

# ATS MESSAGING MANAGEMENT

**ATS Messaging Management Centre (AMC)**

**External COM Centre Operators Briefing**

**ICAO NACC Office, 10-11 April 2019**

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8. Routing management
9. Miscellaneous functions
10. General AMC Operator functions
11. Relation between AMC and EDS (Initial step)
12. Final



# 1. INTRODUCTION

- Concept
- Addressing



## 1.1.1 AMC CONCEPT – HISTORY

- ▶ Dec 2001: Start of CIDIN Management Centre (CMC) operation
- ▶ Dec 2003: EANPG (Conclusion 45/10) invited EUROCONTROL to extend the CIDIN Management Service in order to provide ATSMHS off-line network management
- ▶ Sept 2004-May 2005: Study of AMHS Off-line Management
- ▶ April 2005: ATS Messaging Management Manual was 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
- ▶ 19<sup>th</sup> of Jan 2007: Start of AMC operational service
- ▶ April 2007: Adoption of ATS Messaging Management Manual, Version 3.0 as EUR Doc 021
- ▶ March 2019: Adoption of EUR Doc 021 – ATS Messaging Management Manual, Version 14.0



## 1.1.2 AMC CONCEPT – ICAO STATE LETTER

- ▶ In 2008 EANPG concluded:
  - ▶ 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.



## 1.1.3 AMC CONCEPT – SCOPE AND OBJECTIVES

- ▶ Deliver Off-Line Network Management Services in support of the “ATS Messaging part” of the AFS: AFTN / CIDIN / AMHS as integrated 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
  - For other ICAO Regions, initially focused on Address Management, now extended to Global Routing
- ▶ Service provided on a co-operative basis (not chargeable)



## 1.2.1 AMHS ORGANISATION AND ADDRESSING

- ▶ ICAO is considered as an Administrative Management Domain (ADMD)

However this ADMD is “virtual” and does not manage any MTA, it is defined for organisational reasons only.

- ▶ ICAO Member States and recognised Organisations operate as PRMDs under the ICAO ADMD

- ▶ There is usually one AMHS MD per State/ANSP.
- ▶ For organisational and technical reasons, PRMDs are defined for all ICAO Member States worldwide. However a State PRMD becomes “real” when AMHS is implemented in that State.
- ▶ State PRMDs are directly interconnected between themselves



## 1.2.2 AMHS ADDRESSING FOR MANAGEMENT DOMAINS

- ▶ X.400 and AMHS addressing is hierarchical. An address is an ordered combination of **attributes** which all have a specified syntax
- ▶ An address is usually represented (but not encoded) by a sequence such as: attribute1 initials = value1, attribute2 initials = value2, etc.
- ▶ Each Management Domain is uniquely identified at a global level by 3 standard attributes (together known also as “GDI”- Global Domain Indicator):
  - ▶ Country-name (C) for AMHS: C=XX (International Organisation)
  - ▶ ADMD-name (A) for AMHS: A=ICAO
  - ▶ PRMD-name (P)

Examples for AMHS: C=XX, A=ICAO, P=GERMANY,  
or C=XX, A=ICAO, P=MU



## 1.2.3 AMHS ADDRESSING SCHEMES – CAAS, XF

Attribute	Name of attribute	CAAS Addressing Scheme				XF Addressing Scheme
		Assigned by	Registered by	Value	Comment	Value
<i>High level address attributes:</i>						
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
<i>Low level address attributes</i>						
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),

## 1.2.6 AMHS ADDRESSING FOR USERS OF THIRD PARTIES

(Third Party Providers as SITA or ARINC)

- ▶ No specific Nationality letters assigned to the Third Party Service Providers
- ▶ Identification of this kind of users by entries in the User Address Table
- ▶ Each User is identified by a full “O/R Address” including following attributes:
  - ▶ Global Domain Identifier (GDI) (Country-name/ADMD-name/PRMD-name)
  - ▶ organisation-name (O) = AFTN if XF addressing scheme is selected
  - ▶ organisational-units-name (OU1) = assigned AFTN Address of the User

- ▶ Example “SITA” (XF Addressing scheme):

C=XX / A=ICAO / P=SITA / O=AFTN / OU1=EDIIDLHX

(SITA User Address of a Lufthansa client in Germany)



## 2. OVERALL FRAMEWORK FOR ATS MESSAGING MANAGEMENT

- Network Management
- AMC participants
- Organisation (governance)



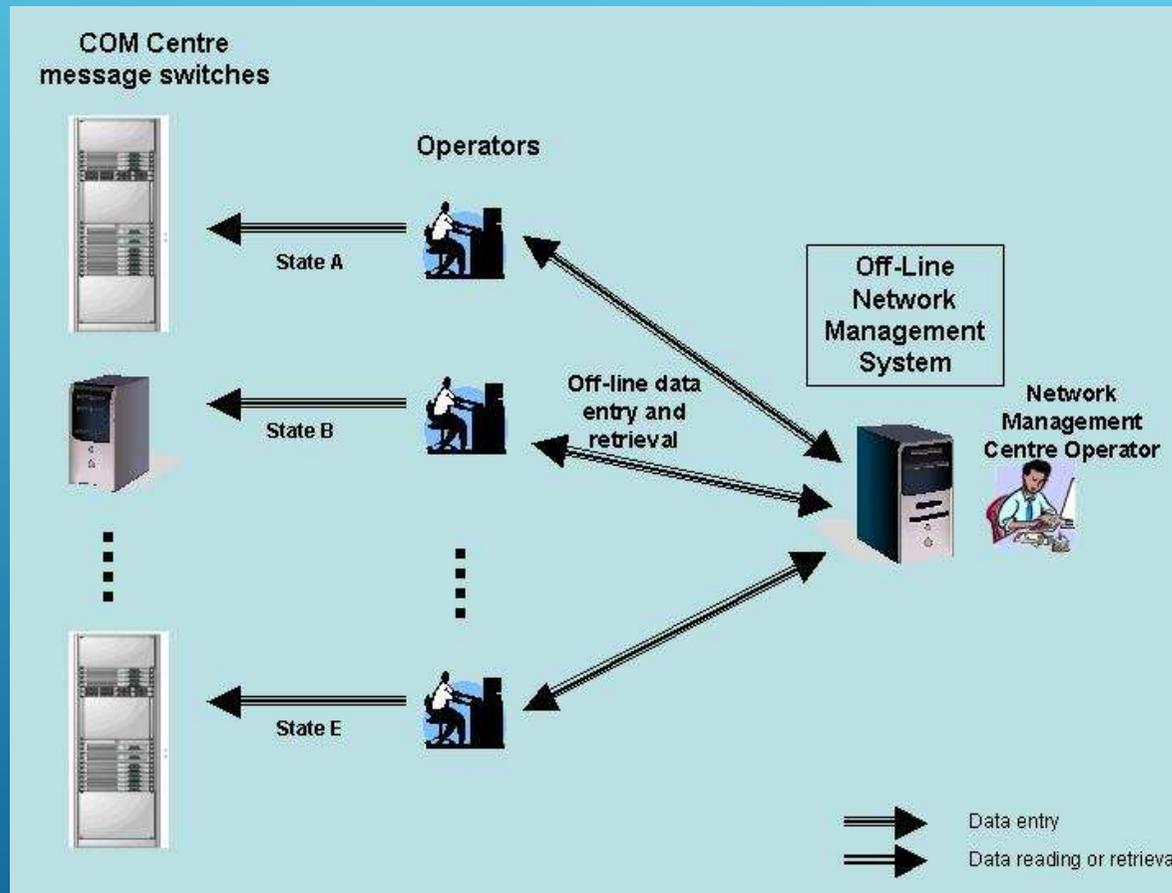
## 2.1.1 NATURE OF NETWORK MANAGEMENT

- ▶ 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”

## 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

## 2.1.3 OFF-LINE NETWORK MANAGEMENT



## 2.2.1 AMC PARTICIPANTS

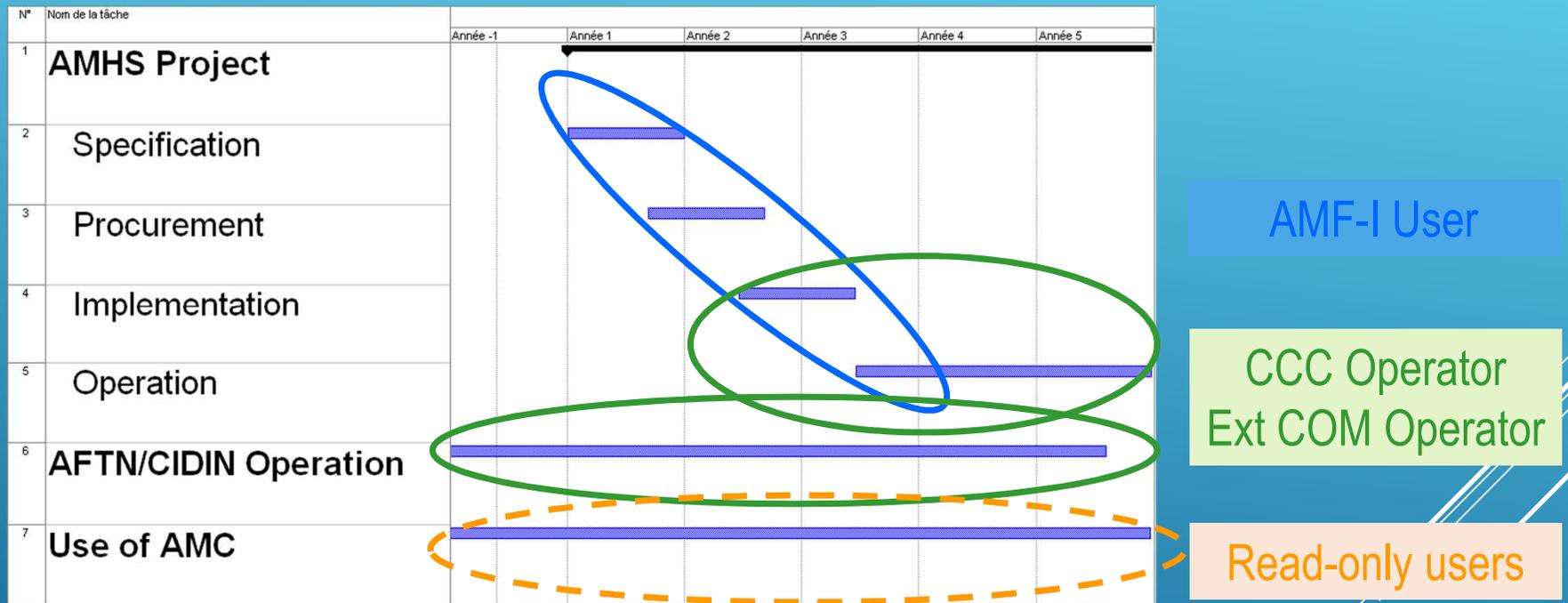
- ▶ AMC Operator
- ▶ CCC (Co-operating COM Centre) Operators
- ▶ External COM Centre Operators
- ▶ AMF-I Users
- ▶ Read-Only Users
  - ▶ Operators without formal responsibility
  - ▶ People overseeing activity
- ▶ Participating COM Centres

AMC Users

**How to be in one of these categories ?**

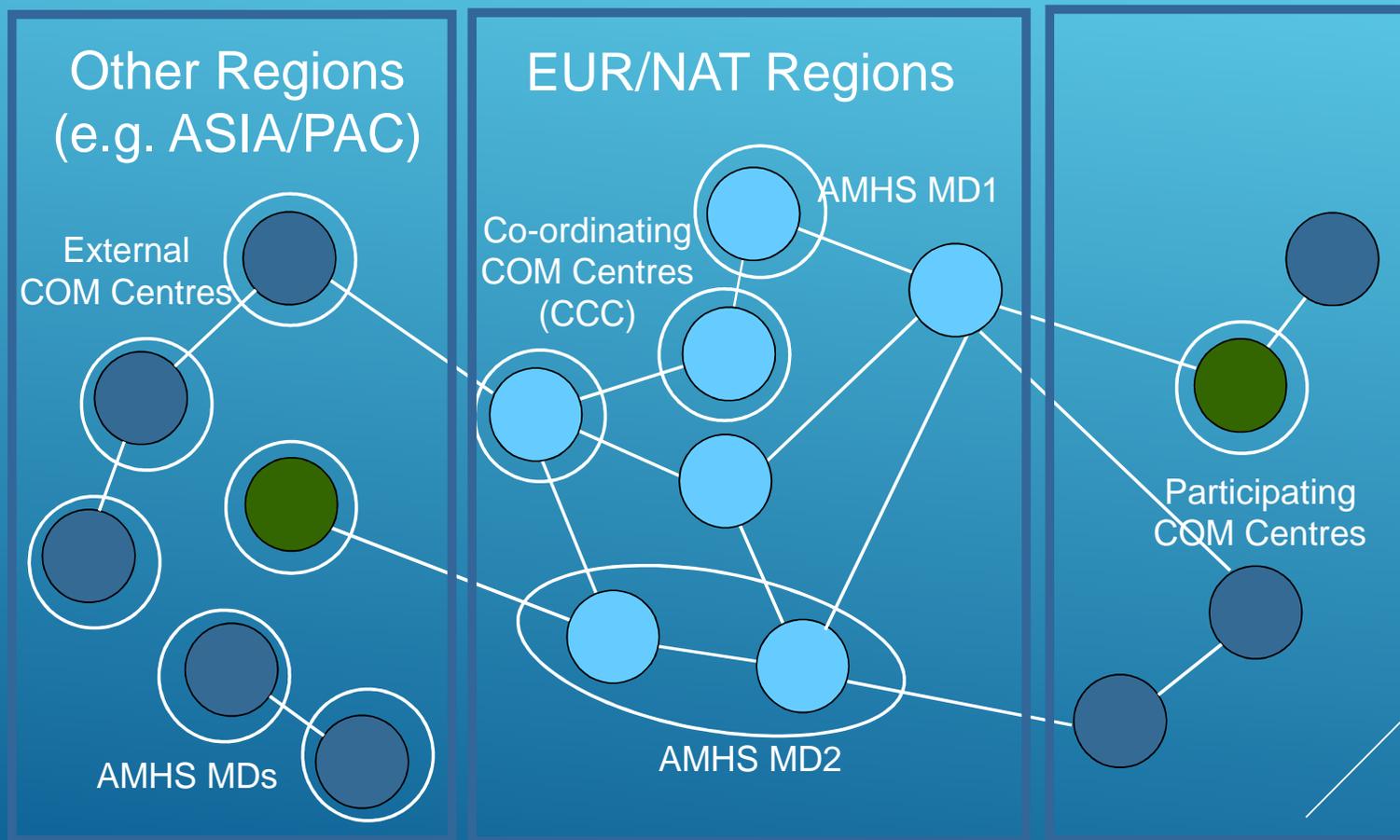
**Use accreditation procedures in the Manual**

