



International Civil Aviation Organization

**AMHS/SWIM SEMINAR AND THE SEVENTH MEETING OF
AERONAUTICAL TELECOMMUNICATION NETWORK
(ATN) IMPLEMENTATION CO-ORDINATION GROUP OF
APANPIRG (ATNICG/7)**



Chiang Mai, Thailand, 5 – 9 March 2012

Agenda Item 3: Review States' ATN/AMHS Implementation Status, Transition and Operational Issues

ATN/AMHS IMPLEMENTATION IN OTHER REGIONS

(Presented by the Secretariat)

SUMMARY

ATN/AMHS is in very advanced stage of implementation in almost all the regions. In other regions IPS has been adopted both at MTA and at Sub-net level. This paper presents a very exhaustive brief on the related activities in the other regions over last one year.

This paper relate to -

Strategic Objectives:

C – Environmental Protection and Sustainable Development of Air Transport

Global Plan Initiative:

GPI 22 – Communication Infrastructure

1. INTRODUCTION

1.1 Third Meeting of North American, Central American and Caribbean Working Group (NACC/WG/3) was held in Guatemala City, Guatemala from 9 to 13 May 2011. The meeting was attended by 50 participants from 11 States/Territories located in North American, Central American and Caribbean Region. Participants from 3 International Organizations also attended the meeting.

1.2 Fifteenth Meeting of the Aeronautical Fixed Service Group (AFSG) of the ICAO European Air Navigation Planning Group (EANPG) was held in Paris from 11 to 15 April, 2011. Outcome of this meeting has already been discussed in ATNICG/6. Fifty-third Meeting of the European Air Navigation Planning Group (EANPG/53) took place in Paris from 28 November to 1 December, 2011. The meeting attended by 97 Participants representing 34 member and non-member States and 5 International organizations discussed ATN/AMHS implementation issues along with other Agenda Items.

1.3 Fourth Meeting of The Communication, Navigation and Surveillance Sub-Group (CNS SG/4) of MIDANPIRG was held in Cairo, Egypt from 25 to 27 September, 2011. The meeting was attended by 21 participants from 6 States and 2 Organizations.

1.4 First Meeting of the AFI AMHS Implementation Task Force (AFI AMHS/TF/1) was held in Nairobi, Kenya on 19 and 20 May, 2011. The meeting was attended by 34 participants from 14 Contracting States, 2 Air Navigation Service Providers (ASECNA and ATNS) and an AMHS facilities manufacturer (AVITECH). An AMHS Workshop was also organized back to back with this Task Force Meeting.

1.5 Seventh Workshop/Meeting of the SAM Implementation Group Regional Project RLA/06/901 (SAM/IG/7) was held from 23 to 27 May, 2011 and the Eighth Workshop/Meeting of the project group (SAM/IG/8) was held from 10 to 14 October, 2011 at Lima, Peru. Both the meetings were attended by 54 participants from 10/11 States and 3 International Organizations.

2. DISCUSSION

North American, Central American and Caribbean (NACC) Region

2.1 NACC/WG/3 was informed that ATN/AMHS activities within the PIRG have been restructured into Projects and are included in Projects D1 and D2, assigned with the updates to the Ground-Ground regional implementation document. AMHS transition and trials are progressing in USA/Central America/Dominican Republic and Cuba. All states are using IPS for AMHS and specifically IPv4 as agreed in the addressing scheme adopted (scheme available at <http://www.mexico.icao.int/fasid/NAMCAR-IPv4AddressingScheme.pdf>). A general follow up was carried out in the NACC/WG/3 held from 9 to 13 May, 2011.

2.2 Preliminary AMHS Management Domain Register, provided on the website <http://legacy.icao.int/anb/panels/amhs/AMHSRegisterList.cfm> provides the Address specifications of all the States which have registered with ICAO. In the NAM region, they have created a sub register with information in respect of its own States only and this has been published and provided on the Regional Office website. Easy availability of this information can help the States in operations.

