INTERNATIONAL CIVIL AVIATION ORGANIZATION
WESTERN AND CENTRAL AFRICA OFFICE

Second Meeting of the AFI Message Handling System Implementation Task Force
(AFI/AMHS/I/TF/2)
(Dakar, Senegal, 30-31 May 2013)

<u>**Agenda Item 3:**</u>**Planning and implementation of AMHS-Planning and Implementation Activities**

ATS Messaging Management Centre (AMC)

(Presented by the secretariat)

SUMMARY
The purpose of this paper is to give an overview of the ATS Messaging Management Centre (AMC)
Action by the meeting is at paragraph 3.
References :   Reports on APIRG/17 Meeting   *Note: References can be downloaded from www.icao.int/wacaf.*
Related ICAO Strategic Objective **A**: *Safety* and C:*Environmental Protection and Sustainable* Development of Air Transport.

1. Introduction

The **ATS Messaging Management Manual (EUR Doc 021)** describes the framework in which the off-line network management services of the **ATS Messaging Management Centre (AMC)** are provided to States/ANSPs in the ICAO EUR Region, and, in a more limited manner, to States/ANSPs in other Regions, under control by the **Aeronautical Fixed Services Group (AFSG)**, a subgroup of **EANPG**.

ATS Messaging refers to the integrated, heterogeneous messaging environment made of AFTN, CIDIN and AMHS.

Two categories of Off-Line Management Functions are defined, Implementation Support Functions primarily for States in the process of implementing AMHS, and Operational Functions in support of States with AFTN, CIDIN and/or AMHS in operational service. The ATS Messaging Management Centre procedures associated with the performance of these functions by Co-operating COM Centres (CCCs) are described in the **ATS Messaging Management Manual**.

The goal of the ATS Messaging Management Centre with regard to AMHS is twofold:

- AMC facilitates the transition from CIDIN/AFTN to AMHS;

- AMC provides new tools in support of AMHS operation, address management and user capabilities management, that will serve during transition and in the target AMHS network.

When States in the ICAO EUR Region implement AMHS, transition is complex to manage and proper coordination between COM Centres is an essential requirement to ensure the overall ATS Messaging quality of service. It is therefore recommended that every State implementing AMHS should participate in AMC activities.

2. Discussion

2.1 Background

To facilitate the operation of CIDIN on a regionally coordinated basis, a CIDIN Management Manual was developed as part of the ICAO EUR-AFS and Aeronautical Fixed Service Group (AFSG) working groups, under the aegis of the European Air Navigation Planning Group (EANPG). EUROCONTROL was subsequently invited by the EANPG to undertake implementation of centralized CIDIN Off-line Management Functions on the basis of the CIDIN Management Manual. This was performed between 2000 and 2001, and the result of this work was a management system called "CIDIN Management Centre" (CMC). The CMC service has been provided by EUROCONTROL under the auspices of the ICAO EUR/NAT Office from 2001 until beginning of 2007.

As a follow up to the EANPG decision, EUROCONTROL undertook in September 2004 and completed in May 2005 the development of the ATS Messaging Management Manual. This Manual introduces the concept of ATS Messaging Management, which is the Management of the integrated AFTN/CIDIN/AMHS messaging environment. Following the endorsement of the ATS Messaging Management Manual by the AFSG/8 meeting in April 2005, EUROCONTROL started the implementation of the ATS Messaging Management Centre (AMC) in October 2005 and completed the work in November 2006. The operation of AMC started in January 2007.

In parallel with the start of AMC operational service, coordination was started with other ICAO Regions regarding the organization and implementation of AMHS Management at a global level. The urgency of starting such global management was recognised. The AMC was identified by ANSPs in the EUR/NAT and ASIA/PAC Regions, as well as by the U.S. FAA, as the only system capable of meeting the short term requirements created by the AMHS deployment process which is currently underway worldwide.

