

**Agenda Item 2: Follow up to the implementation of the ATN architecture and its applications in the SAM Region and considerations to support the meteorology service in the aeronautical applications**

**FOLLOW-UP TO AMHS IMPLEMENTATION AND INTERCONNECTION IN THE SAM REGION**

(Presented by the Secretariat)

<b>SUMMARY</b>	
This working paper presents a follow-up to regional activities pertaining to AMHS implementation and interconnection.	
<b>REFERENCES</b>	
<ul style="list-style-type: none"> <li>• Report of SAM/IG/8 meeting (Lima, Perú, 10-14 October 2011);</li> <li>• Report of the first meeting of the GREPECAS Programmes and Projects Review Committee (PPRC/) (Mexico City, Mexico, 25-27 April 2012), and</li> <li>• Report of SAM/IG/9 meeting (Lima, Peru, 14-18 may 2012).</li> </ul>	
<b>ICAO strategic objectives:</b>	<i>A – Safety</i> <i>C - Environmental Protection and Sustainable Development of Air Transport</i>

**1. Background**

1.1 With AMHS implementation completed by Bolivia and Ecuador at the end of 2011, all SAM States, minus French Guiana (France) and Uruguay, have AMHS installed.

1.2 Panama has purchased a new AMHS from Thales, which will substitute the current basic AMHS. The operation of the new system is scheduled for the end of the last quarter of 2012. Uruguay has drafted, with the support of the ICAO Technical Cooperation, a technical specifications document for the purchasing, installation and operation of an AMHS, and its installation is scheduled for 2013. **Appendix A** to this working paper shows the current AMHS installed in the SAM Region. .

**2. Analysis**

2.1 Works for the interconnection of the two first AMHS installed in the SAM Region were completed in March 2012: The Ezeiza MTA installed in 2005, and the Asuncion MTA installed in 2007. In this manner, three are now the MTA interconnections in the SAM Region using P1 Protocol (Argentina-Paraguay, Colombia-Peru and Guyana-Suriname).

2.2 In the beginning of 2012, a Memorandum of Understanding (MoU) for the interconnection of AMHS in the Region was signed between Ecuador-Peru. This MoU specifies that the trial period would start in the first quarter of 2012, and the operation, by the end of March 2012.

2.3 Since SAM/IG/8 meeting, MoUs for AMHS interconnection between Chile-Peru and Peru-Venezuela pend completion. The MoUs have been examined technically and operationally-wise, and signed by one of the parties. **Appendix B** shows the updated action plan on AMHS interconnection in the SAM Region.

2.4 With the aim of supporting MHS interconnection in the SAM Region and considering that practically all States have implemented the AMHS, the *Course on ATS Message Handling System (COM-AMHS) and Interconnection Aspects* was conducted in Lima, Peru, from 16 to 20 July 2012.

2.5 The objective of the Course was to present information on the technical design of an AMHS (data networks, server topology, user configuration, routing tables, monitoring and supervision tools, interconnection with other AMHS, etc.), as well as on operational topics such as the design of a certain routing, the correct routing policies, migration strategies from AFTN to AMHS, with particular attention on contents related with AMHS interconnection and resolution of operational procedures and scaling of incidences.

2.6 In addition, a *Seminar/Workshop on the implementation of ground-ground and air-ground data links in the SAM Region* (Lima, 10-12 September 2012) has been scheduled, which, among other things, will establish a forum between air navigation services providers and manufacturers to support the Region in completing AMHS interconnection

2.7 AMHS interconnection in the Region is being carried out through the VSAT based REDDIG digital network, currently expected to be substituted by a new ground satellite network in the beginning of 2014.

### 3. **Action suggested**

3.1 The Meeting is invited to:

- a) Note the information presented;
- b) Analyze the progress made in AMHS implementation and interconnection, indicated in section 2 and in Appendices A and B of this working paper; and
- c) Analyze any other aspects related with this agenda item that the Meeting might deem necessary.

