



INTERNATIONAL CIVIL AVIATION ORGANIZATION

ICAO NACC REGIONAL OFFICE

III WORKSHOP/MEETING ON THE FOLLOW-UP TO THE IMPLEMENTATION OF THE ATS MESSAGE HANDLING SYSTEM (AMHS) IN THE NAM/CAR REGIONS

(Boca Chica, Dominican Republic, 24 to 26 September 2013)

SUMMARY OF DISCUSSIONS

1. Introduction

1.1 The workshop/meeting was hosted by the Dominican Republic, Instituto Dominicano de Aviación Civil (IDAC), in coordination with ICAO and the United States/Federal Aviation Administration (FAA). The objectives of the workshop were:

- a) Follow-up on the Regional AMHS implementation Plan
- b) Exchange information, experiences and lessons learned from the Dominican Republic AMHS interconnection and various AMHS preparatory actions taken in the NAM/CAR Regions
- c) Provide guidance on AMHS implementation within the ICAO global operational concept framework, Aviation System Block Upgrades (ASBUs) and regional agreements
- d) Discuss AMHS implementation limitations and concerns to streamline implementation

1.2 The event followed-up on the previous AMHS implementation agreements accomplished at the II ICAO/FAA Workshop/Meeting on the Follow-up to the Implementation of the ATS Message Handling System (AMHS) in the NAM/CAR Regions; First AMHS Implementation Teleconference held 18 April 2012; NAM/CAR Regional Performance-Based Air Navigation Implementation Plan (NAM/CAR RPBANIP), Regional Performance Objectives No. 6 - *Optimization and Modernization of Communication Infrastructure*, applying ICAO Standards and Recommended Practices (SARPs) and guidance material, as well as the CAR/SAM Regional Strategy for Aeronautical Telecommunication Network (ATN) implementation and applications, and other ICAO reference material. The final event programme and presentations/documentation are available at: <http://www.icao.int/NACC/Pages/meetings-2013-amhsIII.aspx>

1.3 The workshop/meeting was attended by a total of 31 participants from 8 States and 2 international organizations from the NAM/CAR Regions. The list of participants is attached as **Appendix A**.

1.4 Mr. Julio Siu, Regional Officer Communications, Navigation and Surveillance (CNS), ICAO NACC Regional Office, on behalf of Mrs. Loretta Martin, Regional Director of the ICAO NACC Regional Office, welcomed the participants; highlighted the objectives of the event; pointed out the importance of the AMHS in the ICAO ASBU approach; implementation status of the AMHS-related bodies in the Regions; and congratulated Dominican Republic and United States for having the first interconnected AMHS IP systems in the NAM/CAR Regions. United States highlighted the excellent and extensive work carried out by the FAA/IDAC team in achieving the interconnection and the experiences shared among the participants to streamline other AMHS interconnections. Mr. Francisco Bolivar Leon, on behalf of Dr. Alejandro Herrera, IDAC Director General, explained the importance of the AMHS in the modernization and improvement of the Dominican Republic air navigation infrastructure; congratulated IDAC staff involved in the interconnection and implementation of the AMHS system; thanked the FAA and ICAO for their support and assistance; wished the participants a successful meeting; invited the delegates to enjoy their stay; and opened the event. Ms. Dulce M. Rosés, MEVA TMG Coordinator, and Mr. Julio C. Siu carried out the coordination and facilitation of the event.

2. Workshop/Meeting Development

2.1 The first day started with Presentation P/01 where ICAO provided an overview of AMHS issues in the NAM/CAR Regions, highlighting the objectives of the workshop; the achievements and agreements made since the previous two AMHS workshops and AMHS 2012 teleconference; highlights of the latest ICAO SARPs references on AMHS implementation, viz Doc 9880 – *Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols*, and Doc 9896 – *Manual on the Aeronautical Telecommunication Network (ATN) using Internet Protocol Suite (IPS) Standards and Protocols*; the existing NAM/CAR implementation bodies that are related to AMHS regional implementation; and the current valid regional ATN-related agreements. Presentation P/02, provided by ICAO, dealt with AMHS deployment within the ASBU methodology; particularly on Module B0 FICE, DAIM and AMET; the relevant AMHS related recommendations from the ICAO Twelfth Air Navigation (AN-Conf/12); AIM/CNS roadmaps; the 4th edition of the Global Air Navigation Plan; and future reporting and monitoring activities to be conducted for 2014, highlighting the target and milestones for ASBU B0 FICE with reference to AMHS implementation.

2.2 Under P/03, United States presented the current and future status of AMHS implementation issues in the NAM/CAR Regions based on the regional matrix and Action Plan, emphasizing the need to review and update this planning, identifying the pending planning/implementation issues and suggesting actions for improving execution.

2.3 Under P/04, United States presented information regarding the ATS Messaging Management Centre (AMC), including its function and purpose. Participants were informed on how to register to use the AMC website and how to download data according to the 28-day AIRAC cycle. The criticality of performing this update on the prescribed date and time was stressed, as well as potential consequences of not doing so.

2.4 Under P/05, United States/FAA presented information on interoperability testing, in general, as well as the specific process used by the FAA for AMHS interoperability tests. Documents used were described, including the AMHS Configuration Parameters Document and the AMHS Interoperability Test Plan.

2.5 Regarding Internet Protocol (IP) Network Connectivity, under P/06, United States presented a description of the networking scheme used by the FAA for IP connectivity to other States' AMHS systems. An explanation of the International User Portal (IUP) was provided, as well as a description of the redundancy offered by the IUP and its associated network elements.