2.2 AMC Functions

The ATS Messaging Management Manual describes the organizational framework in which ATS Messaging Management is implemented in the EUR/NAT Regions. The Manual specifies AMHS off-line Management Implementation Support Functions (AMF-I) and AMHS off-line Management Operations Functions (AMF-O) that are implemented in the ATS Messaging Management Centre.

AMF-I functions and AMF-O functions are intended for two different user categories: the goal of AMF-I functions is mainly to provide support to States that are in the process of implementing AMHS, and do not yet have AMHS in operational use. AMF-O functions are primarily directed to Co-operating COM Centres (CCCs), most of them being already involved in CIDIN Management, that have AMHS in operational use, in order to help managing the Regional transition from AFTN/CIDIN to AMHS.

The key functions of the AMC are address management and routing management. Address management is of utmost importance for efficient AMHS operation. It enables to coordinate the modification and distribution of AMHS addresses, as well as the synchronization of address changes in the AMHS network, in the ATS Message User Agents and AFTN/AMHS Gateways. With routing management, AFTN, CIDIN and AMHS routing tables are defined consistently for the seamless operation of the network, and they are distributed to all COM Centres in the Region.

The network inventory, network planning, routing management and support functions existed for AFTN and CIDIN network technologies as part of CIDIN Management. These functions were complemented with AMHS-related information, to become part of the AMC so as to equally cover AMHS, CIDIN and AFTN. Other functions were developed to provide comprehensive AMHS Management, such as user capabilities management or statistics.

The AMF-O functions are performed in accordance with operational procedures which enable changes in the COM Centres to be coordinated and synchronized, taking place on AIRAC dates. The procedures are based on the organization of each AIRAC cycle in five AMC operational phases.

The AMC has emerged as a natural focal point for distribution of information about matters not only related to network operation, but also to network implementation, particularly with regard to AMHS which is beginning to be deployed. The AMC therefore also includes AMHS off-line management implementation support functions, to provide States that are in the process of implementing AMHS with a set of guidance and implementation co-ordination functions.
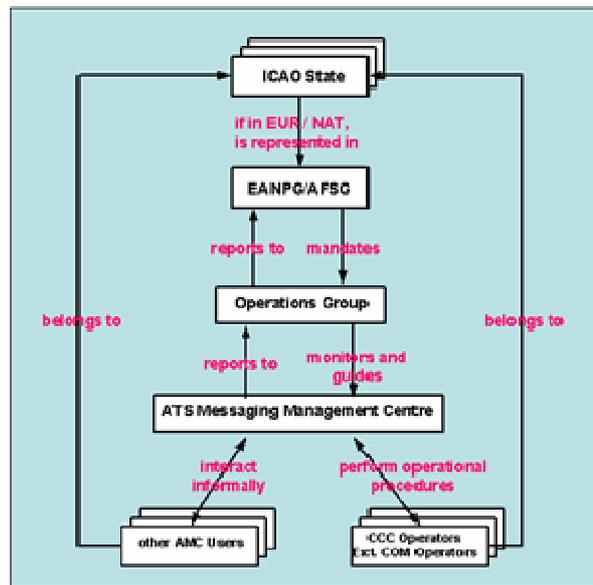
2.3 The AMC coverage

Currently 41 States in the EUR/NAT Region have designated CCC Operators and participate in ATS Messaging Management using the AMC.

Use of AMC by External COM Centre Operators in other ICAO Regions has also started and is expected to grow significantly during 2008 and 2009.

