EUR AMHS Manual

Appendix G-C

EDS Testing Guidelines	
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References

[1]   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), 2nd Edition, 2016

[2]   ICAO Doc 9880 AN/466 Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols, Part IV — Directory Services, Security and Identifier Registration, 2nd Edition, 2016

[3]   ICAO Doc 9896 Manual on the Aeronautical Telecommunication Network (ATN) using Internet Protocol Suite (IPS) Standards and Protocols, 2nd Edition, 2015

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

[5]   EUR Doc 020, EUR AMHS Manual, Appendix G-A – EDS User Interface Control Document

[6]   EUR Doc 020, EUR AMHS Manual, Appendix G-B – EDS Data Description

[7]   EUR Doc 021, ATS Messaging Management Manual

[8]   EUROCONTROL European Directory Service – EDS Test Document – Version 2.0 Edition Date: 11/12/2015, Status: Released Issue, Intended for: AFSG

[9]   ISO/IEC 9594-n Information technology – Open Systems Interconnection – The Directory (multi-part), 5th Edition, 2005

        Note.– This set of standards was also published as ITU-T X.500 (08/2005) set of standards.

[10]   IETF RFC 1006 ISO Transport Service on top of the TCP, Version: 3, May 1987

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1   Introduction

1.1   Scope of the Document

1.1.1   This document describes the European Directory Service (EDS) testing activity by providing a:

- Customisation of the EDS user interface between the Central European Test Directory System Agent (Test-DSA) and Co-operating or Adjacent Test-DSAs as given by the EDS User Interface Control Document [5] for the purpose of the EDS testing activity;

- Description of general aspects of the EDS testing activity such as prerequisites, environment and strategy; and

- Definition of the steps of the EDS testing activity.

1.1.2   The European Directory Service (EDS) is the implementation of ATN Directory services [2] in Europe. The EDS provides future, directory-based means for collection, management and distribution of information within Europe and exchange of information with other Regions, States and Organisations.

1.1.3   Especially for testing activities, EUROCONTROL has implemented the Central European Test-DSA for the initial step according to the EDS Operational Concept adopted by the Aeronautical Fixed Services Group (AFSG) and published in Appendix G to ICAO EUR Doc 020 (EUR AMHS Manual) [4].

1.2   Purpose of the Document

1.2.1   The purpose of this document is to enable involved parties to carry out the EDS testing activity, basically between implementations of the Central European Test-DSA and Co-operating and Adjacent Test-DSAs.

1.2.2   This document identifies targets of the activity, describes the overall testing strategy and environment, lists prerequisites and parameters for setup of implementations and specifies the individual steps of the activity.

1.2.3   Readers of this document should be familiar with the EDS Operational Concept specified in Appendix G to ICAO EUR Doc 020 (EUR AMHS Manual) [4] and the EDS User Interface Control document [5] which summarises the EDS user interface details for communication between the Central European DSA and Co-operating or Adjacent DSAs. For testing and validation, EDS makes use of a dedicated test environment.

1.3   Structure of the Document

1.3.1   This document is composed of the following chapters:

- Chapter 1 (this chapter) contains an introduction to the document.

- Chapter 2 provides an overview on general aspect of the EDS testing activity.

- Chapter 3 identifies prerequisites and provides parameters for communication setup of implementations involved in the testing activity.

- Chapter 4 specifies the steps of the EDS testing activity.

2 Overview

2.1 Objectives

2.1.1   The EDS testing activity has the target to validate an EDS implementation before interconnection with the operational European Directory Service (EDS) is established.

2.1.2   The primary objectives of the EDS testing activity are to determine on the suitability of the:

- Implementations of Co-operating and Adjacent Test-DSAs; and
- Distribution of information within EDS regarding
    o   Underlying networks;
    o   Protocols; and
    o   Directory schema (data structure);

2.1.3   End users and supply of information to end users are considered outside the scope of the EDS Operational Concept and thus are not directly addressed by the EDS testing activity. However, at a local basis involved parties might include end users in their activities.

2.1.4   Besides the primary objectives, the EDS testing activity allows involved parties to familiarise themselves with the X.500 Directory technology [9] at an early stage and ensures interoperability of Co-operating and Adjacent Test-DSAs with the Central European Test-DSA prior to putting them into service.

2.2 Testing Strategy

2.2.1   The general testing strategy follows the principles of ATS Messaging Management as specified for AMC by ICAO EUR Doc 021 (ATS Messaging Management Manual) [7] and for EDS by Appendix G to ICAO EUR Doc 020 (EUR AMHS Manual) [4].

2.2.2   The general overall strategy used in the EDS testing activity follows the full life cycle of information processing ensuring an appropriate coverage of related aspects.