2.6 Under P/07, Dominican Republic explained the use of the Regional CAR/SAM IPv4 addressing scheme, identifying addresses that cannot be used based on the IP concept and recommending this scheme to be reviewed by GREPECAS Project D - *ATN infrastructure in the CAR Region and its ground-ground and ground-air applications*, and proposed an amendment to the scheme.

2.7 On the second day, under P/13, United States provided an overview of the AMHS transition process to be used when interconnecting and testing with the FAA.

2.8 Subsequently, the participating States and COCESNA discussed their current AMHS implementation status highlighting the following:

- a) **Cuba (P/08):** has almost completed AMHS development; internal planned testing; experience with conformance tests; identification of preliminary testing with Dominican Republic; interconnection with United States; and gradual full AMHS implementation nationwide.
- b) **Dominican Republic (P/14):** provided an overview of their AMHS system implementation, highlighting the phases and activities for transition from their AFTN connections to the current AMHS operational architecture and components; and sharing lessons learned from the process.
- c) **Mexico (P/10):** transition of Mexico's AFTN system to the planned AMHS infrastructure; National AMHS Implementation Plan consisting of five AMHS systems nationwide; two interconnections with United States; and gradual implementation starting from 2014 to 2016.
- d) **Trinidad and Tobago/Barbados (P/12):** status of activities for interconnection of the PIARCO AMHS and United States; full AMHS implementation in the E/CAR will start in November 2013; and interconnection with United States in early 2014.
- e) **Turks and Caicos Islands (P/11):** data requirements to achieve AMHS interconnection with United States for Providenciales and Grand Turks and the upgrade of their Stone Field System.
- f) **COCESNA (P/09):** AMHS implementation is being reviewed and implementation was rescheduled for 2015/2016.
- g) Lessons learned are presented in **Appendix B** to this document.

2.9 Under P/15, United States described the necessary steps for AMHS operational cutover, beginning with the conclusion of interoperability tests (described in a previous presentation). In particular, the FAA's Dual Feed approach was discussed, whereby AMHS messages can be exchanged in a non-operational mode in order to provide system validation, as well as training and troubleshooting prior to operational cutover.

2.10 Under P/20, Dominican Republic presented a diagram of their AMHS system and the operation of their web-based access to the AMHS system. After this introduction, site visits to IDAC's AMHS facilities and operational positions and Dominican Republic's Training Academy (ASCA) were conducted.

2.11 On the third day, under P/16, United States provided a description of the role of user agents in AMHS operations. Descriptions and definitions related to user agents were provided, as well as the advantages they offer. Various character sets and encoding, as well as related issues and limitations were also discussed.

2.12 Under P/17, United States described AMHS management domains, the encoding of various fields within addresses, and considerations for the use of such addresses in the transition from AFTN to AMHS.

2.13 Under P/18, ICAO complemented the AMHS discussion with the implementation experiences from other regions; Acceptable Means of Compliance (AMC) relevant supporting documentation; the activities of the ICAO Aeronautical Communication Expert Panel (ACP); relevant AMHS implementation aspects; and an analysis of AMHS training enforcement.

2.14 Under P/19, a review of the relevant planning issues, testing activities and dates was carried out, identifying activities needed to support and streamline AMHS implementation, and finally updating the regional implementation plan.

2.15 Several States not present at the workshop reported their progress based on the Regional AMHS Implementation Plan by email:

a) Aruba

- The Aruba Department of Civil Aviation plans to have its AMHS system implemented during the second half of 2015, subject to the government budget for 2014.

b) Curacao

- A request has been made to the MEVA Service Provider (AGS/SES) for the AMHS circuit.
- The Universal Input/Out (IO) card has been installed in the MEVA Node.
- FAA has been contacted and the coordination conference will start as soon as practical.
- IDS/Ubitech has been contacted for the interconnection implementation activities.
- Before any testing can start, Curacao has to submit the NADIN (FAA) Request Form and Connectivity Plan. The connection to the AMHS system has to be in place.

c) Jamaica

- The AMHS system is operational within Jamaica but only as AFTN.
- A flight plan converter is in use to support the legacy automation system. The system was supplied by Ubitech Technologies Inc/IDS.
- An upgrade is scheduled to the latest version of the AMHS software by October 2013. The system is stable.
- Jamaica will participate in regional AMHS testing in the second quarter of 2014.

d) **Sint Maarten**

- The AMHS system is installed and operational as AFTN since July 2012 (the system is not operating at full capacity because the redundant function is disabled). The system fails occasionally when operating both Hub 1 and 2 simultaneously. Update of the Ubitech software version 6.5 is confirmed and scheduled for 30 September 2013.
- Test with Curacao was completed successfully.
- 2012 FPL deadline met.
- AMHS circuit for testing with United States/FAA scheduled for installation 9 October 2013, by the MEVA Service Provider (AGS / SES).
- Technical letter between FAA and Princess Juliana Airport is being reviewed by United States/FAA.

3. Conclusions/ Recommendations

3.1 The Meeting recognized the importance of the ICAO AMHS webpage (<http://www.icao.int/NACC/Pages/meetings-2013-amhsIII.aspx>) as a common source of reference and implementation follow-up. In this regard, the Meeting identified the need to update the web information with the latest implementation issues and, therefore, agreed on the following Actions (ACTs) to be taken:

ACT 01: United States to provide ICAO with updated versions of the implementation documents to be loaded onto the ICAO AMHS website such as: Configuration Parameters Document, FAA Interoperability Test Procedure, AMHS Cutover Procedure, etc. by **15 November 2013**.

