



International Civil Aviation Organization
CAR/SAM Regional Planning Implementation Group (GREPECAS)
Air Traffic Management / Communications, Navigation and Surveillance
Subgroup (ATM/CNS/SG)
Communications, Navigation and Surveillance Committee
FIFTH MEETING OF THE ATN TASK FORCE (ATN/TF/05)
(Mexico City, Mexico, 12 to 13 June 2009)

Agenda Item 4: Review of the Regional Plan for the implementation of AMHS in CAR/SAM Regions and AMC Directory Services

c) AMC Directory Service

(Presented by the ICAO Secretariat)

SUMMARY

The following working paper present the short-to-medium term agreement between EUROCONTROL and ICAO for the coordination of the allocation and management of AMHS addresses, Directory Services, and the training offered to users for the AMC Operations.

References:

- GREPECAS CNS ATN/TF/04 Report
- ICAO State Letters: SP 54/1-03/39 and AN 7/49.1-09/34

Strategy Objectives:

This paper is related to Strategy Objective D.

1. Introduction

1.1 In attendance to the Recommendation 5/3 of the Aeronautical Telecommunication Expert Panel (ATNP) for creating a central registry for the management of the ATSAMHS service, ICAO issued State letter SP 54/1-03/39, dated 30 May 2003, for input from States and interested international organizations, to allow ICAO to establish the AMHS Management Domains and Addressing Information Register.

1.2 Based on the reply from the States, a register was established and made available on the ICAO-Net, at the following URL: www.icao.net.int/anb/panels/acp/amhs/amhs.cfm.

2. Discussion

2.1 On 14 April 2009, ICAO issued State letter AN 7/49.1-09/34 indicating that for the orderly operation of the AMHS on a global scale, it is necessary the Directory Service to coordinate and synchronize the allocation of AMHS addresses, for which ICAO, in cooperation with the European Organization for the Safety of Air Navigation (EUROCONTROL), established procedures for the coordination and synchronization of AMHS addresses in the short- to medium-term. The mentioned State letter is presented as **Appendix A** to this paper.

2.2 Based on this agreement, in the short- to medium-term, ICAO will utilize the European ATS Messaging Management Centre (AMC), provided by EUROCONTROL, to coordinate the allocation and management of AMHS addresses. And so States were invited to designate representatives to register as AMC users using the procedure detailed on the said State Letter. In this regards all States and/or ANSPs, operating international COM Centres, with the intention of implementing AMHS in the foreseeable future, should engage themselves into the AMHS address coordination process without delay.

2.3 For the use of this system, users were invited for training in EUROCONTROL premises in Luxembourg to be held on June 3-4, 2009. As a courtesy of EUROCONTROL, in **Appendix B** to this note a presentation of this training is available. In order to satisfy the training of the different users in the different regions, EUROCONTROL, in reply to ICAO request, is studying the possible to give the training in other regions different from Europe.

2.4 For the long-term, a truly global method of AMHS address management will be required. ICAO will take the necessary action to develop appropriate recommendations for the establishment of management centres in the ICAO Regions and also the cooperation between such centres.

2.5 The GREPECAS CNS ATN/TF/04 Meeting formulated Recommendation 4/1 – *Establishment of an entity to manage AMHS Addressing*, urging the States that have AMHS implemented should participate with EUROCONTROL AMC to become familiar with the managing and updating of the database, and that ICAO Regional office invite EUROCONTROL to the next ATN Task Force meeting for a demonstration of the AMC program.

3. Suggested Action

3.1 The Meeting is invited to:

- a) Take note of the information provided in this paper and its Appendix A.
- b) Analyze and comment the training information provided on Appendix B; and
- c) Propose any other action for States/ANSP to register in the AMC and about the possible AMC training offered by EUROCONTROL.

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Ref.: AN 7/49.1-09/34

14 April 2009

Subject: Management and update of air traffic services
(ATS) message handling system (AMHS) address
information

Action required: Register a COM Centre representative
to become a user of the ATS messaging management
centre (AMC) using the procedures outlined in
Attachment B

Sir/Madam,

1. I have the honour to invite your attention to a recent development regarding the global management of the emerging air traffic services (ATS) message handling system (AMHS). The methods and procedures outlined in this letter will become important to those involved in the planning and operation of your message switching systems.

2. The transition from the ageing aeronautical fixed telecommunication network (AFTN) to the AMHS is under way and continuing at a good pace. For the orderly operation of the AMHS on a global scale, it is necessary to coordinate and synchronize the allocation of AMHS addresses. In response to this, ICAO, in cooperation with the European Organisation for the Safety of Air Navigation (EUROCONTROL), has established procedures for the coordination and synchronization of AMHS addresses in the short- to medium-term.

3. Before discussing the procedures, I would like to provide you with the background to this development. State letter SP 54/1-03/39, dated 30 May 2003, sought input from States and interested international organizations, to allow ICAO to establish the AMHS Management Domains and Addressing Information Register. This register has now been established and is now available on the ICAO-Net, at the following URL: www.icao.int/anb/panels/acp/amhs/amhs.cfm.

4. With the register established, a means of address coordination was necessary. At the forty-ninth meeting of the European Air Navigation Planning Group (EANPG), two conclusions were reached which dealt with the following:

Conclusion 49/23 – AMHS Address Coordination

That ICAO be invited to utilize the European ATS Messaging Management Centre facility at the earliest opportunity, in support of the initial AMHS implementation and based on the proposed draft AMHS address coordination procedures between the ICAO AMHS MD Register and the ATS Messaging Management Centre.

Conclusion 49/24 – AMHS Messaging Management Centre Users

That ICAO be invited to address States outside the ICAO EUR Region to register with the ATS Messaging Management Centre as external COM centre operators, as soon as possible.

5. This State letter is a response to the EANPG conclusions above. In the short- to medium-term, ICAO will utilize the European ATS Messaging Management Centre (AMC), provided by EUROCONTROL, to coordinate the allocation and management of AMHS addresses. All States are therefore invited to designate representatives to register as AMC users using the procedure described in Attachment B.

6. The procedures for AMHS address coordination through the AMC are given in Attachment A. Users need to be trained before they are actually allowed to enter data in the AMC (<http://www.eurocontrol.int/amc>). A two-day training session will be delivered from 3 to 4 June 2009 (free of charge) to all registered users. The training session will be held at the EUROCONTROL Institute of Air Navigation Services (IANS), located in Luxembourg.

7. All States and/or ANSPs, operating international COM Centres, with the intention of implementing AMHS in the foreseeable future, should engage themselves into the AMHS address coordination process without delay.

8. For the long-term, a truly global method of AMHS address management will be required. Staff within the CNS/AIRS Section of the Air Navigation Bureau will take the necessary action to develop appropriate recommendations for the establishment of management centres in the ICAO Regions and also the cooperation between such centres.

Accept, Sir/Madam, the assurances of my highest consideration.

Taïeb Chérif
Secretary General

Enclosures:

- A — Proposed short-term procedures for global AMHS address coordination
- B — Registration procedure

**PROPOSED SHORT-TERM PROCEDURES FOR
GLOBAL AMHS ADDRESS COORDINATION**

(Based on Appendix O to the EANPG/49 Report)

1. INTRODUCTION

1.1 This paper was developed by the air traffic services (ATS) message handling system (AMHS) Inter-Regional Coordination Team (in short, the IRC Team) formed to address inter-regional air traffic services (ATS) message handling system (AMHS) issues under coordination by the ICAO European and North Atlantic Office (Paris) (EUR/NAT) Office, with the endorsement of the European Air Navigation Planning Group (EANPG).

1.2 The IRC Team action plan included, as part of the definition of short-term working arrangements for the global use of the ATS messaging management centre (AMC) for the AMHS Management Domain (MD) Register, draft procedures to be developed for global AMHS address management in the short term using AMC¹.

1.3 The AMC is a concept defined in the *ATS Messaging Management Manual* (ICAO EUR Doc 021), for the off-line management of the integrated, heterogeneous messaging environment made of the aeronautical fixed telecommunication network (AFTN), common ICAO data interchange network (CIDIN) and AMHS. The concept describes the management organization and includes a set of functions and procedures which are implemented in AMC systems to deliver services to AMC users in ANSPs, and particularly in their international communications (COM) centres.

1.4 This paper provides the proposed procedures. The overall goal of these procedures is to ensure for the short-term that the global AMHS address management is performed in a consistent manner, both from an operational viewpoint and from an official (institutional) viewpoint.

1.5 For the medium and longer term a task force will be set up by the Air Navigation Bureau to develop appropriate recommendations regarding the future evolution of AMHS address management, including the potential establishment of management centres in ICAO Regions, if needed. This task force should be composed of representatives of ICAO Contracting States in various regions.

**2. BACKGROUND ON GLOBAL AMHS ADDRESS
MANAGEMENT IN THE SHORT-TERM USING
AMC**

2.1 The approach for global AMHS address management in the short-term is the following:

- a) for operational purposes, there is an agreement to use the AMC in the short-term by the European (EUR) and the Asia/Pacific (ASIA/PAC) Regions, as well as by the United States Federal Aviation Administration (FAA). Other regions which have not discussed AMHS management so far should be encouraged to use the AMC as soon as they start studying AMHS implementation; and

¹ More information is available at <http://www.eurocontrol.int/amc/>

- b) for institutional aspects, ICAO intends to publish, on its web site, an official version of the register.

2.2 Furthermore, the official ICAO Register and the operational AMC contain the same data and must be periodically aligned.

2.3 The working arrangements proposed in this paper are designed for a global AMHS address management using AMC. This implies that **the use of AMC should be strongly recommended to every ICAO Contracting State worldwide, as soon as there is an AMHS project or implementation in that State.** The procedures rely upon the fact that all States be involved in AMHS, i.e. all States which may declare changes in AMHS addressing are AMC users.

2.4 The basis for these procedures should be that AMC is used operationally and that ICAO Headquarters publishes the AMHS MD Register officially on its website using AMC data.

3. SCOPE OF ENVISAGED AMHS ADDRESS CHANGES

3.1 The possible changes in AMHS addresses which need to be managed as part of the AMHS address management are classified in two categories and include the following modifications:

- a) Major changes (should not be frequent):

- 1) Modification² of PRMD-name,
- 2) Change of addressing scheme, among those defined in ICAO Docs 9705/9880, from “XF” to “CAAS” or vice-versa (less likely to happen);

- b) Minor changes (should be more frequent):

- 1) Modifications in CAAS table (associations between location indicator – “OU” address attribute value and “O” address attribute value).

3.2 Major changes have either an institutional impact or a major operational impact.

3.3 Minor changes have only an operational impact, which may be much more limited, depending on the magnitude of changes which may be roughly assessed on the basis of:

- a) the number of location indicators impacted by the change; and/or
- b) the frequency of messages to/from users in the locations of which the location indicators are impacted.

3.4 Exceptionally, a minor change may have an institutional impact. However this should be very rare and as no specific procedure is defined for this such situations will be handled case by case on an ad hoc basis.

² The term “modification” should be understood here in a general way, meaning addition, modification or deletion.

4. ASSUMPTIONS RELATED TO THE PROCEDURES

4.1 Official interactions

4.1.1 Major changes, due to their institutional impact or major operational impact, must be subject to official interactions between the States and ICAO. These interactions are assumed to be based on the exchange of written documents by fax or letter. Pro formas for such documents are provided in Attachment A to this letter.

4.2 Systems

4.2.1 In the short-term, only two systems are available to contribute to AMHS address management, as mentioned above:

- a) the AMC implemented by EUROCONTROL under the aegis of the ICAO EUR Office (Paris), for all operational purposes, following an EANPG/45 conclusion; and
- b) the ICAO AMHS MD Register, for official purposes. This system is loaded with AMC data to ensure consistency with the operational status of the AMHS network.

4.3 Participants

4.3.1 The procedures rely upon the fact that all States/ANSPs involved in AMHS participate in AMC activity. Participants to the procedures are expected to be:

- a) States, both as the potential initiators of changes in AMHS addressing and as implementers of AMHS systems. The notion of “State” therefore includes:
 - 1) the people in charge of official declarations, for major changes;
 - 2) Cooperating COM Centre (CCC) Operators³ in charge of operational management of AMHS. They use AMC data to configure their message switches and AFTN/AMHS gateways;
 - 3) Other AMC users, such as AMHS project managers, engineers involved in AMHS projects, COM Centre personnel, etc. (several AMC user categories are defined for them, including “AMF-I User⁴” and “Read-only user”);
- b) ICAO Regional Offices as a possible interface for the States in each ICAO Region. The regional office is represented by the CNS Officer;
- c) ICAO Headquarters, represented by the Air Navigation Bureau and more specifically (if needed) by its Communications, Navigation and Surveillance/Aeronautical Information Resource Services Section (CNS/AIRS) Section;
- d) AMC Operators, responsible for overall operation of the AMC and of associated procedures.

³ In the current AMC terminology, the term CCC is limited to Europe, and External COM Centre is used for States outside Europe. This distinction should disappear, and the terminology/documentation should be updated, when global use of AMC is started based on these procedures.

⁴ The term “AMF-I User” denotes an AMC user specifically involved in AMHS Off-Line Management – Implementation Support functions, on behalf of his/her State or ANSP, e.g. the project leader for AMHS implementation.

5. PROCEDURE FOR MAJOR CHANGES

5.1 A simplified diagram of the proposed procedure for major changes is provided in Figure 1. The main stages are as follows:

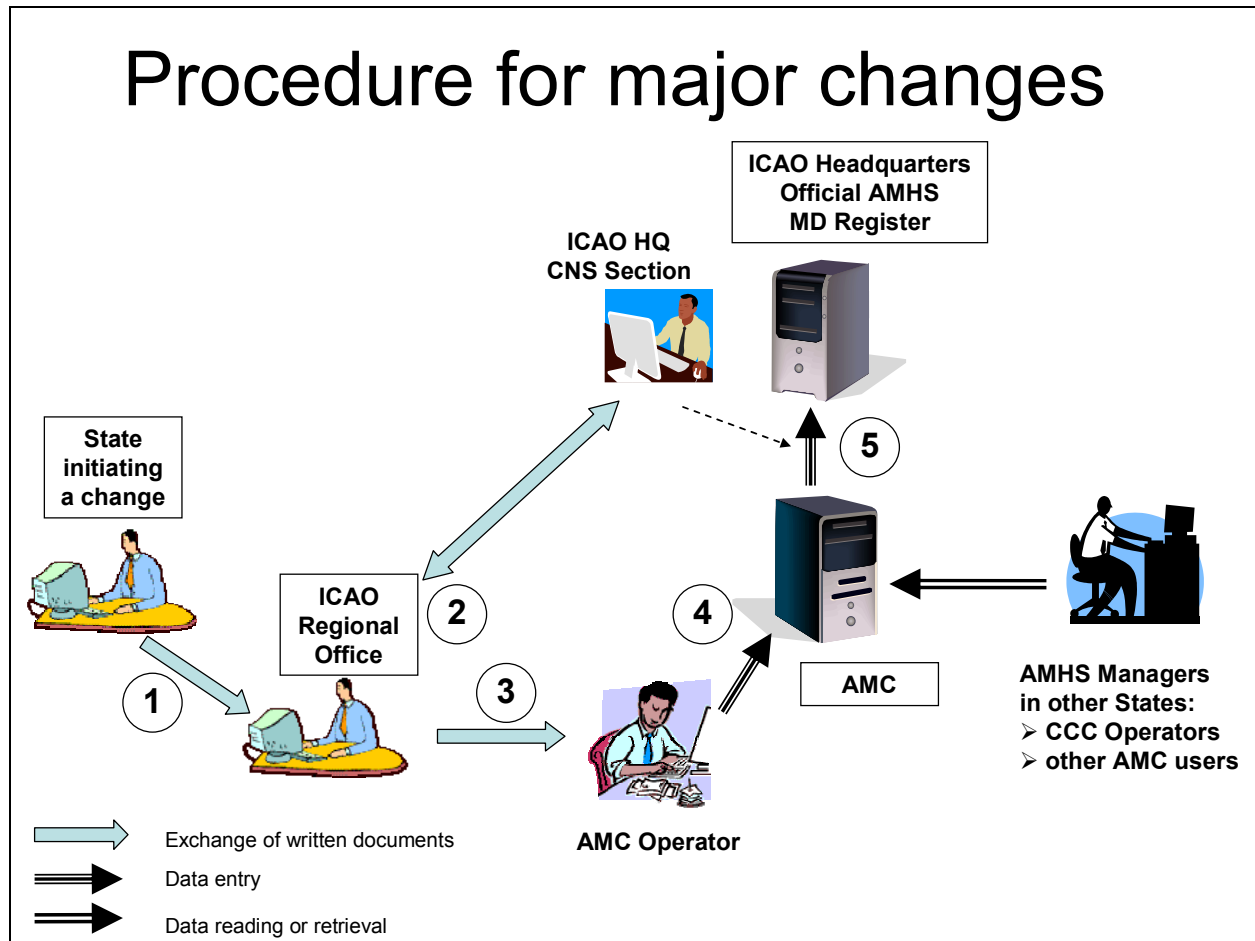
1. an accredited person in the considered State declares the change to ICAO, using a standard written pro forma – “ICAO” in this case means the regional office for the ICAO Region where the State is located. The pro forma includes the applicability date of the change (an AIRAC date);
2. the CNS Officer in the regional office, in coordination with ICAO Headquarters as appropriate⁵, validates the acceptability of the declared change from an official and institutional viewpoint;
3. after validation, the CNS Officer forwards the declaration of change to the AMC operator, using appropriate means such as fax, e-mail, etc. (different from data entry in AMC);
4. the AMC operator enters data in the AMC based on the input received from the regional office, at the appropriate time considering the applicability date of the change and using the AMC operational procedures;
5. at the date of applicability, i.e. at each AIRAC cycle date, the ICAO Headquarters CNS/AIRS Section retrieves an AMHS address management export file from the AMC and uploads it to the ICAO Official AMHS MD Register.