2.4 AMC Organization

The AMC operates under the aegis of the ICAO EANPG, in accordance with the following chart. Regular monitoring of AMC activities is performed by the Operations Group (OG), which reports yearly to the AFSG.
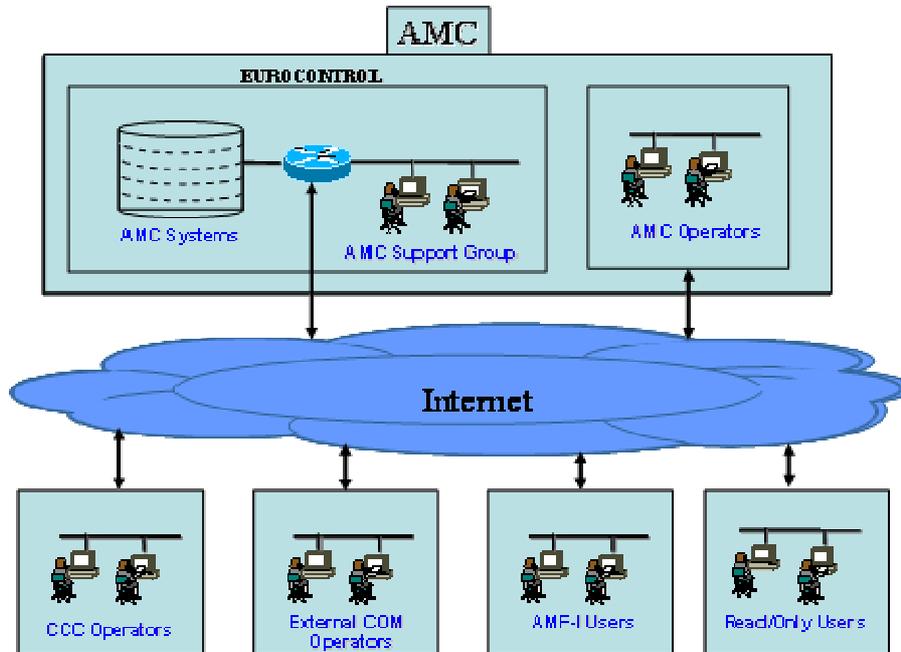

2.5 AMC Systems and AMC Participants

The AMC where management functions are carried out is made up of two components:

- Systems for maintaining the central repository of network. They are called "AMC Systems" and they are under the responsibility of EUROCONTROL.

- ATS Messaging Management operating position, manned by the "AMC Operators."

AMC users are classified into four user categories depending upon their roles and locations.

AMC Operators and all categories of AMC users access the AMC using connections over the Internet which are secured by access control procedures.

2.6 AMC and European Aeronautical Fixed Service (AFS)

Networks organized under the auspices of ICAO are classified into the Aeronautical Fixed and the Aeronautical Mobile services. The Aeronautical Fixed Service is provided by voice and data networks and circuits, including:

- Aeronautical Fixed Telecommunication Network (AFTN);

- Common ICAO Data Interchange Network (CIDIN);

- Air Traffic Services (ATS) Message Handling System (AMHS);

- Dedicated networks of ATS providers;

- OPMET circuits and centres;

- ATS speech networks and circuits;

- ATS computer-to-computer data networks and circuits; and

- Satellite Distribution System for information relating to air navigation (SADIS).

AFTN, CIDIN, and AMHS are the principal among the above-mentioned items.

For the provision of Air Traffic Services, extensive world-wide data interchange in different functional areas among human operators and computer applications is necessary. Networks are planned, implemented, financed and operated on a co-operative basis by ICAO States who need to co-ordinate intensively in order to provide the required services.

3. Action by the meeting:

3.1 The meeting is invited to:
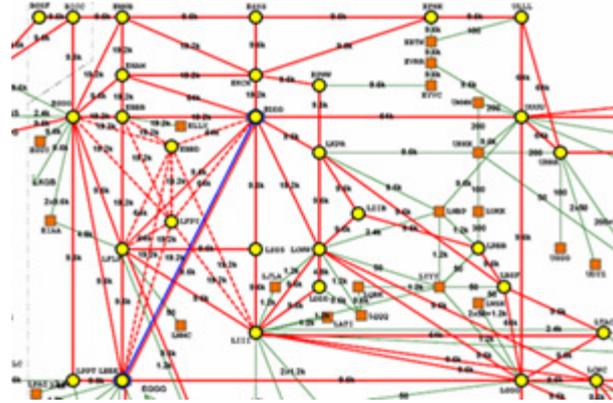
a) Take note of the above information

b) Encourage Administrations/Organizations to register in the AMC

c) Participate in the regional seminars and workshops on AMC organized under the auspice of the ICAO Regional Offices.

