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**Agenda Item 6:           Assessment of operational requirements in order to determine the  
implementation of communications and surveillance (CNS) capabilities  
improvement for en-route and terminal area operations**

**FOLLOW-UP TO THE ACTION PLAN FOR AMHS INTERCONNECTION IN THE SAM  
REGION**

(Presented by the Secretariat)

<b>SUMMARY</b>	
This working paper presents a follow-up analysis to the activities taken under consideration in the action plan for the interconnection of AMHS in the SAM Region, examined during the sixth workshop/meeting of the SAM Implementation Group.	
<b>Reference:</b>	
Sixth workshop/meeting of the SAM Implementation Group (SAM/IG/6) (RLA/06/901 project) Lima, Peru, 18-22 October 2010.	
<b>ICAO strategic objectives:</b>	<i>A – Safety; and C - Environmental protection and sustainable development of air transport</i>

**1.                   Background**

1.1               The action plan drafted by the SAM/IG for the interconnection of AMHS was updated during the sixth workshop/meeting of the SAM Implementation Group (SAM/IG/6).

***Implementation of new AMHS in the SAM Region***

1.2               **Appendix A** to this working paper presents the actual situation with regard to the installation of AMHS in the SAM Region. It additionally indicates the manufacturer of the equipment, and date of installation.

1.3               The latest AMHS installed in the Region are those of Guyana and Suriname, which were completed in the first quarter of 2011.

1.4               With regard to the States soon to install an AMHS, Bolivia has purchased a Thales system which has arrived in the country in March 2011 and is expected to be nationally in operation by the end of 2011 (information provided by the delegate of Bolivia at the fourteenth meeting of the REDDIG Coordination Committee meeting held in Lima, Peru, from 16 to 18 march 2011).

1.5 In addition, Ecuador informed it had completed the bidding process for an AMHS, having already selected the winner and estimating its implementation at the beginning of 2012. Uruguay also informed it was in the bidding process phase, estimating the installation and operation by the end of 2012.

1.6 In this respect, by the end of 2012 all SAM States will have implemented and operational their AMHS, pending only French Guiana (France).

### ***AMHS interconnection***

1.7 With the aim of coordinating the activities pertaining to AMHS interconnection among SAM States, memoranda of understanding (MoU) have been drafted between pairs of States, following the model MoU elaborated by the SAM/IG, with the support of RLA/06/901 project.

1.8 The MoU for the interconnection of AMHS drafted and signed by the parties involved in the SAM Region are the following: Argentina –Paraguay, Argentina –Brazil, Brazil-Paraguay, Argentina –Chile, Argentina –Peru, Brazil-Peru and Colombia-Peru.

1.9 SAM/IG/6 meeting, taking in consideration the delay in the implementation of the drafted MoUs (some of them drafted in 2009), mostly due to the great dependence some States have with their respective providers for the task, urged States to require from their providers the support necessary to successfully end the necessary interconnections; make necessary arrangements to train personnel in the interconnection tasks, with the aim of minimizing the dependency with their providers; and maximize pertinent coordinations, by formulating Conclusion SAM/IG/6-9 – *Actions required for AMHS interconnection*.

1.10 In this respect, it should be highlighted that in the beginning of 2010 the first AMHS interconnection between Colombia and Peru was implemented in the CAR/SAM Regions, through REDDIG. For the interconnection, the IPv4 addressing scheme approved for implementation in the CAR/SAM Regions through GREPECAS Conclusion 16/37, was used.

## **2. Analysis**

2.1 It is expected that during this meeting Argentina, Brazil, Chile, Colombia, Peru and Paraguay inform on the progress made in the interconnection of their AMHS, in follow-up to the activities to be implemented and specified in the MoUs that States have drafted and signed in this regard.

2.2 It is also expected that during this Meeting, MoUs between Brazil–Colombia, Chile–Peru and Colombia –Panamá can be revised and signed, as per SAM/IG/5 meeting considerations.

2.3 In addition, in view of the AMHS implementation in Guyana, Suriname and Venezuela, MoUs between Brazil-Guyana, Brazil-Suriname, Brazil-Venezuela, Colombia-Venezuela, Guyana-Suriname, Guyana-Venezuela, Peru-Venezuela and Suriname-Venezuela are required for the interconnection of their AMHS. The action plan for AMHS interconnection is shown in **Appendix B** to this working paper.

2.4 Interregionally, Brazil has established an agreement with Spain for the interconnection of AMHS, through the use of the CAFSAT satellite network. In addition, Argentina has been coordinating AMHS interconnection tests with Spain, also through the CAFSAT. The implementation of these systems is scheduled for the end of 2011.

2.5 **Appendix C** to this working paper presents Table CNS 1Bb – ATN ground-ground applications plan, for the review of the Meeting.