5.2 Steps 3 to 5 are performed as part of the normal AMC operation. This means that, in parallel with this process, standard AMC procedures are followed by the AMC operator and by AMHS managers in other States. The CCC operators exploit the AMC data reflecting the change, together with other AMHS management data, to update their systems.

5.3 At each stage, coordination may take place, if needed, between the different parties involved to ensure the correctness of the proposed change.

⁵ e.g. to ensure global uniqueness of a requested PRMD-name with respect to other requests under consideration in other regions.

Figure 1: Procedure to handle major AMHS address changes



6. PROCEDURE FOR MINOR CHANGES

6.1 A simplified diagram of the proposed procedure for minor changes is provided in Figure 2. The main stages are as follows:

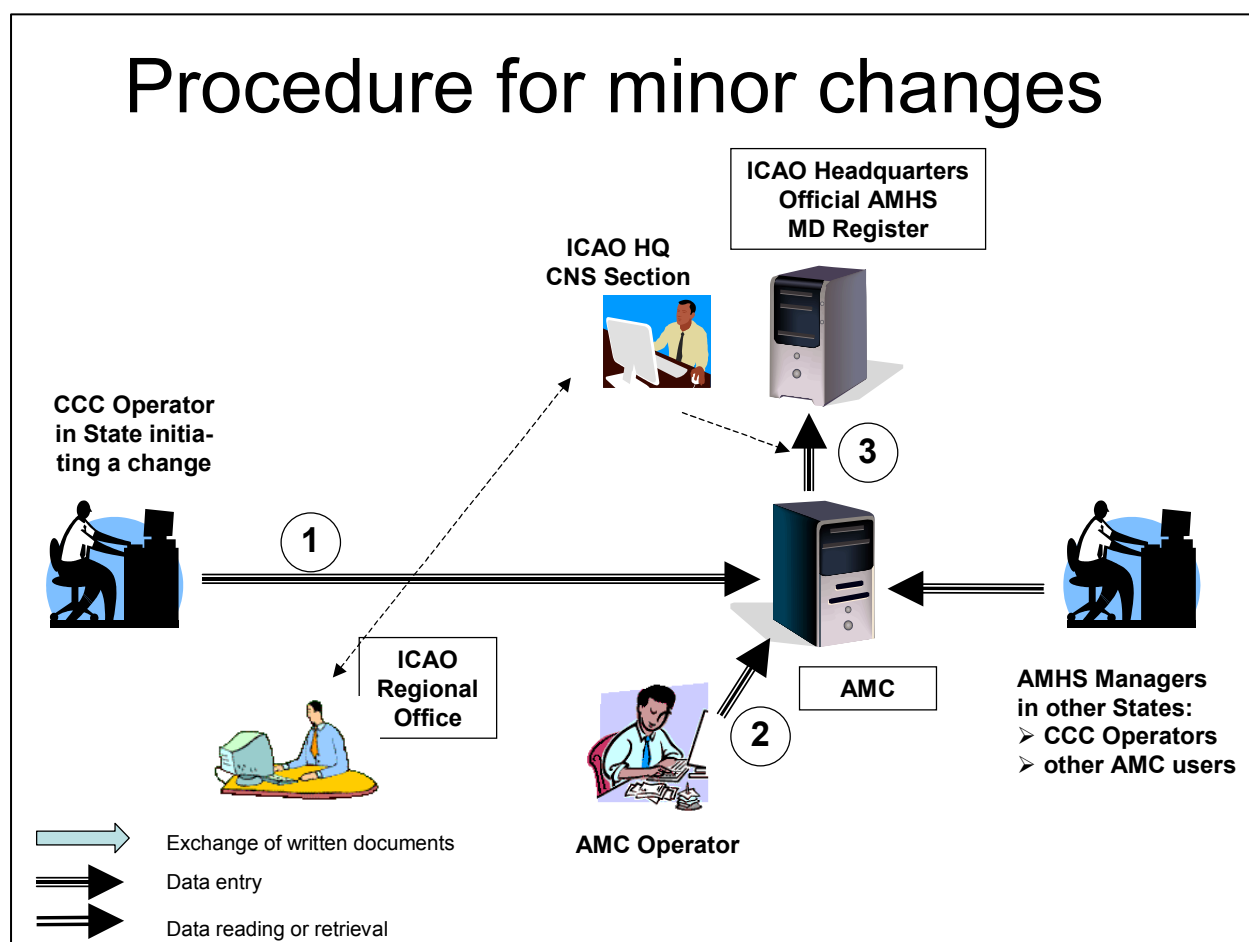
1. the CCC operator in the considered State enters data corresponding to the intended change in the AMC, using the standard AMC operational procedures, taking into account the applicability date of the change (an AIRAC date);
2. the AMC operator performs the standard AMC operational procedures, such that the status of changed data is passed to “operational” at the applicability date;
3. at the date of applicability, i.e. at each AIRAC cycle date, the ICAO HQ CNS/AIRS Section retrieves an AMHS address management export file from the AMC and uploads it to the ICAO Official AMHS MD Register (this is identical to stage 5 in the procedure for major changes).

6.2 This is performed as part of normal AMC operation. This means that in parallel with this process, standard AMC procedures are followed by the CCC operators and other AMC users to exploit

the AMC data reflecting the change, together with other AMHS management data, to update their systems.

6.3 At each stage, coordination may take place if needed between the different parties involved, and with the CNS Officer in the regional office if needed⁶, to ensure the correctness of the proposed change.

Figure 2: Procedure to handle minor AMHS address changes



⁶ The regional office needs to be involved only in exceptional cases, such as institutional impact of a minor change.

Part 1: Modification of PRMD-name Registration

State:

Nationality letters:

PRMD-name registered before modification:

Please consider the following options in case of modification:

Option A: the PRMD-name to be the following reserved identifier.

Option B: the PRMD-name to be modified as proposed below, after validation by the Secretariat.

Option C: the PRMD-name to remain unchanged (only the addressing scheme is modified, see Part 2).

Please specify your choice (A, B or C):

If choice is B, please specify the proposed PRMD-name identifier:

P =

Proposed applicability date for the modification (an AIRAC date):

Name of organization managing the AMHS MD (if applicable):

The contact point:

Postal/electronic mail address and telephone/fax number:

Additional comments:

Part 2: Modification of declaration of addressing scheme

State:

Nationality letters:

PRMD-name registered before modification:

Addressing scheme declared before modification:

Please select one of the following options in case of modification:

Choice A: AMHS user addresses to be allocated by application of the (recommended) CAAS addressing scheme in the AMHS MD operated in the above State.

Choice B: AMHS user addresses to be allocated by application of the (default) XF addressing scheme in the AMHS MD operated in the above State.

Choice C: the addressing scheme to remain unchanged (only the PRMD-name is modified, see Part 1).

Please specify your choice (A, B or C):

If choice is A (CAAS), please fill in the following table for all location indicators found in Doc 7910 under the above nationality letters.

Organization-name for the group of locations	location indicators

(table to be expanded as appropriate)

Proposed applicability date for the modification (an AIRAC date):

Name of organization managing the AMHS MD (if applicable):

The contact point:

Postal/electronic mail address and telephone/fax number:

— — — — —

ATTACHMENT B to State letter AN 7/49.1-09/34

REGISTRATION PROCEDURE

(based on *ATS Messaging Management Manual*, section 2.5.2.4)

1. In order to carry out the procedures described in Attachment A, each State/ANSP should designate an AMC User associated to its COM Centre. A second person may also be designated as a back-up.
2. The AMC User has to register using the following link:

https://extranet.eurocontrol.int/http://chow.mis.eurocontrol.be:8095/elsh_live/elsh/registerNewUserForApplication.do?eurocontrolresourceid=amc_users
3. Once this is performed, the user accreditation procedure defined in section 2.5.2 of the *ATS Messaging Management Manual* will start.
4. After the accreditation of the user, an AMC account will be created by EUROCONTROL AMC Support Team and details of the account will be sent to the users. Training of the user will also be planned at this stage.
5. After training, the user can start accessing the AMC using <http://www.eurocontrol.int/amc/>.


— END —

ATS Messaging Management

ATS Messaging Management Centre (AMC) Users Training
Including AMC Phase 2 functions
03-04 June 2009

Jean-Marc Vacher, EUROCONTROL

European Organisation for the Safety of Air Navigation




1. Introduction

Chapter 1

Introduction

2



1.1 Course Objective

1. Provide a general view of the AMC application to enable new participants to efficiently become AMC users
2. Update existing AMC users on new AMC functionalities, covering Phase 2 functions and address management

3



1.2 Contents

1. Introduction
2. Overall framework for ATS Messaging Management
3. Technical and practical overview
4. Data organization (including Regions) and user interface
5. Overview of operational functions and procedures (AMF-O)
6. Network inventory
7. Routing management (including multiple COM Centres, Import-Export)
8. Address management (including relation to ICAO HQ)
9. Miscellaneous functions (for AMC Operator and other users)
10. General AMC Operator functions
11. Overview of implementation support functions (AMF-I)
12. Questions and answers

4



1.3 Introduction Sessions

- Day 1
 - Session 1 (10:00-11:00): Introduction and Framework
 - Session 2 (11:30-12:30): Technical Overview, User interface and Regions
 - Session 3 (14:00-15:00): AMF-O Overview – Network Inventory
 - Session 4 (15:30-16:30): Routing Management
- Day 2
 - Session 5 (9:30-10:30): Address Management
 - Session 6 (11:00-12:00): Address Management, including relation with ICAO HQ
 - Session 7 (13:00-14:00): Miscellaneous Functions and General AMC Operator Functions
 - Session 8 (14:30-15:30): AMF-I Overview
 - Q & A - Closure

5



1.4 AMC concept - History

- Dec 2001: Start of CIDIN Management Centre (CMC) operation
- Dec 2003: ICAO EANPG Conclusion 45/10:
"that Eurocontrol be invited to consider extending the CIDIN Management Service to provide ATSMHS off-line network management"
- Sept 2004-May 2005: Study of AMHS Off-line Management
 - ATS Messaging Management Manual (approved by AFSG/8 – ICAO Paris)
- Sept 2005: Eurocontrol DG decision to implement ATS Messaging Management Centre (AMC)
- Oct 2005-Nov 2006: Implementation of the AMC
- 19th Jan 2007: Start of AMC operational service
- April 2007: Adoption of ATS Messaging Management Manual Version 3.0 as EUR ICAO DOC 021

6



1.5 AMC concept – ICAO State Letter

- EANPG Conclusions:
 - Conclusion 49/23 – AMHS Address Coordination
“That ICAO be invited to utilize the European AMC facility at the earliest opportunity [...]”
 - Conclusion 49/24 – AMHS Messaging Management Centre Users
“That ICAO be invited to address States outside the ICAO EUR Region to register with the AMC] as external COM centre operators, as soon as possible.”
- ICAO State Letter 09-34 (dated 14th April 2009, “a response to the EANPG conclusions above”):
 - In the short- to medium-term, ICAO will utilize the European ATS Messaging Management Centre (AMC), provided by EUROCONTROL, to coordinate the allocation and management of AMHS addresses.
 - All States are therefore invited to designate representatives to register as AMC users [...].
 - All States and/or ANSPs, operating international COM Centres, with the intention of implementing AMHS in the foreseeable future, should engage themselves into the AMHS address coordination process without delay.

7



1.6 AMC concept - Scope and Objectives

- Deliver Off-Line Network Management Services in support of the “ATS Messaging part” of the AFS:
the integrated AFTN / CIDIN / AMHS network
- Support to States with AMHS in operation
 - AMHS Management Functions – Operational Support (AMF-O)
- Support to States on their way to implement AMHS
 - AMHS Management Functions – Implementation Support (AMF-I)
- Provide the service in a single focal point for AFTN, CIDIN, AMHS
 - For EUR/NAT Regions
 - Also provide service to other Regions, with a priority on address management
- Service provided on a co-operative basis (not chargeable)

8



2. ATS Messaging Management

Chapter 2

Overall Framework for ATS Messaging Management

9



2.1.1 Nature of Network Management

- Technical scope:
In our context "ATS Messaging Management" covers:
AFTN, CIDIN, AMHS
- Functional scope:
 - "FCAPS" model:
fault, configuration, accounting, performance, security
 - Other models:
inventory, change control, help desk, etc.
- Real-time / Short-term / Long-term
- Centralised / Local:
In our context each COM Centre is managed nationally, i.e.
"locally"

10



2.1.2 Need for coordination

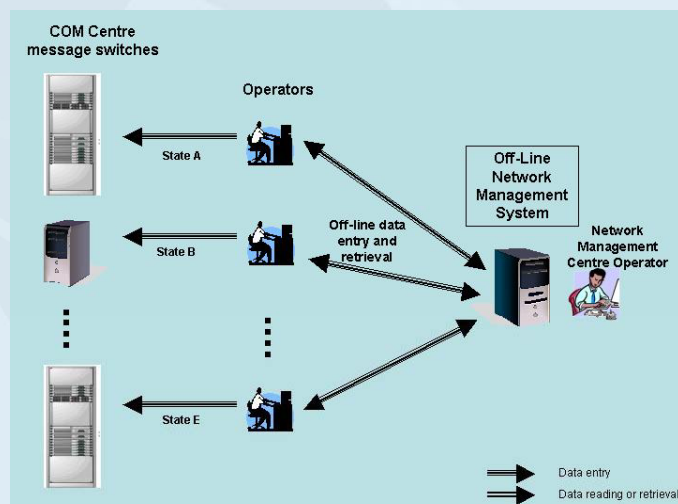
"Local" management does not mean independent one from each other. Coordination is required, e.g. for:

- Sharing of common network-related data
- Synchronisation of changes in the network

11



2.1.3 Off-line Network Management



12



2.2.1 AMC Participants

- AMC Operator
- CCC (Co-operating COM Centre) Operators
- External COM Centre Operators
- AMF-I Users
- Read-Only Users
 - Operators without formal responsibility
 - People overseeing activity
- Participating COM Centres

AMC Users

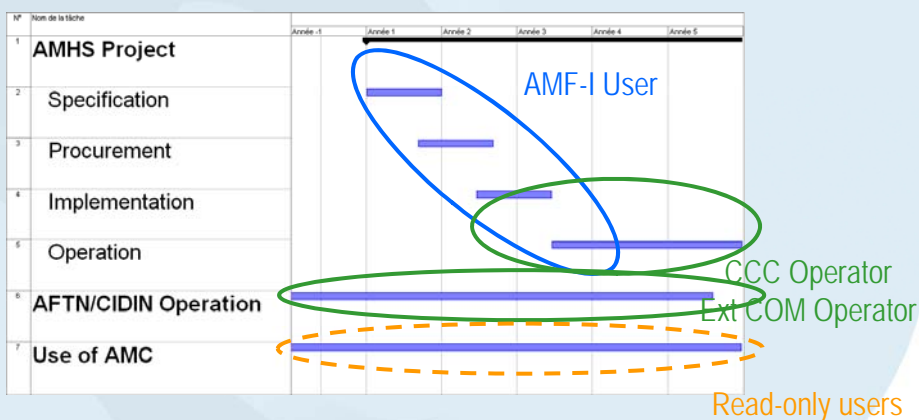
How to be in one of these categories ?