ACT 02: AMHS participating States to review the AMHS webpage content and suggest any additional information to be added by **30 November 2013**.

3.2 Regarding the potential visit to FAA AMHS facilities discussed during the previous AMHS workshop, the Meeting agreed that due to the status of regional implementation, and mainly for security issues, the visit was not necessary.

3.3 The Meeting recognized the importance of the existing AMHS implementation supporting bodies (ANI/WG AMHS Task Force, the GREPECAS D Project, etc.), and how their activities complemented each other, identifying the main role of the AMHS Task Force as coordinating and supporting AMHS implementation activities. The following deliverables were highlighted:

Project D

- Revised IPv4 addressing
- Revised ATN router architecture proposal
- AMHS Transition Plan update

AMHS Task Force:

- Final definition of AMHS/TF deliverables by 30 October 2013
- Support and monitor changes to AMHS addressing scheme from XF to CAAS
- Identification of AMHS training needs
- Review and proposal of updates to AMHS-related strategies and plans
- Guidance for AMHS implementation

Civil Aviation Training Centers Working Group (CATC/WG)

- Implement and coordinate appropriate AMHS training to be available previous to implementation and support planning activities.

ACT 03: ICAO to communicate the training deliverable to the CATC/WG by **30 November 2013**.

3.4 After reviewing the existing CAR/SAM Regional ATN Implementation Strategy and noting the progress made with AMHS system implementation in the region, the Meeting considered that it was necessary to update the CAR/SAM Regional ATN Implementation Strategy. Initial review of this strategy can be completed by the AMHS/TF. ICAO recalled that 2015 is the regional CAR/SAM target date for States to implement AMHS.

3.5 The Meeting recognized the importance of exchanging experiences and lessons learned regarding AMHS system implementation and services, and emphasized the need to produce formal guidance to support further AMHS implementation in the region. In this regard, the Meeting proposed that an AMHS Implementation Guide be developed by the AMHS/TF, considering the initial lessons learned reported in Appendix B to this summary.

3.6 United States highlighted the following issues on AMHS transition:

- States that are ready for the transition to AMHS should plan well in advance and begin coordination with the FAA
- Select a Point-of-Contact (PoC) for the entire transition process
- States share information among themselves regarding AMHS implementation

3.7 Regarding the communication means for testing, United States indicated two options when interconnecting with their systems:

- **Option One:** testing over the Internet (VPN)
- **Option Two:** testing over a dedicated network such as the MEVA II Network

3.7 On a case-by-case basis, States should determine the length of time to keep AFTN and AMHS in dual feed or as backup. One month as the minimum, extendable up to three months was agreed.

3.8 ICAO informed on the progress made by Project RLA/09/801 — *Implementation of Performance-Based Air Navigation Systems in the CAR Region*, which provides a good support tool for air navigation system implementation and services. In this regard, the Meeting identified that the following activities can be achieved with Project support:

Deliverable	Action by	CAR Project RLA/09/801 support on:
ATN routing evaluation and architecture	CAR Experts	Need for an external expert
AMHS workshop implementation	AMHS TF	Scholarships for Project Members
Exchange of experts for AMHS implementation with States that are doing tests	States	Support exchange of experts to expedite AMHS implementation

ACT 04: ICAO to communicate these activities to the Project RLA/09/801 Steering Committee by **30 November 2013.**

3.9 Trinidad and Tobago reiterated their interest to test AMHS implementation with Venezuela. The ICAO NACC Regional Office will continue coordination with the ICAO SAM Regional Office for the SAM boundary States to obtain a response to the proposed testing dates and identification of the PoC for Venezuela.

ACT 05: ICAO NACC RO to continue coordination with the ICAO SAM Regional Office for AMHS interconnection.

3.10 The Meeting recognized that all States must plan realistic dates and activities, commit to compliance with the actions and dates as agreed in the Regional AMHS Plan, and that the PoC must play an active coordination role.

3.12 The AMHS Implementation Matrix was updated as attached in **Appendix C**. The associated Action Plan to the matrix was also updated as shown in **Appendix D**.

3.13 States/Territories/international organizations should follow-up on the conclusions/recommendations resulting from this Follow-up Implementation AMHS Meeting, under the work programme of the ANI/WG; conclusions/recommendations will also be reported to GREPECAS.

APPENDIX A

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 26 September 2013)

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APPENDIX B

AMHS Implementation Lessons Learned

Preparation for implementation

1. Prepare personnel beforehand:
 - a) Must have working knowledge of general AMHS concepts from the start (procurement, FAT, SAT, etc.)
 - b) Must be prepared to make decisions and solve problems
2. Involve operational personnel in all phases:
 - a) Determining requirements for the system
 - b) FAT/SAT
 - c) Interoperability testing
 - d) Feedback from users is of capital importance
3. Highlight any potential issues in the connected systems and identify any mitigation required.
4. States must organize training of personnel to provide necessary capability to maintain and operate the ground-to-ground ATN infrastructure and applications.
5. In order to cover the various backgrounds of trainees and to ensure training standardization worldwide, it is recommended that training be divided into multiple levels in accordance with Air Traffic Safety Electronics Personnel (ATSEP)- ICAO Doc 7192 Part E:
 - a) Basic training
 - b) Qualification training
 - c) System and equipment rating training (also referred to as “Specific training”)
 - d) Continuation training
 - e) Conversion training
 - f) Developmental training
6. ANSPs should establish their AMHS Training Plan based on an analysis of their particular training needs and operating practices.
7. Similar to any ANS system, an AMHS system is subject to maintenance in line with the strategy and processes set out by the ANSP: therefore, States must ensure that the performance, reliability, availability, and maintainability requirements are met.
8. Maintenance responsibilities should be clearly defined and assigned, personnel should be trained accordingly, and procedures of cooperation between the operation and the maintenance entities, when different, should be in place.