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## APPENDIX A / APENDICE A

**STATUS OF IMPLEMENTATION OF AMHS IN THE SAM REGION  
ESTADO DE IMPLANTACION DE LOS SISTEMAS AMHS EN LA REGION SAM**

STATE/ ESTADO	MANUFACTURER/ FABRICANTE	YEAR OF INSTALLATION/ AÑO DE INSTALACION	REMARKS/ OBSERVACIONES
ARGENTINA	RADIOCOM	Dec 2005	Three MTAs installed: Ezeiza, Cordoba and Comodoro Rivadavia/ Se tienen instalados tres MTA: Ezeiza; Córdoba; y Comodoro Rivadavia  Ezeiza MTA connected with MTA Asuncion using P1 protocol (March 2012) / MTA Ezeiza conectado con Protocolo P1 con el MTA de Asunción (Marzo 2012)
BOLIVIA	THALES	Dec 2011	Equipment installed at the end of 2011 / Equipos instalados a finales del 2011
BRASIL	RADIOCOM	Jun 2009	Two MTAs installed: Brasilia; and Manaus / Se tienen instalados dos MTA: Brasilia; y Manaus
CHILE	THALES	Jun 2010	The AMHS system was completed by the end of 2010 / El sistema AMHS se completó a finales del 2010
COLOMBIA	COMSOFT	Dec 2009	AMHS interconnected with Peru. First AMHS interconnection in the CAR SAM Region / Está interconectado con el AMHS con Perú. Primera interconexión AMHS en las Regiones CAR/SAM
ECUADOR	THALES	Feb 2012	A new AMHS from Thales was installed and in operation since February 2012 / Un nuevo sistema AMHS de la marca Thales fue instalado y está en operación desde febrero de 2012
GUYANA	SKYCOM	2011	Operational since May 2011. AMHS interconnected with Surinam, with P1 Protocol / En operación desde finales de mayo 2011. Está interconectado en AMHS con Surinam con protocolo P1
FRENCH GUIANA (FRANCE)	AFTN SIGMA	2009 2012	Version 17 will be installed in June 2012 / La versión V17 se realizará en junio de 2012
PANAMA	COCESNA THALES	End of 2013 / Finales de 2013	Panama approved the acquisition of a new AMHS system from THALES, the same it is expected to be in operation at the end of the first quarter 2013 / Panamá aprobó la adquisición de un Nuevo sistema AMHS de la marca Thales que estará operacionalmente en operación a finales del primer trimestre de 2013
PARAGUAY	RADIOCOM	2007	An update of its AMHS was made in March 2012 / Una actualización del sistema AMHS se realizó en marzo de 2012
PERU	COMSOFT	Jun 2009	AMHS interconnected with Colombia since November 2010. First AMHS interconnection in the CAR/SAM Regions / Está interconectado con el AMHS con Colombia desde noviembre de 2010. Primera interconexión AMHS en las Regiones CAR/SAM

<b>STATE/ ESTADO</b>	<b>MANUFACTURER/ FABRICANTE</b>	<b>YEAR OF INSTALLATION/ AÑO DE INSTALACION</b>	<b>REMARKS/ OBSERVACIONES</b>
SURINAME	SKYCOM	2011	Operational since the start of 2011. Interconnected with Guyana / En operación desde inicios de 2011. Interconectado con Guyana
URUGUAY	AFTN from Global Weather	End of 2013 / Finales de 2013	Currently in the purchasing process / Se encuentra en el proceso de adquisición
VENEZUELA	RADIOCOM	2010	AMHS installed since the end of 2010 / Sistema AMHS instalado desde finales del 2010