2.2.3   The procedures adopted by the ATS Messaging Management describe repeated 28-days cycles consisting of five phases. Each cycle starts with the "Data entry phase", goes through the "Data validation and processing phase" and ends with the "Data distribution and implementation phase".

2.2.4   The start of the EDS testing activity and when new parties are joining the EDS testing activity are considered special situations, which are not reflected in the ATS Messaging Management. The EDS testing activity, including cases that new parties are joining the EDS testing activity for the first time, starts with the data entry phase. The EDS testing activity, including cases that participating parties leave the EDS testing activity, ends with the data distribution and implementation phase.

2.2.5   Further details regarding the procedures and phases could be found in the respective manuals:

- Section 5.1 of ICAO EUR Doc 021 (ATS Messaging Management Manual) [7] that describes the AMC operational procedures in general and gives the details of the individual phases;

- Section 5.4 of Appendix G to ICAO EUR Doc 020 (EUR AMHS Manual) [4] that establishes the relationship to ATS Messaging Management and describes further aspects related to EDS.

2.2.6   Figure 1 outlines the general overall strategy of the EDS testing activity along the five phases of ATS Messaging Management.
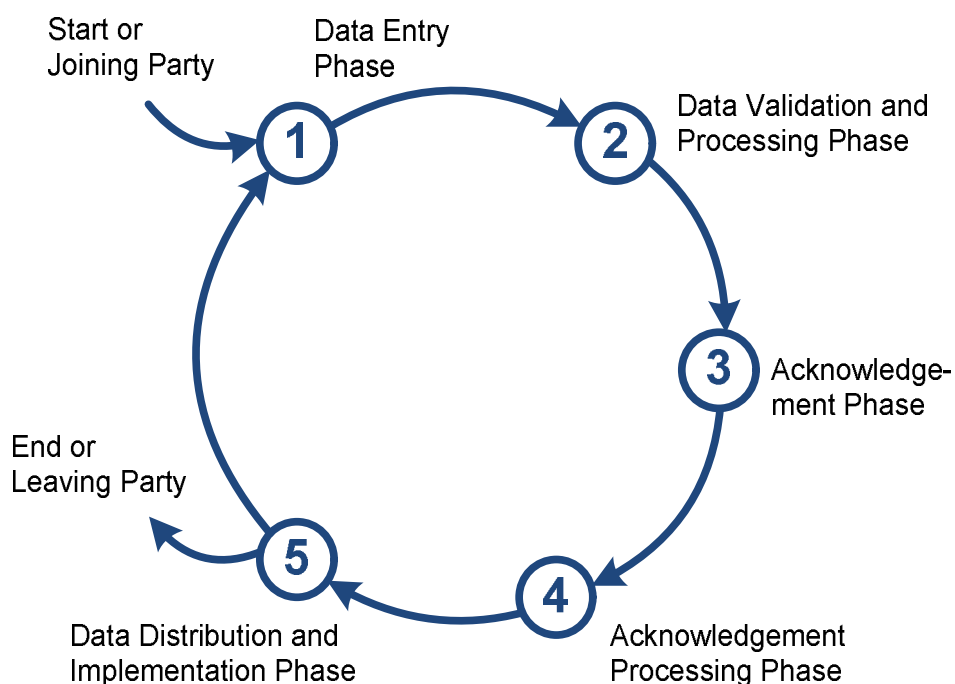
Figure 1: Repeated Phases

2.3   Test Environment

2.3.1   The EDS testing activity takes place in a distributed environment consisting of the following functional test components:

- Test ATS Messaging Management Centre (Test-AMC);

- Central European Test-DSA; and

- the respective Co-operating Test-DSA(s) and/or Adjacent Test-DSA(s).

2.3.2   DUAs accompany the Test-DSAs in order to enable the EDS Central Administrator, Co-operating and Adjacent Operators to access the Directory information in the Test-EDS. An

Administrative DUA is involved at the Central European Test-DSA; Operational Personnel DUAs are used at Co-operating and Adjacent Test-DSAs.

2.3.3   The Test-AMC is the single source of information. The AMC Operator and CCC Operators make use of web browsers for maintenance of information at the Test-AMC. Initiated by the AMC Operator, the AMC periodically provides the EDS information to the Central European Test-DSA. The EDS Central Administrator accesses the EDS information at the Central European Test-DSA through the associated Administrative DUA. After receiving the EDS information from the Test-AMC, the Central European Test-DSA in turn provides this information to Co-operating and Adjacent Test-DSAs through the adopted X.500 protocols.

