaaaAMHA:

```
PRI: FF
FT: <FT>
OHI:

TEST PRE011/TC02

THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG
```

Test control:

Check the correct reception of the message as well as the reference text by aaaaAFTN and aaaaAMHA.

Test result:

PASS	FAILED	INCONCLUSIVE

5.2.4 **Load Tests**

5.2.4.1 **Load Test using IPMs with a text body part only**

Test reference :	Tested functionality :
PRE012/TC01	This test is performed to observe the behaviour of both systems during a load situation and in particular the capability of the operational network infrastructure to allow immediate relay of a high amount of messages.

Introduction

As per ICAO Annex 10 Vol. II para. 4.4.1.3.2.1, diversion routing has to be initiated within a ten minute period after detection of the circuit outage. This means that for this test case, the expected number of operational messages exchanged between SUT-A and SUT-B during 10 minutes can be used to define the size of the respective message queues.

It could be inferred from ICAO Annex 10 Vol. II par. 4.4.9.2, that a message has to be transmitted within five minutes, including the time lost in a queue. This means that for this test case, the queues shall be completely flushed in no longer than five minutes after the end of the circuit outage.

In order to complete the analysis, the number of the messages potentially queued during ten minutes is added to the number of messages pending during the five minutes allowed to restore the outage. Therefore, the following formula can be used to determine the message queue size for SUT-A and SUT-B.

Number of messages queued	**=**	Calculate the sum of messages per minute intended to be migrated to the new AMHS connection	**X**	15 minutes

The content and the size of messages to be exchanged shall be coordinated between the test partners.

Test description:

1. Both sides shall inform each other about the amount of messages to be expected.

2. At **Test partner 2** (or 1) interrupt the LAN connection to **Test partner 1** (or 2) by appropriate commands (should be agreed between the Test partners).

3. At **Test partner 1** and **Test partner 2** create message queues as agreed in 1.

4. After co-ordination, at **Test partner 2** (or 1) re-establish the LAN connection by appropriate commands.

5. Observe and notice the incoming and outgoing message flow. Record the time it takes from re-connecting the LAN until the message queues are empty.

Test control:

1. The number of messages received shall be equal to the number of messages expected.

2. Check the event logging of the system for abnormalities in the area of AMHS / X.400 / AFTN/AMHS Gateway.

3. Check the event logging / traffic traces for NDRs.

4. Check for Control Position events.

5. Check the X.400 / AMHS diagnostics, check the number of associations used (in particular for possible hanging/unused associations).

6. At both sides note the amount of time needed to flush the queues.

The following table can be used to make notes of the Test Control result.

Test Control	Result
1. The number of messages received shall be equal to the number of messages expected.	
2. Check the event logging of the system for abnormalities in the area of AMHS / X.400 / AFTN/AMHS Gateway.	
3. Check the event logging / traffic traces for NDRs.	
4. Check for events at the Control Position.	
5. Check the X.400 / AMHS diagnostics check the number of used associations (in particular possible hanging/unused associations).	
6. At both sides note the amount of time needed to flush the queues.	

The test is failed if messages are lost, duplicated, corrupted or if the queues are flushed in more than five minutes.

The observations have to be exchanged between the involved parties in the form of a test log and discussed in a test review.

Test result:

PASS	FAILED	INCONCLUSIVE

5.2.4.2 Load Test using a) IPMs with a single text body part (optional) and b) IPMs with a FTBP and optionally a text body part – *Conditional*

Test reference:	Tested functionality:
PRE012/TC02 Conditional	The tests described below are performed to observe the behaviour of both systems during a load situation where IPMs containing a FTBP are involved, as well as the capability and performance of the operational network infrastructure to allow the fast relay of a high amount of messages.

Introduction

As per ICAO Annex 10 Vol. II para. 4.4.1.3.2.1, diversion routing has to be initiated within a ten minute period after detection of the circuit outage. This means that for this test case, the expected number of operational messages exchanged between SUT-A and SUT-B during 10 minutes can be used to define the size of the respective message queues.

It could be inferred from ICAO Annex 10 Vol. II par. 4.4.9.2, that a message has to be transmitted within five minutes, including the time lost in a queue. This means that for this test case, the queues shall be completely flushed in no longer than five minutes after the end of the circuit outage.

In order to complete the analysis, the number of the messages potentially queued during ten minutes is added to the number of messages pending during the five minutes allowed to restore the outage. Therefore, the following formula can be used to determine the message queue size, message types and priorities for SUT-A and SUT-B.

The numbers, sizes, contents and body part types of the messages to be exchanged shall be coordinated between the test partners.

Number of IPMs with a single text body part queued (optional)	=	Number of IPMs with a single text body part per minute intended to be migrated to the new AMHS connection	X	15 min	text body part size (bytes)		Message priority (Normal/Non-urgent)

Number of IPMs with a FTBP and optionally a text body part queued	=	Number of IPMs with a FTBP and optionally a text body part per minute intended to be migrated to the new AMHS connection	X	15 min	FTBP size (kBytes)	text body part size (bytes) (optional)	Message priority (Normal/Non-urgent)

Test description:

1.   Both sides shall agree on the numbers, sizes, contents <u>and body part types</u> of the messages to be expected.

2.   Both sides shall consider diverting all operational traffic via alternate routes.

3.   At Test partner 2 (or 1) interrupt the LAN connection to Test partner 1 (or 2) or the P1 connection to Test partner 1 (or 2), by appropriate commands (should be agreed between the Test partners).

4.   At Test partner 1 and Test partner 2 create message queues, as agreed in step 1.

5.   After coordination, at Test partner 2 (or 1) re-establish the LAN connection or the P1 connection, by appropriate commands.