## 2.2.2 MAIN FOCUS FOR AMC PARTICIPANTS IN AN AMHS PROJECT

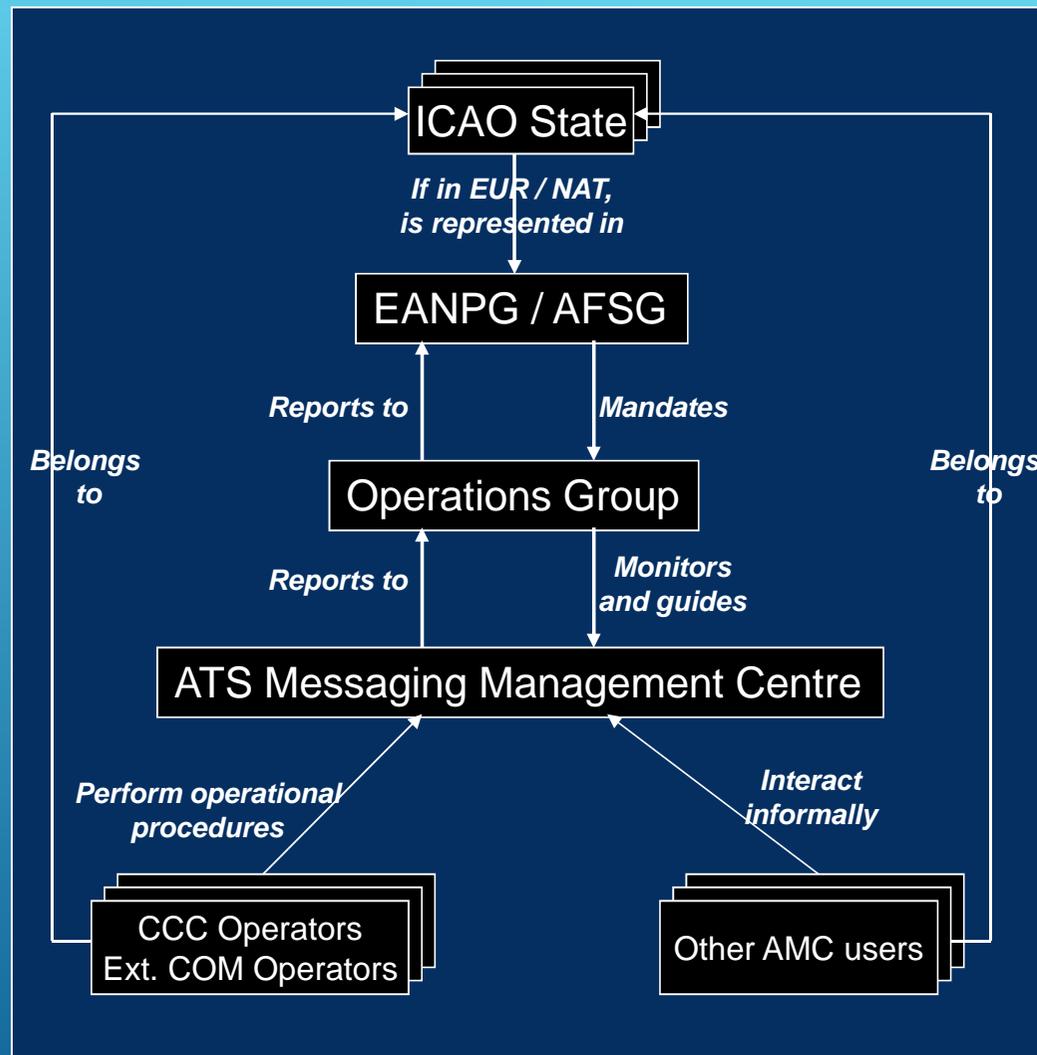


- AMF-I Users, CCC Operators and Ext. COM Operators are officially representing their COM Centre and/or ANSP
- Read-only users have no formal responsibility and may be not directly involved in an AMHS project

## 2.2.3 ATS MESSAGING MANAGEMENT AREA



## 2.3.1 ORGANISATION



### 3. TECHNICAL OVERVIEW

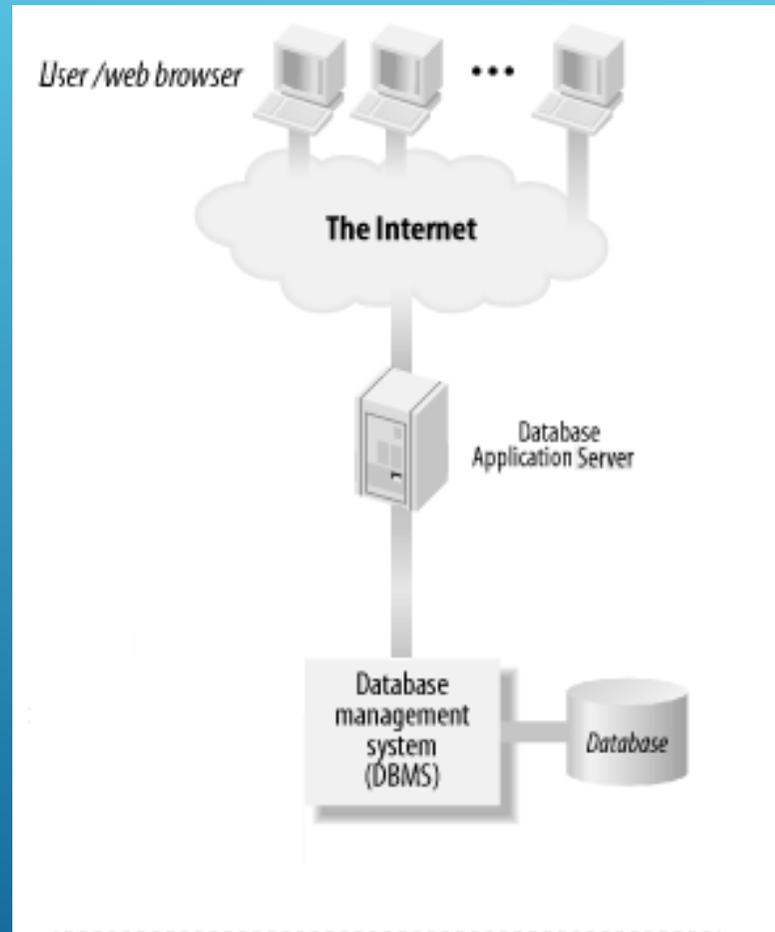
- AMC System
- AMC access



## 3.1.1 A DATABASE APPLICATION

AMC Users

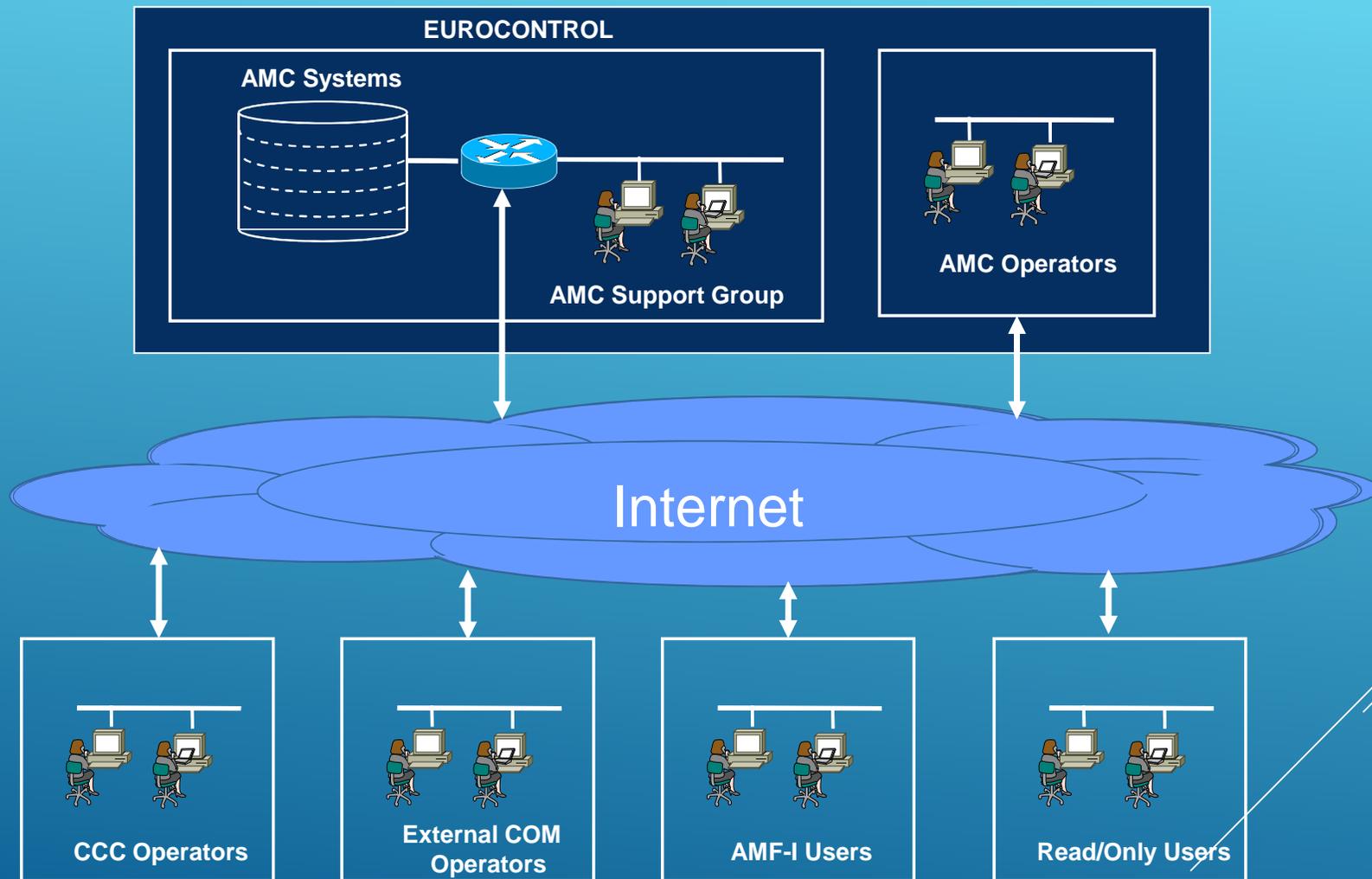
AMC Systems



User interfaces  
Data processing

Database objects

## 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://ext.eurocontrol.int/elsh/registerNewUserForApplication.do?eurocontrolresourceid=amc\\_users](https://ext.eurocontrol.int/elsh/registerNewUserForApplication.do?eurocontrolresourceid=amc_users)
  - ▶ The accreditation procedure is then started  
(see ATS Messaging Management Manual section 2.5.2)
  - ▶ Follow AMC training



## 3.2.2 HOW TO ENTER THE AMC APPLICATION ?

- ▶ Various entry points:
  - ▶ [www.eurocontrol.int/amc/](http://www.eurocontrol.int/amc/)
  - ▶ [www.paris.icao.int](http://www.paris.icao.int)