2.3.4   Figure 2 describes the overall environment of the EDS testing activity including Test-AMC, Test-DSAs, DUAs, involved roles and flow of information.
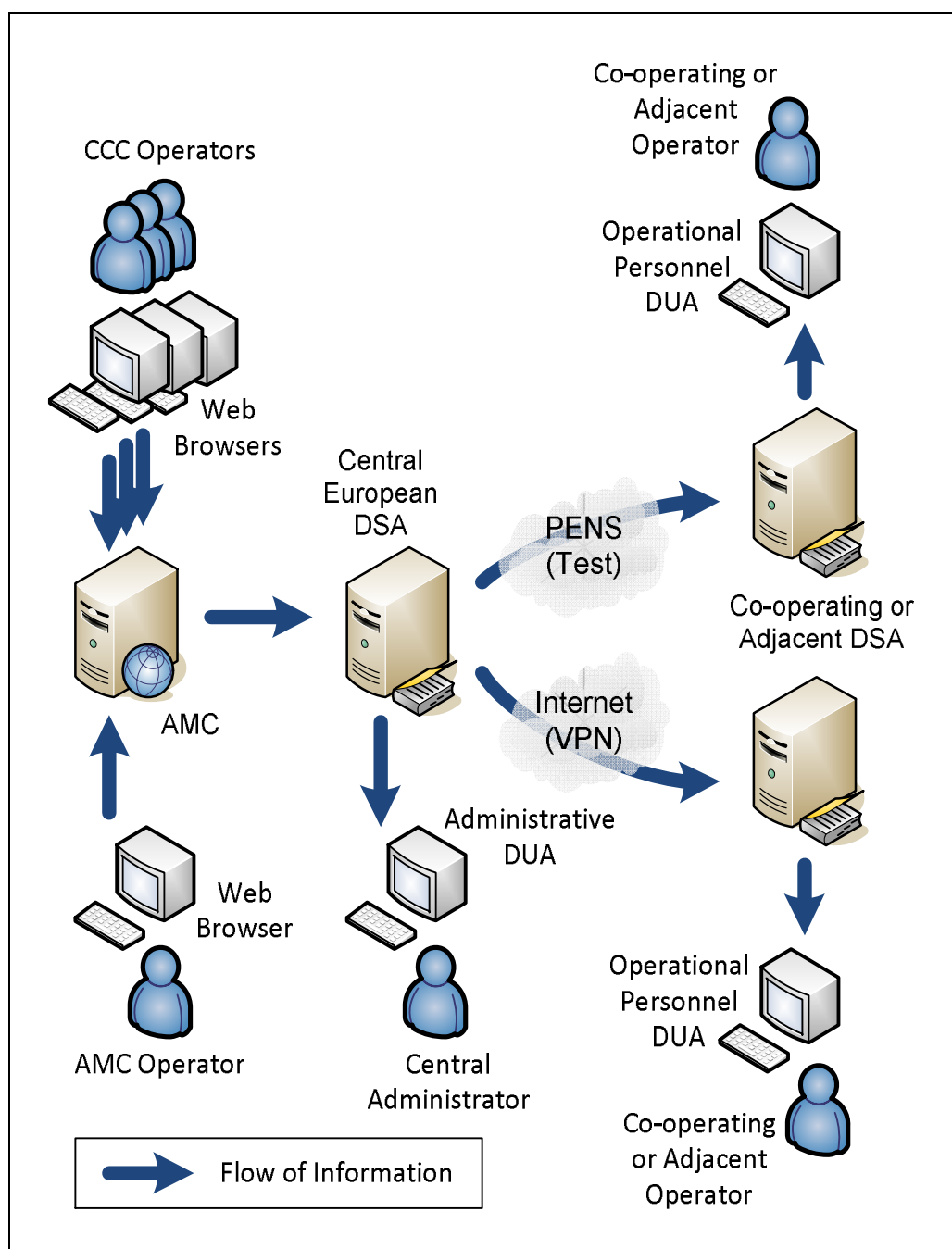
Figure 2: EDS Testing Environment

2.3.5   Communication between Co-operating and Adjacent Test-DSAs on one hand and the Central European Test-DSA on the other hand is established over a common network infrastructure. The Pan-European Network Service (PENS) is the preferred means for communications. Virtual Private Networks (VPNs) established over the public Internet serve as an alternate means of communications in cases where PENS is not available. The use of VPNs established over the public Internet is subject to bilateral agreement.

2.3.6   It is recalled that Co-operating Test-DSAs receive the full set of information whereas Adjacent Test-DSAs receive the information of co-operating States and Organisations only. In order to receive the full set of information, Adjacent Test-DSAs have to exchange information

with other Adjacent Test-DSAs. For Co-operating Test-DSAs there is no need to establish other communication paths for the exchange of information at international level.

2.3.7   Co-operating and Adjacent Operators access the EDS information at the local Test-DSAs through their Operational Personnel DUAs. The EDS Central Administrator accesses the Central European Test-DSA through his Administrative DUA.

