AMHS Implementation Overview

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III Workshop/Meeting on the Follow-up to the Implementation of the ATS Message Handling System (AMHS) in the NAM/CAR Regions
Santo Domingo, Dominican Republic, 24 to 27 September 2013
III AMHS Workshop Objectives

a) follow-up the Regional AMHS implementation Plan;
b) exchange information, experiences and lessons learned from the Dominican Republic AMHS interconnection and different AMHS preparatory actions made in the NAM/CAR Regions;
c) provide guidance on the AMHS implementation within the global operational concept framework of the ICAO, the Aviation System Block Upgrades (ASBU) and the regional agreements; and;
d) discuss AMHS implementation limitations and concerns to decide actions and agreements to streamline the implementations.
The concepts to implement the safety and sustainability/efficiency strategic objectives (Global ATM Operational Concept)

- Global Air Navigation Plan
- Global Aviation Safety Plan
- Global Performance ASBU approach
- Global Safety Initiatives (GSI)
- Global and regional work plans and action plans (RPBANIP)
Global ATM Operational Concept

- The Global Air Traffic Management System Operational Concept;
  - describes how an integrated global air navigation system should operate
  - describes what is envisaged on the basis of services
  - describes how the services form an integrated system
  - utilizes an information rich environment, that solves most problems strategically, through a collaborative process
  - provides States and industry with clearer objectives for the design and implementation of ATM and supporting CNS systems

- ATM user expectations are drivers for change, requiring:
  - Safety case
  - Business case

Technical Enablers
Operational Enablers procedures
Socio-economic Enablers
ICAO Global Implementation Overview

- **Aviation System Block Upgrade (ASBU) Methodology (2012)**
- **Global ATM system (2006)**
- **CNS/ATM systems (1994)**
- **Ground based Air Navigation systems (Before 1992)**

**EVOLUTION TO A PERFORMANCE BASED GLOBAL AIR NAVIGATION SYSTEMS WITH ASBU METHODOLOGY**
To evolve the aeronautical mobile and fixed communication infrastructure, supporting both voice and data communications, accommodating new functions as well as providing the adequate capacity and quality of service to support ATM requirements.

Common objective: to seek the most efficient communication network service providing the desired services with the required performance and interoperability required for aviation safety levels at minimum cost.
ATN/ AMHS relevant SARPs

ATN Ground-ground data applications

- AFTN (Aeronautical Fixed Telecommunications Network) (between communication centres)
  - low/medium speed
  - 1800 character message limitation
  - store and forward
- OLDI (On Line Data Interchange) (between ATS centres)

- AMHS (Aeronautical Message Handling System) an ATN application between communication centers
- AIDC (ATS Interfaculty Data Communication) an ATN application between ATS centers
- OLDI (IP)

Annex 10 Volume II:
4.4 Aeronautical fixed telecommunication network (AFTN)
4.6 ATS message handling services (ATSMHS).

Annex 10 Volume III:
CHAPTER 8. AFTN Network
Chapter 3: Aeronautical Telecommunication Network (ATN)
ATN/ AMHS relevant SARPs

Guidance Material

For OSI Implementations

Doc 9880 (First Ed 2010)
A/G and G/G Applications
Application Support
Detailed Technical Spec

For IPS Implementations

Doc 9896 (2nd Ed 7 September 2011)
Detailed Technical Spec
Application Support
Guidance for implementation

Doc 9880
A/G and G/G Applications

• Part I - Air-Ground Applications
• Part II - Ground-Ground Applications - Air Traffic Services Message Handling Services (ATSMHS)
• Part III - Upper Layer Communications Service (ULCS) and Internet Communications Service (ICS)
• Part IV - Directory Services, Security and Systems Management
ATSMHS: ATS Message Service, exchange of ATS messages between service users

Two ATSMHS levels of service: a) the basic ATSMHS and b) extended ATSMHS

AMHS: Set of end systems providing the ATSMHS

ATN End Users: a) ATS message server, b) ATS message user agent and c) AFTN/AMHS gateway

Ground networking elements are relatively stable, based on IPv6 and BGP routing

Compatible with on-going IP implementations

Networking protocols

Provisions for mobility management

Provisions for security (IPSec, SSL/TLS, ATN Security)

VoIP material
ATN/AMHS relevant SARPs

DOC 9896

ATN/IPS Protocol Architecture

Protocol Reference Model
### CAR/SAM Regional Strategy for the deployment of the ATN and its applications