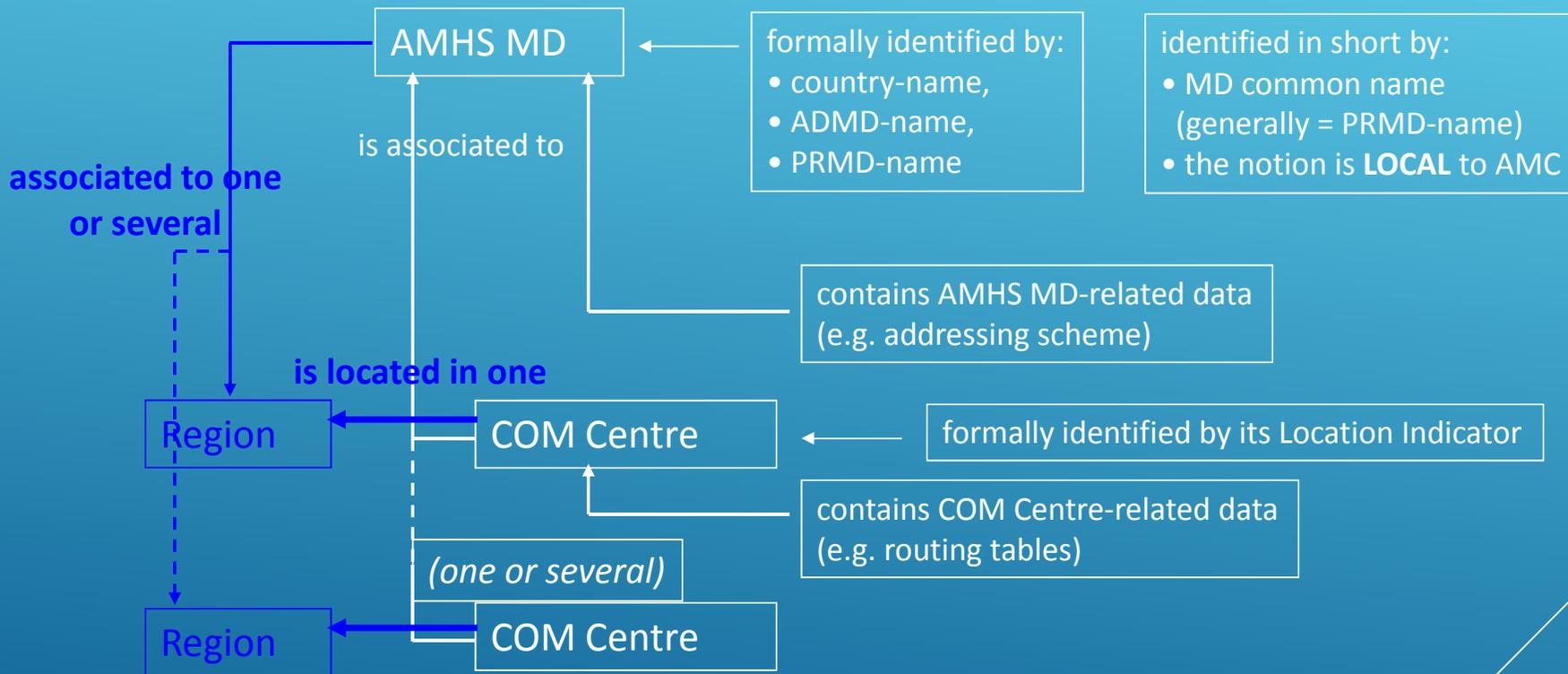


## 4. DATA ORGANIZATION AND USER INTERFACE

- Data Organisation
- Window structure
- Access rights



## 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 (e.g. 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 'ATS Messaging Management' interface. On the left is a vertical menu with three sections: 'View Operational Data', 'View Pre-Operational Data', and 'Enter Background Data'. The 'View Operational Data' section is expanded to show 'Network Inventory' as the selected function. The main window contains a header with the 'Network Inventory' title and 'Operational Area' status. Below the header are several tabs: 'Persons & Contacts', 'Com Centres', 'AFTN / CIDIN Capabilities', 'AMHS Capabilities', 'VCG's', and 'Connections'. The 'VCG's' tab is active. The main content area includes search filters for 'Region or Country', 'COM Centre', 'Location', and 'Country', along with 'HOME' and 'SEARCH' buttons. Below these are fields for 'MD Common Name', 'Country-Name', 'ADMD-Name', and 'PRMD-Name'. A table lists 'External COM Operator' records with columns for 'Personal Role', 'Firstname', 'Surname', 'Phone', and 'E-Mail'. Annotations with blue boxes and arrows identify the 'Menu (functions)', 'Main window', and 'Sub-functions (tabs)'.

**Menu (functions)**

- View Operational Data
  - Network Inventory
  - Routing Directory
  - Address Management
  - User Capabilities Management
  - Statistics
  - Static Report
  - COM Charts
- View Pre-Operational Data
  - Network Inventory
  - Routing Directory and ACK
  - Address Management
  - User Capabilities Management
  - Statistics
  - Static Report (updated data)
- Enter Background Data
  - Network Inventory
  - Address Management
  - User Capabilities Management
  - Statistics
- Miscellaneous Functions
  - Support Functions
  - View Bulletin Board
  - View AIRAC Cycle

**Main window**

**Sub-functions (tabs)**

Personal Role	Firstname	Surname	Phone	E-Mail
External COM Operator	Andrianierenana	Nary	+00 261 332337034	buzzprod@hotmail.fr
External COM Operator	Patrick	RAKOTOMAHEFA		rakotomahefapat@asecna.org

## 4.2.2 MAIN WINDOW AND POP-UP STRUCTURE

The screenshot displays the 'ATS Messaging Management' interface. The main window, titled 'Network Inventory', shows a list of records under the 'Persons & Contacts' tab. A record for 'Andrianierenana Nary' is selected. A pop-up window, titled 'Persons & Contacts - Source COM Centre : FMMM - Inte...', provides detailed information for this record. The pop-up window includes fields for Personal Roles, Firstname, Surname, Local Title, Phones, Fax, E-mail, Telex, User Id, AFTN, CIDIN/AFTN, CIDIN/OPMET, SITA, Remark, Created by, Created on, Last Modified by, and Last Modified on. The 'CREATE' button is visible in the main window, and 'MODIFY', 'DELETE', 'SUBMIT', 'CANCEL', and 'CLOSE' buttons are visible in the pop-up window.

**Network Inventory (Main Window)**

Region or Country	COM Centre	Location	Country
AFI	FMMM	ANTANANARIVO (FIC,ACC,COM,NOF)	Madagascar

MD Common Name	Country-Name	ADMD-Name	PRMD-Name
FM	XX	ICAO	FM

Personal Role	Firstname	Surname	Phone	E-Mail
External COM Operator	Andrianierenana	Nary	+00 261 332337034	buzzprod@hotmail.fr
External COM Operator	Patrick	RAKOTOMAHEFA		rakotomahefapal@asecna.org

**Persons & Contacts - Source COM Centre : FMMM - Inte...**

https://ext.eurocontrol.int/amc/protected/NetworkInventory\_PersonsContactsPopupLoar

**Network Inventory**

**Persons & Contacts**

**Personal Roles**

Personal Roles	Firstname	Surname	Local Title
External COM Operator	Andrianierenana	Nary	

**Phones**

Phones	Fax	E-mail	Telex
+00 261 332337034		buzzprod@hotmail.fr	

**User Id**

User Id
naryandria

**AFTN**

AFTN	CIDIN/AFTN	CIDIN/OPMET	SITA

**Remark**

**Created by**

Created by	Created on	Last Modified by	Last Modified on
eyubogly	15/03/2017 09:15	eyubogly	15/03/2017 09:15

**Buttons:** CREATE, MODIFY, DELETE, SUBMIT, CANCEL, CLOSE

detailed information  
about  
selected record

## 4.2.3 SCREEN AREAS OF MAIN WINDOW

The screenshot displays the 'ATS Messaging Management' interface, specifically the 'Network Inventory' section. The interface is divided into several key areas:

- SEARCH area:** Located at the top right, containing search filters for 'Region or Country' (AFI), 'COM Centre Location' (FMMM), 'Country' (Madagascar), and 'Country-Name' (XX).
- RESULTS area:** A table listing search results for 'External COM Operator' with columns for 'Personal Role', 'Firstname', 'Surname', 'Phone', and 'E-Mail'.
- DETAILS area:** A detailed form for 'Persons & Contacts' showing fields for 'Personal Roles', 'Firstname', 'Surname', 'Local Title', 'Phones', 'Fax', 'E-mail', 'Telex', 'User Id', 'AFTN', 'CIDIN/AFTN', 'CIDIN/OPMET', 'SITA', and 'Remark'. It also includes a 'Remark' text area and a 'Created by' section.
- ACTIONS area:** A vertical sidebar on the left containing various management functions such as 'View Pre-Operational Data', 'Enter Background Data', 'Miscellaneous Functions', 'Manage Background Data', and 'Transfer Data between Areas'. A 'CREATE' button is highlighted in the 'Manage Background Data' section.

Buttons for 'MODIFY', 'DELETE', 'SUBMIT', 'CANCEL', and 'CLOSE' are located at the bottom of the details form.

## 4.3.1 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

## 4.3.2 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



## 4.3.3 EXAMPLE: REGIONS FUNCTION

### Demonstration

- Menu: Regions → NAM/CAR



## 5. OVERVIEW OF OPERATIONAL FUNCTIONS AND PROCEDURES (AMF-O)

- Functions
- Data Areas
- AIRAC Cycle

## 5.1.1 LIST OF AMF-O FUNCTIONS

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

## 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

## 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

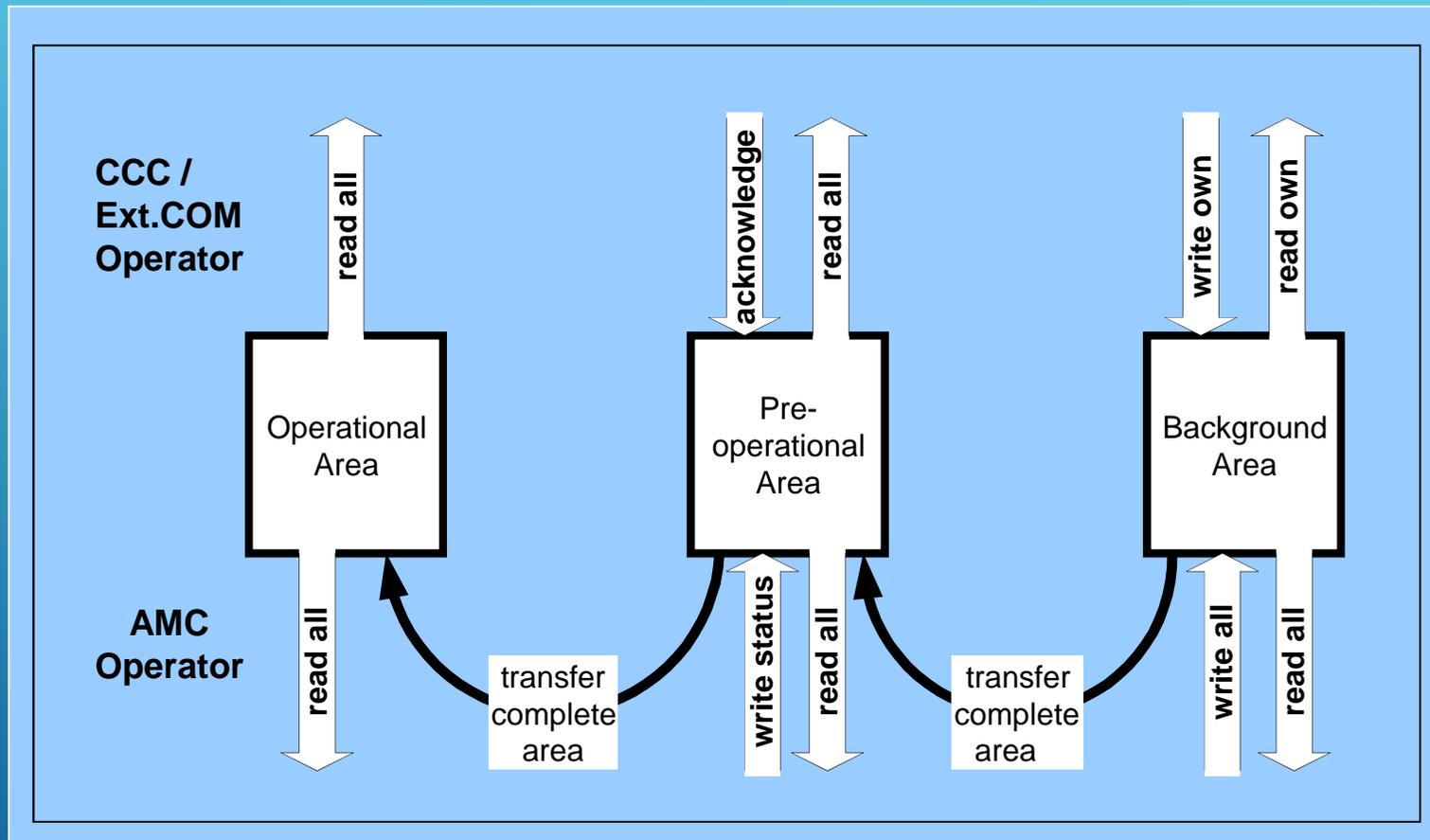
## 5.2.3 PRE-OPERATIONAL DATA AREA

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

## 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

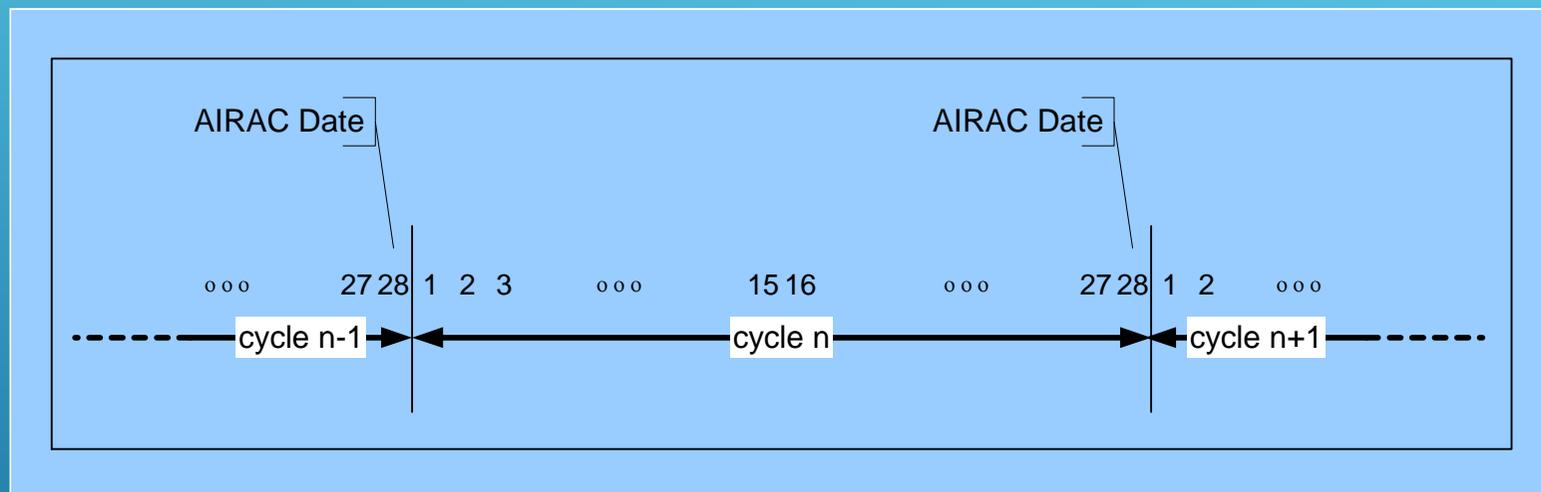
## 5.2.5 RELATION BETWEEN AREAS



## 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

## 5.3.2 THE AIRAC CYCLE



## 5.3.3 THE PROCEDURE CYCLE

Day in Cycle	Data Entry	Data Validation and Processing	ACK Phase	ACK Processing	Data Retrieval and Implementation (by CCC)
	by CCC / Ext COM / AMC	by AMC	by CCC	by AMC	Data Publication (by AMC)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					