9. Detailed guidance for AMHS system operation and maintenance training is available in the EUR AMHS COM Centre Training Guidelines, version 1.0.
10. AFTN and AMHS expected to co-exist for a considerable period; plan for resources for at least one to three months of transition (dual feed mode).
11. Follow-up on AMHS Implementation according to ATN-related Action Plans and CAR/SAM ATN Strategy Implementation.
12. Take note and follow-up on regional AMHS references: <http://www.icao.int/NACC/Pages/edocs-cns.aspx> under AMHS section
13. Air Traffic Service Message Management Center (AMC) operation is a key component in Global AMHS operation, until Directory Service (part of AMHS Extended Service) is widely implemented.
14. Revision and definition of the most appropriate AMHS Addressing Scheme (XF/CAAS)
15. Close coordination with your adjacent ATS unit involved in interconnection and the System Provider:
 - a) It takes at least two systems for AMHS-AMHS interchange
 - b) Take advantage of mutual experiences
 - c) Enables a much quicker solution to problems
16. Use test means that do not interfere with normal operations
 - VPN
 - Test sites and systems
 - Exercise the system thoroughly; it is better when it breaks in a non-operational setting!
 - Use of regional common network infrastructures (IP networks)
17. Before tests, check conformance test results and perform connection trials using pings and MTA connection attempts.
18. Share/exchange information on all technical concerned aspects, mainly covering the configuration Table of the systems to be interconnected and common network-related data and user capabilities
19. It is recommended to perform a subset of the conformance trials as some of these may not be tested during the conformance tests due to application or facilities limitations.
20. Test that both systems are successfully connected in accordance with the stated Interoperability Test.

21. The dual operation of AMHS with User Agents and AFTN requires global coordination.

Implementation matter (test, transition, cutover)

22. Extensively test your system locally ensuring that:

- a) Your system is working as well as possible before interoperability
- b) Internal (local) use of AMHS makes your operational staff familiar and aware of the system
- c) Errors detected beforehand

23. The physical connection may take time and affect the overall implementation schedule:

- a) Take lead times and paperwork into account
- b) Get it soon enough for testing, but not so soon that it will be idle for a long time - you will be paying for the circuit

24. Control software and configuration changes

- a) Do not make software or configuration changes before a test
- b) Always test significant changes to systems
- c) Always backup configurations in case of the unexpected
- d) Maintain a log of changes

25. Document test procedures

- a) Make detailed test plans
- b) Conduct collaborative test procedure elaboration and revision
- c) Make them practical but also realistic

26. Ensure that the software versions of the test-bed and operational MTAs are the same versions.

27. During tests:

- a) Save logs
- b) Time-stamp the test cases and always use UTC time
- c) Use the AMHS application to communicate and exchange messages
- d) For the new stress test cases (IT601) suggested, it is highly recommended to perform a single message pre-test previous to the n x 1.000 message test

28. From experiences from the tests, several testing issues were highlighted:

- a) A training lab or test-bed/system is mandate
- b) Due to current operation of AMHS systems on an AFTN world (many users), it is recommended to initially have the AMHS Basic Service implemented.
- c) AMC registration and data completion is required prior to conducting the tests
- d) The tests between United States and other States should consider on-site system tests as a priority other than a factory test given by system manufacturers
- e) All implementation need to use the regional CAR/SAM IPv4 addressing scheme

28. Doc 9880 - *Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI standards and protocols*, Part II – *Ground-Ground Applications ATS message handling service (ATSMHS)*, and EUR Doc 020 - *AMHS Manual Appendix D* provide good references for trials and tests for the Message Transfer Agent (MTA) final set-up process.

29. Regarding the ATSMHS User Agent, the following considerations should be taken:

- a) Basic ATS Message should be used unless you are certain that all recipients and every AMHS node in the path is capable of processing Extended ATS Messaging.
- b) Limit on message length needs to be considered when in ‘mixed’ AFTN/AMHS mode (e.g., message received at US AFTN center from a remote user consisting of 102 parts).
- c) Limit on the number of recipients per message.
- d) Limit the use of extended character encoding as most all messages will transit an AFTN/AMHS gateway and be destined for a remote AFTN user.
- e) Data types, including the use of XML, and character encoding are issues that need careful inspection to prevent any possible interruption in the AFTN network.
- f) Once operating the AMHS, the offline directory service provided by the AMC should be strictly followed in accordance with the AIRAC cycle dates and AMC process.
- g) Avoid as much as possible “Cut and Paste: Messages” created with MS Word, which can be problematic. MS Word uses a CP-1252 character set, which includes characters from 0x80 - 0xA0, which are not a part of ISO-8859-1. Exercise extreme caution if copying text from another document into a UA text box. MS Windows options of auto complete or auto correction can affect a UA’s output (e.g., long dash). In these cases, be aware that rejection or automatic character substitution will occur.
- h) AMHS Basic Services message text shall comprise a single body part carrying IA-5 characters. Any characters > x7F will likely be translated to ‘?’.
- i) Extensive testing between partners should be executed before any of the expanded capabilities are used operationally. Character encoding and body part types should be clearly defined during testing. This testing should be done between originator and end recipients as well as all relaying nodes in between.