Use accreditation procedures in the Manual

13



2.2.2 Main focus for AMC Participants in an AMHS Project

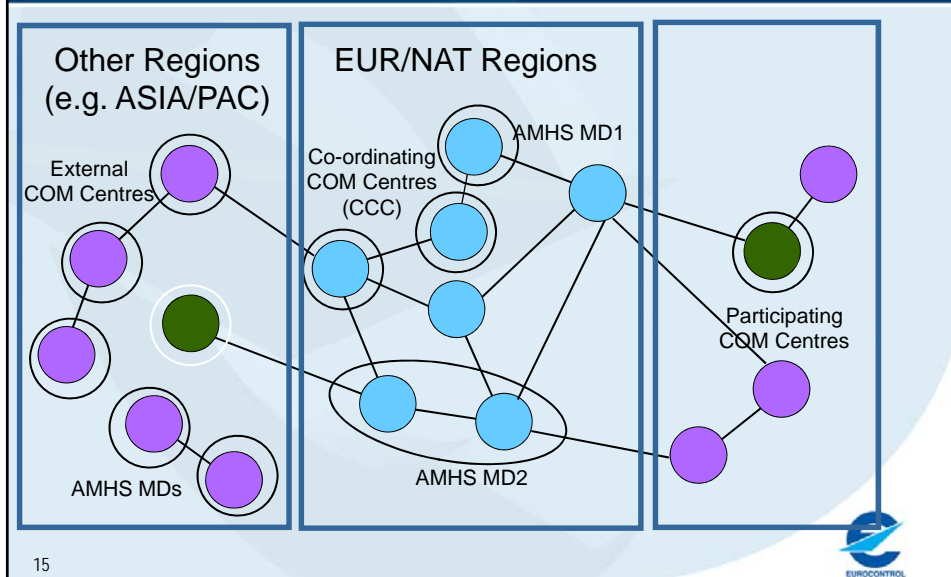


- AMF-I Users, CCC Operators and Ext. COM Operators are officially representing their COM Centre and/or ANSP
- Read-only users have no formal responsibility and may be not directly involved in an AMHS project

14

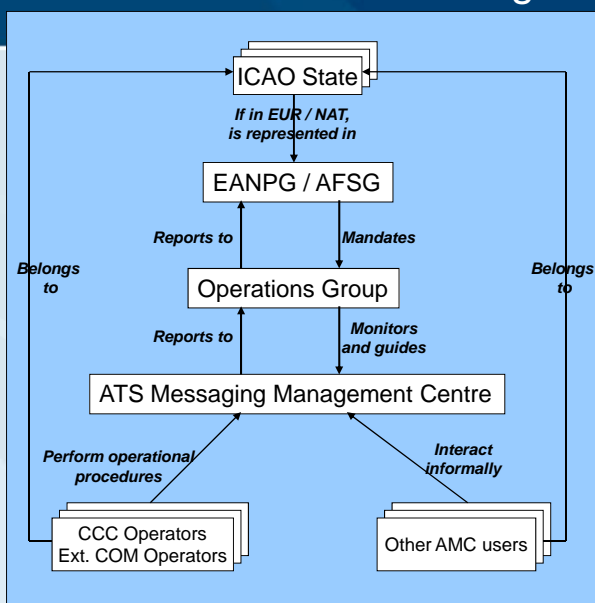


2.2.3 ATS Messaging Management Area



15

2.2.4 Organisation



16

2.2.5 Organisation: AMC Participants and access to functions

Participant categories	AMC functions	AMF-I functions	AMF-O functions	AMC Operator functions
AMF-I users		yes	some	
CCC operators		yes	yes	
External COM operators		yes	All but routing and statistics	
Read/only users		some	some	
AMC Operators		yes	yes	yes

AMC users

A task performed by a group of ANSP/COM Centre representatives under contract by Eurocontrol

+ AMC Support Group:
(Eurocontrol)

AMC Project Leader
system infrastructure operators



17

3. ATS Messaging Management

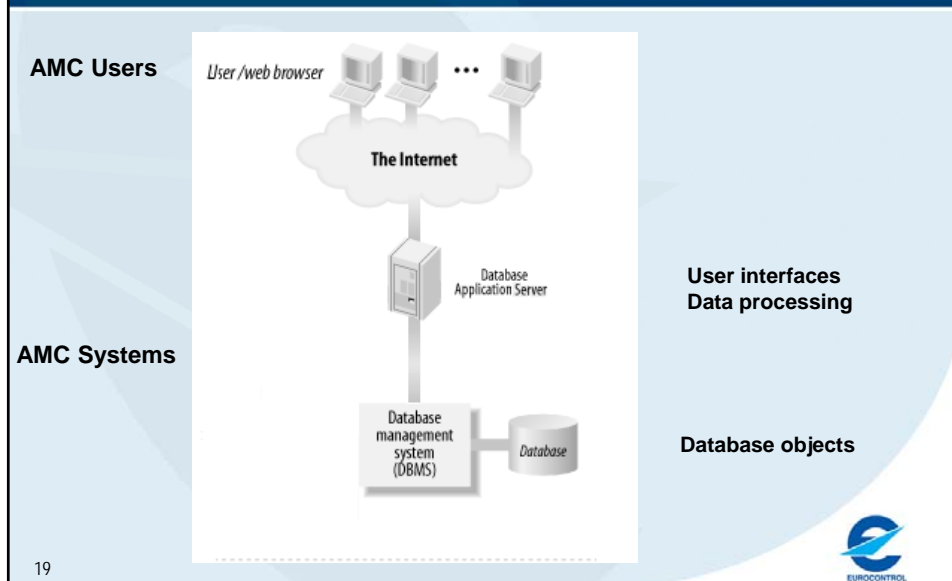
Chapter 3

Technical and Practical Overview

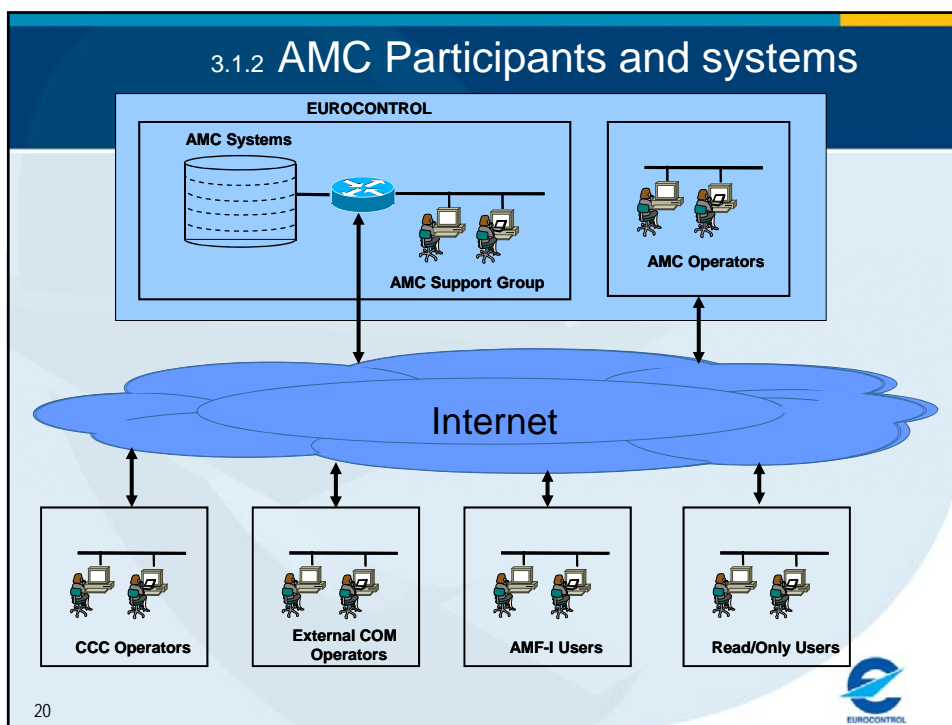


18

3.1.1 A Database Application



3.1.2 AMC Participants and systems



3.2.1 How to become an AMC User ?

- Use procedure described in **ATTACHMENT B** to ICAO State letter AN 7/49.1-09/34 :
- Fill in the electronic form provided at:
https://extranet.eurocontrol.int/http://chow.mis.eurocontrol.be:8095/elsh_live/elsh/registerNewUserForApplication.do?eurocontrolre_sourceid=amc_users
- The accreditation procedure is then started (see ATS Messaging Management Manual section 2.5.2)
- Follow AMC training

21



3.2.2 How to enter the AMC application ?

- Various entry points:
 - www.eurocontrol.int/amc/
 - www.paris.icao.int

22



3.2.5 How to enter the AMC application ? (via ICAO)

1. Select "AMC"

2. Select "Continue to AMC"

25

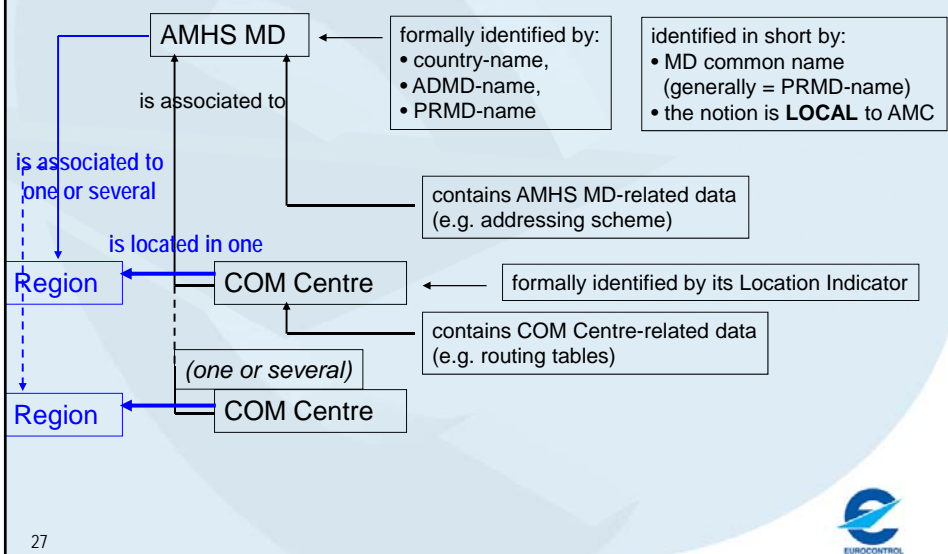
EUROCONTROL

4. ATS Messaging Management

Chapter 4

Data Organization and User Interface

4.1.1 AMHS Management Domains and COM Centres in AMC



4.1.2 Relation to ICAO Regions

- A common data structure for the description of:
 - All AMHS MDs world wide
 - All COM Centres world wide
- The functions (routing and statistics) which are not opened to External COM Centres (and other COM Centres outside EUR/NAT) include no data for these Centres
- Regions are taken into account in two different ways:
 - Using the single COM Centre / Region association in the Search criteria
 - To graphically represent the geographical network organisation, using Regional COM Charts

4.2.1 Menu and Window Structure

The screenshot displays the 'Network Inventory - Persons & Contacts - Operational' web application. The interface is divided into three main sections:

- Menu (functions):** A vertical sidebar on the left containing a tree view of functions such as 'View Operational Data', 'View Pre-Operational Data', 'Enter Background Data', and 'Miscellaneous Functions'.
- Main window:** The central area titled 'Network Inventory' with tabs for 'Persons & Contacts', 'Com Centres', 'AFTH / CIBIN Capabilities', 'AMRS Capabilities', 'VCS's', and 'Connections'. The 'Persons & Contacts' tab is active, showing a search form and a table of personnel.
- Sub-functions (tabs):** The tabs at the top of the main window, which allow switching between different data views.

The personnel table contains the following data:

Personal Role	Firstname	Surname	Phone	E-Mail
Operator	Operator	24 H	+49 6103 707 7922	ns2@ets.de
Technical / Oper. Supervisor	Supervisor	24 H	+49 6103 707 7920	ns2@ets.de
Management	Carsten	Jakis	+49 6103 707 6300	carsten.jakis@ets.de
System Administrator	Stefan	Jochims	+49 6103 707 7170	stefan.jochims@ets.de
Operations Manager	Uwe	Kunz	+49 6103 707 7174	uwe.kunz@ets.de
AMC Operator	Uwe	Kunz	+49 6103 707 7174	uwe.operator@am.ets.de
AMC Operator	Stefan	Voll	+49 6103 707 7920	stefan.voll@am.ets.de

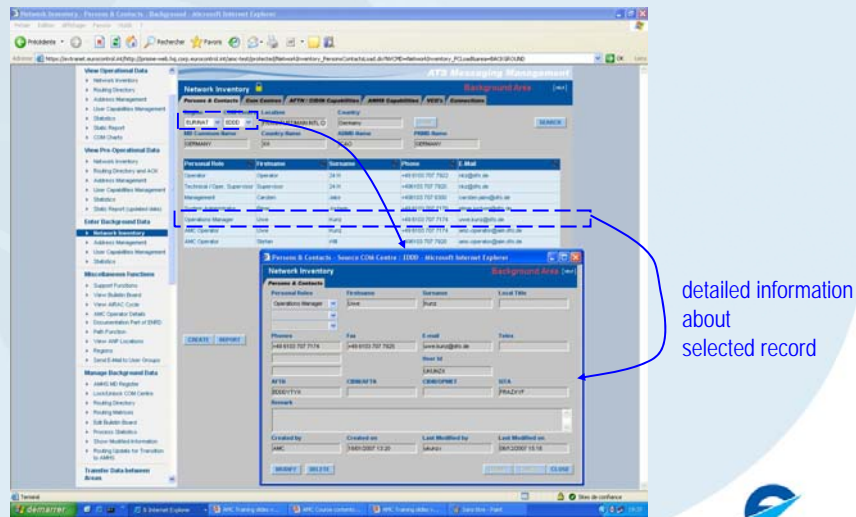
29

4.2.2 Interface Conventions

- Common lay-out
- Help
- Input fields
- Disabled buttons
- List boxes
- Scroll bars
- Waiting after an operation
- Maintaining context
- Association mechanism
- Sorting of columns in RESULTS tables
- Record history information