<b>LEGEND</b>		AMC Operator locks COM Centres		AMC Operator releases the routing matrix
		AMC Operator transfers to pre-operational area		AMC Operator moves data to operational area, unlocks COM Centres and makes official publications;
		Weekends		CCC Operators use new data for operational service

## 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
Data Entry Phase	data entry, Inventory, Addressing Routing Tables		access current operational data
Data Processing and Validation Phase	Transfer of data	Investigate, check and validate data	access current operational data
ACK Phase		investigate and acknowledge Routing Matrices	access current operational data
ACK Processing Phase		Coordination if required, decisions, transfer of data	access current operational data
Data Retrieval and Implementation Phase			access current operational data

## 5.3.5 VIEW AIRAC CYCLES IN AMC

### Demonstration

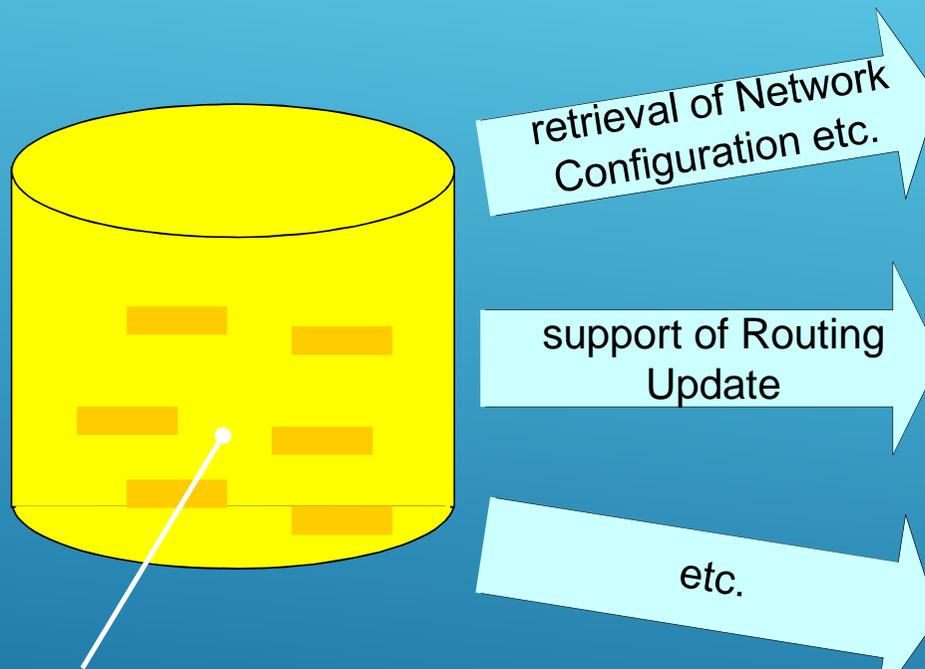
- Menu: Miscellaneous Functions
  - View AIRAC Cycle
  - View AIRAC Dates



## 6. NETWORK INVENTORY

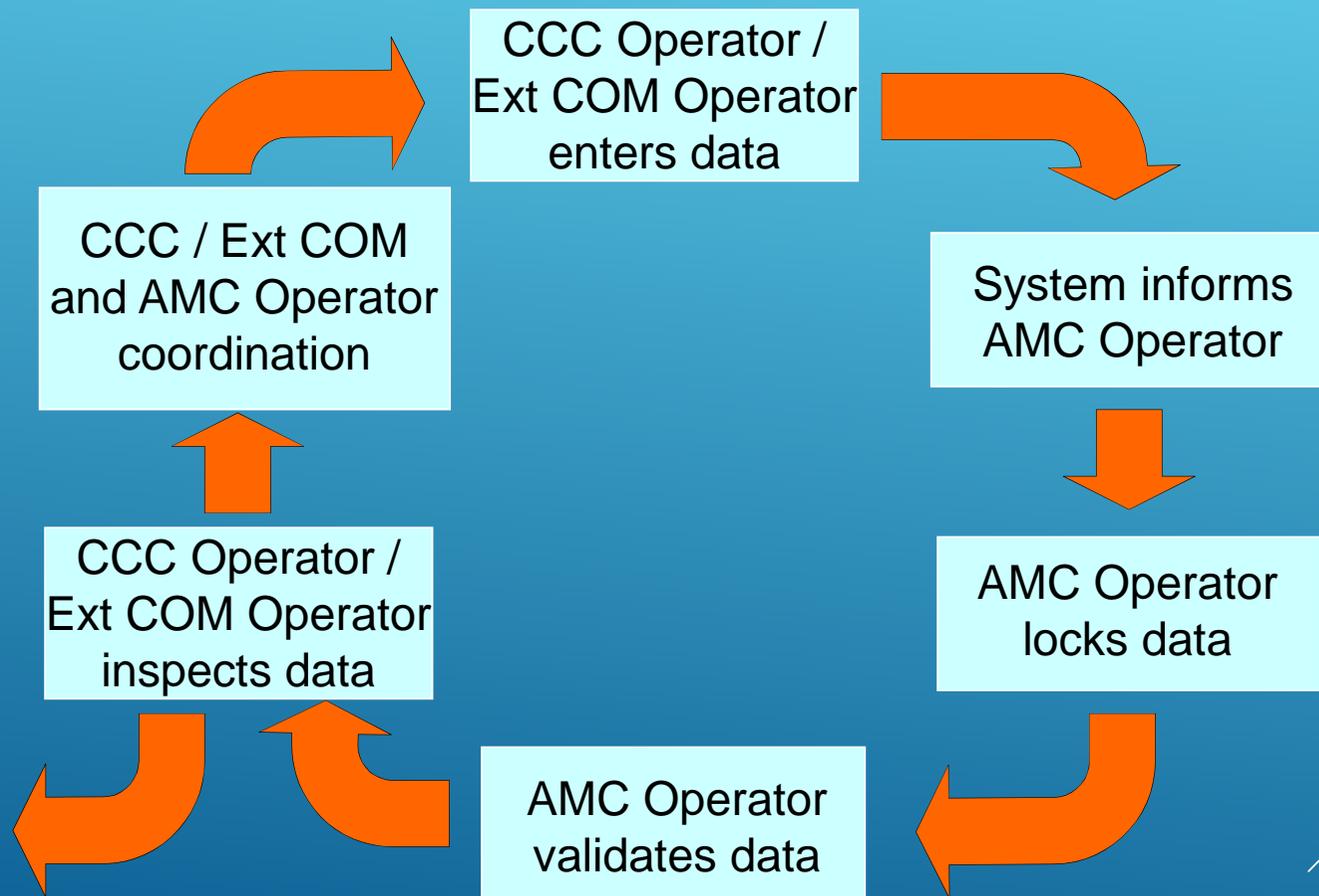
- Network Inventory interactions
- Subfunctions

## 6.1.1 NETWORK INVENTORY PURPOSE



Persons and Contacts  
COM Centre Info and Capabilities  
Connections  
(CIDIN VCGs)

## 6.1.2 INVENTORY UPDATE INTERACTIONS



## 6.2.1 THE SUB-FUNCTIONS OF NETWORK INVENTORY

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

The screenshot displays the 'Network Inventory' section of the 'ATS Messaging Management' system. The interface includes a sidebar for navigation, a main header with 'Network Inventory' and 'Background Area', and a search form with various filters and a results table.

**View Pre-Operational Data**

- ▶ Network Inventory
- ▶ Routing Directory and ACK
- ▶ Address Management
- ▶ User Capabilities Management
- ▶ Statistics
- ▶ Static Report (updated data)

**Enter Background Data**

- ▶ **Network Inventory**
- ▶ Address Management
- ▶ User Capabilities Management
- ▶ Statistics

**ATS Messaging Management**

**Network Inventory** [HELP]

**Background Area**

**Persons & Contacts** | **Com Centres** | **AFTN / CIDIN Capabilities** | **AMHS Capabilities** | **VCG's** | **Connections**

**Region or Country**: AFI  
**COM Centre Location**: FMMM  
**Country**: Madagascar  
**MD Common Name**: FM  
**Country-Name**: XX  
**ADMD-Name**: ICAO  
**PRMD-Name**: FM

**SEARCH** **HOME**

Personal Role	Firstname	Surname	Phone	E-Mail
External COM Operator	Andrianierenana	Nary	+00 261 332337034	buzzprod@hotmail.fr
External COM Operator	Patrick	RAKOTOMAHEFA		rakotomahefapat@asecna.org

## 6.2.2 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)

## 6.2.3 NETWORK INVENTORY

### Demonstration

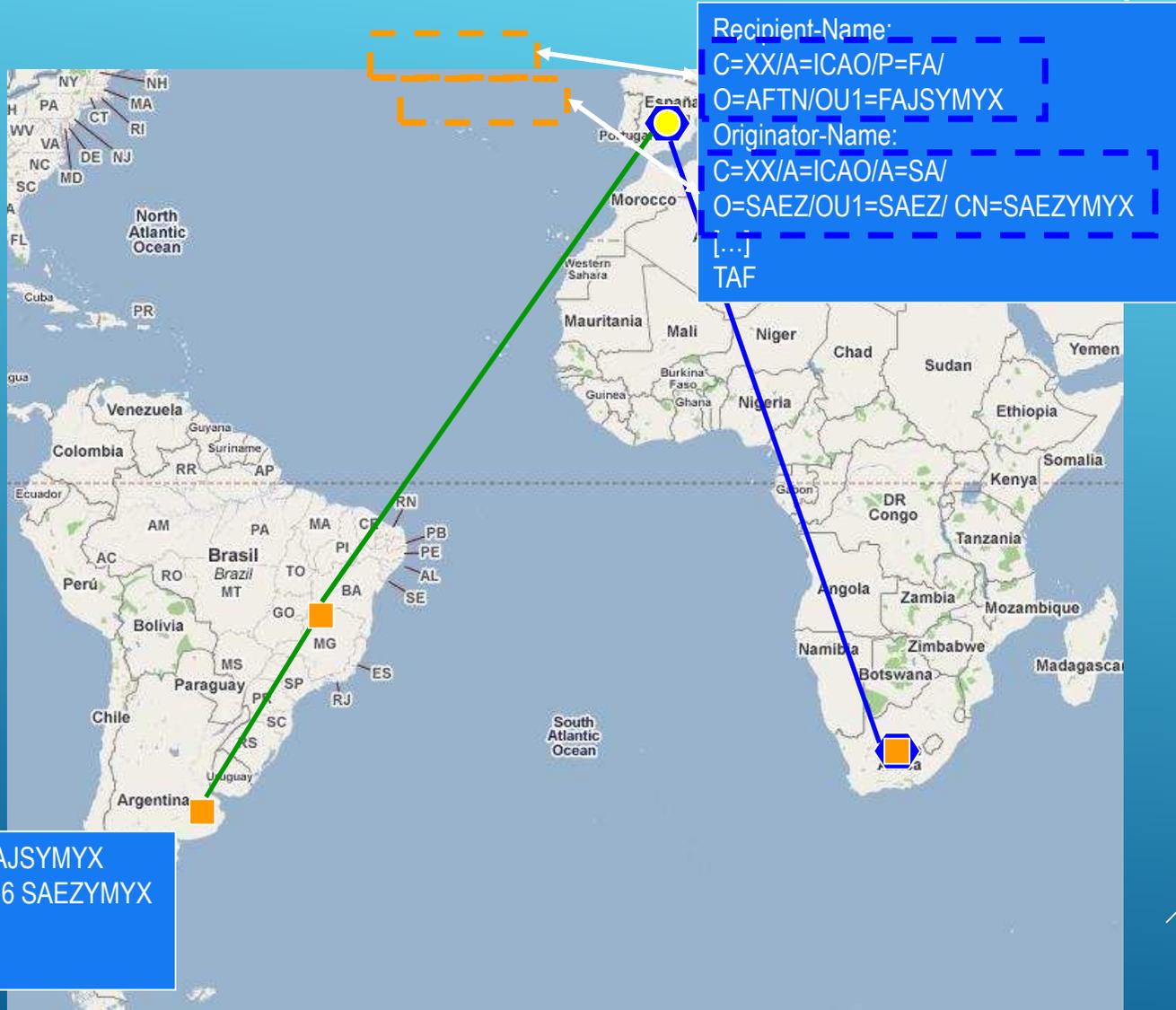
- Menu: Network Inventory  
→ EDDD all folders