30. Regarding the transition to AMHS, the following considerations should be followed:

- a) The first four characters of the AFTN address shall be a Doc 7910 location indicator (these are also listed on AMC). States should ensure that their State's information on Location Indicators published in ICAO Doc 7910 are up-to-date. If not, States need to coordinate the necessary changes with ICAO.
- b) Optimize the addressing and routing analyzing:
 - What AFTN traffic is currently sent out of my country
 - What AFTN traffic is currently received by my country
 - Self-addressing traffic for confirmation of receipt or other reasons
 - There may be a need for some exception cases to be configured in MTA routing rules, but these should be analyzed closely and eliminated if possible
 - Use Group addresses to multiple copies within my domain
- c) Like email, duplicate addresses are typically dropped from X.400 messaging systems.

APPENDIX C

Update: October 2013															
CAR Region AMHS Implementation Matrix (2013-2016)															
Administration	STATUS	System Description					System implementation milestones				(COM CHART) Connection with	POC	Remarks		
		Location of Facility	AMHS Facility Type	AMHS Vendor	Current Facility Type	Current Vendor	AMHS System Procurement Date	AMHS System Implementation Date	AMHS Interoperability Test	AMHS Service Cutover					
Antigua & Barbuda	see Trinidad and Tobago	Antigua										Port-of-Spain		Same as Piarco	
Aruba	Under study	Aruba	AMHS (MTA + UA)	TBD			2Q2015	2Q 2015	4Q2015-1Q2016	2Q 2016		United States	Joselito Andrade		
Bahamas	Not reported	Nassau					1Q2011 mgt FAA Feb11	Jun 2011	TBD	TBD		United States	Hillard Walker	Q2 2011: will engage an Isode Integrator to provide an AMHS	
Canada												United States			
Cayman Islands	Under study	Grand Cayman	MTA + UA	TBD	AFTN switch	Copperchase	TBD	TBD	TBD	TBD		United States	Wayne DaCosta		
Dominican Republic	Implemented	Santo Domingo	AMHS - MTA/UAs	Ubitech	AFTN Switch		already	already	Sep 2013	Oct 2013		United States	Fernando Casso		
Cuba	98% Developed and pending equipment acquisition	La Havanna	AMHS - MTA/UAs	ISODE/ In-house	AFTN Switch	Own system	N/A	TBD	Mar 2014	TBD		United States	Carlos Jimenez y Layla Rodriguez		
Haiti	Under Study	Port-au-Prince	TBD	TBD	AFTN User	DSA	N/A	TBD	4Q2014	TBD		Mexico (Merida)			
COCESNA	Under study	Tegucigalpa	AMHS Gateway	ISODE/ In-house	AFTN Switch	COCESNA	N/A	TBD	TBD	TBD	TBD		Belize - MTA	Mayda Avila	
								TBD	TBD	TBD	TBD	Guatemala - MTA			
								TBD	TBD	TBD	TBD	Managua - MTA			
								TBD	TBD	TBD	TBD	Mexico - MTA			
								TBD	TBD	TBD	TBD	San Jose - MTA			
								TBD	TBD	TBD	TBD	San Pedro Sula - MTA			
								TBD	TBD	TBD	TBD	San Salvador - MTA			
								TBD	TBD	TBD	TBD	United States			
Jamaica	Scheduled for testing	Kingston	AMHS MTA/UAs	TBD	AFTN Switch	TBD	Q2-2012		2Q 2014	TBD		United States	Gordon/Derrick Grant		
Mexico	Pending System installation	Mexico	AMHS - MTA/UAs	THALES	AFTN Switch	Own system	2013-2016 (by phases)	2013-2016 (by phases)	TBD	TBD		Centro-America	Rafael Castro y Jose de Jesus Jimenez		
									4Q 2014	TBD	United States				
Curacao	Scheduled for testing	Curacao	AMHS MTA	Ubitech	AMHS System	Ubitech	May 2012	Jul 2012	TBD	TBD		Caracas - MTA	Jean Getrouw		
St Maarten	Scheduled for testing	Princess Juliana	AMHS MTA	Ubitech	AMHS System	Ubitech	May 2012	Jul 2012	3Q 2014	4Q 2014		United States	Phylogene Mattheeuw		
Trinidad and Tobago	Scheduled for testing	Port-of-Spain	AMHS MTA/UAs/Gateway	Comsoft	AFTN Switch	Comsoft	Apr 2012	Sep 2012	Nov 2013	Nov 2013	Anguilla	Veronica Ramdath	Randy Gomez		
									Nov 2013	Nov 2013	Antigua				
									Nov 2013	Nov 2013	Barbados-UA				
									TBD	TBD	Caracas - MTA				
									Nov 2013	Nov 2013	Dominica - UA				
									Nov 2013	Nov 2013	Fort-de-France- UA				
									Nov 2013	Nov 2013	Georgetown-UA				
									Nov 2013	Nov 2013	Grenada-UA				
									Nov 2013	Nov 2013	Montserrat-UA				
									Nov 2013	Nov 2013	Pointe-a-Pitre- MTA				
									Nov 2013	Nov 2013	Saint Kitts and Nevis-UA				
									Nov 2013	Nov 2013	Saint Lucia-UA				
									Nov 2013	Nov 2013	Saint Vincent-UA				
									Nov 2013	Nov 2013	United States				
									Jan 2014	2 Q 2014	United States				
									Turks and Caicos Islands	Under study	Providenciales			MTA	Stonefield Sys
United States	Scheduled for testing	Atlanta	AMHS G/W	U.S.A.	AFTN Switch	U.S.A.	now	now	4Q2015-1Q2016	2Q 2016	Aruba	Dulce Roses			
									TBD	TBD	Brazil				
									TBD	TBD	Caracas				
									TBD	TBD	Cayman				
									TBD	TBD	Centro America				
									3Q 2014	2 Q 2014	Curacao				
									TBD	TBD	Turks and Caicos				
									Mar 2014	TBD	La Habana				
									TBD	TBD	Kingston				
									TBD	TBD	Lima				
									4Q 2014	TBD	Mexico				
									TBD	TBD	Nassau-S				
									TBD	TBD	Panama				
									TBD	TBD	Port-au-Prince				
									January 2014	2 Q 2014	Port-of-Spain				
									1Q 2014	2Q 2014	Saint Maarten				
									Sep 2013	Oct 2013	Santa Domingo				