2.3.8   Even though considered out of scope of the EDS testing activity, the information available at Co-operating and Adjacent Test-DSAs might be made available to DUAs of end users in order to test the full chain at a local level. An example of a system end user is the AFTN/AMHS Gateway as per ICAO Doc 9880 Part II [1].

2.4   Actors and Coordination

2.4.1   In order to provide input, to trigger actions and to validate results, following roles take an active part in the EDS testing activity:

- **AMC Operator** for management of information at the Test-AMC and for initiating transfer of information from the Test-AMC to the Test-EDS.

- **CCC Operators** of States and Organisations participating in the EDS testing activity for management of information at the Test-AMC.

- **EDS Central Administrator** for checking EDS content at the Central European Test-DSA and testing the results of push distribution through shadowing.

- **Co-operating Operators** and **Adjacent Operators** for testing the result of distribution and EDS content at local Test-DSAs.

2.4.2   For the EDS testing activity EUROCONTROL nominates at least one person taking the role of the AMC Operator and at least one person taking the role of the EDS Central Administrator. Nominations shall include name, email address and telephone number. A single individual may fulfil both roles.

2.4.3   States and Organisations participating in the EDS testing activity nominate at least one person taking the role of the CCC Operator and at least one person taking the role of the Co-operating or Adjacent Operator. Nominations shall include name, email address and telephone number. A single individual may fulfil both roles.

2.4.4   The distributed nature of the EDS testing activity and the number of active roles demand coordination and exchange of information beyond the automated exchange of information by EDS. Email is proposed for direct communication between individuals. Due to the central position, the EDS Central Administrator is the focal point for the exchange of information between the actors.

2.4.5   This document defines two methods for provision of modifications applied to the Test-AMC Background Area and which require testing in EDS:

- AMC Static Report (updated data), and

- Collection and Distribution via email.

2.4.6   The AMC Static Report (updated data) is available for download in the Pre-operational Area at the Test-AMC. In application of the second method, the CCC Operator collects relevant modifications and reports to the EDS Central Administrator. The EDS

Central Administrator collects the reports and in turn provides a collection of reports to the Co-operating and Adjacent Operators. The EDS Central Administrator informs involved parties on the method of choice.

2.4.7   Co-operating and Adjacent Operators shall as a minimum validate the modifications that have been applied by the CCC Operator of the respective State or Organisation. The Central Administrator shall as a minimum validate the modifications that have been applied by the AMC Operator. At this point every modification is at least validated once. Co-operating and Adjacent Operators as well as the Central Administrator may validate other modifications which have been reported.

2.4.8   Using email Co-Operating and Adjacent Operators report the results of their testing of EDS content to the Central Administrator.

2.5   Schedule

2.5.1   The start and duration of the EDS testing activity is subject to announcement by EUROCONTROL.

2.5.2   The cycle applied to the EDS testing activity basically follows the AIRAC Cycle defined in ICAO EUR Doc 021 (ATS Messaging Management Manual) [7], which lasts 28 days. The duration of a cycle in the EDS testing activity may deviate from the duration of an AIRAC Cycle. The duration of a cycle may be shortened in order to accelerate the EDS testing activity and to increase the overall number of cycles performed during the testing period. A phase in the EDS testing activity takes one day as a minimum resulting in a cycle with a period of at least five, consecutive days. The EDS testing activity may be suspended as necessary.

2.5.3   The schedule of a cycle includes start and end dates of the cycle as well as allocation of the phases with start and end dates. The EDS Central Administrator announces the schedule of a cycle by email.

3   Testing Setup

3.1   *Prerequisites*

3.1.1   Implementations intended to participate in the EDS testing activity shall implement a Directory System Agent (Test-DSA) accompanied by a Personnel DUA as a minimum. For further details and conformance requirements please refer to the EDS User Interface Control document [5], Section 4.1.

3.1.2   The Test-DSA acting as either Co-operating or Adjacent Test-DSA shall support Directory protocols on top of the Transmission Control Protocol (TCP) and the Internet Protocol version 4 (IPv4) by providing an ISO transport service on top of TCP according to RFC 1006 [10]. The underlying common network infrastructure shall be either the ANSP Test Messaging VPN of PENS or a site to site VPN over the Internet as outlined in the EDS User Interface Control document [5].

3.1.3   In order to prevent address conflicts in the network EUROCONTROL provides the external IP address of the Co-operating or Adjacent Test-DSA (accessible hosts) for the establishment of the connection using a VPN over the Internet. The State or Organisation operating the Co-operating or Adjacent Test-DSA is invited to map the external IP address provided by EUROCONTROL to the local IP address within the network of the respective State or Organisation as necessary.

3.1.4   It is recalled at this point that Co-operating or Adjacent Test-DSAs shall support ATN- and EDS-specific object classes and attribute types and shall implement the Directory schema of EDS specified in Appendix G-B to the ICAO EUR Doc 020 (EUR AMHS Manual) [4].