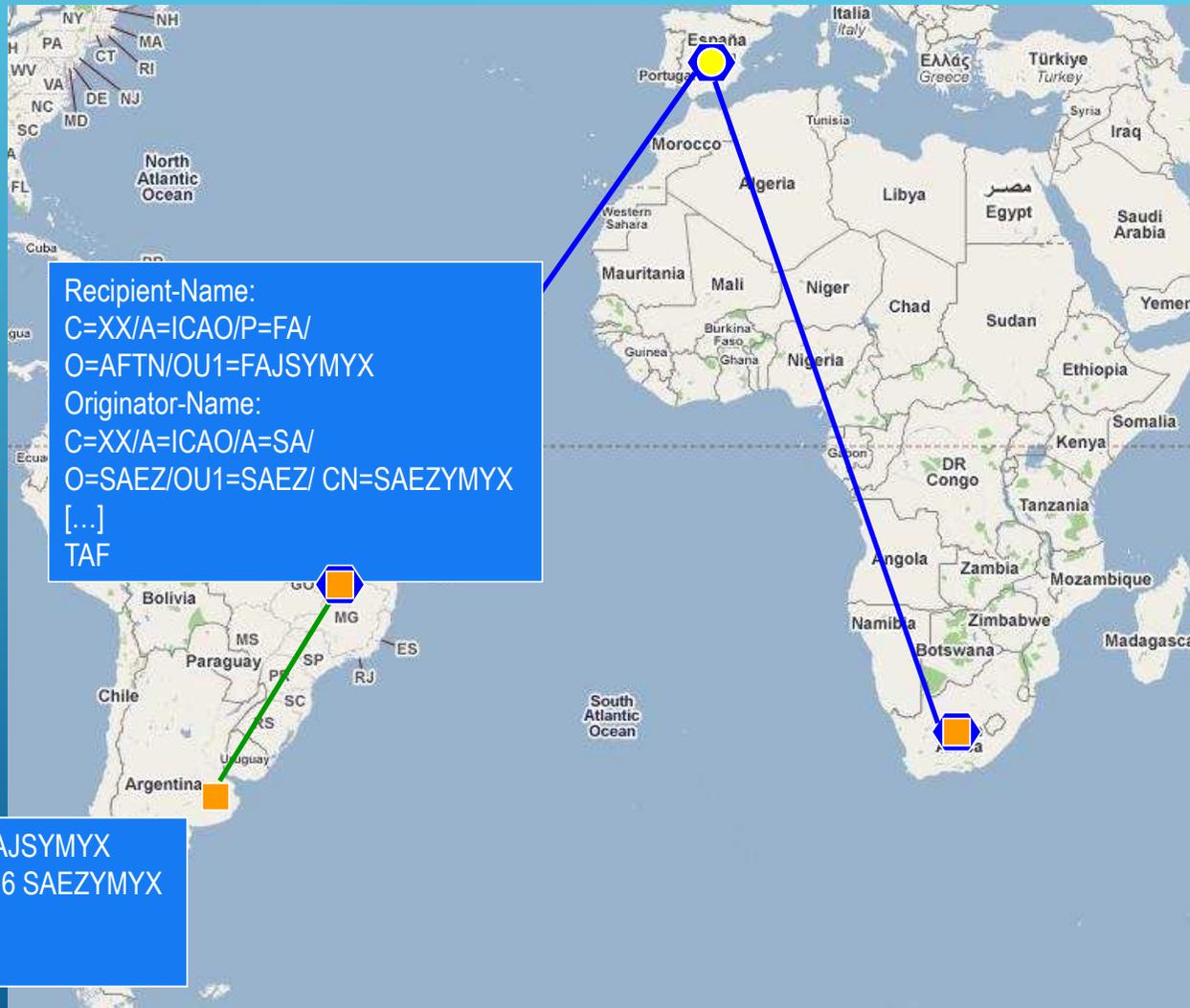
## 7. ADDRESS MANAGEMENT

- The need
- Aspects
- Categories of changes
- Major Changes
- Minor changes
- AMHS MD addressing
- Intra-MD addressing

# 7.1.1 THE NEED FOR ADDRESS MANAGEMENT (1)



## 7.1.2 THE NEED FOR ADDRESS MANAGEMENT (2)



## 7.1.3 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

## 7.1.4 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.

## 7.2.1 TWO ASPECTS IN ADDRESS MANAGEMENT

		CAAS	XF	
Attribute	Name of attribute	Value	Value	
<i>High level address attributes:</i>				
C	Country-name	'XX'	AMHS MD Register	
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'	Intra-MD Addressing
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>	

"Other" addressing schemes or addresses using additional attributes

## 7.2.2 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



## 7.2.3 USE OF AMHS ADDRESS INFORMATION

### EXAMPLE 1: ADDRESS CONVERSION IN AFTN/AMHS GATEWAY

State	AMHS Address Specification						
Name	Nationality Letters or Designator	Country-name attribute	ADMD-name attribute	PRMD-name attribute	Addressing scheme	ATN Directory naming-context	Comments
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 EFHKZTZ** : if not in the User Address Table

- 1) Extract EF, EFHK, EF—ZTZ, EFHKZTZ
- 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=EFHKZTZ



## 7.2.4 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			

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

**Convert GCRRZPX (Lanzarote) :** if not in the User Address Table

- 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

## 7.3.1 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:

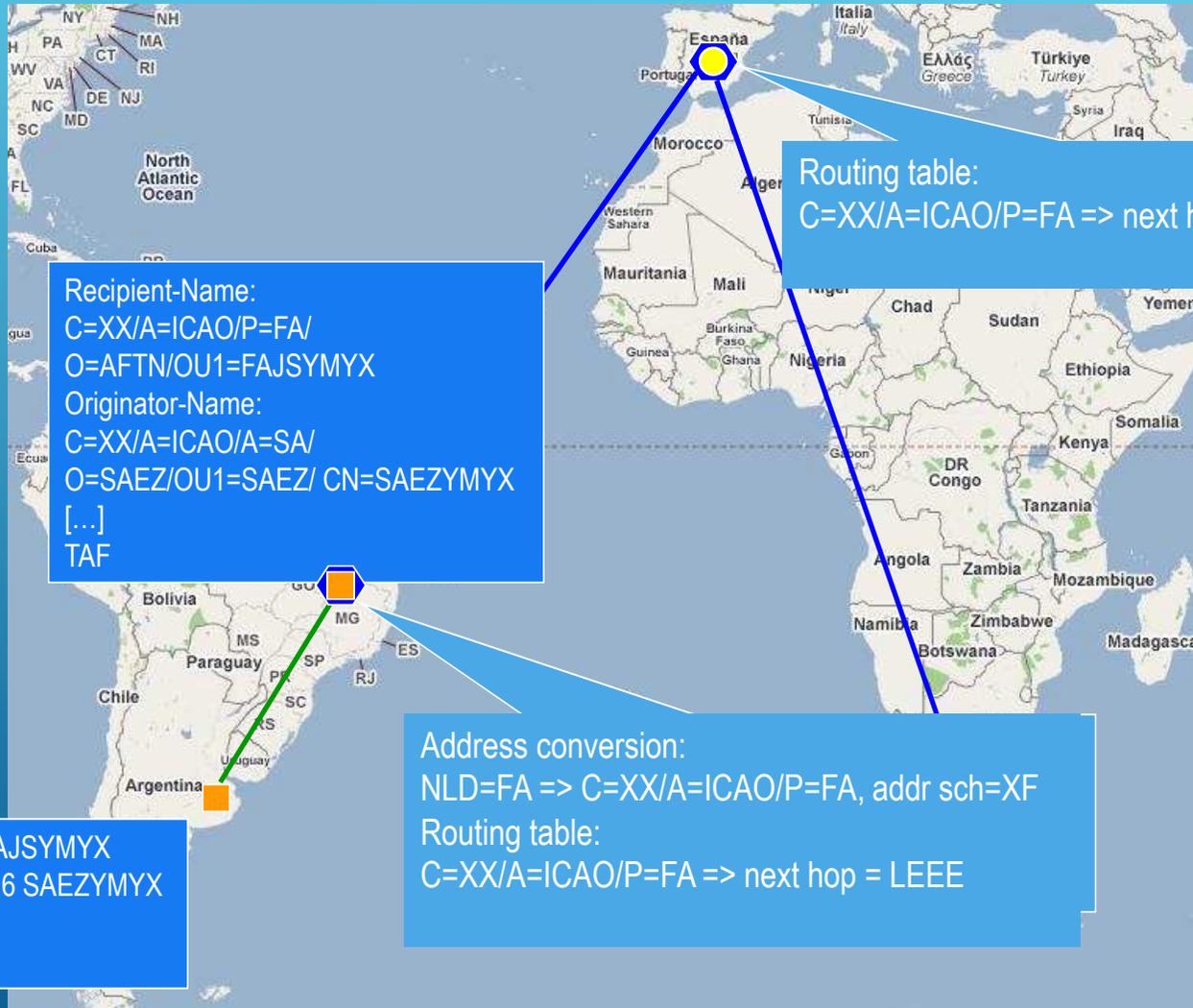
#### ▶ They consist in modifications in a CAAS table

#### ▶ They have an operational impact which can be more limited

#### ▶ They can be more frequent

## 7.4.1 EXAMPLE OF MAJOR ADDRESS CHANGE

PRMD-NAME = 'FA' BECOMES PRMD-NAME = 'SOUTH-AFRICA'



Before the  
change

## 7.4.2 EXAMPLE OF MAJOR ADDRESS CHANGE

PRMD-NAME = 'FA' BECOMES PRMD-NAME = 'SOUTH-AFRICA'



After the  
change

## 7.4.3 EXAMPLE OF MAJOR ADDRESS CHANGE

PRMD-NAME = 'FA' BECOMES PRMD-NAME = 'SA'



Routing table:  
C=XX/A=ICAO/P=**FA** => next hop = FAJS

Recipient-Name:  
C=XX/A=ICAO/P=**SOUTH-AFRICA**/  
O=AFTN/OU1=FAJSYMYX  
Originator-Name:  
C=XX/A=ICAO/A=SA/  
O=SAEZ/OU1=SAEZ/ CN=SAEZYMYX  
[...]  
TAF

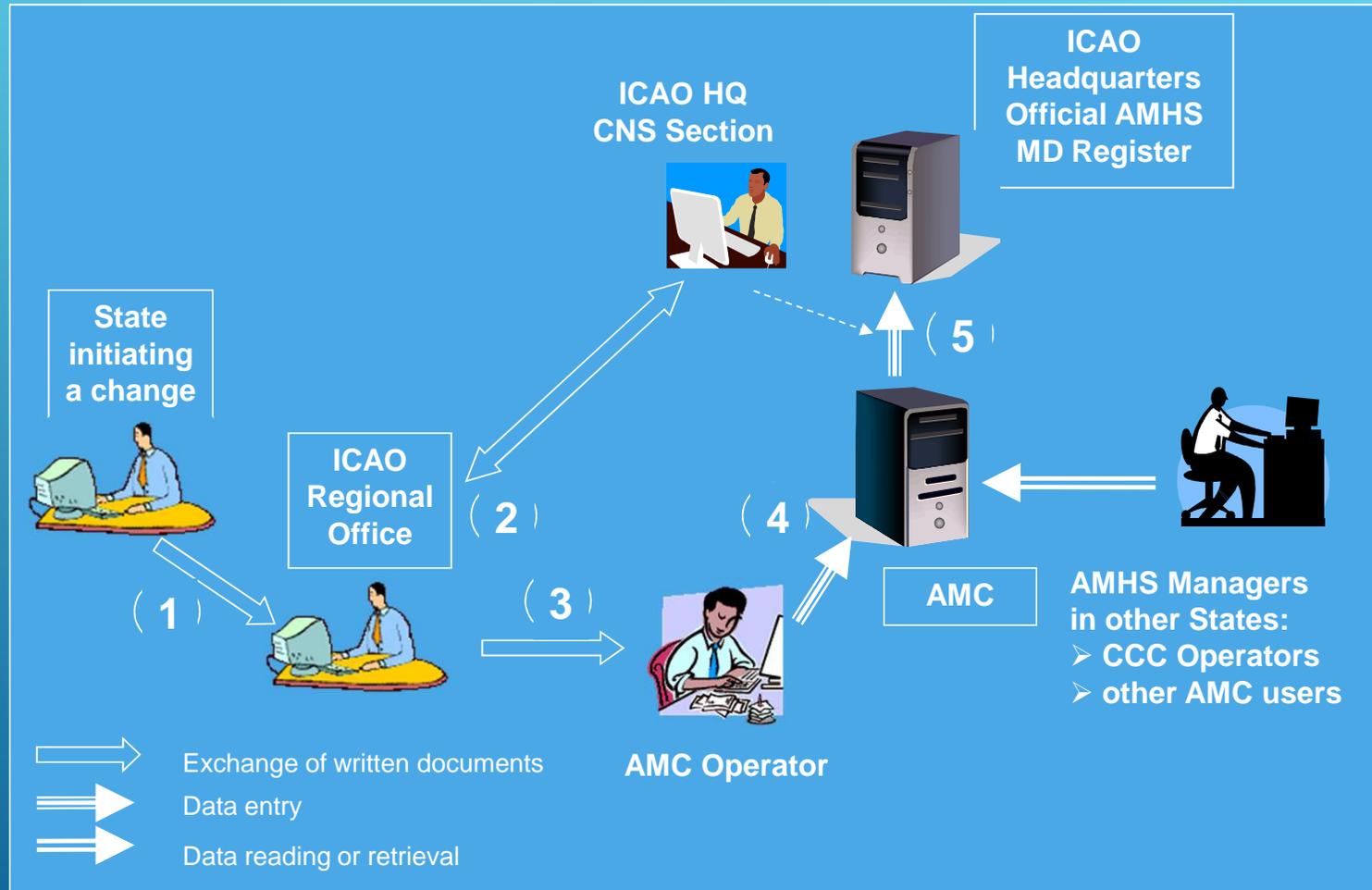
Address conversion:  
NLD=FA => C=XX/A=ICAO/P=**SOUTH-AFRICA**, addr sch=XF  
Routing table:  
C=XX/A=ICAO/P=**SOUTH-AFRICA** => next hop = LEE

GG FAJSYMYX  
180516 SAEZYMYX  
[...]  
TAF

In case of error



## 7.4.4 PROCEDURE FOR MAJOR CHANGES



## 7.4.5 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.

## 7.4.6 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.



## 7.5.1 EXAMPLE OF MINOR ADDRESS CHANGE

FOR OU1 = 'LFFF', O = 'LFFF' BECOMES O = 'LFBB'



Routing table: includes  
 C=XX/A=ICAO/P=FRANCE/  
 O=LFFF/OU1=LFFF/CN=LFFFZQZX  
 => next hop = message delivered (direct user)

Recipient-Name:  
 C=XX/A=ICAO/P=FRANCE/  
 O=LFFF/OU1=LFFF/CN=LFFFZQZX  
 Originator-Name:  
 C=XX/A=ICAO/A=SA/  
 O=SAEZ/OU1=SAEZ/ CN=SAEZZPZX  
 [...]  
 (FPL-

Routing table:  
 C=XX/A=ICAO/P=FRANCE => next hop = LFLF

Before the change

Address conversion:  
 NLD=LF => C=XX/A=ICAO/P=FRANCE, addr sch=CAAS,  
 OU1=LFFF => O=LFFF  
 Routing table:  
 C=XX/A=ICAO/P=FRANCE => next hop = LEEE

FF LFFFZQZX  
 181512 SAEZZPZX  
 [...]  
 (FPL-



## 7.5.2 EXAMPLE OF MINOR ADDRESS CHANGE

FOR OU1 = 'LFFF', O = 'LFFF' BECOMES O = 'LFBB'