30

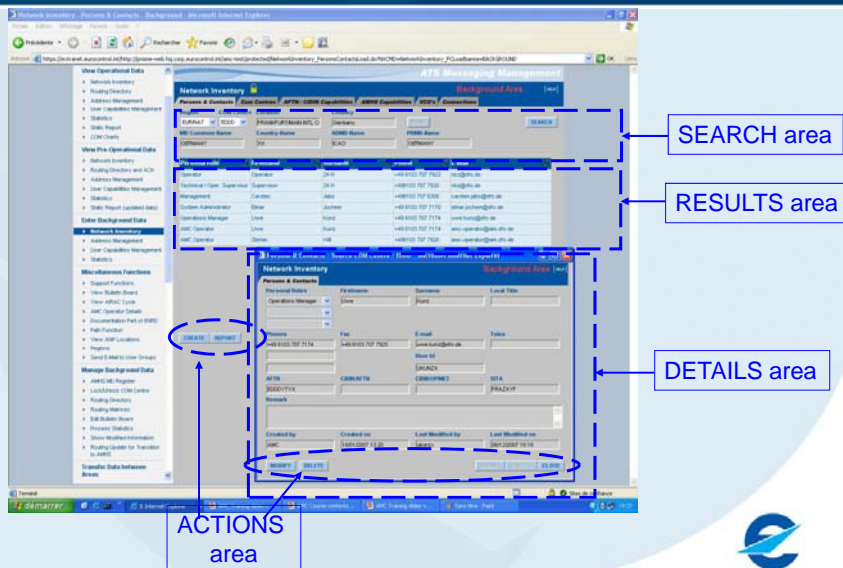
4.2.3 Main Window and Pop-up Structure



31



4.2.4 Screen areas of main window



32



4.2.5 Management of Access Rights

- at menu level:
 - not the same groups of functions are visible for each category
- at window level:
 - sub-functions can be hidden depending on user category
 - buttons are enabled / disabled
 - data are enabled / disabled

33



4.3.1 Example: Regions function

- A function for the description of ICAO Regions and Regional Offices:
 - Details: Regional Office
 - Results:
 - Regional Persons and Contacts
 - Associated COM Centres
- Data modification by AMC Operator only
- Other users have "read" access
- All users have:
 - a standard REPORT button
 - A specific VIEW COM CHART button

34



4.3.2 Example: Regions function

Demonstration

35



5. ATS Messaging Management

Chapter 5

Overview of Operational Functions (AMF-O) and Procedures

36



5.1.1 List of AMF-O Functions

- Network Inventory
- Routing Directory
- Address Management
- User Capabilities Management
- Statistics
- Static Report
- COM Charts

37



5.2.1 Common Aspects of AMF-O Functions

- Information is structured in three data areas:
 - the Operational Data Area
 - the Pre-Operational Data Area
 - the Background Data Area
- Specific functions (different menu items) enable to access each area with a given purpose

38



5.2.2 Background Data Area

purpose	working area (CCC, External COM Centre and AMC Operators)
access	restricted to own COM Centre (except for AMC Operator)
AMC Operator actions	validating Inventory, work on Routing Tables
functions	data entry and validation

39



5.2.3 Pre-operational Data Area

purpose	represent planned operational state
access	read (all), routing acknowledgement (restricted)
AMC Operator actions	transfers COM centre information, propose Routing Tables
functions	retrieval, all functions, routing acknowledgement

40



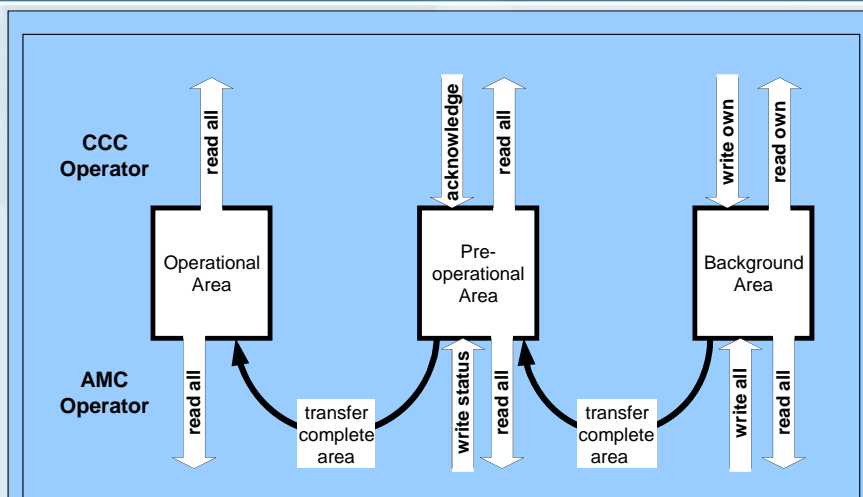
5.2.4 Operational Data Area

purpose	represent operational state
access	read (all)
AMC Operator actions	copied as whole from Pre-operational
functions	retrieval, all functions

41



5.2.5 Relation between Areas



42



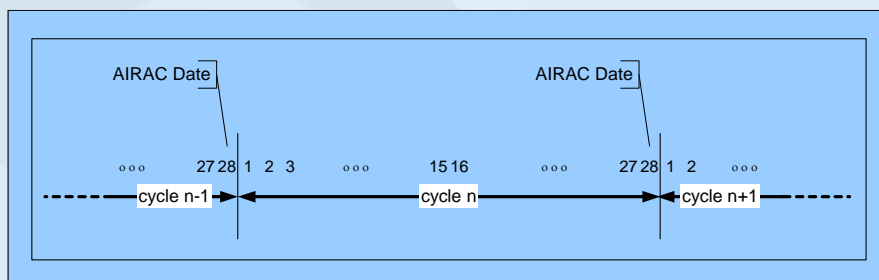
5.3.1 General View of Procedures

- AMF-O functions are governed by procedures
- Although formulated a bit differently, they are aligned on formerly existing CIDIN Management (CMC) procedures to gain from the experience accumulated in that area

43



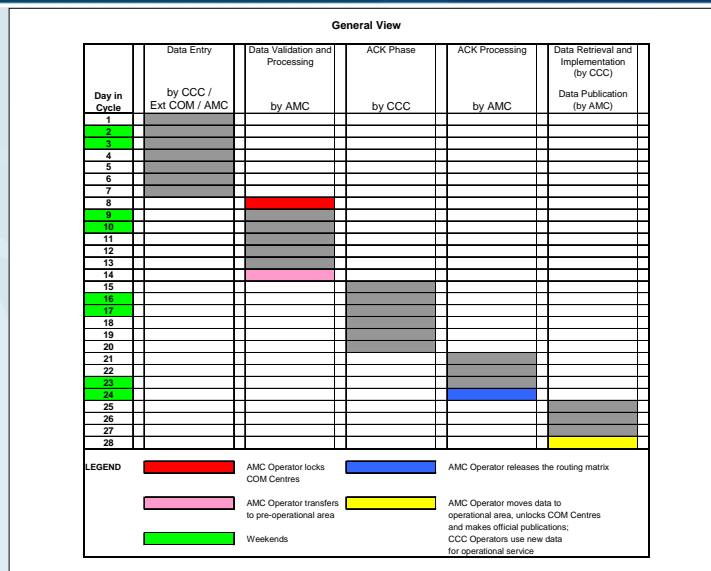
5.3.2 The AIRAC Cycle



44



5.3.3 The Procedure Cycle



45



5.3.4 Relation between Data Areas and Procedures

	Use of Background Data Area	Use of Pre-operational Data Area	Use of Operational Data Area
initial data entry phase	data entry	investigate validated data	access current operational data
creation of new Routing Matrix phase		investigate and acknowledge Routing Matrices	access current operational data
implementation of new Routing Matrix phase			access current operational data

46



5.3.5 View AIRAC Cycles in AMC

- A miscellaneous function:
 - View AIRAC Cycle
 - View AIRAC Dates

Demonstration

47



6. ATS Messaging Management

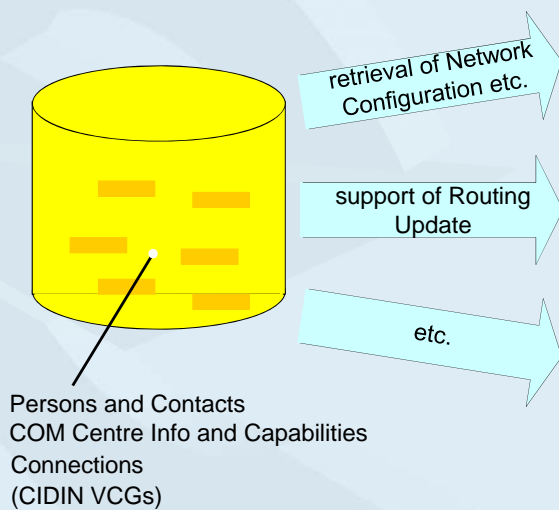
Chapter 6

Network Inventory

48



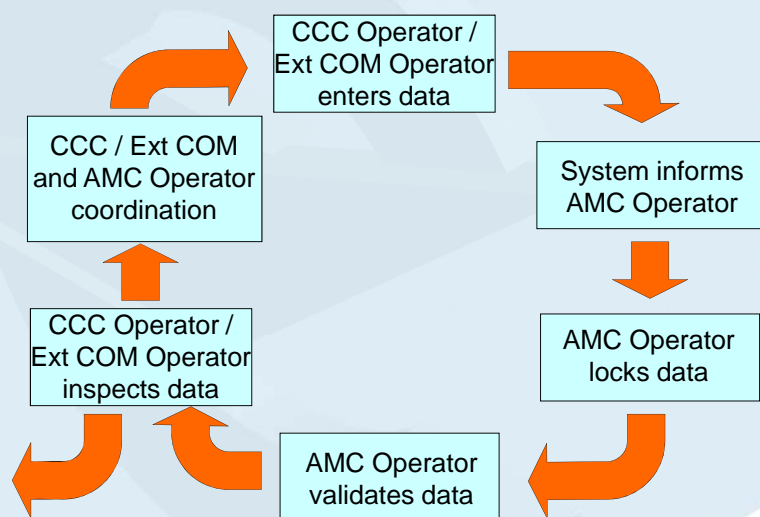
6.1.1 Network Inventory Purpose



49



6.1.2 Inventory Update Interactions



50



6.1.3 The Sub-functions of Network Inventory

- Persons and Contacts
- COM Centres
- AFTN/CIDIN Capabilities
- AMHS Capabilities
- VCGs
- Connections

Personal Role	Firstname	Surname	Phone	E-Mail
Operator	Operator	24 H	+49 6103 707 7922	nkz@dfs.de
Technical / Oper. Supervisor	Supervisor	24 H	+49 6103 707 7920	nkz@dfs.de

51



6.1.4 Network Inventory: objectives

- Persons and Contacts: operational contact points in COM Centres
- COM Centres: general information (address)
applications (AFTN, CIDIN, AMHS, others)
- AFTN/CIDIN Capabilities: details of AFTN and CIDIN configuration and capabilities
- AMHS Capabilities: details of AMHS configuration and capabilities
- VCGs: list of CIDIN VCGs with adjacent COM Centres
- Connections: list of all connections of all types with other COM Centres (network topology)

52



6.2.1 AMHS Capabilities Data Fields

Field	Comments	Values
<i>ATS Message Server frame</i>		
ATS Message Server	Derived from "applications" selected in the COM Centres function (not modifiable) If unticked the whole frame is disabled.	a checkbox: ticked = present and active unticked = not present or not active
MTA-name	The X400 MTA-name used to declare an association, to use in trace-information, etc.	recommendation in EUR AMHS Manual : 'MTA-' followed with LI (4 letters) followed by "-" " and a sequence number
Maximum Content Length	Maximum length (in bytes) of messages that the MTA is capable to accept, transfer and deliver	recommendation in EUR AMHS Manual : should be at least 2 Mbytes
Message Lifetime	Duration during which the MTA will try to transfer before assuming transfer failure and generating NDR	to be coordinated regionally. Under discussion within AFSG subgroups
Extended Encoded Information Types (EITs) in support of...	Message Encodings that the MTA is capable to transfer to accept, transfer and deliver	one checkbox (ticked = yes, unticked = no) for each body part / encoding combination specified in Doc 9705
<i>AFTN/AMHS Gateway frame</i>		
AFTN/AMHS Gateway	Derived from "applications" selected in the COM Centres function (not modifiable) If unticked the whole frame is disabled.	a checkbox: ticked = present and active unticked = not present or not active
Currently Authorized Content Length	Maximum length (in bytes) of messages that the gateway will accept to convert to AFTN	recommendation in EUR AMHS Manual : should be at least 2 Mbytes
Maximum Number of Recipients	The maximum number of recipients O/R addresses allowed in a message converted by the gateway. Messages with more recipients are rejected.	Doc 9705 requirement is 512 recipients
Converted General-Text Body Parts	General-text body parts that the gateway is capable to convert to AFTN	one checkbox (ticked = yes, unticked = no) for each body part character set specified in Doc 9705 (ISO 646 or ISO 8859-1)
Operational Status	Coming from the AMHS MD Register function (not modifiable)	'op', 'non-op', 'unknown'

53



6.2.2 Protocol Capabilities

- The table shows the protocol stacks available for international AMHS connectivity
- Each stack includes application layer (P1 between MTAs), presentation, session and lower layers
- Several instances of the same stack can be present
- The table is managed as **one** parameter of the Com Centre:
 - enabled for modification or creation only when MODIFY is clicked
 - after entering data, UPDATE in pop-up **and** SUBMIT in main window

Protocol Capabilities					
Protocol	P-SEL	S-SEL	T-SEL	Network Address (NSAP or IP)	Active
AMHS/TPD-X.25			WAN	20601234567890	<input checked="" type="checkbox"/>
AMHS/TCP-IP			TCP	192.168.0.4	<input checked="" type="checkbox"/>

54



6.2.3 Protocol Capabilities Data Fields

Data fields = the parameters which a remote MTA needs to correctly configure an association:

Field	Comments	Values
Protocol	Supported AMHS protocols for COM Centre to COM Centre communication. There can be various protocol stacks	'AMHS/TCP-IP' 'AMHS/ATN-TP4' 'AMHS/TP0-X.25'
P-SEL	Presentation selector for OSI Upper Layer stack. A characteristic of the MTA-to-MTA	assigned by COM Centre 4 characters maximum
S-SEL	Session selector for OSI Upper Layer stack	assigned by COM Centre 16 characters maximum
T-SEL	Transport selector for OSI Upper Layer stack	assigned by COM Centre 32 characters maximum
Network Address (NSAP or IP)	The IP address or ATN NSAP allocated to the considered protocol stack in the MTA.	assigned by COM Centre
Active	indicates the current operational status of the protocol stack	a checkbox: ticked = active unticked = present but not yet active

55



6.2.4 Connections

- need to represent the network topology at "messaging level"
- in summary three main connection categories:
 - AFTN circuits (conventional or X.25)
 - CIDIN (PVC or SVC)
 - AMHS connections
- an AMHS connection = a X.400 P1 association between two MTAs over a lower layer network infrastructure
- two tables:
 - Existing connections
 - Planned Connections – includes Events (creation, modification, etc.)
- existing connections form the basis for:
 - routing tables
 - COM Charts
 - ANP FASID Report produced by EANPG/AFSG for ICAO

56



6.2.5 Connections Data Fields

Field	Comments	Values
Remote COM	The "other end" of the connection	a COM Centre location indicator described in the AMC (4 letters)
Protocol	protocol used over the connection	can be an AMHS protocol stack, 'CIDIN PVC' or 'CIDIN SVC', 'Conv. AFTN' or 'AFTN/X25', etc.
Network Address	The network address of the REMOTE Com Centre used for the connection	entered using the remote Centre's inventory information
Link Type	an indication of the physical connectivity used for the connection	free text, can be the name of the operational lower layers network (e.g. REDAN+RAPNET, CFMU, etc.)
Capacity	the capacity of the link or circuit (if fixed end-to-end) or of the network access	value in kbits/s
Circuit type (in pop-up window only)	the type of circuit supporting the connection, based on a standard ICAO classification	'L' (Landline), 'M' (Multiplexer), 'N' (Network), 'R' (Radio), 'S' (Satellite)
Supplier	an indication of the supplier of physical connectivity used for the connection	free text, can be a generic name such as 'telco', or specific 'SITA', 'PENS', etc.
Active	indicates the current operational status of the connection	a checkbox: ticked = active unticked = present but not yet active (should not happen in "existing connections")