2.3 The NACC/WG/3 also noted that CAR region uses several VSAT telecommunication networks such as MEVA II (Mejoras al Enlace de Voz del ATS) and the network of Central America (CAMSAT) as well as ground network in the Eastern Caribbean (E/CAR Network). Both the CAMSAT networks (NI/21) and East Caribbean networks are in the process of renewing its infrastructure and changes are planned in MEVA II network. Meeting urged the corresponding network administrations to share information and coordinate requirements in order to foresee network integration as a requirement in its modernization/changes. USA informed the meeting that implementation of MEVA station in Atlanta will be completed in May 2011, resulting in completion of AFTN circuit implementation of the MEVA II/REDDIG interconnection. USA also informed about the progress made in AMHS trials through MEVA II network. COCESNA (Central American Corporation for Air Navigation Services) informed about progress regarding OLDI, ATS voice circuits and the project known as CNS/ATM improvements in Honduras.

European and North Atlantic Region (EUR/NAT Region)

2.4 EANPG, in its fifty third meeting reviewed a proposal to establish the EUR Network Service Access Points (NSAP) Address Registry in support of Aeronautical Telecommunication Network/Controller-Pilot Data Link Communication (ATN/CPDLC) implementation programme. The purpose of this document was to collect the Context Management or CM application addressing information of the ground ATC systems providing ATN/CPDLC data link services (the NSAP were registered within the avionics systems in order to allow aircrew to perform a first LOGON with any of the participating centres).

2.5 The draft EUR NSAP Address Registry was derived from the “Addressing database for Link2000+” document in close coordination with the LINK2000+ Implementation Team. As LINK2000+ programme would be discontinued before 2013, it was noted that EUR/NAT Office of ICAO, supported by Aeronautical Fixed Service Group (AFSG) will take over the task of maintaining the EUR/NAT Address Registry for ICAO EUR Region. It was considered an interim solution till such time a global mechanism is developed. Since information contained in the Registry will be uploaded into the aircraft avionics; therefore it is considered that published data should be as stable as possible and change proposals infrequent. EANPG adopted following Conclusion:

EANPG Conclusion 53/11 – EUR NSAP Address Registry

That the ICAO Regional Director, Europe and North Atlantic, undertake appropriate actions for publication of EUR Network Service Access Point (NSAP) Address Registry document presented at Appendix E to this report, including its change control procedure, as version 1.0 by 1 January 2012.

Mid East Region (MID Region)

2.6 Fourth Meeting of The Communication, Navigation and Surveillance Sub-Group (CNS SG/4) of MIDANPIRG was held in Cairo, Egypt from 25 to 27 September, 2011. CNS SG/4 started with the review of ACP meetings outcome and then reviewed the outcome of Third Meeting of the Aeronautical Telecommunication Network (ATN)/Internet Protocol Suite (IPS) held in Cairo, Egypt from 17 to 19 July 2011.

2.7 It was informed that ‘MID REGIONAL ATN PLANNING AND IMPLEMENTATION DOCUMENT’ had been updated. Updating the status of ATN/AMHS implementation in the region, it was informed that Jordan had integrated AFTN/AMHS system and had started operation with United Arab Emirates (UAE) using VPN. Trilateral tests had been carried out between Amman, Cairo and Jeddah in November 2010 following the prescribed test procedures. After completion of the tests, the network was put into operation and it was considered the first AMHS triangle world-wide that uses static routing with pre-defined routing tables.

2.8 CNS SG/4 agreed with the ATN/IPS WG/3 view that conducting timely and thorough post-implementation review (PIR) helps in identifying lessons which assist in planning, managing, and meeting the objectives of the future AMHS projects, where it was noted that Asymmetric routing may cause loss of messages due to the fact that a gateway cannot map a Non-Delivery Report to a subject message. Furthermore, it was noted that Singular AMHS diversion for an area representing several PRMDs is substantial and cannot be performed by one letter as used in AFTN to facilitate a diversion from AFTN to AMHS and vice versa. Based on above, it was recommended that MID AMHS COM Centers should review the current routing tables and make sure that symmetric routes, where possible should be deployed. Meeting also encouraged MID States to make use of the corresponding PRMD table to facilitate diversion from AFTN to AMHS and vice versa. Also the meeting agreed with ATN/IPS WG/3 opinion that States start the PRMD with the first two letters for their location indication. Jordan volunteered to keep the PRMD file updated on their website which can be accessed through link <http://carc.gov.jo/images/filemanager/061808AMC92%20corresponding%20PRMDs.pdf>