**Short term (1/2)**

<table>
<thead>
<tr>
<th>Actions</th>
<th>Implementation Status</th>
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<tr>
<td>Complete the updating of the aeronautical digital communication networks by providing intra and inter-regional interconnection and interoperability.</td>
<td>Completed</td>
</tr>
<tr>
<td>Implementation of the AMHS to replace the AFTN.</td>
<td>On going</td>
</tr>
<tr>
<td>Carry out the strategic deployment of a limited number of ATN routers of the ATN backbone to support other ground-ground and air-ground applications.</td>
<td>On going with Network improvements</td>
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<tr>
<td>The referred ATN routers must provide AFTN/AMHS gateway during the transition phase.</td>
<td>completed</td>
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<tr>
<td>Beginning of implementation of the AIDC within control centres</td>
<td>On going with delays</td>
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CAR/SAM Regional Strategy for the deployment of the ATN and its applications

*Short term (2/2)*

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<td>undertake the training of operational and technical personnel in order to provide the necessary knowledge to introduce the ATN and its ground-ground applications (AMHS and AIDC).</td>
<td>On going with delays</td>
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<tr>
<td>Based on the relevant deployment of the ATN ground-to-ground infrastructures and ground applications, gradual introduction of ATN air-ground applications is suggested</td>
<td>2015 onwards</td>
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<td>Implementation will be in full agreement with SARPs, ICAO PANS and GREPECAS guide.</td>
<td>completed</td>
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## ATN/AMHS Regional References

### CAR/SAM Regional References

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<tr>
<td><strong>AFTN PLAN  CNS TABLE 1A</strong></td>
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<tr>
<td><strong>Chart CNS 1A – Rationalized AFTN Plan for CAR/SAM Regions</strong></td>
</tr>
<tr>
<td><strong>Table CNS 1Ba – Routers Regional Plan</strong></td>
</tr>
<tr>
<td><strong>Table CNS 1Ba – Routers Regional Plan (Chart)</strong></td>
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<tr>
<td>All FASID References available at: <a href="http://www.icao.int/NACC/Pages/edocs-cns.aspx">http://www.icao.int/NACC/Pages/edocs-cns.aspx</a></td>
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Overview of ATN/AMHS Regional Implementation Follow-up

2010: Workshop on the Implementation of the ATS Message Handling System (AMHS) in the NAM/CAR Regions
(Miami, Florida, United States, 19 to 21 October 2010)

• ICAO references and guidance material
• Procedure/activities to follow-up for AMHS trials
• System Configuration and Procurement
• Test considerations with the FAA
• Training aspects
• Monitoring edge device services
• Exchange of experience and lessons learned: AMC/FAA Websites
• Recommendation for a follow-up AMHS implementation meeting
• A website for AMHS and technical exchange of information
• Matrix: Trial sequence and technical information to follow-up
Overview of ATN/AMHS Regional Implementation Follow-up

2012: ICAO/FAA Workshop/Meeting on the Follow-up to the Implementation of the ATS Message Handling System (AMHS) in the NAM/CAR Regions and ATN Meeting (Miami, Florida, United States, 10 – 13 April 2012)

- United States/FAA exchanged their information, experiences and lessons learned from the different AMHS tests carried out with United Kingdom, Japan, Fiji and NAM/CAR States and followed up on the corresponding AMHS implementation issues.
- Update on ICAO AMHS SARPs and guidance material on the AMHS implementation within the global operational concept framework of the ICAO, ASBU methodology, NAM/CAR Regional Performance-based Air Navigation Implementation Plan (RPBANIP NAM/CAR) and the regional agreements
- Update to NAM/CAR AMHS implementation matrix by States
- Regional agreements (CAR Test and Service Cutover plan) for tests and service cutover to AMHS: 7 States/International Organization defined their dates and activities for AMHS implementation for 2012 and 1st semester 2013: Implementation Plan
- Six States and COCESNA registered in the AMC Database for AMHS implementation
- Knowledge on the current and future status of the AMHS implementation in the NAM/CAR Regions
1. Update of milestones of AMHS implementation action Plan (Signature of Technical Letter, Interoperability tests and service cutover), agreeing in the following:
   a) All States/ANSPs involved in this action plan shall complete the dates of the remaining activities to the milestones by **June 29, 2012** and send it to ICAO for posting it on the ICAO AMHS Webpage.
   b) Jamaica, Curacao, Turks and Caicos, Aruba, Cuba and Trinidad and Tobago will signed the requested technical letter to carry out the AMHS test and implementation activities preferably before **30 May 2012**.
   c) For testing, Dominican Republic and COCESNA plan to use a VPN connection, Trinidad & Tobago will used either a VPN or dedicated MPLS connection and the rest of States/ANSP plan to have a dedicated MEVA circuit.
   d) All States plan to have a full AMHS implementation within their local users and with United States. COCESNA will have several AFTN users within Central American once AMHS connection with United States is completed.
   e) All States/ANSPs will have the AFTN service available as a backup, for an agreed period of time for example 1 month, once AMHS service is implemented.

2. Trinidad and Tobago indicated that they had already coordinated testing with Venezuela, and so will inform ICAO by **20 April 2012** of the progress achieved for ICAO NACC Office to continue the coordination with SAM Office.