57



6.2.6 Network Inventory

Demonstration

58



7. ATS Messaging Management

Chapter 7

Routing Management

59



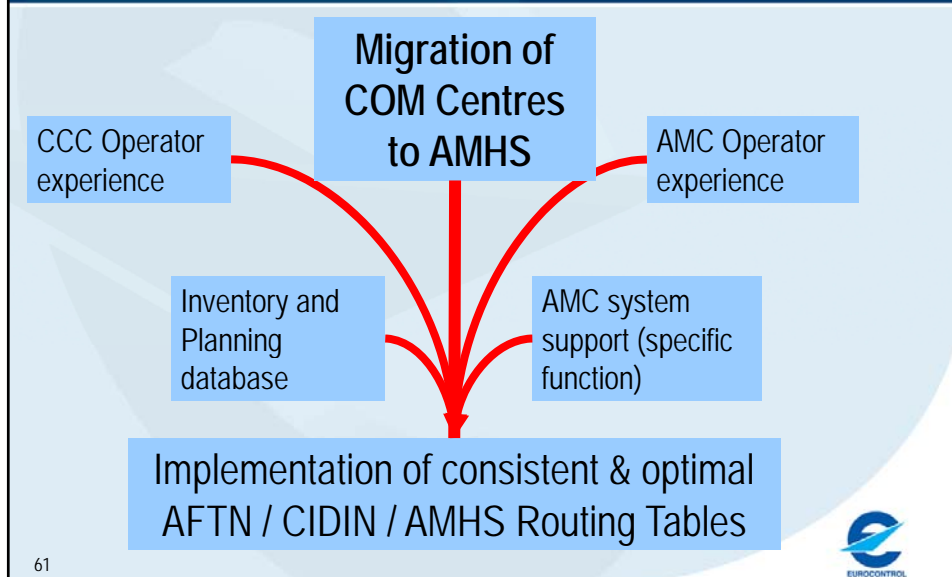
7.1.1 Routing Management: Objective

- Need to integrate AMHS routing with AFTN and CIDIN routing
- Provide **consistent** routing tables
- Support progressive migration of traffic flows to AMHS
- Provide optimal routing tables

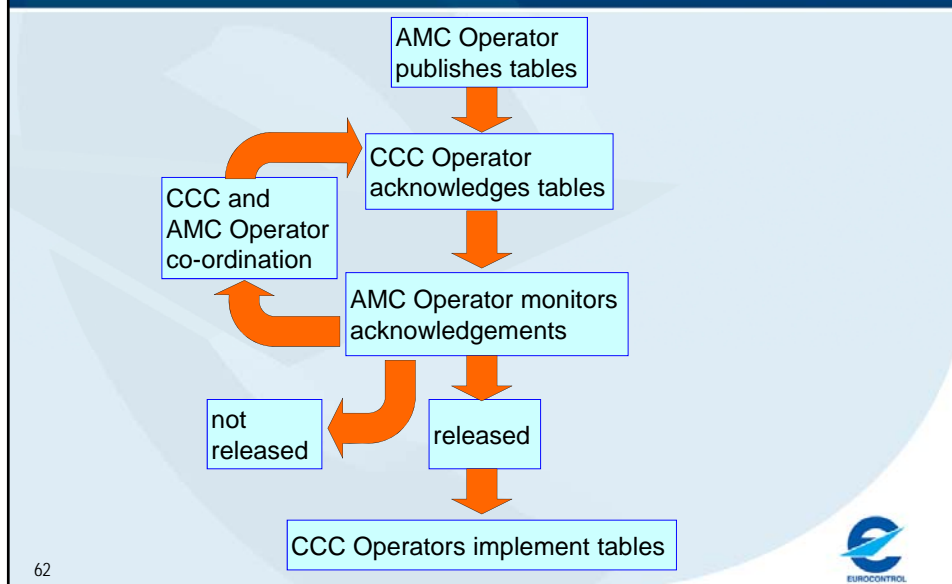
60



7.1.2 Routing Management Process



7.1.3 Routing Update Interactions



7.1.4 Routing Update Results

- “Consistent” means:
 - correctly manage routing from AFTN to AMHS via MTCU, and vice-versa
 - timely support of phased integration of flows,
 - set exit addresses at appropriate places (borders of AMHS island)
- “Optimal” means (could mean)
 - minimum number of hops,
 - robust in the case of failures / overload,
 - symmetry of routes,
 - good distribution of traffic,
 - simple relationships with other Regions,
 - etc.

63



7.2.1 Routing Management: Integrated AFTN / CIDIN / AMHS Routing

The screenshot shows the 'Routing Directory' web application. It features a navigation menu on the left with sections like 'AMHS MD Contacts', 'AMHS Implementation Planning', 'Interworking Test Support', 'AMHS PDR Monitoring', 'Helpdesk Functions', and 'View Operational Data'. The main content area displays three routing tables: 'AFTN Routing Table', 'CIDIN Routing Table', and 'AMHS Routing Table'. Each table has columns for 'Destination', 'Existing Main', 'MTCU', 'Existing Alt', 'MTCU', 'Planned Main', 'MTCU', and 'Planned Alt'. Blue dashed circles highlight the 'MTCU' columns across the three tables, indicating their inter-relationship for routing. The application is running in a Microsoft Internet Explorer browser window.

3 Routing Tables

Inter-related via
MTCU columns
for routing

64



7.2.2 AFTN Routing: Specific Aspects

- in AFTN, message routing is performed using character sequences extracted from the message addressee indicator
- in an AFTN routing table:
 - a destination = 1 to 8 characters
 - Examples:
 - Another Region: in general 1 character
 - Another COM Centre in the same Region: in general 2 characters (Nationality Letters)
 - There are exceptions: EBBB, LFPY etc.
 - a route (existing main, etc.) = a COM Centre Location Indicator
- All defined and valid ICAO addressee indicators must be routable
- In general an international AFTN routing table includes 60 entries (in Europe)

65



7.2.3 AMHS Routing: Specific Aspects

- in AMHS, routing is performed using address attributes:
 - From AMHS MD to AMHS MD, using « high-level » attributes
 - Within an AMHS MD, using « low-level » attributes
- in the AMHS routing table for one COM Centre (in the MTA):
 - A destination = a GDI (C, A, P) + O if needed
 - A route (existing main, etc.) = a COM Centre implementing AMHS
 - Routes must be defined for all AMHS MDs world wide: approx. 300 entries
- specific case: AMHS MD with multiple international COM Centres:
 - Different routes to several of the international COM Centres can be defined in one table only if O is used (CAAS addressing)
 - No value of Organisation-name specified:
use one single « default route » to AMHS MD from the considered COM Centre

66



7.2.4 AMHS Routing: Use of O attribute (Organisation-Name)

- The O (Organisation-name) is available in AMHS routing table:
 - As part of a destination
 - If the destination AMHS MD has selected CAAS
 - All O values specified in the CAAS table can be selected
 - A default route (without O) to the same AMHS MD is always possible
 - Routes must be defined for **all** O values of the destination AMHS MD unless a default route (based on C, A, P) is specified
 - Some routes with a specified O value can be combined with a default route
- To be used in the following cases:
 - For destination AMHS MDs with multiple international COM Centres
- Possible impact on message rejection:
 - If all O values are specified (and no default) for a destination AMHS MD in a routing table, incoming messages with destination addresses including incorrect O values will trigger NDRs (unable to transfer / unrecognised O/R name)

67



7.2.5 From AFTN to AMHS in a Gateway

- At the border of AMHS islands, Routing Tables must specify which message flows (which destinations) have to be converted
- « M » (for « MTCU ») parameter:
 - In the AFTN Routing Table: the destination is passed (internally routed) to the MTCU (to be routed in AMHS)
 - In the AMHS Routing Table: the destination is passed to the MTCU (to be routed in AFTN)
- In the AMHS Routing Table, any unspecified route is assumed to be passed to the MTCU

68



7.2.6 AFTN Routing Table

Demonstration

69



7.2.7 CIDIN Routing Table

Demonstration

70



7.2.8 AMHS Routing Table

Demonstration

71



7.3.1 Routing Acknowledgement

- in Pre-Operational Area
- essential step in the Routing Update procedure
- when the AMC Operator sets the Routing Matrix status to 'proposed'

Demonstration

72



7.4.1 Export / Import of Routing Tables

- All routing tables can be exported from all data areas
- The AMC Operator can import a routing table in the background area
- Export/Import files are CSV files (editable in MS-Excel) and following the same format
- File format (specified in ATS Messaging Management Manual Appendix D):
 - One identification line
 - One header line
 - Existing route record lines
 - Planned route record lines

73



7.4.2 Use of Export / Import Routing Tables

- Operational use of Export files:
 - **Current** operational cycle: use files exported from Operational Area
 - Prepare **next** operational cycle: use files exported from Pre-Operational Area, with status RELEASED
- Potential use of Export/Import in Background area (AMC Operator only):
 - For off-line preparation work using MS-Excel
 - For "initial load" of the routing table of a COM Centre starting AMHS operation
 - Import can be done only in an existing routing matrix / routing table (which can either be empty or already contain data)
 - **Note:** deletion of routes is not possible via import (to avoid loss of data): A route missing in an imported file will not be erased from the pre-existing data.

74



Demonstration



8. ATS Messaging Management

Chapter 8

Address Management



8.1.1 AMHS Addressing Schemes

		CAAS Addressing Scheme				XF Addressing Scheme
Attribute	Name of attribute	Assigned by	Registered by	Value	Comment	Value
High level address attributes:						
C	Country-name	ITU-T	ITU-T	'XX'	According to ITU-T Recommendation X.666	'XX'
A	ADMD-name	ICAO	ITU-T	'ICAO'	As agreed by ICAO and ITU-T	'ICAO'
P	PRMD-name	ANSP	ICAO	To be defined by each ANSP		To be defined by each ANSP
Low level address attributes						
O	Organisation name	ANSP	ICAO	e.g. a "region" within a country, to be defined by each ANSP	Representing local/national geographical information	'AFTN'
OU1	Organisational unit name 1	ANSP	ICAO	4-character ICAO location indicator	As specified in ICAO Doc 7910	8-character AFTN address
CN	Common name	ANSP		8-character AFTN address		<i>not used</i>

"Other" addressing schemes are possible (but discouraged), using additional attributes: OUn, S, G, DDAn etc.
If implemented they need to be known and registered.

77



8.1.2 AMHS Addressing Attributes

PRMD-name (16 characters max.) and Organisation-name (64 characters max.) must use the following character set and should be as short as possible.

Technically authorised character set

Name	Graphics
Capital letters	A, B, ... Z
Small letters	a, b, ... z
Digits	0, 1, ... 9
Space	(space)
Apostrophe	'
Left Parenthesis	(
Right Parenthesis)
Plus sign	+
Comma	,
Hyphen	-
Full stop	.
Solidus	/
Colon	:
Equal sign	=
Question mark	?

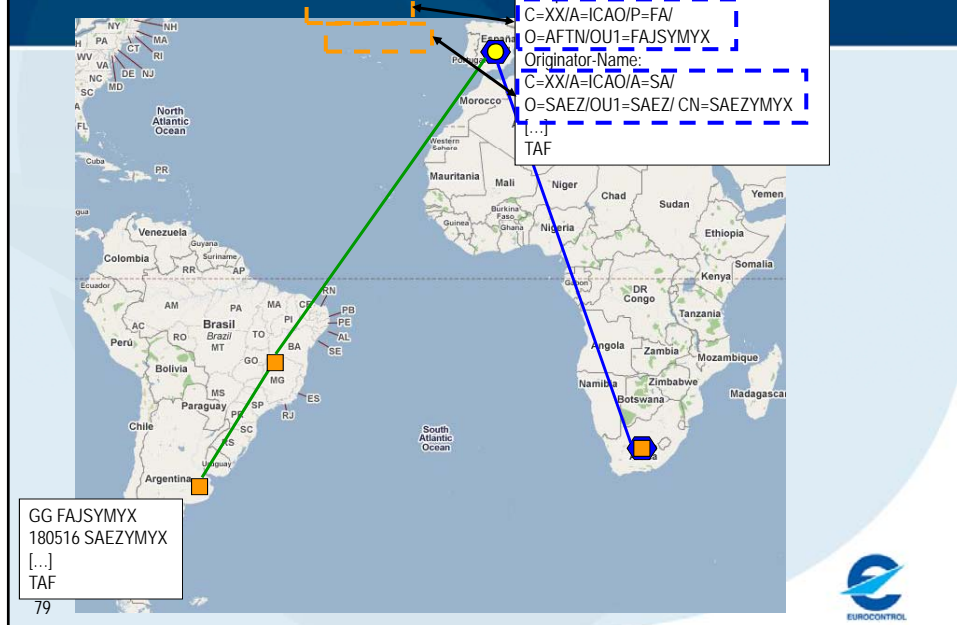
Suggested preferred character set

Name	Graphics
Capital letters	A, B, ... Z
Digits (if needed)	0, 1, ... 9
Hyphen	-

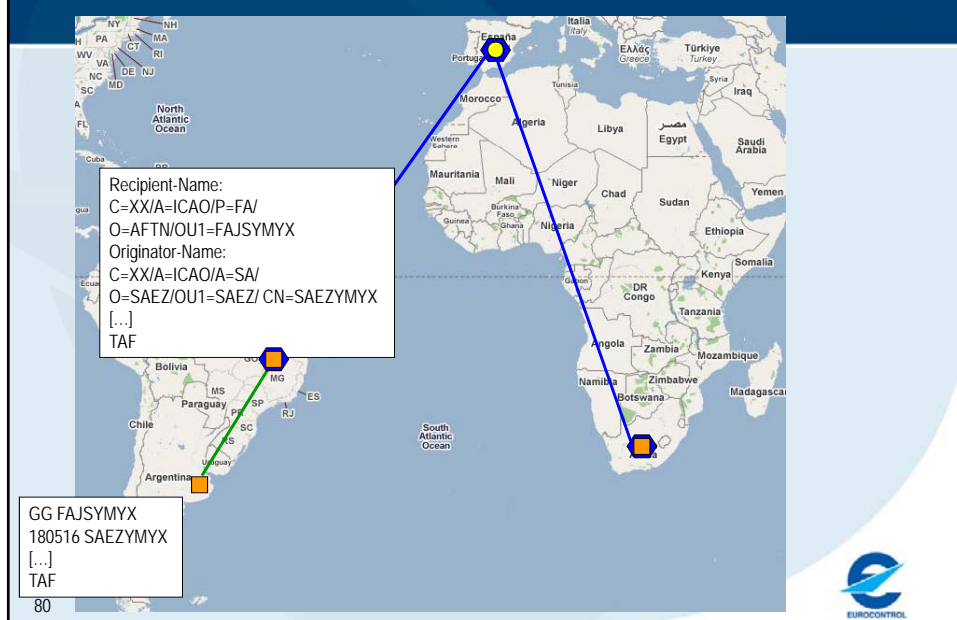
78



8.2.1 The Need for Address Management (1)



8.2.2 The Need for Address Management (2)



8.2.3 The Need for Address Management (3)

AMHS Address Management is required because:

- in any network, the knowledge of originator and recipient addresses is mandatory to enable the exchange of information
- at present there is not yet an official source for AMHS addressing information:
 - the global ICAO Register of AMHS MDs and addressing information is being implemented by ICAO Headquarters
 - it is not the role of ICAO HQ to maintain an operational Register subject to the (potentially) frequent changes of a dynamic network under deployment
 - The ICAO Register is intended to be used for institutional purposes, not for operational purposes
- There is a need for an **operational** source of information regarding AMHS addressing

81



8.2.4 The Need for Address Management (4)

- All addresses are converted at the boundary between CIDIN/AFTN and AMHS. This means that **ANY** AFTN address in an AFTN message reaching an AFTN/AMHS gateway is converted to an AMHS address:
 - even if the address is in another Region
 - Address management handles information for AMHS world wide
 - even if the considered State has not migrated to AMHS
 - Address management is not affected by new implementations (in principle)
- The use of wrong AMHS addresses may cause mis-routings and non-deliveries.
- Lack of synchronisation in changes introduces wrong addresses.
- AFTN and CIDIN addresses are well-known and rather static. At least during the deployment phase, AMHS addresses are expected to be modified more dynamically.