3.2   *Peers*

3.2.1   The setup of peers follows the EDS User Interface Control document [5], Section 4.2 using the parameters given by Table 1. The State or Organisation participating in the EDS testing is requested to complete the information in the table.

Parameter	Central European Test-DSA	Co-operating or Adjacent Test-DSA
Distinguished Name	O=EUXX	See below
Password	PWD-EUXX	See below
Presentation Selector	-	
Session Selector	-	
Transport Selector	-	
Network Address TCP Port	3003	3003 (See below)

Parameter	Central European Test-DSA	Co-operating or Adjacent Test-DSA
IPv4 Address (PENS) IPv4 Address (Internet)		See below See below

Table 1: Peer Parameters

3.2.2   The Central European Test-DSA uses the parameters given in Table 1 for the establishment of associations with Co-operating and Adjacent Test-DSAs. In the presentation address of the Central European Test-DSA the presentation, session and transport selectors are omitted, i.e. these selectors are not present in the presentation address of the Central European Test-DSA. The IP address of the Central European Test-DSA is either the PENS or the Internet IPv4 address given in Table 1, depending on the common underlying network infrastructure in use for this connection.

3.2.3   The parameters of a Co-operating or Adjacent Test-DSA shall be defined in accordance with the following provisions:

- The *distinguished name* shall be represented by an attribute of type *organization*. The value of the attribute shall take the location indicator of the respective COM Centre.

- The value of the attribute *password* follows a similar scheme whereas *PWD* is used as a prefix separated by a hyphen, e.g. *PWD-EDDD*.

- The *TCP port* should be set to the value provided in Table 1. A configuration using a TCP port different from this value requires bilateral agreement between the parties operating the peers. Within the network of the State or Organisation operating the Co-operating or Adjacent Test-DSA this TCP port might be mapped to a different TCP port in line with local requirements.

- The *IP address* of the Co-operating or Adjacent Test-DSA is restricted by the common underlying network infrastructure in use. Only one IP address is required. In case of PENS the IPv4 address needs to be allocated to the ANSP Test Messaging VPN. In case of a VPN over the Internet the IP address is provided by EUROCONTROL in order to prevent address conflicts.

3.2.4   States or Organisations with the intention to participate in the EDS testing activity provide the parameters of their Co-operating or Adjacent Test-DSA. The presentation address is used by the Central European Test-DSA and has to reflect measures applied by routers, firewalls or security appliances such as Network Address Translation (NAT).

Shadowing

3.2.5   The setup of replication using shadowing follows the EDS User Interface Control document [5], Section 4.2 using the parameters given in Table 2.

Parameter	Central European Test-DSA	Co-operating or Adjacent Test-DSA
Identifier	See below	
Version	0	
Role	Supplier	Consumer

Parameter	Central European Test-DSA	Co-operating or Adjacent Test-DSA
Unit of replication	O=European-Directory	
Mode	Supplier Initiated, On Change	
Access Point	See Table 1 (Central European Test-DSA)	

Table 2: Shadowing Parameters

3.2.6   The parameter *identifier* denoting the replication agreement is provided by the Central Administrator.

Chaining

3.2.7   The setup of chaining follows the EDS User Interface Control document [5], Section 4.2 using the parameters given in Table 3.

Parameter	Co-operating or Adjacent Test-DSA
Content Prefix	O=European-Directory
Type	Cross Reference
Access Point	See Table 1 (Central European Test-DSA)

Table 3: Knowledge Reference Parameters

3.3   Users

3.3.1   The setup of Co-operating and Adjacent Operators follows the EDS User Interface Control document [5], Section 4.3 using the parameters given in Table 4.

Parameter	User
Distinguished Name	See below
Password	See below

Table 4: User Parameters

3.3.2   Co-operating and Adjacent Operators are allocated and managed by the Central Administrator who provides Co-operating and Adjacent Operators with their distinguished names and initial passwords. An operator may change his password.

3.3.3   Allocation and management of EDS end users is a local matter; however, the same parameters apply in general.

4 Testing Process

4.1 General

4.1.1 The description of the EDS testing activity follows a common approach widely used in distributed test environments and trials where involved parties join and leave the activity in a controlled manner.

4.1.2 The overall EDS testing activity consists of repeated cycles. Each cycle is composed of five phases. The principles of cycles and phases have been adopted by Appendix G to the ICAO Doc 020 (EUR AMHS Manual). After completion of the final phase of a cycle, a new cycle starts with the first phase. The precondition of a phase corresponds to the post-condition of the previous phase. Figure 1 outlines this general approach with repeated cycles and phases.