3. **Action suggested**

3.1 The Meeting is invited to:

- a) Take note of the information presented;
- b) Analyze the progress made in AMHS interconnection in the SAM Region, as per the MoU signed and mentioned in paragraph 2.1 of this working paper;
- c) Examine and proceed, as possible, with the signature of the MoU for AMHS interconnection between the States indicated in paragraph 2.2;
- d) Draft MoUs for the interconnection of the AMHS specified in paragraph 2.3;
- e) Update CAR/SAM FASID Table CNS 1Bb in Appendix C of this working paper; and
- f) Analyze any other matters in this regard that the Meeting might consider 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	2005	Three MTAs installed: Ezeiza, Cordoba and Comodoro Rivadavia Se tienen instalados tres MTA: Ezeiza; Córdoba; y Comodoro Rivadavia
BOLIVIA	THALES	2011	Equipment in the country and national installation scheduled for the end of 2011 Todo el equipamiento ya se encuentra en el país y su instalación a nivel nacional está previsto para finales del 2011
BRASIL	RADIOCOM	2009	Two MTAs installed: Brasilia; and Manaus Se tienen instalados dos MTA: Brasilia; y Manaus
CHILE	THALES	2010	
COLOMBIA	COMSOFT	2009	AMHS interconnected with Peru. Only interconnection in the Region. Está interconectado en AMHS con Perú. Única interconexión en la Región
ECUADOR	RADIOCOM	2007	AMHS installed only in Guayaquil and operates only there, consists of an MTA and some terminals. Ecuador has purchased a new AMHS to become operational nationally in the beginning of 2012 El sistema AMHS está instalado únicamente en Guayaquil y funciona solamente en esa localidad consiste de un MTA y algunos terminales. Ecuador ha adquirido un nuevo sistema AMHS que estará en operación a nivel nacional a principio de 2012
GUYANA	SKYCOM	2011	Operational at the end of May 2011 Finales de mayo 2011 puesta en operación
FRENCH GUIANA (FRANCE)			No information available regarding AMHS implementation plans No se tiene información de planes para la implantación de un sistema AMHS
PANAMA	COCESNA	2009	
PARAGUAY	RADIOCOM	2007	
PERU	COMSOFT	2009	
SURINAME	SKYCOM	2011	Operational since the start of 2011 En operación desde inicios de 2011
URUGUAY			Currently in the purchasing process Se encuentra en el proceso de adquisición
VENEZUELA	RADIOCOM	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> <ul style="list-style-type: none"> <li>a) Argentina-Brazil</li> <li>b) Argentina-Chile</li> <li>c) Argentina-Peru</li> <li>d) Argentina-Paraguay</li> <li>e) Brazil-Colombia</li> <li>f) Brazil-Paraguay</li> <li>g) Brazil-Peru</li> <li>h) Chile-Peru</li> <li>i) Colombia-Peru</li> <li>j) Colombia-Panama</li> <li>k) Colombia-Venezuela</li> <li>l) Peru-Venezuela</li> <li>m) Brazil-Suriname</li> <li>n) Guyana-Venezuela</li> <li>o) Suriname-Venezuela</li> <li>p) Brazil-Guyana</li> <li>q) Brazil-Suriname</li> <li>r) Guyana-Suriname</li> <li>s) Brazil-Venezuela</li> </ul> <p>The AMHS interconnection MoU in Bolivia, Ecuador, 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) completed	<ul style="list-style-type: none"> <li>e) May 2011</li> <li>h) May 2011</li> <li>j) Oct 2011</li> <li>k) Oct 2011</li> <li>l) May 2011</li> <li>m) May 2011</li> <li>n) Oct 2011</li> <li>o) Oct 2011</li> <li>p) Oct 2011</li> <li>q) Jun 2011</li> <li>r) Oct 2011</li> <li>s) Oct 2011</li> </ul>

ITEM	ACTIVITY	RESPONSIBLE	EXPECTED RESULT	STATUS	FINALIZATION DATE
1	2	3	4	5	6
8	<p>Phase I Interconnection trials between MTAs of:</p> <ul style="list-style-type: none"> <li>a) Argentina-Brazil</li> <li>b) Argentina-Paraguay</li> <li>c) Brazil-Paraguay</li> <li>d) Colombia-Peru</li> <li>e) Argentina-Chile</li> <li>f) Argentina-Peru</li> <li>g) Brazil-Peru</li> </ul> <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 and Paraguay MTAs	<p>Valid</p> <ul style="list-style-type: none"> <li>a) network transportation and connectivity trials carried out with the Manaus node. MoU was updated, since Brazilian entrance node will be Curitiba. Network connectivity, and transport and exchange of messages tests will be repeated</li> <li>b) network transportation and connectivity, and message exchanges trials carried out.</li> <li>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.</li> <li>d) Operational interconnection trials completed.</li> <li>e), f) and g) No tests carried out</li> </ul>	<ul style="list-style-type: none"> <li>a) Mar 2011</li> <li>b) May 2011</li> <li>c) May 2011</li> <li>e) Mar 2011</li> <li>f) May 2011</li> <li>g) May 2011</li> </ul>
9	<p>Operational interconnection implementation at the following MTAs:</p> <ul style="list-style-type: none"> <li>a) Argentina-Paraguay</li> <li>b) Argentina-Brazil</li> <li>c) Argentina-Chile</li> <li>d) Argentina-Peru</li> <li>e) Brazil-Paraguay</li> <li>f) Brazil-Peru</li> <li>g) Colombia-Peru</li> </ul> <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	Colombia and Peru completed and operating	<ul style="list-style-type: none"> <li>a) Jun 2011</li> <li>b) Jun2011</li> <li>c) Jun 2011</li> <li>d) Jun 2011</li> <li>e) Jun 2011</li> <li>f) Jun2011</li> </ul>