82



8.3.1 Two Aspects in Address Management

		CAAS	XF
Attribute	Name of attribute	Value	Value
<i>High level address attributes:</i>			
C	Country-name	'XX'	
A	ADMD-name	'ICAO'	
P	PRMD-name	To be defined by each ANSP	
<i>Addressing scheme:</i>		CAAS	XF
<i>Low level address attributes</i>			
O	Organisation name	e.g. a "region" within a country, to be defined by each ANSP	'AFTN'
OU1	Organisational unit name 1	4-character ICAO location indicator	8-character AFTN address
CN	Common name	8-character AFTN address	<i>not used</i>

AMHS MD Register

Intra-MD Addressing

80 "Other" addressing schemes or addresses using additional attributes



8.3.2 Use of AMHS address information

AMHS address information is used for two different aspects:

- Routing
 - In every AMHS MTA
 - Between AMHS Management Domains (MDs):
 - Using high-level attributes (C, A, P)
 - In some cases using the Organisation-name attribute (towards MDs with multiple COM Centres)
 - Internally to the destination AMHS MD:
 - Using low-level attributes (O, OU1, CN)
- Addressing conversion
 - In AFTN/AMHS Gateways
 - Upon entry and exit of AMHS:
 - Using the full address (all attributes of a CAAS or XF address)
 - Using Nationality Letters (or Designator) associated with the AMHS MD

84



8.3.3 Use of AMHS address information example 1: address conversion in AFTN/AMHS gateway

State	AMHS Address Specification					ATN Directory naming-context	Comments
Name	Nationality Letters or Designator	Country-name attribute	ADMD-name attribute	PRMD-name attribute	Addressing scheme		
Solomon Islands	AG	XX	ICAO	AG	XF		
...							
Côte d'Ivoire	DI	XX	ICAO	DI	XF		
Nigeria	DN	XX	ICAO	DN	XF		
Niger	DR	XX	ICAO	DR	XF		
Tunisia	DT	XX	ICAO	DT	XF		
Togo	DX	XX	ICAO	DX	XF		
Belgium	EB	XX	ICAO	BELGIUM	CAAS		see Table Belgium
Eurocontrol	EBBD	XX	ICAO	CFMU	CAAS		see Table Eurocontrol-CFMU
Germany	ED	XX	ICAO	GERMANY	CAAS		see Table Germany
Estonia	EE	XX	ICAO	EE	XF		
Finland	EF	XX	ICAO	EF	XF		
United Kingdom	EG	XX	ICAO	EG	XF		
Netherlands	EH	XX	ICAO	EH	CAAS		see Table EH

Convert EFHKZTX :

- 1) Extract EF, EFHK, EF—ZTX, EFHKZTX
- 2) Look for best match in Nationality Letters column: EF
- 3) Retrieve MD-name: C=XX, A=ICAO, P=EF
- 4) Retrieve addressing scheme: XF
- 5) Construct XF-address: C=XX, A=ICAO, P=EF, O=AFTN, OU=EFHKZTX

85



8.3.4 Use of AMHS address information example 2: address conversion (CAAS)

State	AMHS Address Specification					ATN Directory naming-context	Comments
Name	Nationality Letters or Designator	Country-name attribute	ADMD-name attribute	PRMD-name attribute	Addressing scheme		
United Kingdom	EG	XX	ICAO	EG	XF		
Netherlands	EH	XX	ICAO	EH	CAAS		see Table EH
...							
Dem. Republic of the Congo	FZ	XX	ICAO	FZ	XF		
Mali	GA	XX	ICAO	GA	XF		
Gambia	GB	XX	ICAO	GB	XF		
Canary Islands (Spain)	GC	XX	ICAO	AENA	CAAS		see Table Aena
Spain	GE	XX	ICAO	AENA	CAAS		see Table Aena
Sierra Leone	GF	XX	ICAO	GF	XF		
Guinee-Bissau	GG	XX	ICAO	GG	XF		

Convert GCRRZPX (Lanzarote) :

- 1) Extract GC, GCRR, GC—ZPX, GCRRZPX
- 2) Look for best match in Nationality Letters column: GC
- 3) Retrieve MD-name: C=XX, A=ICAO, P=AENA
- 4) Retrieve addressing scheme: CAAS
- 5) Extract location indicator (GCRR) and look for a match in detailed table Aena
- 6) Retrieve Organisation-name from column "Organisation": GCCC
- 7) Construct CAAS address: C=XX, A=ICAO, P=AENA, O=GCCC, OU=GCRR, CN=GCRRZPX

86

Location Indicator/ Organisation Unit	Region/ Organisation
OU1	O
...	
GCLB	GCCC
GCLP	GCCC
GCMP	GCCC
GCRR	GCCC
GCTS	GCCC
GCDX	GCCC
LEAB	LECB
LEAL	LECB
LEAP	LECB
LEAT	LECB
LEBL	LECB
LEBN	LECB



8.4.1 Two categories of address changes

Two categories of address changes are identified:

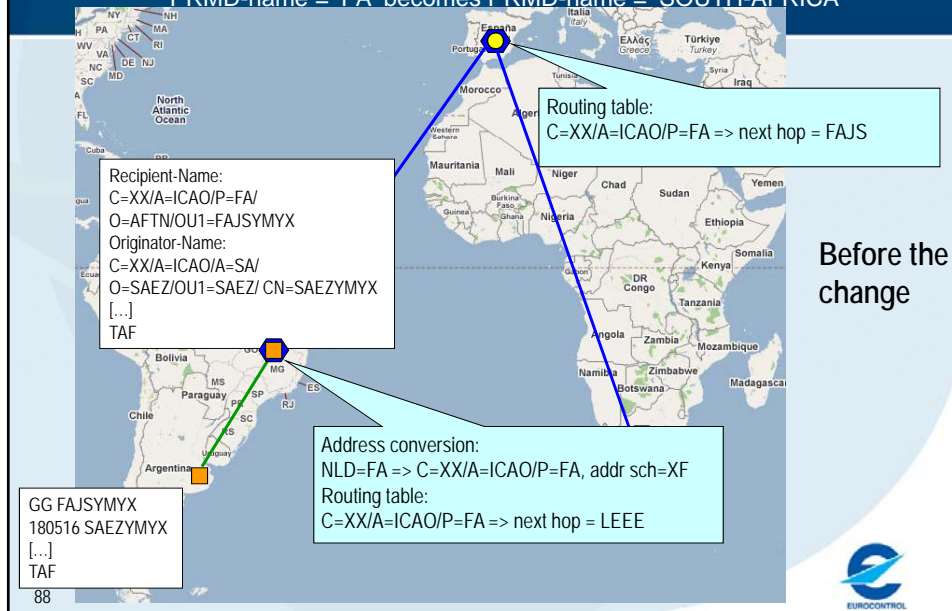
- Major changes:
 - They include:
 - Addition or deletion of PRMDs
 - Modification of PRMD-name
 - Change of addressing scheme (from XF to CAAS or vice-versa)
 - They have an institutional impact or a major operational impact
 - They are expected to be infrequent
- Minor changes:
 - They consist in modifications in a CAAS table
 - They have an operational impact which can be more limited
 - They can be more frequent

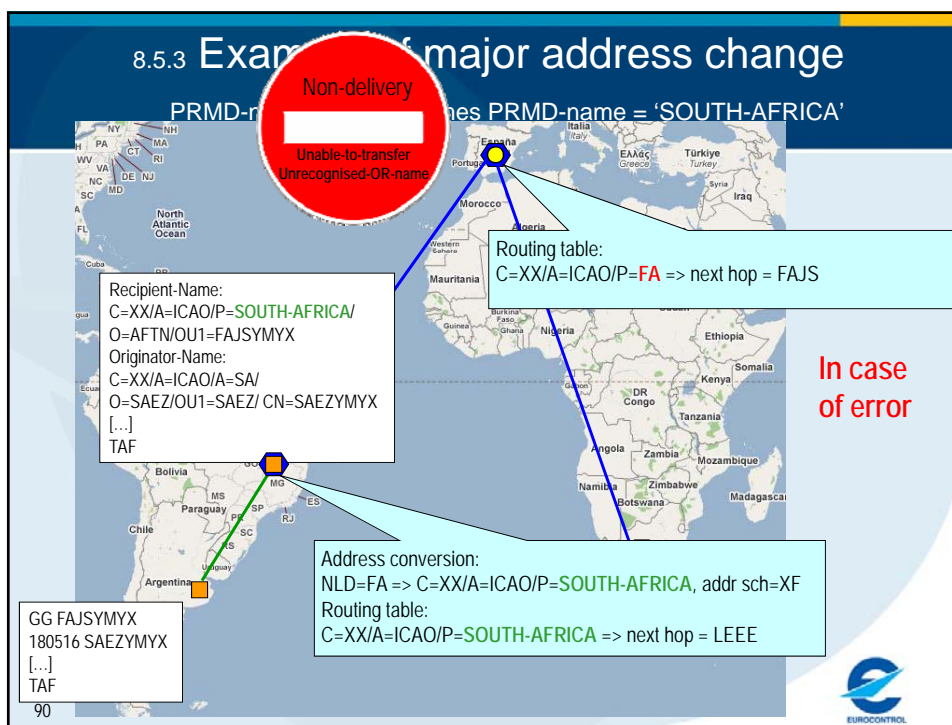
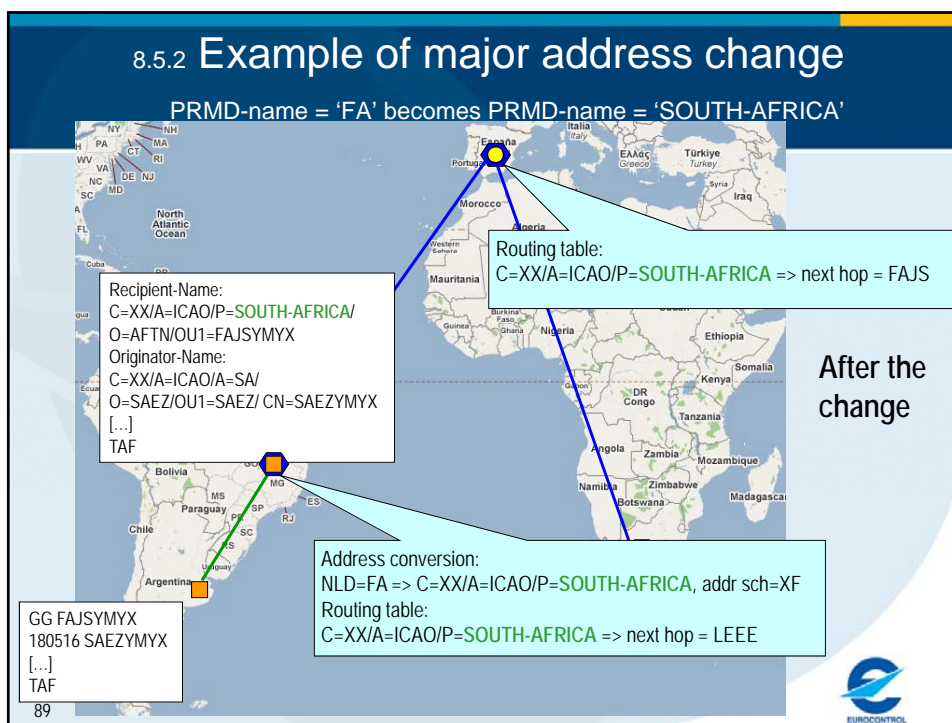
87



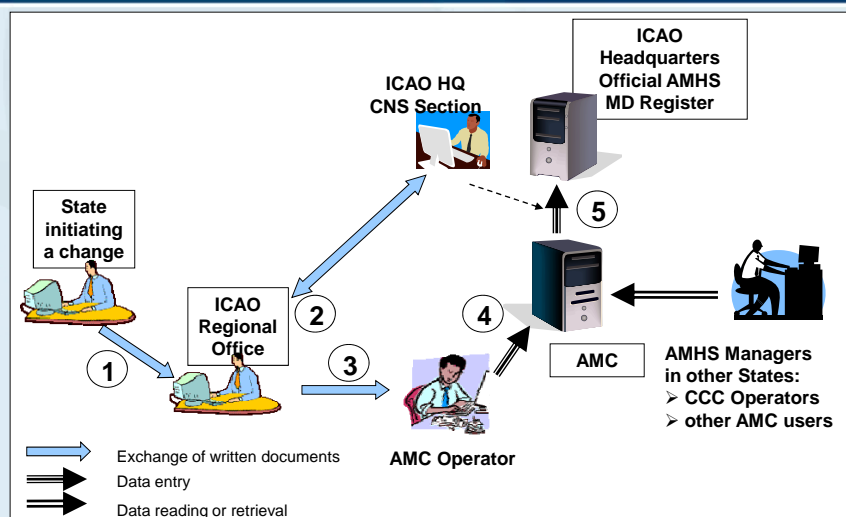
8.5.1 Example of major address change

PRMD-name = 'FA' becomes PRMD-name = 'SOUTH-AFRICA'





8.5.4 Procedure for major changes



91



8.5.5 Procedure for major changes as proposed by EANPG/49 and endorsed by ICAO HQ

1. An accredited person in the considered State declares the change to ICAO, using a standard written pro forma – "ICAO" means here the Regional Office for the ICAO Region where the State is located. The pro forma includes the applicability date of the change (an AIRAC date);
2. the CNS Officer in the Regional Office, in coordination with ICAO Headquarters as appropriate, validates the acceptability of the declared change from an official and institutional viewpoint;
3. after validation, the CNS Officer forwards the declaration of change to the AMC Operator, using appropriate means such as fax, e-mail, etc. (different from data entry in AMC); **[at the latest 21 days before the applicability date]**
4. the AMC Operator enters data in the AMC based on the input received from the Regional Office, at the appropriate time considering the applicability date of the change and using the AMC operational procedures;
5. at the date of applicability, i.e. at each AIRAC cycle date, the ICAO HQ CNS Section retrieves an AMHS address management export file from the AMC and uploads it in the ICAO Official AMHS MD Register.

92



8.5.6 Procedure for major changes

Role of ICAO Regional Office and Headquarters

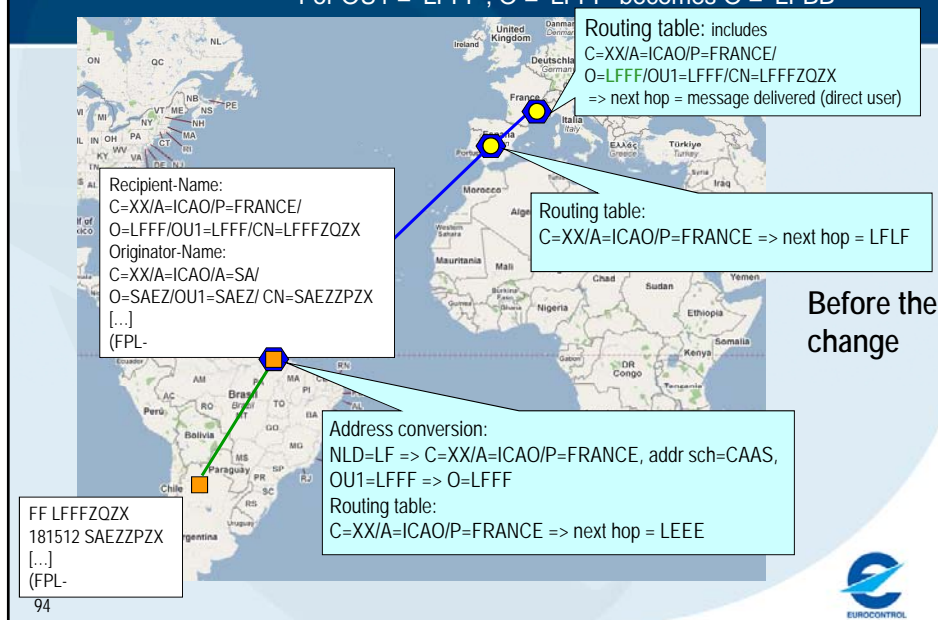
1. RO: Receive and process the declaration;
2. Validate the acceptability of the declared change from an official and institutional viewpoint:
 - RO: Verify that the PRMD-name has a valid syntax (see 8.1.2) and correctly identifies the declaring State or Organisation, e.g. not 'CAA');
 - RO + HQ: Verify that the PRMD-name is unique world wide (including declarations being processed);
 - RO: Coordinate with declaring State or Organisation if the two criteria above are not met;
 - RO: If new or modified, verify that the Nationality Letters or Designator are not ambiguous;
 - RO: If ambiguous, coordinate with AMC Operator and with declaring State or Organisation to select appropriate Nationality Letters or Designator
3. RO: after validation, forward the declaration of change to the AMC Operator;
[at the latest 21 days before the applicability date]
4. No ICAO action;
5. HQ: At each AIRAC cycle date, update Official Register with AMC data.