APPENDIX

Overview on AFTN CIDIN and AMHS concepts

Aeronautical Fixed Telecommunication Network (AFTN)

The major part of data message interchange in the AFS is performed by the Aeronautical Fixed Telecommunications Network, AFTN. This is a message handling network running according to ICAO Standards documented in Annex 10 to the ICAO Convention. With a history dating back to the 1950's, it was in fact the world's first large-scale message handling system. It was conceived according to the special needs of its users but also restricted by the technology available then. Today several hundred nodes located in virtually every country of the world exchange messages on links of different types and speeds using "store-and-forward" procedures.

The European part of the AFTN forms an important component of this world-wide network. It handles a large volume of message traffic originating and/or terminating in Europe but also considerable transit traffic. There is one or more AFTN nodes in every European country.

Common ICAO Data Interchange Network (CIDIN)

The importance of data communications in the aeronautical environment and its reliance on the AFTN is major and continues to increase. Unfortunately the technology on which the AFTN is based (its speeds, capacity, protocols) has, for many years, been completely outdated. In order to create a technological upgrade, the Common ICAO Data Interchange Network, CIDIN, was conceived in the 1980's to replace the core of the AFTN. While the services provided by the AFTN and its procedures remain in place as a user application of the CIDIN, and on the periphery of the network for compatibility reasons, the data transport within the network using CIDIN takes advantage of techniques with higher capacity and better quality of service, such as X.25 and ISO OSI layering for CIDIN protocols.

In Europe most nodes which are part of the AFTN, approximately 40 in number, also have CIDIN capability. They were generally deployed in the 1990's. The CIDIN can therefore be considered to be a data transport network which supports the AFTN.

Air Traffic Services (ATS) Message Handling System (AMHS)

Whilst the goal of CIDIN was to upgrade the outdated AFTN, CIDIN technology is now itself nearing obsolescence: X.25 equipment and protocols upon which CIDIN is based will soon be phased out, and new messaging requirements are emerging, that cannot be met by these networks. Both AFTN and CIDIN need to be replaced by more modern technology. To meet this requirement, the ICAO has specified the ATS Message Handling System (AMHS). The AMHS is an integral part of the CNS/ATM concept, and it is associated to the Aeronautical Telecommunication Network (ATN) environment. The AMHS is defined by the ICAO ATN SARPs and Manuals as the implementation of proven MHS/X.400 communication standards for the purpose of exchanging ATS messages over the ATN Internet in a store-and-forward mode.

The deployment of the AMHS has been started by European Air Navigation Service Providers. The European AMHS makes use of a TCP/IP network infrastructure, in line with the recent evolution of the ATN concept for ground communications.

In addition to being the replacement for AFTN/CIDIN technology, the AMHS also provides increased functionality, in support of more ATS message exchanges than those traditionally conveyed by the AFTN and/or CIDIN. This includes, for example, the capability to exchange binary data messages or to secure message exchanges by authentication mechanisms. The old AFTN limit of a 1,800 character maximum message length will of course be removed also.

Co-existence between ATS messaging technologies

The AFTN, CIDIN and AMHS together form an integrated, heterogeneous data messaging environment, which is collectively referred to as "ATS Messaging". Because of the distributed nature of these networks, and of the co-operative way of operating them, evolution has to be progressive from one technology to the other. A "Big Bang" change is not applicable in the AFS. During transition from AFTN/CIDIN to AMHS, messages will be exchanged seamlessly between users of all networks. The end-to-end communication path between a source and a destination may involve any combination of path segments within the three networks.

During transition to AMHS, the potential complexity of this integrated environment creates a requirement for even closer co-ordination between operators. The ATS Messaging Management Centre (AMC) provides centralized off-line management functions in support of such co-ordination.