4.1.3 The phases of the EDS testing activity correspond to the five phases of the EDS Operational Concept as per Appendix G to ICAO Doc 020 (EUR AMHS Manual) [4]. A tabular description provides the details of each testing phase. Table 5 lists the elements of the description and gives a brief definition of the elements.

Identification	Unique identification of testing step
Phase	Phase according to the EDS Operational Concept
Description	High level description of the testing step
Under Test	Aspects, elements and features under testing
Environment	Involved components, roles and data areas
Input	Testing input (input action, input data)
Output	Testing output (expected results, output events and data)
Information	Additional information

Table 5: Description of Phases

4.1.4 Each phase is identified by a unique identifier. The details include the related phase, the reference to Appendix G of ICAO EUR Doc 020 (EUR AMHS Manual) [4], a high level description, elements under test, the environment, input to the testing, expected output, and additional information as necessary.

4.1.5 The identifier serves two purposes. It identifies a test description in this document and during the EDS testing activity, it uniquely identifies a given phase of a given cycle and supports identification of the related test description. The unique identifier composes out of the prefix *EDSTest*, the two-digit number of the cycle and the consecutive two-digit number of the phase. The description of the EDS testing phases makes use of the placeholder CC for the cycle number. During the EDS testing activity, the initial cycle number takes the value

one, i.e. CC equals 01. The cycle number is incremented after completion of a cycle. The phases are numbered starting with one for the Data Entry Phase to 5 for the Data Distribution and Implementation Phase. The hyphen is used to separate the elements from each other.

Examples:

EDSTest-CC-01: Identifier used in the description of the Data Entry Phase.

EDSTest-02-05: Identifier for Data Distribution and Implementation Phase in the second cycle.

4.2   *Data Entry Phase*

4.2.1   In the initial step of EDS, this phase does not imply activities on EDS side apart from the establishment of prerequisites and setup as per Chapter 3, when applicable. However, essential test data used in the EDS testing activity is compiled in this phase.

4.2.2   The EDS testing activity begins with this phase. New parties also join at the beginning of this phase.

4.2.3   Table 6 provides the description of the Data Entry Phase.

Identification	EDSTest-CC-01
Reference	Section 5.4.2.1 of Appendix G to ICAO EUR Doc 020 (EUR AMHS Manual) [4]
Description	Modification of information in the AMC Background Area
Under Test	N/a in initial phase of EDS
Environment	<u>Components</u>: Test-AMC <u>Roles</u>: AMC and CCC Operators <u>Areas</u>: AMC Background
Input	<u>Data</u>: Valid set of information in the AMC Background Area <u>AMC Operator</u>: Data entry in the AMC background area for the AMHS MD Register and AFTN, CIDIN and AMHS routing information. Data entry in the AMC background area of AMHS address information (CAAS table, AMHS user address look-up table) and AMHS user capabilities of States and Organisations not participating in the EDS testing activity as necessary. <u>CCC Operator</u>: Data entry of AMHS address information (CAAS table, AMHS user address lookup table) and AMHS user capabilities in the AMC Background Area
Output	<u>Data</u>: Modified and validated set of information in the AMC Background Area

Information	Modification of EDS related types of information maintained at AMC: • AMHS MD Register • CAAS tables • AMHS user address lookup table • AMHS user capabilities • AFTN, CIDIN and AMHS routing matrices

Table 6: Data Entry Phase

4.2.4   This testing phase simulates the modification of AMHS-related information without immediate effect to the EDS. It is required to compile the input for subsequent testing phases. Modifications to the AMC Background Area shall get logged for the purpose of tracking and verification.

4.2.5   The AMC Operator is in charge of maintenance of the AMHS MD Register and the AFTN, CIDIN and AMHS routing directory. In addition, the AMC Operator maintains the CAAS tables, AMHS user address lookup tables and AMHS user capabilities of States and Organisation not participating in the EDS testing activity whenever considered necessary. It is proposed to simulate a variety of use cases and typical scenarios, such as:

• Introduction of a new AMHS Management Domain by insertion of an entry in the AMHS MD Register;

• Modification of the PRMD name of an existing AMHS Management Domain;

• Change of the AMHS Address Scheme of an existing AMHS Management Domain;

• Revocation of an existing AMHS Management Domain by removal of the respective entry from the AMHS MD Register;

• Insertion of new routing entries for AFTN, CIDIN and AMHS;

• Modification of existing routing entries for AFTN, CIDIN and AMHS;

• Removal of existing routing entries for AFTN, CIDIN and AMHS; and

• Use cases of CCC Operator on behalf of non-participating States and Organisations, as indicated in the next paragraph.

4.2.6   The CCC Operator is in charge of maintenance of the respective CAAS table, the AMHS user address lookup table and the AMHS user capabilities table. It is proposed to simulate a variety of use cases and typical scenarios, such as:

• CAAS table, AMHS user address lookup table and AMHS user capabilities tables:

   o Introduction of a new entry;

   o Modification of individual fields of an existing entry; and

   o Removal of an existing entry.