93



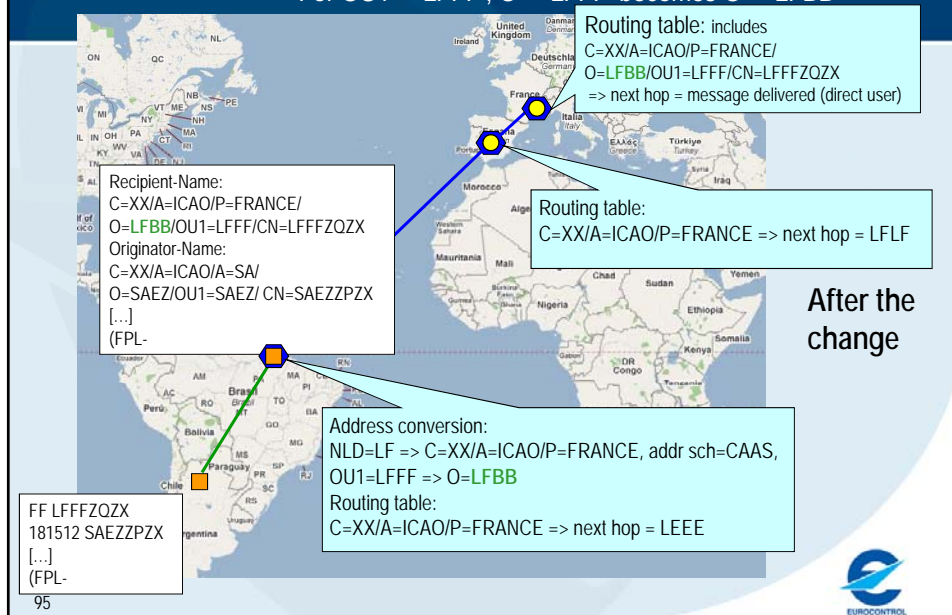
8.6.1 Example of minor address change

For OU1 = 'LFFF', O = 'LFFF' becomes O = 'LFBB'



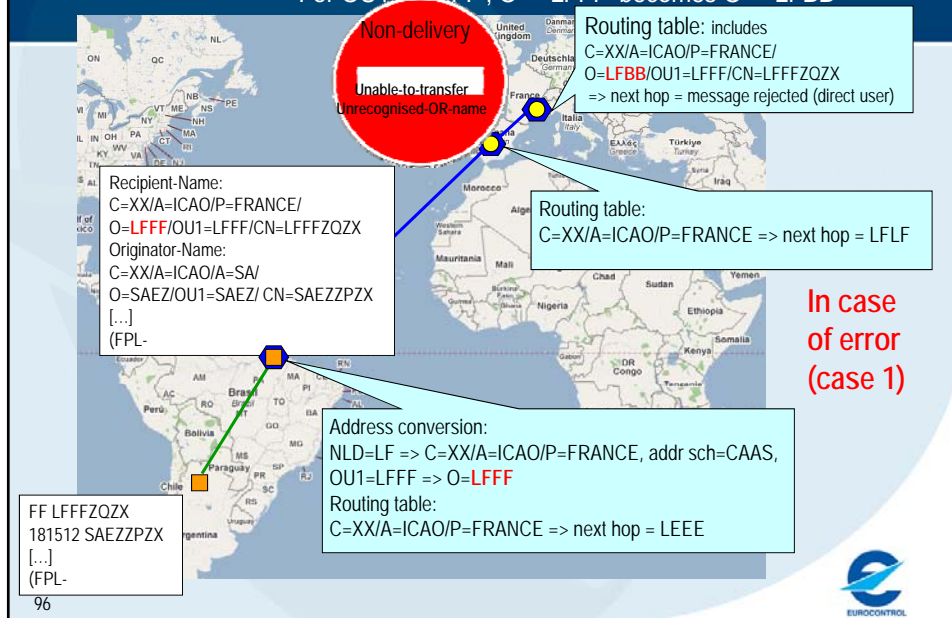
8.6.2 Example of minor address change

For OU1 = 'LFFF', O = 'LFFF' becomes O = 'LFBB'



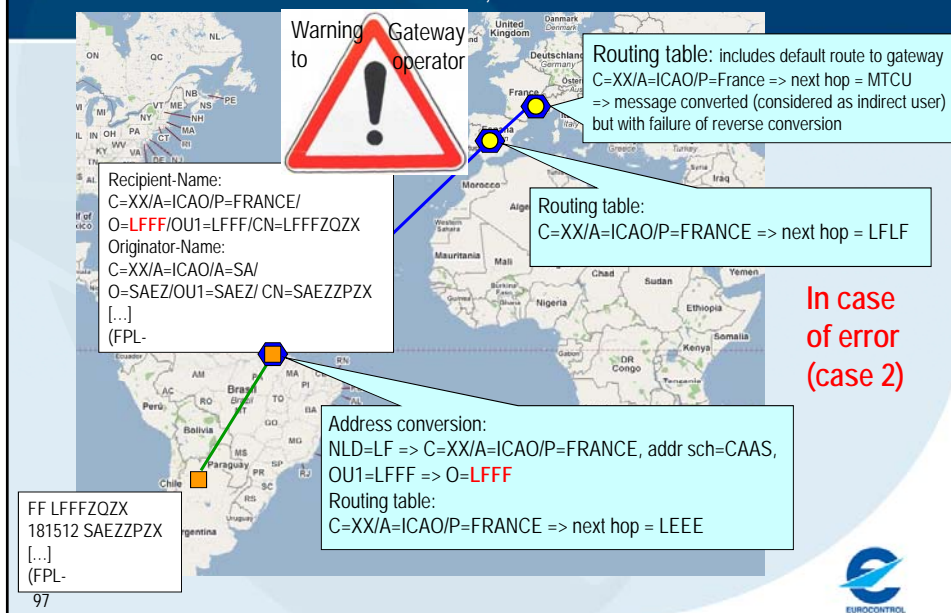
8.6.3 Example of minor address change

For OU1 = 'LFFF', O = 'LFFF' becomes O = 'LFBB'

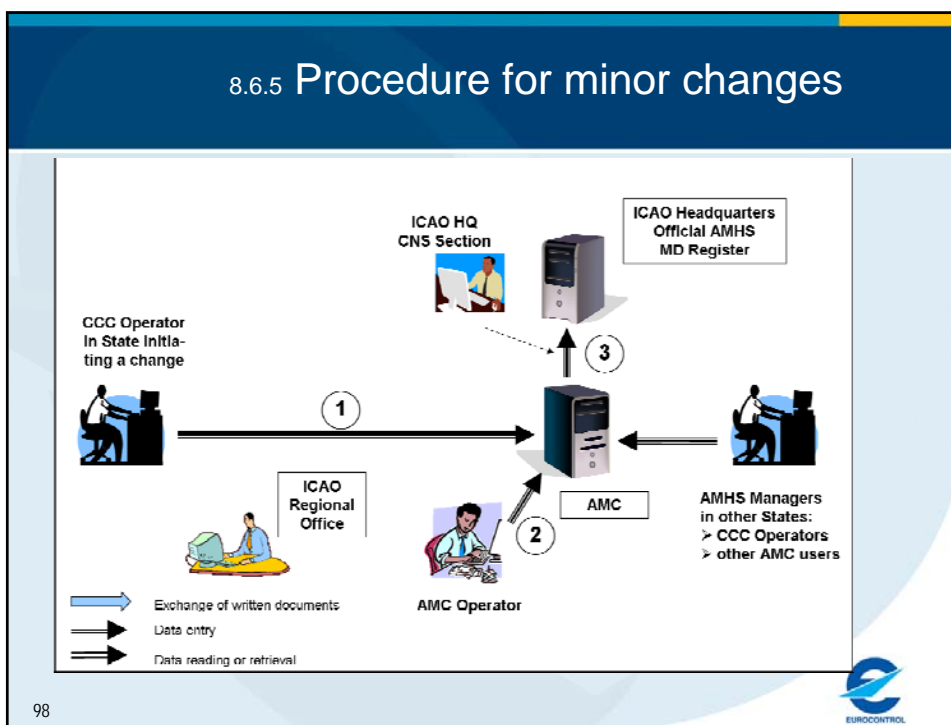


8.6.4 Example of minor address change

For OU1 = 'LFFF', O = 'LFFF' becomes O = 'LFBB'



8.6.5 Procedure for minor changes



8.6.6 Procedure for minor changes as proposed by EANPG/49 and endorsed by ICAO HQ

1. The CCC Operator [or External COM Operator] in the considered State enters data corresponding to the intended change in the AMC, using the standard AMC operational procedures, taking into account the applicability date of the change (an AIRAC date);
2. the AMC Operator performs the standard AMC operational procedures, such that the status of changed data is passed to "operational" at the applicability date;
3. at the date of applicability, i.e. at each AIRAC cycle date, the ICAO HQ CNS Section retrieves an AMHS address management export file from the AMC and uploads it in the ICAO Official AMHS MD Register (this is identical to stage 5 in the procedures for major changes).

99



8.7.1 Address Management AMC implementation structured by different information flows

- AMHS MD Register information:
 - from State/ANSP to ICAO – Regional (and HQ) - for validation
 - from ICAO (Regional and HQ) to AMC for data entry and operational publication
 - from AMC to ICAO HQ for official Registration and Publication
- Intra-MD Addressing information:
 - from State/ANSP to AMC for operational publication (direct data entry)
 - from AMC to ICAO HQ for official Registration and Publication

Potential Institutional Implications ?

Yes

No

These flows are integrated in AMC functions and procedures

100



8.7.2 AMHS MD – State/Org Relationship

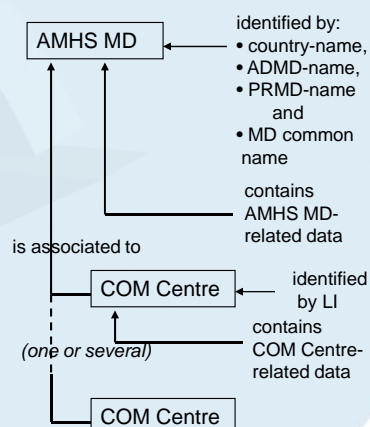
- managed in AMHS MD Register
- already registered for each State world wide (declared or default)
- each State/Organisation is associated to one or many "Nationality Letters/ Designator" (NLD)
- each NLD is unique
- generally a one-to-one MD-to- "State/Organisation" relationship
- occasionally a one-to-many MD-to- "State/Organisation" relationship
- potentially a many-to-one is possible (does not exist at present "as such") :
 - multiple AMHS MDs in one State
 - Nationality Letters / Designator (NLD) **must** be different
- the references are:
 - ICAO Doc 7910 ⇔ Eurocontrol database of ANP locations (**consistency issue**)
 - **unofficial** ANP locations and territories, created by AMC Operator when needed
- **impacts:**
 - address conversion (high level attributes)
 - routing



101

8.7.3 AMHS MD – COM Centre Relationship

- managed in AMHS MD Register Function
- not formally registered / published (apart from Doc 7910)
"well-known" at AFSG/regional group level
- each COM Centre is associated to a unique location indicator
- generally a one-to-one MD-to-COM Centre relationship
- occasionally a one-to-many relationship
- the references are:
 - ICAO Doc 7910 ⇔ Eurocontrol database of ANP locations (+ "unofficial" if needed)
- **impacts routing**



102

8.7.4 overall AMHS MD Register Update Procedure

- States inform ICAO Regional Offices about their intended changes and apply for their registration (as part of the procedure for major changes)
- ICAO Regional Offices and HQ validate the request, and coordinate with AMC about the need for an update to the Register (as part of the procedure for major changes)
- The AMC Operator takes into account the ICAO validate changes and enters them in the AMC (as part of the procedure for major changes)
- The AMC Operator transfers to Pre-Operational area
- CCC and Ext COM Operators monitor changes and prepare implementation:
 - processing individually each modification, or
 - using the EXPORT action to retrieve the whole Register from AMC
- On the AIRAC date, the AMC Operator transfers to Operational area
- On AIRAC date at 11:00UTC, CCC and Ext COM Operators set the new data to become live
- In parallel (at the AIRAC date), with no impact on AMHS network operation, ICAO HQ updates the official Register for institutional purposes, using AMC data

103



8.7.5 AMHS MD Register Data Fields

Field	Comments	Values
MD Common Name	unique ID local to AMC	usually PRMD-name
Global Domain Identifier (C, A, P)	official identification of AMHS MD	as declared by ANSP and listed in ICAO HQ Register
Addressing Scheme		'XF', 'CAAS', 'other', as declared in Register
ATN Directory naming-context	provision for future implementation of Directory	
Administrative Status	relation to AMC	'internal', 'external', 'participating', 'non-participating'
Operational Status		'op', 'non-op', 'unknown'
State/Organization	from Doc 7910 = ANP locations (+unofficial)	strictly equal to Doc 7910 (typing included) or unofficial territory
Nationality Letters / Designator (NLD)	from Doc 7910 and list of unofficial ICAO locations	2, 4, 5 or 7 letters: 'A*', 'AB', 'ABC*', 'ABCD', 'AB***XYZ', 'ABCDXYZ'
Doc 7910 status	indicates if complies with Doc 7910 (as reflected in ANP locations), or not (not yet)	'official', 'unofficial'
Offic. Register status	indicates if complies with ICAO HQ Register, or not (not yet)	'registered', 'not-registered'
COM Centre Location	internationally "visible" COM Centre(s) from Doc 7910 = ANP locations (+unofficial)	Location indicator imported from list of ANP locations (+ unofficial)
Relation to Doc 7910	AMHS MD summary of "Doc 7910 status"	'consistent', 'inconsistent'
Relation to Official Register	AMHS MD summary of "Offic. Register status"	'registered', 'not-registered'

104



8.7.6 AMHS MD Register

Demonstration

105



8.8.1 Intra-MD Addressing: two Parts

- CAAS Table:
 - contains "O-OU1" relationship
 - enabled depending on addressing scheme selection
 - User Address Table:
 - contains full user O/R address
 - always enabled, not often used during transition from CIDIN/AFTN
- AMHS MDs having selected XF may not need to enter data

106



8.8.2 Intra-MD Addressing Update Procedure

- the CCC or Ext COM Operator updates data (data entry phase) in the AMC:
 - entering individually each modification, or
 - using an IMPORT action to upload his CAAS Table or User Address Table into AMC
- the AMC Operator enters data from ICAO HQ and/or from Regional Offices (if received)
- the AMC Operator checks and validates updated data,
- he co-ordinates with CCC Operators and External COM Operators, if needed
- the AMC Operator transfers to Pre-Operational area
- CCC and Ext COM Operators monitor changes and prepare implementation:
 - processing individually each modification, or
 - using the EXPORT action to retrieve the whole CAAS Tables from AMC
- the AMC Operator transfers to Operational area
- CCC and Ext COM Operators set the new data to become live