6.   Observe and notice the incoming and outgoing message flows. Record the time it takes from re-establishing the LAN or P1 connection until the message queues are empty.

Test Control:

1.   The number of messages (per body part type) received shall be equal to the number of messages expected.

2.   Check the event logging of the system for abnormalities in the area of AMHS / X.400 / AFTN/AMHS Gateway.

3.   Check the event logging / traffic traces for NDRs.

4.   Check for events at the Control Position.

5.   Check the X.400 / AMHS diagnostics.

6.   Check the number of associations used (in particular for possible hanging/unused associations).

7.   At both sides note the amount of time needed to flush the queues.

The following table can be used to make notes of the Test Control result.

Test Control	Result	
1. The number of messages (per body part type) received shall be equal to the number of messages expected.	IPMs Sent (total and per body part type)	IPMs Received (total and per body part type)
2. Check the event logging of the system for abnormalities in the area of AMHS / X.400 / AFTN/AMHS Gateway.		
3. Check the event logging / traffic traces for NDRs.		
4. Check for events at the Control Position.		
5. Check the X.400 / AMHS diagnostics		
6. Check the number of used associations (in particular possible hanging/unused associations).		
7. At both sides note the amount of time needed to flush the queues.		

The test is failed if messages are lost, duplicated, corrupted or if the queues are flushed in more than five minutes.

The observations have to be exchanged between the involved parties in the form of a test log and discussed in a test review.

Test result:

PASS	FAILED	INCONCLUSIVE

5.2.5 Go-No Go test cases with operational traffic

5.2.5.1 Exchange of operational bilateral traffic

Test reference :	Tested functionality :
PRE013a Go-NoGo	Message integrity. Exchange of operational bilateral traffic without duplication.

Test control:

1. Re-route the bilateral operational traffic to the respective MTAs (SUTs).

2. Monitor the new X.400 connection until the first operational message is transmitted and check the system behaviour. Contact the test partner to confirm the correct reception of the operational message. This action shall be performed for the first operational messages of each partner.

3. Permanently monitor the new X.400 connection. The test partners shall contact each other from time-to-time to check the transmission / reception of messages. The time intervals are commonly agreed during the tests and can vary according to the amount of messages exchanged.

4. The test duration shall be set upon common agreement and relative to the amount of bilateral traffic.

During the test, each partner permanently monitors the following items:

- System event logs, abnormalities in the area of AMHS / X.400 / AFTN/AMHS Gateway.

- Event logging / traffic traces for NDRs.

- Control Position events.

At each contact, partners shall confirm the reciprocity of their mutual traffic.

The test is immediately stopped when a message is lost, duplicated, corrupted or if a critical event occurs.

The observations have to be exchanged between involved parties, in order to be discussed.

PASS	**FAILED**	**INCONCLUSIVE**

5.2.5.2 Exchange of duplicated traffic

Test reference :	Tested functionality :
	Message integrity.
PRE013b Go-No Go	For selected AFTN destination addresses all traffic will be duplicated to corresponding AMHS recipient addresses at the remote system. At the remote system the AFTN messages received will be compared with the copies transmitted via AMHS.

Note: In case PRE013a is not performed, execution of PRE013b is strongly recommended.

Addresses for Traffic Duplication
Due to the fact that the Pre-operational tests will be performed in an operational environment the addresses selected for duplication cannot be pre-determined in this document. The test partners are free to define and select appropriately.

Test description:

On the system of **Test partner 1** enable the duplication of Operational traffic for the agreed AFTN addressee indicators.

On the system of **Test partner 2** enable the duplication of Operational traffic for the agreed AFTN addressee indicators.

The test duration should be set by mutual agreement.

Test control:

Note: Not all details of test control can be defined since two different systems are involved. Therefore the control is done in a general form. The main purpose of this test is to prove the integrity of the message exchange. At the same time, it is possible to detect problems which have not been spotted during previous tests.

1. Compare the number of messages received at the AFTN addresses with the number of messages received as copies at the corresponding AMHS addresses (check if all duplicated messages are received)..

2. Compare the contents of the messages received for one randomly selected hour of traffic per day. The method of comparison is a local matter. Some options are:

   a)   the messages can be displayed on two screens and compared one by one,

   b)   the traffic log can be exported and compared (partly) electronically/in an automated way.

3. Check the event logging of the system for abnormalities in the area of AMHS/X.400/AFTN/AMHS Gateway.

4. Check the event logging / traffic traces for NDRs.

5. Check for Control Position events.

6. Check the X.400/AMHS Diagnostics, check the number of associations used (in particular possible hanging/unused associations).

The following table can be used to make notes of the Test Control result.

Test Control	Result
1. Compare the number of messages received as AFTN copy with the number of messages received as AMHS copy	
2. Compare the contents of the messages.	
3. The messages can be displayed on two screens and compared one by one.	
4. The traffic log can be exported and compared (partly) electronically/in an automated way.	
5. Check the event logging of the system for abnormalities in the area of AMHS / X.400 / AFTN/AMHS Gateway.	
6. Check whether NDRs have been received or transmitted.	
7. Check for events at the Control Position.	
8. X.400 / AMHS diagnostics, check the number of associations used (in particular possible hanging/unused associations).	

The test is failed if messages are lost, duplicated or corrupted. The other observations have to be forwarded to each other in the form of a test log and discussed in a test review.

Test result:

PASS	FAILED	INCONCLUSIVE

5.2.6 <u>Additional selected and agreed Interoperability Tests</u>

The selected and bilaterally agreed Test cases should be listed in this section.

END of Appendix F