4.3   *Data Validation and Processing Phase*

4.3.1   Table 7 provides the description of the Data Validation and Processing Phase.

Identification	EDSTest-CC-02
Reference	Section 5.4.2.2 of Appendix G to ICAO EUR Doc 020 (EUR AMHS Manual) [4]
Description	Validation of information in the AMC Background Area by the AMC Operator and transfer of information to the EDS Pre-operational Area. Validation of information in the Pre-operational Area of the Central European Test-DSA by the EDS Central Administrator and of the Co-operating and Adjacent Test-DSAs by the EDS Co-operating and Adjacent Operators.
Under Test	AMC-EDS user interface: Transfer of information to EDS Pre-operational Area. Distribution of information: Push distribution by DISP or Pull distribution by DSP.
Environment	Components: Test-AMC, Central European Test-DSA, Co-operating and Adjacent Test-DSAs Roles: AMC Operator, EDS Administrator, Co-operating and Adjacent Operators Areas: AMC Background, AMC and EDS Pre-operational
Input	Data: Validated set of information in the AMC Background Area AMC Operator: Transfer of information to the EDS Pre-operational Area at the Central European Test-DSA
Output	Data: Modified set of data in the EDS Pre-operational Area at the Central European, Co-operating and Adjacent Test-DSAs
Information	Assessment of the test phase by inspection

Table 7: Data Validation and Processing Phase

4.3.2   At the AMC, the AMC Operator initiates the transfer of information to the EDS Pre-operational Area. The result of the operation is reported by AMC.

4.3.3   At the Central European Test-DSA, the EDS Central Administrator checks as a minimum:

- Result of transfer operation by inspection of the attribute values of the auxiliary object class *eds-unit* associated with the entry with the distinguished name O=European-Directory; OU=Pre-operational;

- Existence of new entries added by the AMC Operator (DUA);

- Absence of entries removed by the AMC Operator (DUA);

- Values of attribute types resulting from modifications by the AMC Operator (DUA); and

- Results of distribution for each Co-operating and Adjacent Test-DSA using replication through shadowing.

4.3.4   At Co-operating and Adjacent Test-DSAs, the Co-operating or Adjacent Operator checks as a minimum:

- Result of distribution by the Central European Test-DSA. The way to determine the results of push or pull distribution depends on the implementation. It is assumed that implementations provide this information at a Human-Machine-Interface for configuration and management or by log files;

- Existence of new entries added by the CCC Operator of the respective State or Organisation (DUA);

- Absence of entries removed by the CCC Operator of the respective State or Organisation (DUA); and

- Values of attribute types resulting from modifications by the CCC Operator of the respective State or Organisation (DUA).

4.3.5   The Central Administrator, Co-operating and Adjacent Operators may validate EDS information beyond the minimum requirements specified above. The results of the testing shall be logged and reported according to Section 2.4.

4.4   Acknowledgement Phase

4.4.1   Table 8 provides the description of the Acknowledgement Phase.

Identification	EDSTest-CC-03
Reference	Section 5.4.2.3 of Appendix G to ICAO EUR Doc 020 (EUR AMHS Manual) [4]
Description	Acknowledgment of routing matrices by CCC Operators.
Under Test	N/a in initial phase of EDS
Environment	<u>Components</u>: Test-AMC <u>Roles</u>: CCC Operators <u>Areas</u>: AMC Pre-operational Area
Input	<u>Data</u>: Valid set of information in the AMC and EDS Pre-operational Area <u>CCC Operator</u>: Acknowledgement of AFTN, CIDIN and AMHS routing matrices if updated
Output	<u>Data</u>: Valid and acknowledged set of information in the AMC Pre-operational Area

Information	This test phase is maintained for compatibility with the ATS Messaging Management process in order to allow for future implementation of an acknowledgement within the workflow mechanism of EDS. Acknowledgement is required for information generated by the Central European Test-DSA such as routing information.
	No modification of EDS related types of information appear in this phase.