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ID	Task Name	Start	Finish	2013		Half 1, 2014			Half 2, 2014			Half 1, 2015		
				Sep	Nov	Jan	Mar	May	Jul	Sep	Nov	Jan	Mar	
0	AMHS Project Plan	Wed 11-04-12	Mon 23-03-15											
1	Sint Maarten -United States	Thu 01-08-13	Fri 20-06-14											
2	Planning and management	Thu 31-10-13	Fri 17-01-14											
8	Technical Development	Fri 17-01-14	Tue 13-05-14											
9	Interface configuration Control Doc	Fri 17-01-14	Thu 30-01-14											
10	Test access Provisioning	Fri 17-01-14	Thu 30-01-14											
11	Test Plan	Fri 31-01-14	Tue 11-02-14											
12	Interoperability Testing	Wed 12-02-14	Tue 08-04-14											
13	Test Report	Wed 09-04-14	Tue 15-04-14											
14	Operational Configuration	Wed 16-04-14	Tue 29-04-14											
15	Traffic Cutover Plan	Wed 30-04-14	Tue 13-05-14											
16	Operational Procedures	Wed 12-02-14	Tue 25-03-14											
17	Provisioning	Thu 01-08-13	Wed 20-11-13											
24	Service implementation	Wed 14-05-14	Fri 20-06-14											
25	Circuit Cutover	Wed 14-05-14	Tue 27-05-14											
26	Pre-operational Testing	Wed 28-05-14	Tue 10-06-14											
27	TRAFFIC CUTOVER	Wed 11-06-14	Fri 20-06-14											
28	ICAO Confirmation	Fri 20-06-14	Fri 20-06-14											
29	Curacao - United States	Fri 25-10-13	Wed 31-12-14											
30	Planning and management	Fri 25-10-13	Fri 18-04-14											
31	Technical letter signed	Fri 25-10-13	Thu 21-11-13											
32	documentation exchange	Fri 22-11-13	Thu 02-01-14											
33	requirements/ Concept Planning	Fri 03-01-14	Thu 27-02-14											
34	International Interconnection Definition	Fri 28-02-14	Thu 17-04-14											
35	ICAO notification	Fri 18-04-14	Fri 18-04-14											
36	Technical Development	Fri 18-04-14	Thu 04-12-14											
37	Interface configuration Control Doc	Fri 18-04-14	Thu 29-05-14											
38	Test access Provisioning	Fri 18-04-14	Thu 29-05-14											
39	Test Plan	Fri 30-05-14	Thu 26-06-14											
40	Interoperability Testing	Fri 27-06-14	Thu 09-10-14											
41	Test Report	Fri 10-10-14	Thu 23-10-14											
42	Operational Configuration	Fri 24-10-14	Thu 06-11-14											
43	Traffic Cutover Plan	Fri 07-11-14	Thu 04-12-14											