Routing table: includes  
 C=XX/A=ICAO/P=FRANCE/  
 O=LFBB/OU1=LFFF/CN=LFFFZQZX  
 => next hop = message delivered (direct user)

Recipient-Name:  
 C=XX/A=ICAO/P=FRANCE/  
 O=LFBB/OU1=LFFF/CN=LFFFZQZX  
 Originator-Name:  
 C=XX/A=ICAO/A=SA/  
 O=SAEZ/OU1=SAEZ/ CN=SAEZZPZX  
 [...]  
 (FPL-

Routing table:  
 C=XX/A=ICAO/P=FRANCE => next hop = LFLF

After the change

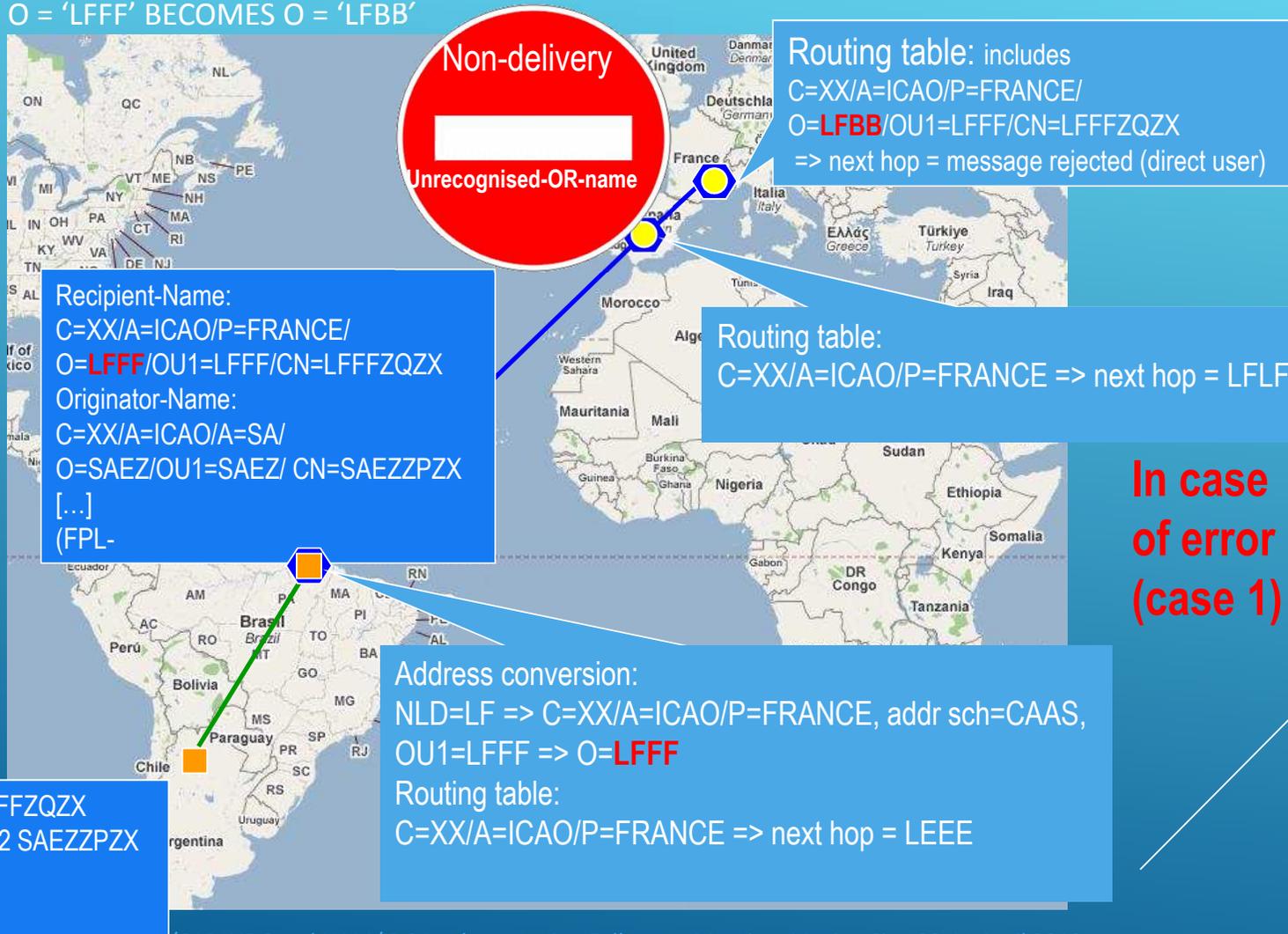
Address conversion:  
 NLD=LF => C=XX/A=ICAO/P=FRANCE, addr sch=CAAS,  
 OU1=LFFF => O=LFBB  
 Routing table:  
 C=XX/A=ICAO/P=FRANCE => next hop = LEEE

FF LFFFZQZX  
 181512 SAEZZPZX  
 [...]  
 (FPL-



## 7.5.3 EXAMPLE OF MINOR ADDRESS CHANGE

FOR OU1 = 'LFFF', O = 'LFFF' BECOMES O = 'LFBB'

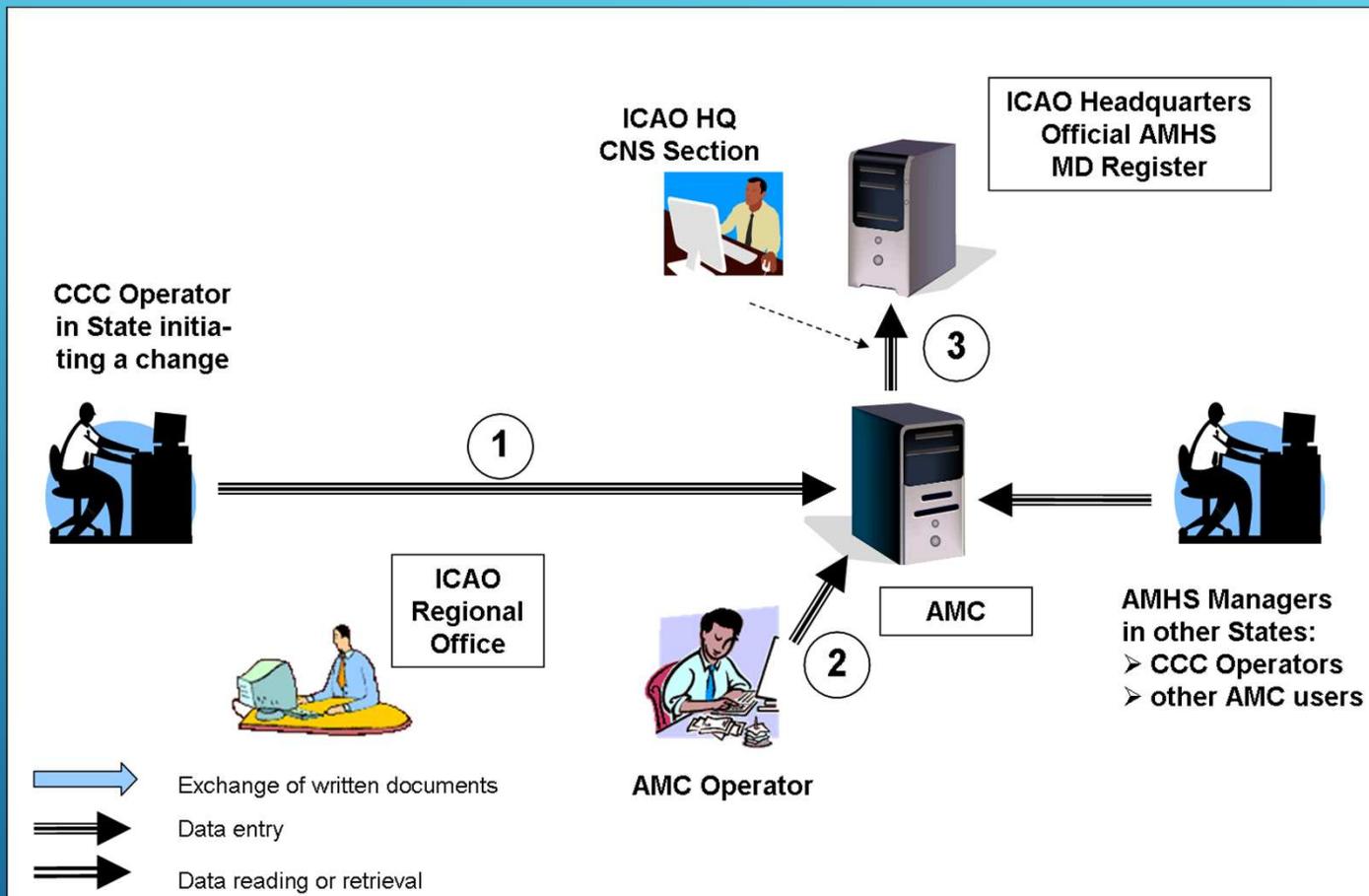


## 7.5.4 EXAMPLE OF MINOR ADDRESS CHANGE

FOR OU1 = 'LFFF', O = 'LFFF' BECOMES O = 'LFBB'



## 7.5.5 PROCEDURE FOR MINOR CHANGES



## 7.5.6 PROCEDURE FOR MINOR CHANGES

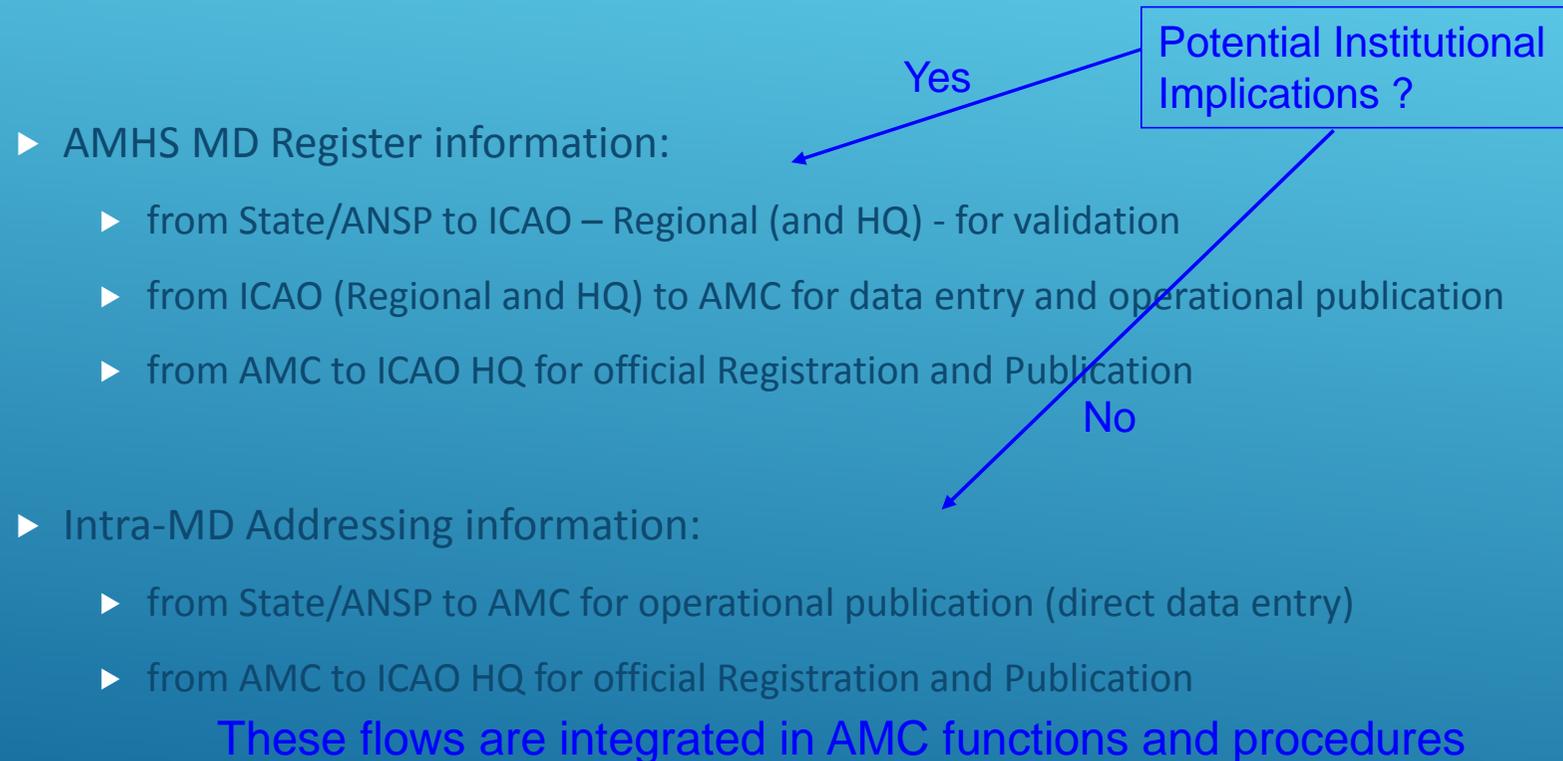
AS PROPOSED BY EANPG/49 AND ENDORSED BY ICAO HQ

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).