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## APPENDIX B

## ACTION PLAN FOR THE INTERCONNECTION OF AMHS SYSTEMS IN THE SAM REGION

ITEM	ACTIVITY	RESPONSIBLE	EXPECTED RESULT	STATUS	FINALIZATION DATE
1	2	3	4	5	6
1	Review of the ATN Regional Plan as regards AMHS implementation	Secretariat	Revised ATN ground applications plan (Table CNS 1Bb)	Completed	Jun 2009
2	Review and assignment of intra-regional routers IP addressing	Secretariat	Assignment of IP addressing	Completed	Jun 2009
3	Review of CAAAS addressing plan	SAM States	Revised CAAS addressing Plan	Completed	Jun 2009
4	Prepare interconnection protocol tests to determine bandwidth required for transmission of AMHS messages between MTAs through REDDIG	RLA/06/901 project CNS Expert	Protocol interconnection tests. A guide for the operational interconnection of AMHS systems was drafted	Completed	Dec 2009
5	Preparation of Guide for the Operational Interconnection of AMHS Systems in the SAM Region	RLA/06/901 project CNS Expert	Guide for the operational interconnection of AMHS systems in the SAM Region	Completed	Oct 2009
6	Drafting of a model MoU for the interconnection of AMHS	Argentina	Model MoU for the interconnection of AMHS	Completed	Oct 2009
7	<p>MoU for the interconnection of AMHS currently implemented in the SAM Region:</p> <p>a) Argentina-Brazil b) Argentina-Chile c) Argentina-Peru d) Argentina-Paraguay e) Brazil-Colombia f) Brazil-Paraguay g) Brazil-Peru h) Chile-Peru i) Colombia-Peru j) Colombia-Panama k) Colombia-Venezuela l) Peru-Venezuela m) Brazil-Suriname n) Guyana-Venezuela o) Suriname-Venezuela p) Brazil-Guyana q) Guyana-Suriname r) Brazil-Venezuela s) Bolivia-Peru t) Bolivia-Brazil u) Bolivia-Argentina v) Ecuador-Peru w) Ecuador-Colombia x) Ecuador-Venezuela y) Bolivia-Paraguay</p> <p>The AMHS interconnection MoU in French Guiana (France) and Uruguay should be drafted once AMHS installation is completed at national level.</p>	SAM States involved	MoU for interconnection of AMHS systems between SAM States having AMHS implemented	Valid a), b) c), d), f), g), i), q) & v) completed	<p>h) Oct 2012 j) Mar 2013 k) Oct 2012 SAMIG10 l) Jul 2012 m) Oct 2012 SAMIG10 n) Oct 2012 SAMIG10 o) Oct 2012 p) Oct 2012 r) Oct 2012 s) Oct 2012 SAMIG10 t) Dec 2012 u) Oct 2012 SAMIG10 w) Mar 2013 x) Mar 2013 y) Oct 2012 SAMIG10</p>

ITEM	ACTIVITY	RESPONSIBLE	EXPECTED RESULT	STATUS	FINALIZATION DATE
1	2	3	4	5	6
8	<p>Phase I Interconnection trials between MTAs of:</p> <p>a) Argentina-Brazil b) Argentina-Paraguay c) Brazil-Paraguay d) Colombia-Peru e) Argentina-Chile f) Argentina-Peru g) Brazil-Peru h) Guyana-Suriname i) Ecuador-Peru j) Brazil-Colombia</p> <p>Types of tests to carry out: Network transportation; Network connectivity; Message exchange; Preparatory phase.</p> <p><b>Note:</b> Inclusion has been made of only the AMHS interconnected between States having implemented and signed the MoU.</p>	Argentina, Brazil, Chile, Colombia, Paraguay, Peru and REDDIG Administration	Interconnection trials between Argentina, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru and Suriname MTAs	Valid a) message exchange trials were held between Brasilia (Brazil) and CIPE (Argentina) MTAs c) MoU was updated, as entrance node to Brazil will be Curitiba, and the network connectivity, and transport and exchange of messages tests will be carried out. b), d) and h) Operational interconnection trials completed c), e), i), and j) No tests carried out f) operational trial pending	<p>a) Jun 2012 b) Mar 2012 c) Oct 2012 d) Oct 2010 e) Oct 2012 f) Aug 2012 g) Jun 2012 h) Jun 2011 i) Oct 2012 j) Dec 2012</p>
9	<p>Operational interconnection implementation at the following MTAs:</p> <p>a) Argentina-Paraguay b) Argentina-Brazil c) Argentina-Chile d) Argentina-Peru e) Brazil-Paraguay f) Brazil-Peru g) Colombia-Peru h) Guyana-Suriname i) Ecuador-Peru j) Brazil-Colombia</p> <p><b>Note:</b> Inclusion has been made of only the AMHS interconnected between States having implemented and signed the MoU.</p>	Argentina, Brazil, Chile, Colombia, Paraguay and Peru	Operational implementation of AMHS systems	AMHS interconnection completed between following MTA, using P1 protocol and operational: Colombia-Peru Guyana-Suriname Argentina-Paraguay	<p>a) Mar 2012 b) Jun 2012 c) TBD d) Oct 2012 e) Dec 2012 f) Oct 2012 i) Dec 2012 j) Mar 2013</p>

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