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ID	Task Name	Start	Finish	2013		Half 1, 2014			Half 2, 2014			Half 1, 2015		
				Sep	Nov	Jan	Mar	May	Jul	Sep	Nov	Jan	Mar	
44	Operational Procedures	Fri 27-06-14	Fri 27-06-14											
45	Provisioning	Fri 18-04-14	Thu 16-10-14											
46	Determine circuit vendor	Fri 18-04-14	Thu 01-05-14											
47	Order circuit	Fri 02-05-14	Thu 12-06-14											
48	International Vendor coordination	Fri 13-06-14	Thu 10-07-14											
49	Circuit implementation and testing	Fri 11-07-14	Thu 21-08-14											
50	Troubleshooting Procedures	Fri 22-08-14	Thu 02-10-14											
51	Circuit service acceptance	Fri 03-10-14	Thu 16-10-14											
52	Service implementation	Fri 05-12-14	Tue 30-12-14											
53	Circuit Cutover	Fri 05-12-14	Thu 11-12-14											
54	Pre-operational Testing	Fri 12-12-14	Tue 23-12-14											
55	TRAFFIC CUTOVER	Wed 24-12-14	Tue 30-12-14											
56	ICAO Confirmation	Wed 31-12-14	Wed 31-12-14											
57	Jamaica - United States	Fri 18-10-13	Fri 12-09-14											
58	Planning and management	Fri 18-10-13	Fri 21-02-14											
59	Technical letter signed	Fri 18-10-13	Thu 28-11-13											
60	documentation exchange	Fri 29-11-13	Thu 26-12-13											
61	requirements/ Concept Planning	Fri 27-12-13	Thu 23-01-14											
62	International Interconnection Definition	Fri 24-01-14	Thu 20-02-14											
63	ICAO notification	Fri 21-02-14	Fri 21-02-14											
64	Technical Development	Fri 21-02-14	Thu 07-08-14											
65	Interface configuration Control Doc	Fri 21-02-14	Thu 06-03-14											
66	Test access Provisioning	Fri 21-02-14	Thu 06-03-14											
67	Test Plan	Fri 07-03-14	Thu 03-04-14											
68	Interoperability Testing	Fri 04-04-14	Thu 26-06-14											
69	Test Report	Fri 27-06-14	Thu 10-07-14											
70	Operational Configuration	Fri 11-07-14	Thu 24-07-14											
71	Traffic Cutover Plan	Fri 25-07-14	Thu 07-08-14											
72	Operational Procedures	Fri 04-04-14	Thu 10-04-14											
73	Provisioning	Fri 21-02-14	Thu 15-05-14											
74	Determine circuit vendor	Fri 21-02-14	Thu 20-03-14											
75	Order circuit	Fri 21-03-14	Thu 27-03-14											

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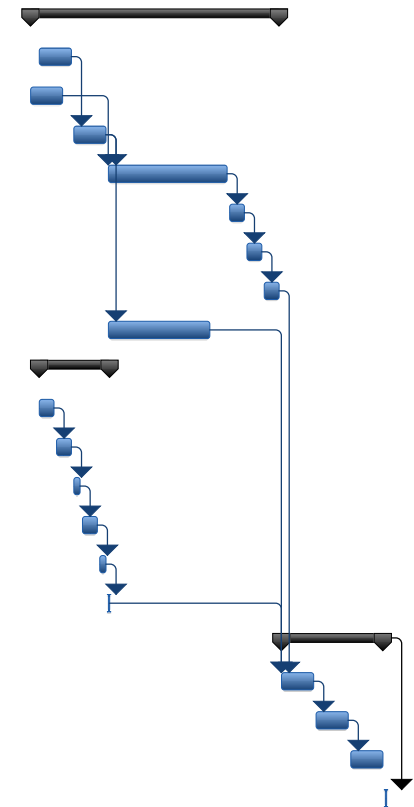
ID	Task Name	Start	Finish	2013		Half 1, 2014			Half 2, 2014			Half 1, 2015		
				Sep	Nov	Jan	Mar	May	Jul	Sep	Nov	Jan	Mar	
76	International Vendor coordination	Fri 28-03-14	Thu 03-04-14											
77	Circuit implementation and testing	Fri 04-04-14	Thu 01-05-14											
78	Troubleshooting Procedures	Fri 02-05-14	Thu 08-05-14											
79	Circuit service acceptance	Fri 09-05-14	Thu 15-05-14											
80	Service implementation	Fri 08-08-14	Thu 11-09-14											
81	Circuit Cutover	Fri 08-08-14	Thu 21-08-14											
82	Pre-operational Testing	Fri 22-08-14	Thu 04-09-14											
83	TRAFFIC CUTOVER	Fri 05-09-14	Thu 11-09-14											
84	ICAO Confirmation	Fri 12-09-14	Fri 12-09-14											
85	Trinidad & Tobago - United States	Wed 11-04-12	Fri 27-06-14											
86	Planning and management	Wed 11-04-12	Thu 14-11-13											
87	Technical letter signed	Fri 06-09-13	Thu 03-10-13											
88	documentation exchange	Fri 04-10-13	Thu 17-10-13											
89	requirements/ Concept Planning	Fri 18-10-13	Thu 31-10-13											
90	International Interconnection Definition	Fri 01-11-13	Thu 14-11-13											
91	ICAO notification	Wed 11-04-12	Wed 11-04-12											
92	Technical Development	Fri 15-11-13	Thu 08-05-14											
93	Interface configuration Control Doc	Fri 15-11-13	Thu 12-12-13											
94	Test access Provisioning	Fri 15-11-13	Thu 28-11-13											
95	Test Plan	Fri 13-12-13	Thu 02-01-14											
96	Interoperability Testing	Fri 03-01-14	Thu 27-03-14											
97	Test Report	Fri 28-03-14	Thu 10-04-14											
98	Operational Configuration	Fri 11-04-14	Thu 24-04-14											
99	Traffic Cutover Plan	Fri 25-04-14	Thu 08-05-14											
100	Operational Procedures	Fri 03-01-14	Thu 13-03-14											
101	Provisioning	Fri 15-11-13	Wed 01-01-14											
102	Determine circuit vendor	Fri 15-11-13	Tue 26-11-13											
103	Order circuit	Wed 27-11-13	Tue 03-12-13											
104	International Vendor coordination	Wed 04-12-13	Tue 10-12-13											
105	Circuit implementation and testing	Wed 11-12-13	Tue 24-12-13											
106	Troubleshooting Procedures	Wed 25-12-13	Tue 31-12-13											
107	Circuit service acceptance	Wed 01-01-14	Wed 01-01-14											
108	Service implementation	Fri 09-05-14	Thu 26-06-14											