3. United States will send the test procedures to Dominican Republic by **20 April 2012**, which shall be used as reference for the other States/ ANSP and for its availability in the AMHS Webpage. Also United States will send by **20 April** the Technical Letter to those States/ ANSP that has not signed it and are scheduled for test.

4. Regarding the potential meeting on FAA Tech Center, all agreed that this matter shall be review by the end of this year for its scheduling for 2013 if necessary.

5. ICAO recommended to States/ANSP involved in these test/implementation activities that they should informed the Directors and working Group Meeting on their planning and progress made, for the benefit of the regional and the AMHS users.
ATN/AMHS Regional IMPLEMENTATION Issues

CAR/SAM Regional References

NEED TO REVIEW BY STATES
ATN/AMHS Regional IMPLEMENTATION Issues

CAR/SAM Regional References

Table CNS 1Bb – ATN Ground- Ground Applications Plan

- Due to the implementation of the New Flight plan format, several States have speed up the implementation of their AMHS Systems

- With the recognition of the operation benefits achieved through the implementation of CPL-LAM functionalities, several States plan to implement AIDC shortly

- The modernization of regional telecommunication networks are facilitating the implementation of ATN applications

Revision of CNS 1Bb Table by States
ATN/AMHS Regional IMPLEMENTATION Issues

Adoption of AMHS CAAS Addressing Scheme for CAR Region (only 2 States in CAR)

IPv4 Addressing Scheme — NAM/CAR Regions Inter/Intra Regional G-G Links (Under review)

ATS Messaging Management Centre (AMC) Registration (almost all)
http://www.icao.int/NAC/Documents/eDOCS/CN S/AMCTrainingSlidesV3-0b.pdf
NAM/CAR REGIONAL PERFORMANCE-BASED AIR NAVIGATION IMPLEMENTATION PLAN (NAM/CAR RPBANIP)

Harmonized implementation of Air Navigation Services and Systems under PBA.

States, Air Navigation Implementation Working Group (ANI/WG) and other regional implementation groups follow-up this Plan, and formulate detailed Action Plans.

Among the 9 Regional Performance Objectives (RPO), the implementation of the ATN is considered under RPO No. 6 Optimization and Modernization of Communication Infrastructure.

Version 3.0 of the RPBANIP is ASBU compliant and includes new ICAO ANRFs for monitoring and reporting.
MEVA II Network:
- VSAT Network / Frame Relay
- Provides services to all Central Caribbean, Mexico and Central America
- Main Network for AMHS implementation
- Interconnection with REDDIG and E/CAR Networks

E/CAR Network:
- MPLS Network / IP
- Provides services to all Eastern Caribbean States
- Main Network for AMHS implementation

CAMSAT Network:
- VSAT Network / Frame Relay
- Provides services to all Central America
- In support of ground based Telecom Network
- New node in Panama and Central America

ATN/AMHS Regional IMPLEMENTATION Issues
ATN/AMHS Regional IMPLEMENTATION Issues

ICAO NACC Office Regional Website:

AMHS common References:
http://www.icao.int/NACC/Pages/edocs-cns.aspx

Regional Groups

Links to Regional Groups and Regional Documents

| CAR/SAM Regional Planning and Implementation Group (GAREPCAS) |
| Regional Aviation Safety Group – Pan America (RASG-PA) |
| Collaborative Arrangement for the Prevention and Management of Public Health Events in Civil Aviation (CAP SCA) |
| MEVA Technical Management Group (MEVA TMG) |
| NAM/CAR Air Navigation Implementation Working Group (ANI/WG) |
| Bali Civil Aviation Steering Committee (Bali CASC) |

September 2013
ATN/AMHS Regional IMPLEMENTATION Issues

NAM/CAR Implementation supporting and implementing Bodies

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<tr>
<th>Supporting Bodies</th>
<th>NAM/CAR Regional Performance-based Air Navigation Implementation Plan (RPBANIP)</th>
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**Task Force Member- Name:**
- Carlos Jimenez Guerra
- Carmen Dearmas
- Jean Baptiste Getrouw
- Fernando A. Casso
- Raul van Heyningen
- Veronica Ramdath
- Randy Gomez
- Emmanuel Rigby
- Dulce M. Rosés (Rapporteur)
- Mayda Avila
- Eduardo Vega
- Roger Pérez

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<th>State/T/IO</th>
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- Cuba
- Curacao
- Dominican Republic
- Sint Maarten
- Trinidad-Tobago
- Turks and Caicos Islands
- United States
- COCESNA

**AMHS TaskForce Responsibilities:**
- a) Work Programme Management
- b) Coordination, implementation and trials of ATN ground applications/AMHS implementation (AMHS Regional Plan)
- c) Revising and updating the IPv4 address plan and other CAR Region technical implementation issues in accordance with ICAO technical principles and guidelines
Thank You