# 7.6.1 ADDRESS MANAGEMENT AMC IMPLEMENTATION

STRUCTURED BY DIFFERENT INFORMATION FLOWS



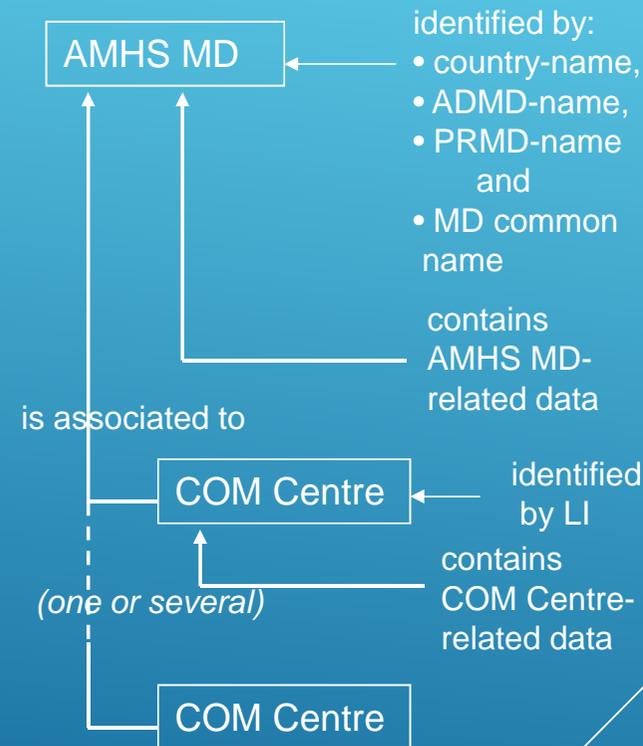
## 7.6.2 AMHS MD – STATE/ORG RELATIONSHIP

- ▶ 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**



## 7.6.3 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**



## 7.6.4 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 AMHS MD 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

## 7.6.6 AMHS MD REGISTER

### Demonstration

- Menu: Address Management
  - EUR/NAT
  - Spain



## 7.7.1 INTRA-MD ADDRESSING: TWO PARTS

- ▶ CAAS Table:
  - ▶ contains “O-OU1” relationship
  - ▶ enabled depending on addressing scheme selection
- ▶ AMHS MDs having selected XF do not need to enter data in CAAS Table
  
- ▶ User Address Table:
  - ▶ contains full user O/R addresses
  - ▶ Used for identification of users from Third-party Providers (e.g. SITA), which have no specific Nationality letters assigned in the AMHS MD Register

## 7.7.2 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 and User Address Tables from AMC
- ▶ the AMC Operator transfers to Operational area
- ▶ CCC and Ext COM Operators set the new data to become live

## 7.7.3 INTRA-MD ADDRESSING DATA FIELDS

The screenshot displays the 'Address Management' interface, specifically the 'Intra MD Addressing' section. The main form includes fields for Region (NAM/CAR), COM Centre (MUHA), MD Common Name (MU), Country-Name (XX), ADMD-Name (ICAO), PRMD-Name (MU), and Addressing Scheme (CAAS, XF, Other). A CAAS Table is visible below the main form, showing a single entry for MU. A popup window titled 'Address Management - Intra MD Addressing - Caas ...' is open, showing a 'CAAS Entry' form with fields for Country-Name (XX), ADMD-Name (ICAO), PRMD-Name (MU), Organization, and Organizational Unit. The popup also includes buttons for MODIFY, DELETE, SUBMIT, CANCEL, and CLOSE.

**Address Management** **Background Area** [HELP]

**Intra MD Addressing**

**Region** NAM/CAR **COM Centre** MUHA **MD Common Name** MU **Addressing Scheme**  CAAS  XF  Other **HOME**

**Country-Name** XX **ADMD-Name** ICAO **PRMD-Name** MU **SEARCH**

**CAAS Table**

Org. (O)	Org. Unit (OU)	7910 Status	Offic. Register Status
MU	MU**	Official	Registered

**Address Management** **Background Area** [HELP]

**Intra MD Addressing**

CAAS Entry

**Country-Name** XX **ADMD-Name** ICAO **PRMD-Name** MU

**Organization** **Organizational Unit**

**MODIFY** **DELETE** **SUBMIT** **CANCEL** **CLOSE**

**CREATE CAAS ENTRY** **IMPORT GLOBAL CAAS TA**

**CREATE USER ADDRESS** **IMPORT GLOBAL USER ADD**

## 7.7.3 INTRA-MD ADDRESSING DATA FIELDS

**Address Management** Background Area [HELP]

**Intra MD Addressing**

**Region**: SAM  
**COM Centre**: SKBO  
**MD Common Name**: COLOMBIA  
**Addressing Scheme**:  CAAS,  XF,  Other

**Country-Name**: XX  
**ADMD-Name**: ICAO  
**PRMD-Name**: COLOMBIA

Buttons: HOME, SEARCH

---

CAAS Table

User Address Table

User Short Name	AFTN Addr Indicator	O/R Address
PTYASCM	SKBOCMPO	/C=XX /A=ICAO /P=SITA /O=AFTN /OU1=SKBOCMPO

Buttons: EXPORT CAAS TABLES, REPORT

---

**Address Management - Step 1** Background Area [HELP]

**Intra MD Addressing**

**AFTN Address Indicator**:  
  
**PRMD Name**: SITA

Buttons: NEXT STEP, CLOSE

---

Buttons: CREATE USER ADDRESS, IMPORT GLOBAL USER ADDRESSES, EXPORT USER ADDRESSES

## 7.7.4 INTRA-MD ADDRESSING

### Demonstration

- Menu: Address Management
  - Intra-MD Addressing
  - CAAS Table
  - User Address Table



## 7.7.5 INTRA-MD ADDRESSING EXPORT / IMPORT FILE FORMAT

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

- one identification line (is present, but not taken for IMPORT)
- one header line

```
1.1;AmhsCaasTables;OPER194;28.02.2019 11:00:00;Operational;;06.03.2019 13:03:39
country-name;ADMD-name;PRMD-name;organization-name;organizational-unit-name
XX;ICAO;ANSA BH;LQBK;LQBK
XX;ICAO;ANSA BH;LQQQ;LQ**
XX;ICAO;AUSTRALIA;YBBN;Y***
XX;ICAO;AUSTRIA;LOVV;LO**
XX;ICAO;BANGLADESH;VGHS;VG**
XX;ICAO;BELGIUM;EBBR;EB**
XX;ICAO;BHUTAN;VQPR;VQ**
XX;ICAO;BOLIVIA;SLLP;SL**
XX;ICAO;CAMBODIA;VDPP;VD**
XX;ICAO;CHINA;CS;ZG**
XX;ICAO;CHINA;CS;ZH**
XX;ICAO;CHINA;CS;ZJ**
XX;ICAO;CHINA;EC;ZS**
XX;ICAO;CHINA;HQ;ZBBB
XX;ICAO;CHINA;NC;ZB**
XX;ICAO;CHINA;NE;ZY**
XX;ICAO;CHINA;NW;ZL**
```

Minimum: one line  
for Default value  
per AMHS MD

## 7.7.6 AMHS ADDRESSING EXPORT / IMPORT

### Demonstration

- Menu: Address Management
  - Export AMHS MD Register
  - Export CAAS Table
  - Export User Address Table



## 7.7.7 USER CAPABILITIES

- ▶ **AMHS User Capabilities management** allows to manage and distribute information about the functional capabilities of an AMHS user. **This function will be particularly useful when the AMHS expands to new functions and/or new message types (e.g. BUFR, security, extended service, etc.), to determine the capabilities of a message recipient before sending the message;**
- ▶ The considered AMHS User Capabilities information comprises the direct as well as the indirect AMHS users and includes:
  - ▶ the AMHS user OR-address and AF-address, as a reference and
  - ▶ the following Capability Classes:
    - ▶ Body-parts (which includes the former capability elements as defined in ICAO Document 9880 like ‘maximum deliverable content length’ and ‘encoded information types – EITS’),
    - ▶ Address type,
    - ▶ IPM heading extensions,
    - ▶ Directory,
    - ▶ AMHS Security.
- ▶ The composition of the resulting profile name is detailed in Appendix D, Section D.5 (ATS Messaging Management Manual).

## 7.7.8 USER CAPABILITIES

### Demonstration

- Menu: User Capabilities Management
  - forced setting e.g. for SITA Users
  - For other User addresses



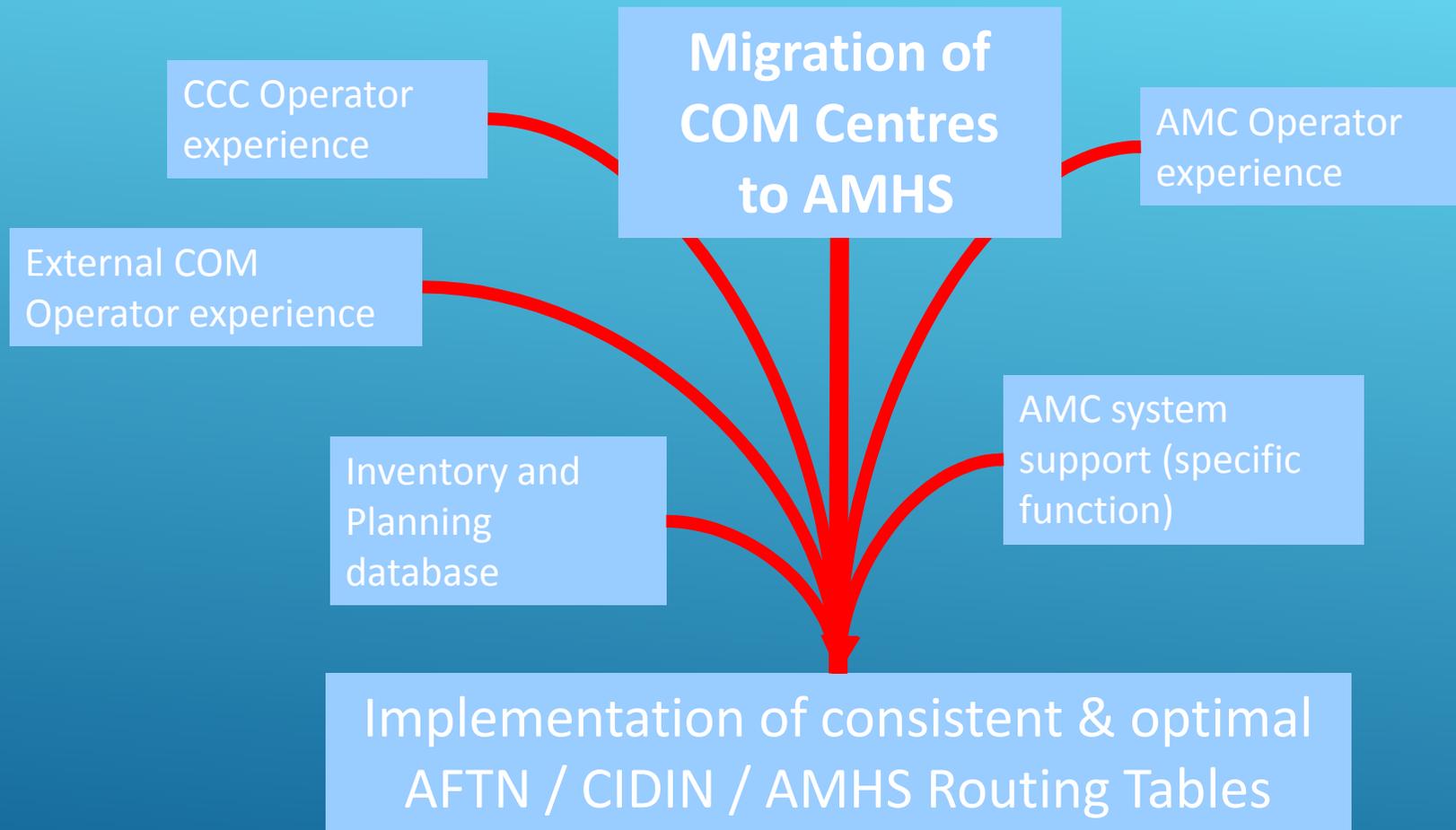
## 8. ROUTING MANAGEMENT

- Routing Management
- AFTN/(CIDIN)/AMHS
- Acknowledgement
- Import/Export of Routing Tables

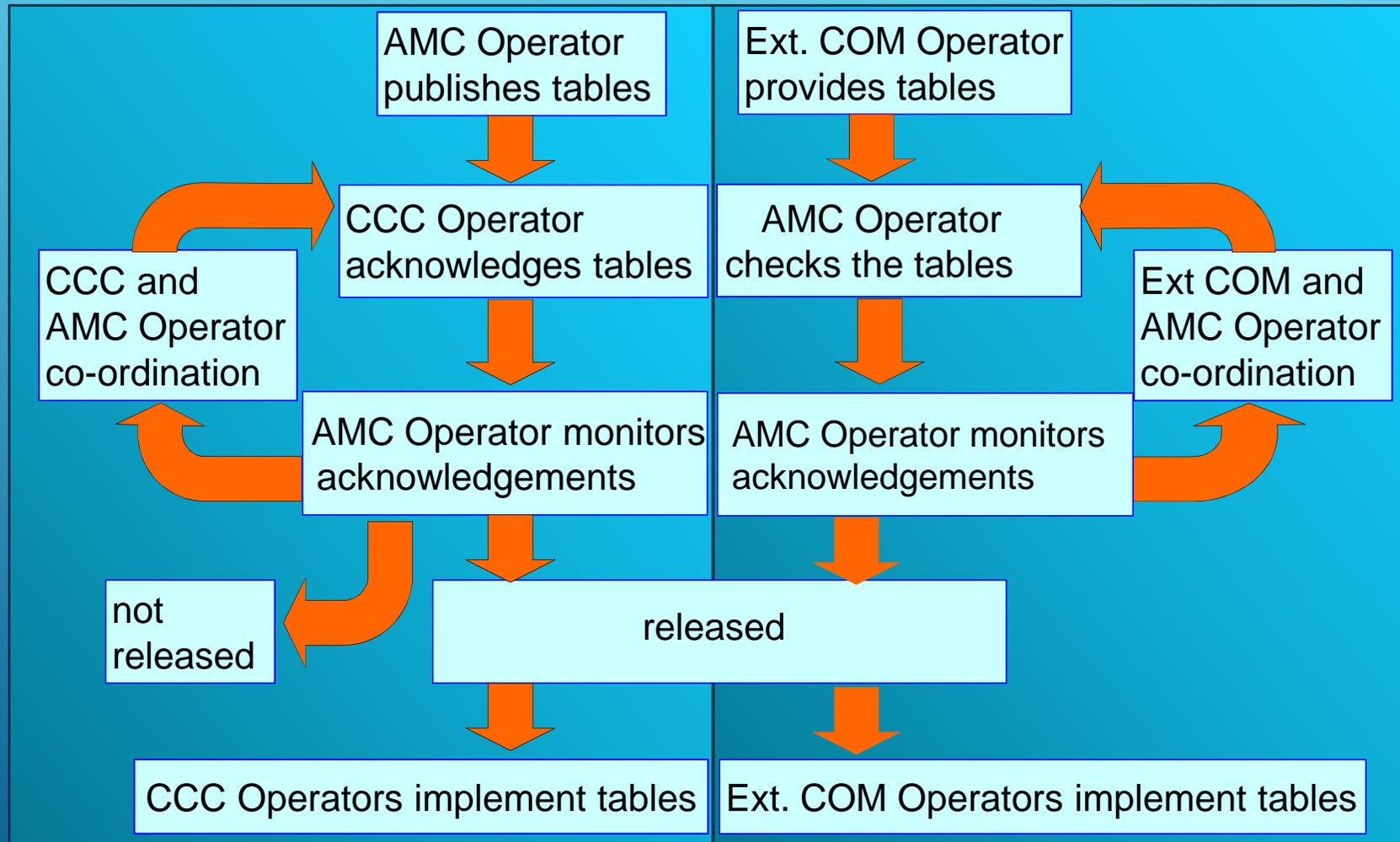
## 8.1.1 ROUTING MANAGEMENT: OBJECTIVE

- ▶ Need to integrate AMHS routing with AFTN (and CIDIN) routing
- ▶ Need to integrate exceptional AFTN routing for User Addresses
- ▶ Provide **consistent** routing for all PRMDs on Global level
- ▶ Support migration of AFTN traffic flows to AMHS
  
- ▶ Provide optimal routing tables on Global level

## 8.1.2 ROUTING MANAGEMENT PROCESS



## 8.1.3 ROUTING UPDATE INTERACTIONS



## 8.1.4 ROUTING UPDATE RESULTS

- “Consistent” means:
  - correctly manage routing from AFTN to AMHS via MTCU, and vice-versa
  - existence of Routing Paths for all Routing Indicators (Nationality Letters)
  - timely support of phased integration of flows,
- “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.