2.9 Meeting also agreed with the global view that the complete implementation of IPv6 will take time and consequently, there will be a long period of both protocols IPv4 and IPv6 coexisting. MIDANPIRG/12 agreed that the MID ATN implementation should take place on the basis of regionally agreed requirements, taking into account the System Wide Information Management (SWIM) concept and any other new development.

2.10 MIDANPIRG/12 had agreed for the development of an MID IP Network. In line with this agreement, CNS SG/4 developed following draft Conclusion for the consideration of MIDANPIRG:

DRAFT CONCLUSION 4/2 - DEVELOPMENT OF IP BASED MID NETWORKS

That, MID States be urged to:

- a) develop national plans, in line with the ICAO Manual on the Aeronautical Telecommunication Network (ATN) using Internet Protocol Suite (IPS) Standards and Protocols (Doc 9896), for migration to IPv6 taking the existing IPv4 based aeronautical systems into account;
- b) consider the use of IPv4/IPv6 protocol translation devices only as a provisional solution during the migration; and
- c) include a requirement for both IPv4 and IPv6 in their ongoing Air Traffic Services (ATS) Message Handling System (AMHS) implementation programmes in order to ensure seamless transition and interoperability.

Eastern and South African Office

2.11 First Africa and Indian Ocean or AFI Regional Workshop on AMHS was held in Nairobi, Kenya on 17 and 18 May , 2011. Main objective of the Workshop was to provide an overview of AMHS concept, system level provisions, detailed technical specifications and AFTN/AMHS gateway specifications, based on the provisions contained in ICAO Annex 10, Aeronautical Telecommunications, Volume III, Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols (Doc 9880) and Manual on the Aeronautical Telecommunication Network (ATN) using Internet Protocol Suite (IPS) Standards and Protocol (Doc 9896). 32 participants from 12 Contracting States, 2 Air Navigation Service Providers (ASECNA acting on behalf of AFI 17 Contracting States and ATNS) and an AMHS manufacturer (AVITECH).

2.12 Workshop developed following set of recommendations

Number	Recommendation
Agenda Item 1	Introduction: Overview – End systems providing the ATSMHS - Terminology
No. 1/01	<p>Reinforcement if AFI Ground-Ground Communication medium capability to support the implementation of ATN</p> <p>That, considering the critical role of the satellite VSAT based networks to support ATN components in particular AMHS within AFI, Administrations/Organizations <u>reinforce the capability of current networks</u> (AFISNET, NAFISAT and SADC/2) to comply with the requirements of ATSMHS in accordance with the specifications provided by ICAO Doc 9880</p>
Agenda Item 2	System Level Provisions
No. 1/02	<p>Bilateral and Multilateral Agreement</p> <p>That, in accordance with the provision of Doc 9880, States/Organizations develop <u>models of bilateral and multilateral agreements</u> aiming to ensure the compliance and the full interoperability of their AMHS facilities.</p>
Agenda Item 3	ATSMHS Specifications
No. 1/03	<p>Need of reference technical specifications for the implementation of AMHS in AFI Region</p> <p>That, in accordance with interoperability requirements for the implementation of Extended AMHS, AFI/AMHS/1/TF develop a <u>draft referential technical specification</u> taking into consideration the existence AMHS systems with the support of ICAO.</p>