Table 8: Acknowledgement Phase

4.4.2   This testing phase simulates the acknowledgement by CCC Operators without an immediate effect to the EDS.

4.5   Acknowledgement Processing Phase

4.5.1   Table 9 provides the description of the Acknowledgement Processing Phase.

Identification	EDSTest-CC-04
Reference	Section 5.4.2.4 of Appendix G to ICAO EUR Doc 020 (EUR AMHS Manual) [4]
Description	Acknowledgment processing by the AMC Operator
Under Test	AMC-EDS user interface: Transfer of information to the EDS Pre- operational Area (optional)
	Distribution of information: Push distribution by DISP or Pull distribution by DSP (optional)
Environment	Components: Test-AMC, Central European Test-DSA, Co-operating and Adjacent Test-DSAs
	Roles: AMC Operator, EDS Administrator, Co-operating and Adjacent Operators
	Areas: AMC and EDS Pre-operational
Input	Data: Validated and acknowledged set of information in the AMC Pre-Operational Area
	AMC Operator: Status update of routing matrices and transfer of information to the EDS Pre-operational Area at the Central European Test-DSA (optional)
Output	Data: Modified and acknowledged set of data in the EDS Pre-operational Area at the Central European, Co-operating and Adjacent Test-DSAs

Information	Modification of EDS related types of information maintained at AMC:
	• AFTN, CIDIN and AMHS routing matrices

Table 9: Acknowledgement Processing Phase

4.5.2   This phase might result in one or potentially several repetitions as given below.

4.5.3   Depending on the acknowledgments received during the acknowledgment phase, the AMC Operator adjusts the status of the routing matrices (in preparation, proposed, released) and re-transfers the updated information to the EDS Pre-operational Area. The result of the operation is reported by AMC.

4.5.4   At the Central European Test-DSA, the EDS Central Administrator checks as a minimum:

- Result of transfer operation by inspection of the attribute values of the auxiliary object class *eds-unit* associated with the entry with the distinguished name O=European-Directory; OU=Pre-operational;

- Modifications applied to routing entries, if any; and

- Results of distribution for each Co-operating and Adjacent Test-DSA using replication through shadowing.

4.5.5   At Co-operating and Adjacent Test-DSAs, no checks are required by the Co-operating or Adjacent Operator in order to achieve the minimum coverage.

4.5.6   The Central Administrator, Co-operating and Adjacent Operators may validate EDS information beyond the minimum requirements specified above. The results of testing shall be logged and reported according to Section 2.4.

4.6   Data Distribution and Implementation Phase

4.6.1   The EDS testing activity ends with this phase and participants leave at the end of this phase.

4.6.2   Table 10 provides the description of the Data Distribution and Implementation Phase.

Identification	EDSTest-CC-05
Reference	Section 5.4.2.5 of Appendix G to ICAO EUR Doc 020 (EUR AMHS Manual) [4]
Description	Transfer of information to the EDS Operational Area. Testing of information in the Operational Area of the Central European Test-DSA by the EDS Central Administrator and of the Co-operating and Adjacent Test-DSAs by the EDS Co-operating and Adjacent Operators. Report of results.

Under Test	<u>AMC-EDS interface</u>: Transfer of information to the EDS Operational Area. <u>Distribution of information</u>: Push distribution by DISP or Pull distribution by DSP.
Environment	<u>Components</u>: Test-AMC, Central European Test-DSA, Co-operating and Adjacent Test-DSAs <u>Roles</u>: AMC Operator, EDS Administrator, Co-operating and Adjacent Operators <u>Areas</u>: AMC Pre-operational Area, AMC and EDS Operational Areas
Input	<u>Data</u>: Validated set of information in the AMC Operational Area <u>AMC Operator</u>: Transfer of information to the EDS Operational Area at the Central European Test-DSA
Output	<u>Data</u>: Modified set of data in the EDS Operational Area at the Central European, Co-operating and Adjacent Test-DSAs
Information	Assessment of the test phase by inspection

Table 10: Data Distribution and Implementation Phase

4.6.3   At the AMC, the AMC Operator initiates the transfer of information to the EDS Operational Area. The result of the operation is reported by AMC.

4.6.4   At the Central European Test-DSA, the EDS Central Administrator checks as a minimum:

- Result of transfer operation by inspection of the attribute values of the auxiliary object class *eds-unit* associated with the entry with the distinguished name O=European-Directory; OU=Operational;

- Existence of new entries added by the AMC Operator (DUA);

- Absence of entries removed by the AMC Operator (DUA);

- Values of attribute types resulting from modifications by the AMC Operator (DUA); and

- Results of distribution for each Co-operating and Adjacent Test-DSA using replication through shadowing.

4.6.5   At Co-operating and Adjacent Test-DSAs, the Co-operating or Adjacent Operator checks as a minimum:

- Result of distribution by the Central European Test-DSA. The way to determine the results of push or pull distribution depends on the implementation. It is assumed that implementations provide this information at a Human-Machine-Interface for configuration and management or by log files;

- Existence of new entries added by the CCC Operator of the respective State or Organisation (DUA);

- Absence of entries removed by the CCC Operator of the respective State or Organisation (DUA); and

- Values of attribute types resulting from modifications by the CCC Operator of the respective State or Organisation (DUA).

4.6.6   The Central Administrator, Co-operating and Adjacent Operators may validate EDS information beyond the minimum requirements specified above. The results of testing shall be logged and reported according to Section 2.4.

END of Appendix G-C