## 8.2.1 ROUTING MANAGEMENT: INTEGRATED AFTN / CIDIN / AMHS ROUTING

**ATS Messaging Management**

**Routing Directory** Operational Area [HELP]

**AFTN Routing Table** **CIDIN Routing Table** **AMHS Routing Table**

Region or Country: AFI [AFI] COM Centre: FMMM Location: ANTANANARIVO (FIC,ACC) Country: Madagascar AFTN Matrix: OPER.195 [SEARCH]

MD Common Name: FM Country-Name: XX ADMD-Name: ICAO PRMD-Name: FM [EXTENDED]

Destination	Existing Main	MTCU	Existing Altn	MTCU	Planned Main	MTCU	Planned Altn	MTCU
A	FAOR	[ ]	(FIMP)	[X]		[ ]		[ ]
B	FAOR	[ ]		[X]		[ ]		[ ]
C	FAOR	[ ]	(FIMP)	[ ]		[ ]		[ ]
D*		[X]		[ ]		[ ]		[ ]
DA	FAOR	[ ]		[ ]		[ ]		[ ]
DNR		[X]		[ ]		[ ]		[ ]
DNL		[X]		[ ]		[ ]		[ ]
DT	FAOR	[ ]		[ ]		[ ]		[ ]
E	FAOR	[ ]		[X]		[ ]		[ ]
FA	FAOR	[ ]	(FIMP)	[ ]		[ ]		[ ]
FB	FAOR	[ ]	(FIMP)	[ ]		[ ]		[ ]
FC		[X]	(FAOR)	[ ]		[ ]		[ ]
FD	FAOR	[ ]	(FIMP)	[ ]		[ ]		[ ]
FE		[X]	(FAOR)	[ ]		[ ]		[ ]
FG		[X]	(FAOR)	[ ]		[ ]		[ ]
FH		[X]		[ ]		[ ]		[ ]
FT	BTMP	[ ]	(FIMP)	[ ]		[ ]		[ ]

[REPORT] [EXPORT]

3 Routing Tables

Inter-related via  
MTCU columns  
for routing

## 8.2.2 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: EBBD, 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) (minimum about 25 entries)

## 8.2.3 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: currently about 260 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

## 8.2.4 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)

## 8.2.5 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

## 8.2.6 AFTN ROUTING TABLE

### Demonstration

- Menu: Routing Directory  
→ AFTN Routing Table



## 8.2.7 CIDIN ROUTING TABLE

### Demonstration

- Menu: Routing Directory  
→ CIDIN Routing Table



## 8.2.8 AMHS ROUTING TABLE

### Demonstration

- Menu: Routing Directory  
→ AMHS Routing Table



## 8.3.1 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

- Menu: Routing Directory (Pre-Op Area)  
→ Acknowledgement



## 8.4.1 EXPORT / IMPORT OF ROUTING TABLES

- ▶ All routing tables can be exported from all data areas
- ▶ The AMC Operator and External COM 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 (not used for import)
  - ▶ One header line
  - ▶ Existing route record lines
  - ▶ Planned route record lines

## 8.4.2 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, External COM Operator):
  - ▶ 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.

# 8.4.3 EXAMPLE OF EXPORTED ROUTING TABLE

```

1.0:AMHSRoutingTable;OPER.74;07.05.2009 10:23:58;OPERATIONAL;;25.05.2009 11:00:00
COM Centre;Matrix Version;Destination C;Destination ADMD;Destination PRMD;Destination O;Current Or Planned;Main;Main
MTCU;Alternate;Alternate MTCU;Coordination For Alternate;Comments;Event Type;Planned Date;Description
EDDD;AMHS74.23;XX;ICAO;AENA;;C;LEEE;N;;Y;N;
EDDD;AMHS74.23;XX;ICAO;FA;;C;LEEE;N;;Y;N;
EDDD;AMHS74.23;XX;ICAO;FB;;C;LEEE;N;;Y;N;
EDDD;AMHS74.23;XX;ICAO;FC;;C;LEEE;N;;Y;N;
EDDD;AMHS74.23;XX;ICAO;FD;;C;LEEE;N;;Y;N;
EDDD;AMHS74.23;XX;ICAO;FE;;C;LEEE;N;;Y;N;
EDDD;AMHS74.23;XX;ICAO;FG;;C;LEEE;N;;Y;N;
EDDD;AMHS74.23;XX;ICAO;FI;;C;LEEE;N;;Y;N;
EDDD;AMHS74.23;XX;ICAO;FK;;C;LEEE;N;;Y;N;
EDDD;AMHS74.23;XX;ICAO;FL;;C;LEEE;N;;Y;N;
EDDD;AMHS74.23;XX;ICAO;FM;;C;LEEE;N;;Y;N;
    
```

Identification line  
Header line

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	1.0	AMHSRoutin	OPER.74	07.05.2009 10:23:58	OPERATIONAL		25.05.2009 11:00:00								
2	COM Centre	Matrix Version	Destination	Destination	Destination	Destination	Current Or P	Main	Main MTCU	Alternate	Alternate M	Coordinator	Comments	Event Type	Planned Date
3	EDDD	AMHS74.23	XX	ICAO	AENA		C	LEEE	N		Y	N			
4	EDDD	AMHS74.23	XX	ICAO	FA		C	LEEE	N		Y	N			
5	EDDD	AMHS74.23	XX	ICAO	FB		C	LEEE	N		Y	N			
6	EDDD	AMHS74.23	XX	ICAO	FC		C	LEEE	N		Y	N			
7	EDDD	AMHS74.23	XX	ICAO	FD		C	LEEE	N		Y	N			
8	EDDD	AMHS74.23	XX	ICAO	FE		C	LEEE	N		Y	N			
9	EDDD	AMHS74.23	XX	ICAO	FG		C	LEEE	N		Y	N			
10	EDDD	AMHS74.23	XX	ICAO	FI		C	LEEE	N		Y	N			
11	EDDD	AMHS74.23	XX	ICAO	FK		C	LEEE	N		Y	N			
12	EDDD	AMHS74.23	XX	ICAO	FL		C	LEEE	N		Y	N			
13	EDDD	AMHS74.23	XX	ICAO	FM		C	LEEE	N		Y	N			
14	EDDD	AMHS74.23	XX	ICAO	FME		C	LEEE	N		Y	N			
15	EDDD	AMHS74.23	XX	ICAO	FO		C	LEEE	N		Y	N			
16	EDDD	AMHS74.23	XX	ICAO	FS		C	LEEE	N		Y	N			
17	EDDD	AMHS74.23	XX	ICAO	FT		C	LEEE	N		Y	N			
18	EDDD	AMHS74.23	XX	ICAO	FV		C	LEEE	N		Y	N			
19	EDDD	AMHS74.23	XX	ICAO	FX		C	LEEE	N		Y	N			
20	EDDD	AMHS74.23	XX	ICAO	FY		C	LEEE	N		Y	N			
21	EDDD	AMHS74.23	XX	ICAO	FZ		C	LEEE	N		Y	N			
22	EDDD	AMHS74.23	XX	ICAO	GA		C	LEEE	N		Y	N			
23	EDDD	AMHS74.23	XX	ICAO	GB		C	LEEE	N		Y	N			
24	EDDD	AMHS74.23	XX	ICAO	GF		C	LEEE	N		Y	N			
25	EDDD	AMHS74.23	XX	ICAO	GG		C	LEEE	N		Y	N			

Identification line  
Header line

Demonstration



## 9. MISCELLANEOUS FUNCTIONS

- Overview
- Static Report
- COM Charts



## 9.1 MISCELLANEOUS FUNCTIONS - OVERVIEW

- ▶ Support Functions
- ▶ View Bulletin Board
- ▶ View AIRAC Cycle ✓
- ▶ AMC Operator Details [Demonstration](#)
- ▶ Documentation Part of AMRD [Demonstration](#)
- ▶ Path Function [Demonstration](#)
- ▶ Convert AFTN Address
- ▶ AFTN Country Code and AMHS PRMD
- ▶ View ANP Locations [Demonstration](#)
- ▶ Regions ✓
- ▶ Send E-Mail to User Groups
- ▶ Archived Data [Demonstration](#)



## 9.2 STATIC REPORT (GENERATED PER REGION)

- ▶ 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

## 9.3 COM CHARTS

### Demonstration

- Menu: COM Charts  
→ EUR/NAT  
Maps



## 10. GENERAL AMC OPERATOR FUNCTIONS

- Functions in Support of Procedures
- Functions for User and Context Management

## 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
- ▶ Transfer Data to EDS
  - ▶ To Pre-Operational
- ▶ Transfer Data to EDS
  - ▶ To Operational

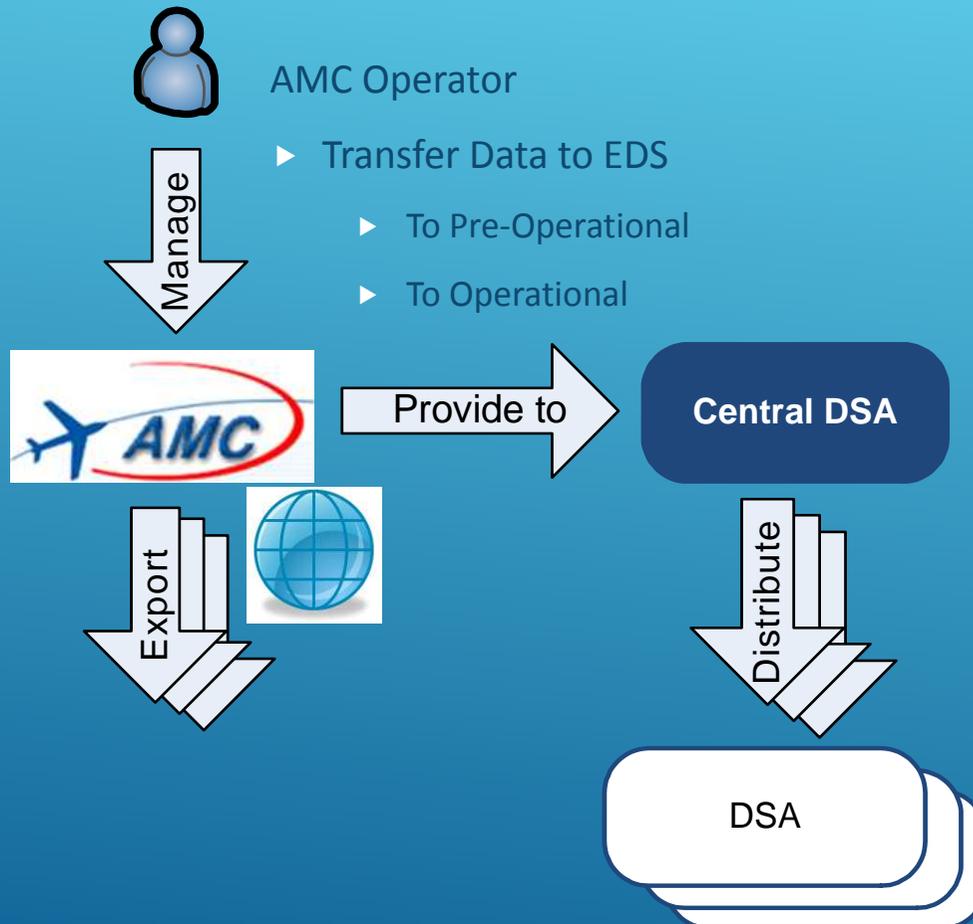
## 10.2 FUNCTIONS FOR USER AND CONTEXT MANAGEMENT

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

# 11. RELATION BETWEEN AMC AND EDS (INITIAL STEP)



## 11.1 RELATION BETWEEN AMC AND EDS (INITIAL STEP)



EDS operational in:

- ▶ Austria,
- ▶ Cyprus,
- ▶ Germany,
- ▶ Portugal,
- ▶ Romania,
- ▶ Switzerland and
- ▶ Taiwan

## 12. FINAL

- Summary
- Questions
- Feedback

## 12.1 SUMMARY

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



## 12.2 QUESTIONS AND ANSWERS

Any question ?  
Don't hesitate to ask.



## 12.3 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](mailto:yuksel.eyuboglu@eurocontrol.int)), and
- to the AMC Operator



Thank you for your attention

End