No. 1/04	<p>National and Regional Security Policy and Regulation</p> <p>That, the AFI/AMHS/I/TF should develop with the support of ICAO, guidelines for <u>national and regional policy and regulation for AMHS systems and applications</u>.</p>
Agenda Item 4	AFTN/AMHS Gateway Specifications
No. 1/05	<p>Survey of the Status of implementation ATSHS in AFI neighboring regions be conducted in order to <u>align the implementation of cost effective AFTN AMHS Gateway</u> capability aiming to ensure seamless Aeronautical Fixed Service during the AMHS transition period.</p>
Agenda Item 5	AMHS Implementation in the AFI Region
No. 1/06	<p>Development of AFI Strategy for the Implementation of AMHS in the AFI Region</p> <p>That, in the spirit of APIRG Conclusion 17/16 (Implementation of AMHS), active coordination should be maintained between States and all relevant stakeholders to <u>develop the regional strategy</u> of implementation of AMHS taking into consideration, the experience gained by the States/Organizations who have already implemented basic ATSMHS systems.</p>
No. 1/07	<p>Need of training in AMHS for AFI technical personnel</p> <p>That,</p> <ul style="list-style-type: none"> a) States/Organizations should develop <u>consolidated training plan</u> for technical operational and maintenance personnel; b) ICAO should pursue its efforts in supporting the AFI States through training <u>Regional Workshops</u> and <u>Seminars</u> on AMHS facilities and applications.
No. 1/08	<p>Integrity of software tools</p> <p>That,</p> <ul style="list-style-type: none"> a) States should <u>establish regulations and procedures</u> to ensure integrity of the software tools being introduced in the management of civil aviation systems; and b) The Secretariat should coordinate the development of <u>specifications and criteria for software integrity validation</u>, in liaison with States, and report to the next meeting of the AFI AMHS TF

2.13 First Meeting of the AFI AMHS Implementation Task Force (AFI AMHS/TF/1) was held in Nairobi, Kenya on 19 and 20 May, 2011. The meeting was attended by 34 participants from 14 Contracting States, 2 Air Navigation Service Providers (ASECNA and ATNS) and an AMHS facilities manufacturer (AVITECH).

2.14 AFI AMHS/TF/1 developed following recommendations for the consideration of the next APIRG Meeting.

Number	Item
Agenda Item 3	Review of AFTN Performance
Draft Conclusion 1/01	<p>VSAT Network Performance and Capacity</p> <p>That, according to the specifications provided by ICAO Doc 9880 Part II, and considering the critical role of the satellite VSAT based networks to support ATN components in particular AMHS within AFI, States/Organizations ensure that the VSAT networks (AFISNET, CAFSAT, NAFISAT and SADC/2) meet the established performance and capacity</p>
Agenda Item 5	AMHS Planning and Implementation
Draft Decision 1/02	<p>Survey of the status of implementation of ATS AMHS in AFI</p> <p>That, in accordance with the AMHS Implementation Task Force Terms of Reference Composition and Work Programme, a survey should be conducted in order to analyze data on AMHS implementation status in AFI region through a data collection format to be finalized by the secretariat.</p>
Draft Conclusion 1/03	<p>Bilateral and Multilateral Agreements for AMHS implementation</p> <p>That bilateral and multilateral agreement should be concluded between AFI States based on the model provided at Appendix B in order to ensure, through trials, the compatibility/interoperability between their AMHS systems.</p>
Draft Decision 1/04	<p>Technical Guidance Material</p> <p>That, the development of technical guidance material should be included in the Work Programme of the AFI AMHS Implementation Task Force in order to assist States in the implementation process.</p>
Draft Conclusion 1/05	<p>Human Resource and Training needs</p> <p>That,</p> <ul style="list-style-type: none"> a) States/Organizations should: <ul style="list-style-type: none"> 1. Ensure that sufficient Human Resources are made available for AMHS Engineering, operations and maintenance; and 2. Develop comprehensive training programmes for AMHS personnel in partnership with industry; b) ICAO should pursue its efforts in supporting the AFI States through training Regional Workshops and Seminars on AMHS concept, facilities and applications.