107



8.8.3 Intra-MD Addressing Data Fields

Field	Comments	Values
<i>CAAS Table (enabled only if the CAAS Addressing Scheme is selected)</i>		
Organization	identifies a geographical unit (e.g. a region within a State) in conformance with CAAS addressing scheme	assigned by ANSP
Organizational Unit		ALL Doc 7910 location indicators for the considered AMHS MD
Doc 7910 status	indicates if complies with Doc 7910 (as reflected in ANP locations), or not (not yet)	'official', 'unofficial'
Offic. Register status	indicates if complies with ICAO HQ Register, or not (not yet)	'registered', 'not-registered'
<i>User Address Table</i>		
AFTN Addr Indicator	individual AFTN addressee indicator to be mapped individually to an AMHS O/R address	8-letter indicator
O/R Address	the corresponding O/R address in conventional format, built using the O/R address attribute values	derived from fields in pop-up window
User Short Name (in pop-up window)	a unique identifier of the user to whom the O/R address is allocated. Can be used to correlate with data in User Capabilities	assigned by ANSP
"High-level" address attributes (in pop-up window)	country-name, ADMD-name, PRMD-name	coming from the AMHS MD register function (not modifiable)
"Low-level" address attributes (in pop-up window)	OU1 to OU4 (do not leave empty levels) S, G, I, Q Domain-defined attributes (DDA) type/value 1 to 4 (do not leave empty levels)	assigned by ANSP

108



8.8.4 Intra-MD Addressing

Demonstration

109



8.8.5 Intra-MD Addressing IMPORT File Format

CAAS Table IMPORT: text CSV file using semi-colons (;) as separator

one identification line (must be present, but not taken into account upon IMPORT)

one header line

```
1.0;CAASTable;;;BACKGROUND;;25.05.2009-11:00:00%
country-name;ADMD-name;PRMD-name;organization-name;organizational-unit-name%
XX;ICAO;AENA;GCCC;GCCC%
XX;ICAO;AENA;GCCC;GCFV%
XX;ICAO;AENA;GCCC;GCGA%
XX;ICAO;AENA;GCCC;GCGC%
XX;ICAO;AENA;GCCC;GCGM%
[...]%
XX;ICAO;AENA;LECB;LEAB%
XX;ICAO;AENA;LECB;LEAL%
XX;ICAO;AENA;LECB;LEAP%
XX;ICAO;AENA;LECB;LEAT%
XX;ICAO;AENA;LECB;LEBC%
XX;ICAO;AENA;LECB;LEBL%
XX;ICAO;AENA;LECB;LEBN%
XX;ICAO;AENA;LECB;LEBP%
XX;ICAO;AENA;LECB;LEBT%
XX;ICAO;AENA;LECB;LECB%
XX;ICAO;AENA;LECB;LECD%
[...]%
```

one line
for every LI
in AMHS MD

User Address Table IMPORT: will use same principle,
will be implemented in the future

110



8.8.6 Intra-MD Addressing IMPORT

Demonstration

111



9. ATS Messaging Management

Chapter 9

Miscellaneous Functions

112



9.1.1 Manage ANP Locations

the requirement

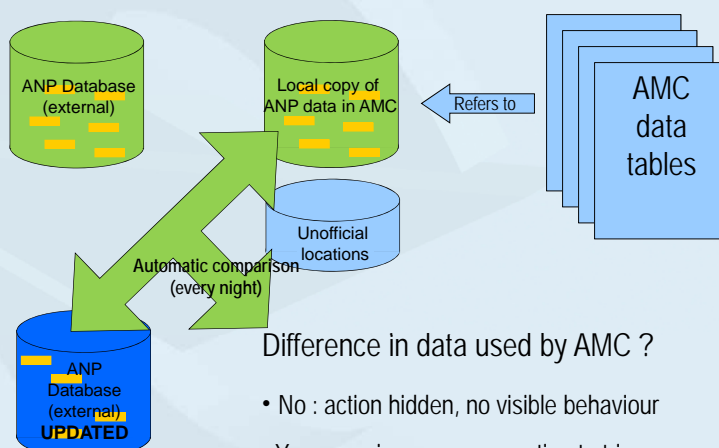
- The AMC is heavily based on Doc 7910 information:
 - Using an external reference for consistency
 - Using an external reference to avoid overtaking management responsibility
 - Doc 7910 is not specific to ATS Messaging
 - Use of the external "Eurocontrol ANP database"
 - Information specifically useful:
 - Location Indicators
 - State (or Country, Territory) names and associated Nationality Letters/Designators
 - Changes in Doc 7910 / external ANP database affect AMC operation:
 - Official Doc 7910 publication is not synchronised with AIRAC cycles
 - Errors may (and do) happen in the officially published data
- Need for an additional Management (via Unofficial ANP Locations) local to AMC

113



9.1.2 Manage ANP Locations

the detection process



114



9.1.3 Manage ANP Locations

AMC Operator action

When the AMC Operator is invited to act upon the warning:

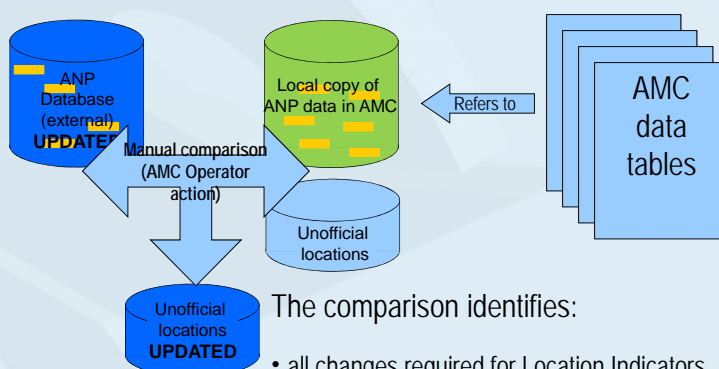
- Go to AMC Miscellaneous, Manage ANP Locations, Update ANP tables and COMPARE VERSIONS
- Creates a pop-up window with two tables and the UPDATE button:
 - Location Indicators which will be modified automatically upon UPDATE of ANP data in AMC
 - States/organizations and Nationality Letters/Designators of the AMHS MD Register to be modified manually after UPDATE of ANP data in AMC

115



9.1.4 Manage ANP Locations

AMC Operator action (diagram)



The comparison identifies:

- all changes required for Location Indicators (update to unofficial ANP locations)
- all inconsistencies to be resolved for State names and NLDs

116



9.1.5 Manage ANP Locations

Example results of AMC Operator comparison

117

9.1.6 Manage ANP Locations

Automatic modifications of Location Indicators

- Main situations envisaged:
 - A previously used official LI is removed from ANP database
 - The LI is created as unofficial
 - A previously used unofficial LI is created in ANP database
 - The unofficial LI is deleted
 - A previously used unofficial LI is created in ANP database but with differences (different Country-name and/or Location-name)
 - The unofficial LI continues being used
- The following principles apply:
 - An unofficial ANP location always takes precedence. Its use is maintained until it becomes official, without any difference in data
 - The whole ANP database – updated contents is copied **as a whole** into the "ANP data in AMC"
 - The UPDATE process remains in the hands of the AMC Operator, who:
 - can see all changes before they are entered
 - can decide when the UPDATE is performed

118

9.1.7 Manage ANP Locations

States/organizations and NLDs to be modified manually

- Main situations envisaged:
 - A Country-name is modified in ANP database and is no longer matching in AMHS MD Register
 - The AMC Operator should modify the Country-name
 - New NLD values are introduced in ANP database and a NLD with wild cards in AMHS MD Register becomes ambiguous
 - The AMC Operator should modify the NLD to use better a specified value (avoiding wild cards if possible)
 - NLD values are modified in ANP database and a NLD is no longer matching in AMHS MD Register (more likely for States using 3 or 4 character NLDs)
 - The AMC Operator should check Official locations to determine the new appropriate NLD value
- The following principles apply:
 - An indication of the error found is given in the pop-up window
 - Errors related to NLDs should be corrected as soon as possible, as they create a risk of wrong AMHS address conversion
 - The UPDATE process remains in the hands of the AMC Operator, who:
 - can see all identified inconsistencies
 - can analyse their impact and look for an appropriate correction
 - can modify the AMC data at his own pace, based on the analysis above

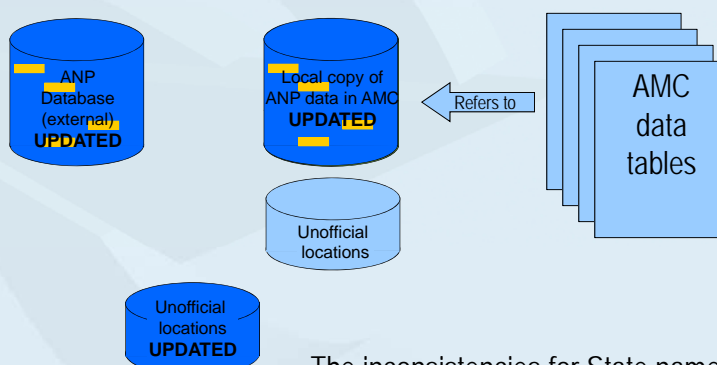
119



9.1.8 Manage ANP Locations

Results of UPDATE ANP DATA in AMC

When the AMC Operator uses the button UPDATE ANP DATA in AMC in the pop-up window :



The inconsistencies for State names and NLDs remain to be resolved.

120



9.1.9 Manage ANP Locations

Demonstration

121



9.2.1 View ANP Locations

Demonstration

122



9.3.1 Static Report

- a printable structured version of the database contents
- split into 4 parts in PDF format, or complete in XLS
 - network inventory
 - routing management
 - address management
 - user capabilities
- exists in Operational Area:
 - provides operational data
- exists in Pre-Operational Area: Static Report (updated data)
 - shows modification since last cycle (in red characters)
 - only complete report to avoid « missing » changes

Demonstration

123



9.4.1 COM Charts

Demonstration


124



9.5.1 AMC Operator Details

Demonstration


125

EUROCONTROL

9.6.1 Path Function

Demonstration

126

EUROCONTROL

10. ATS Messaging Management

Chapter 10

General AMC Operator Functions

127



10.1 AMC Operator Functions in Support of Procedures

- Lock/Unlock COM Centres
- Show Modified Information
- Transfer Data between Areas
 - To Pre-Operational
 - Generate Static Report (updated data)
- Edit Bulletin Board
- Modify Routing Matrix Status
- Transfer Data between Areas
 - To Operational
 - Generate Static Report

128



10.2 Simulation of AIRAC cycle

Demonstration

129



10.3 Edit COM Chart

Demonstration

130



10.4 Functions for User and Context Management

- Assign functions to user groups
- Associate AMC Users to COM Centres
- Show users
- Reference tables

131



11. ATS Messaging Management

Chapter 11

Overview of Implementation Support Functions (AMF-I)

132



11.1 The Overall Goal of AMF-I Functions

- Support AMHS planning, implementation and test activities in the EUR/NAT Regions
- Provide information to AMHS implementers in ICAO member States about:
 - AMHS implementation matters
 - AMHS implementation projects in other States
- Be the EUR/NAT focal point for structured storage and exchange of such information

133



11.2 Overview of AMF-I Functions

- AMHS MD Contacts
- AMHS Implementation Planning
- Interworking Test Support
 - Download test documentation
 - Test activities database
 - Test environment data
 - Test planning
- Monitoring of AMHS Documentation Maintenance
 - PDRs and APs
 - AMHS Documentation Maintenance Procedures
- Helpdesk Functions
 - Download support information
 - Implementers' forum
 - FAQs

134



11.3 AMHS MD Contacts

- Objective:
 - Who is involved in AMHS implementation in ANSP ABC, State XYZ ?
- Potential contacts:
 - the AMF-I Users (2): Key contact persons
 - design engineers, project engineers, technical specialist, head of project/unit, etc.
 - personnel involved in AMHS testing
 - (operational staff preparing AMHS deployment)
- an AMHS MD-oriented function
- Reciprocal interaction with no AMC Operation intervention:
 - Each AMF-I User enters contacts in his/her own AMHS MD
 - He/she can view and retrieve same data from other AMHS MDs

135



11.4 AMHS Implementation Planning

- Objective:
 - When does ANSP ABC, State XYZ, intend to implement AMHS ?
- High-level information:
 - main stages planned (procure, test, operate)
 - which system category (AFTN/AMHS gateway, ATS message server, UAs)
 - for each COM Centre associated to the AMHS MD
- a primarily AMHS MD-oriented function
- reciprocal interaction with no AMC Operation intervention:
 - Each AMF-I User enters contacts in his/her own AMHS MD
 - He/she can view and retrieve same data from other AMHS MDs

136



11.5 Inter-working Test Support

Objective: "How can I organise tests for the AMHS implementation project which I am involved in ?"

- Find methods, tools, test scenarios, etc. ?
 - Download test documentation: makes available test documents approved by AFSG/PG
- Take benefit from testing experience in other States ?
 - Test activities database: summary of international test activities (past, present, planned)
- Do international tests... with whom ?
 - Test environment data: shows test systems available in each AMHS MD
- ... and when ?
 - Test planning: a shared diary between AMHS MDs

137



11.6 Helpdesk Functions

- An interactive community website:
 - Support Information to be downloaded
 - implementers' forum
 - Frequently Asked Questions (FAQs)
- Dedicated to AMHS Implementation
(avoid confusion with AMF-O Support functions)
- Files for download are subject to procedures

Demonstration

138



11.7 AMF-I Procedures

- a usage context different from operational functions:
 - no strict relation to time, nor to AIRAC cycle: information is valid for use as soon as it is posted
 - AMHS MD-related information is generally only relevant to one State/ANSP, published under its responsibility
 - a requirement for validation of common documents and information :
 - final documents (in general no "work in progress", unless specifically agreed)
 - produced by an ICAO body, ICAO Member State or recognised Organisation ("no commercial")
 - not subject to copyright
 - no internal contradiction
- File / document validation by AFSG subgroups
- File management (upload etc.) by AMC Operator

139



11.8 AMF-I Functions

Summary demonstration

140



12. ATS Messaging Management

Chapter 12

Closing considerations

141



12.1 Conclusions: Observed/Expected User Benefits

- Only focal point in the EUR/NAT Regions with complete visibility of the entire AFTN/CIDIN/AMHS network.
- Essential implementation support needed during transition from AFTN/CIDIN to AMHS.
- Coordination of integration of a new COM centre, and upgrade to AMHS, in the network.
- Generation and distribution of routing tables for each COM centre in the EUR/NAT Regions on AIRAC cycle basis.
- Helpdesk support for off-line network management during office hours.
- Tools used by the coordinating COM centres to facilitate network operation.
- Interaction with the COM centres and Regional Offices in the other ICAO regions as a focal point of EUR/NAT Regions.

142



12.2 Conclusions: Summary

- The AMC comprises
 - a management organization and framework
 - AMC systems
 - functions and procedures
 - support and operator resources
- To provide off-line network management services in support of AFTN/CIDIN/AMHS operation and AMHS deployment in
 - EUR/NAT ICAO Regions and
 - external COM Centres, potentially world wide
- The AMC currently is the only system in operation with such capability

143



12.3 Questions and Answers

Any pending question ?

Don't hesitate

The floor is to you...

144



12.4 Feedback Channels

During your participation in AMC activities, you will most likely wish to provide feedback on your experiences concerning, for example:

- ◇ procedures,
- ◇ AMC Systems, or
- ◇ organisational matters.

Please send your feedback to

- Eurocontrol (yuksel.eyuboglu@eurocontrol.int), and
- to the AMC Operator

145



12.5 Closing

It has been a great pleasure giving this course and we wish you all great success in using the ATS Messaging Management application!

PS. Please don't forget the Feedback Form!

146