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ID	Task Name	Start	Finish	2013		Half 1, 2014			Half 2, 2014			Half 1, 2015		
				Sep	Nov	Jan	Mar	May	Jul	Sep	Nov	Jan	Mar	
109	Circuit Cutover	Fri 09-05-14	Thu 05-06-14											
110	Pre-operational Testing	Fri 06-06-14	Thu 19-06-14											
111	TRAFFIC CUTOVER	Fri 20-06-14	Thu 26-06-14											
112	ICAO Confirmation	Fri 27-06-14	Fri 27-06-14											
113	Mexico-United States and Cuba-Mexico	Mon 07-10-13	Mon 23-03-15											
114	Planning and management	Mon 07-10-13	Mon 30-06-14											
115	Technical letter signed	Mon 07-10-13	Fri 24-01-14											
116	documentation exchange	Mon 27-01-14	Fri 07-03-14											
117	requirements/ Concept Planning	Mon 10-03-14	Fri 18-04-14											
118	International Interconnection Definition	Mon 21-04-14	Fri 27-06-14											
119	ICAO notification	Mon 30-06-14	Mon 30-06-14											
120	Technical Development	Mon 30-06-14	Fri 06-02-15											
121	Interface configuration Control Doc	Mon 30-06-14	Fri 22-08-14											
122	Test access Provisioning	Mon 30-06-14	Fri 25-07-14											
123	Test Plan	Mon 25-08-14	Fri 03-10-14											
124	Interoperability Testing	Mon 06-10-14	Fri 26-12-14											
125	Test Report	Mon 29-12-14	Fri 09-01-15											
126	Operational Configuration	Mon 12-01-15	Fri 23-01-15											
127	Traffic Cutover Plan	Mon 26-01-15	Fri 06-02-15											
128	Operational Procedures	Mon 06-10-14	Fri 28-11-14											
129	Provisioning	Mon 18-08-14	Mon 06-10-14											
130	Determine circuit vendor	Mon 18-08-14	Fri 29-08-14											
131	Order circuit	Mon 01-09-14	Fri 19-09-14											
132	International Vendor coordination	Mon 22-09-14	Fri 26-09-14											
133	Circuit implementation and testing	Mon 29-09-14	Wed 01-10-14											
134	Troubleshooting Procedures	Thu 02-10-14	Fri 03-10-14											
135	Circuit service acceptance	Mon 06-10-14	Mon 06-10-14											
136	Service implementation	Mon 09-02-15	Fri 20-03-15											
137	Circuit Cutover	Mon 09-02-15	Fri 20-02-15											
138	Pre-operational Testing	Mon 23-02-15	Fri 06-03-15											
139	TRAFFIC CUTOVER	Mon 09-03-15	Fri 20-03-15											
140	ICAO Confirmation	Mon 23-03-15	Mon 23-03-15											
141	Cuba - United States	Wed 11-04-12	Mon 13-10-14											


















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ID	Task Name	Start	Finish	2013		Half 1, 2014			Half 2, 2014			Half 1, 2015		
				Sep	Nov	Jan	Mar	May	Jul	Sep	Nov	Jan	Mar	
142	Planning and management	Wed 11-04-12	Thu 03-05-12											
148	Technical Development	Mon 30-12-13	Fri 18-07-14											
149	Interface configuration Control Doc	Mon 06-01-14	Fri 31-01-14											
150	Test access Provisioning	Mon 30-12-13	Fri 24-01-14											
151	Test Plan	Mon 03-02-14	Fri 28-02-14											
152	Interoperability Testing	Mon 03-03-14	Fri 06-06-14											
153	Test Report	Mon 09-06-14	Fri 20-06-14											
154	Operational Configuration	Mon 23-06-14	Fri 04-07-14											
155	Traffic Cutover Plan	Mon 07-07-14	Fri 18-07-14											
156	Operational Procedures	Mon 03-03-14	Fri 23-05-14											
157	Provisioning	Mon 06-01-14	Mon 03-03-14											
158	Determine circuit vendor	Mon 06-01-14	Fri 17-01-14											
159	Order circuit	Mon 20-01-14	Fri 31-01-14											
160	International Vendor coordination	Mon 03-02-14	Fri 07-02-14											
161	Circuit implementation and testing	Mon 10-02-14	Fri 21-02-14											
162	Troubleshooting Procedures	Mon 24-02-14	Fri 28-02-14											
163	Circuit service acceptance	Mon 03-03-14	Mon 03-03-14											
164	Service implementation	Mon 21-07-14	Fri 10-10-14											
165	Circuit Cutover	Mon 21-07-14	Fri 15-08-14											
166	Pre-operational Testing	Mon 18-08-14	Fri 12-09-14											
167	TRAFFIC CUTOVER	Mon 15-09-14	Fri 10-10-14											
168	ICAO Confirmation	Mon 13-10-14	Mon 13-10-14											



APPENDIX D

Project: AMHS P
Date: Sun 20-10

Task		External Milestone		Manual Summary Rollup	
Split		Inactive Task		Manual Summary	
Milestone		Inactive Milestone		Start-only	
Summary		Inactive Summary		Finish-only	
Project Summary		Manual Task		Deadline	
External Tasks		Duration-only		Progress	