<p>Draft Conclusion 1/06</p>	<p>AMHS Capability for upgraded AFS systems That, States/Organizations, when upgrading/modernizing their current AFS (AFTN) systems should take into account the existing AMHS capabilities in the region and the experience gained by their neighbors in order to develop and conduct a harmonized AMHS implementation process in AFI region and ensure AMHS systems capability with neighboring region.</p>
<p>Agenda Item 6</p>	
<p>Draft Conclusion 1/07</p>	<p>Procedures for Global Coordination of AMHS Address Information AMC Registration That, based on ICAO State Letter AN 7/49.1-09/34 of 14/04/2009, States/Organizations should</p> <ul style="list-style-type: none"> a) Designate representatives to register as AMC users; b) Ensure that the designated AMC users are duly trained on AMC Web based training platform before they are actually allowed to enter data in AMC http://www.eurocontrol.int/amc; and c) Communicate to the relevant ICAO Regional Office the details of the designated AMC users to facilitate their accreditation enabling them to access the ATS Messaging Management Center (AMC) d)
<p>Agenda Item 7</p>	
<p>Draft Conclusion 1/08</p>	<p>Work Programme and Composition of the AMHS Implementation Task Force, Assignment of Responsibilities and Timelines for identified activities Draft Terms of Reference, Composition and Work Programme of AFI/AMHS/1/TF That, the Terms of Reference, Composition and Work Programme of AFI/AMHS/1/TF be adopted as presented in Appendix C</p>
<p>Agenda item 8</p>	
<p>Draft Decision 1/09</p>	<p>Any Other Business Review of the outcome of the AFI regional Workshop on AMHS (17-18 May, 2011) That, the Task Force endorse the recommendations of the AFI regional Workshop on AMHS held in Nairobi on 17 and 18 May 2011 as provided in Appendix D, for consideration in addressing its Work Programme.</p>

Central/South American (SAM) Region

2.15 The two Implementation Group meetings, in addition to reviewing the status of implementation of AMHS in the region also analyzed the checklist of the systems involved in the flight plan process to evaluate the impact of new flight plan implementation and assessed the automated systems including the flight plan processor and the AMHS terminals. Implementation of new flight plan format was planned to complete AMHS implementation by 31/12/2011 and FDP to be completed by 31/03/2012. As part of the Strategy for Implementing Amendment 1 to the 15th Edition of the ICAO PANS-ATM (Doc 4444) in the CAR/SAM region, it is mentioned that ‘AFTN is the principal means used in the Region to transmit flight plans and is currently in transition to an AMHS system. All the States in the SAM region are expected to have installed AMHS systems by 2012.....’. For States with no automated ATM systems, the changes in the new Flight Plan format will affect only AFTN or AMHS based data communication systems, primarily in relation to the Human Machine Interface (HMI) of the system terminals available at AIS offices or other specific sites for insertion into flight plans.

2.16 CAR/SAM Regions have been stressing on integrating all the ground-ground communication and assessing the bandwidth requirement to create a single network (REDDIG II). This network, in addition to carrying the AMHS/AFTN data will also be used for carrying Radar and ADS-B data.

3. ACTION BY THE MEETING

3.1 The meeting is invited to note the status of implementation of ATN/AMHS in other regions and note the significant policy decisions taken to support implementation. Some such significant policy decisions taken in other regions include the following:

- a) **EUR/NAT Region:** establish the EUR Network Service Access Points (NSAP) Address Registry in support of Aeronautical Telecommunication Network/Controller-Pilot Data Link Communication (ATN/CPDLC) implementation programme;
- b) **MID Region:** recommended that MID AMHS COM Centers should review the current routing tables and make sure that symmetric routes, where possible should be deployed;
- c) **MID Region:** include a requirement for both IPv4 and IPv6 in their ongoing Air Traffic Services (ATS) Message Handling System (AMHS) implementation programmes in order to ensure seamless transition and interoperability;
- d) **AFI Region:** Ensure that sufficient Human Resources are made available for AMHS Engineering, operations and maintenance;
- e) **AFI Region:** Develop comprehensive training programmes for AMHS personnel in partnership with industry; and
- f) **CAR/SAM Region:** Assessing new Flight Plan messaging requirement and inter-connectivity between the automation systems.