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## APPENDIX C / APENDICE C

**TABLE CNS 1BB –GROUND-GROUND APPLICATIONS PLAN / TABLA CNS1 Bb – PLAN DE APLICACIONES TIERRA-TIERRA  
SAM REGION / REGIÓN SAM**

ATN GROUND-GROUND APPLICATIONS PLAN / PLAN DE APLICACIONES TIERRA-TIERRA					
Administration and Location/ Administración y localidad	Application Type/ Tipo de Aplicación	Conneted with Administration & Location of/ Conectada con Administración y Localidad de	Used Standard / Norma usada	Implementation Date/ Fecha de Implementación	Remarks/ Observaciones
1	2	3	4	5	6
Argentina, Buenos Aires	AMHS	Bolivia	IPS	TBD	
		Brasil	IPS	2010	
		Chile	IPS	2011	
		Paraguay	IPS	2010	
		Peru	IPS	2010	
		Uruguay	IPS	TBD/Por determinar	
		AFI	IPS	TBD/Por determinar	
	AIDC	Bolivia	IPS	TBD/Por determinar	
		Brasil	IPS	2012	
		Chile	IPS	2012	
		Paraguay	IPS	TBD/Por terminar	
		Uruguay	IPS	2012	
		AFI	IPS	TBD/Por terminar	
Bolivia , La Paz	AMHS	Argentina	IPS	TBD/Por terminar	
		Brasil	IPS	TBD/Por terminar	
		Peru	IPS	TBD/Por terminar	
	AIDC	Argentina	IPS	TBD/Por terminar	
		Brasil	IPS	TBD/Por terminar	
		Peru	IPS	TBD/Por terminar	

ATN GROUND-GROUND APPLICATIONS PLAN / PLAN DE APLICACIONES TIERRA-TIERRA					
Administration and Location/ Administración y localidad	Application Type/ Tipo de Aplicación	Conneted with Administration & Location of/ Conectada con Administración y Localidad de	Used Standard / Norma usada	Implementation Date/ Fecha de Implementación	Remarks/ Observaciones
1	2	3	4	5	6
Brazil, Brasilia	AMHS	Argentina	IPS	2010	
		Bolivia	IPS	TBD	
		Paraguay	IPS	2010	
		Uruguay	IPS	TBD/Por determinar	
		NAM	IPS	TBD/Por determinar	
		EUR	IPS	TBD/Por determinar	
		AFI	IPS	TBD/Por determinar	
	AIDC	Argentina	IPS	2012	
		Bolivia	IPS	TBD/Por determinar	
		Paraguay	IPS	2012	
		Uruguay	IPS	2012	
		NAM	IPS	TBD/Por determinar	
		AFI	IPS	TBD/Por determinar	
Brazil, Manaus	AMHS	Colombia	IPS	2010	
		Guyana	IPS	TBD/Por determinar	
		Guyana Francesa	IPS	TBD/Por determinar	
		Perú	IPS	2010	
		Surinam	IPS	TBD/Por determinar	
		Venezuela	IPS	2012	
	AIDC	Colombia	IPS	TBD/ Por determinar	
		Guyana	IPS	TBD/ Por determinar	
		Guyana Francesa	IPS	TBD/ Por determinar	
		Perú	IPS	2012	
		Surinam	IPS	TBD/ Por determinar	
		Venezuela	IPS	TBD/ Por determinaar	



ATN GROUND-GROUND APPLICATIONS PLAN / PLAN DE APLICACIONES TIERRA-TIERRA					
Administration and Location/ Administración y localidad	Application Type/ Tipo de Aplicación	Conneted with Administration & Location of/ Conectada con Administración y Localidad de	Used Standard / Norma usada	Implementation Date/ Fecha de Implementación	Remarks/ Observaciones
1	2	3	4	5	6
Chile, Santiago	AMHS	Argentina	IPS	2011	
		Peru	IPS	2011	
		PAC	IPS	TBD	
	AIDC	Argentina	IPS	2012	
		Perú	IPS	TBD/ Por determinar	
		PAC	IPS	TBD/ Por determinar	
Colombia , Bogotá	AMHS	Brazil	IPS	2010	
		Ecuador	IPS	TBD	
		Panamá	IPS	2011	
		Perú	IPS	2010	
		Venezuela	IPS	2011	
	AIDC	Brazil	IPS	TBD/ Por determinar	
		Ecuador	IPS	TBD/ Por determinar	
		Perú	IPS	TBD/ Por determinar	
Ecuador ,Quito	AMHS	Venezuela	IPS	TBD/ Por determinar	
		Colombia	IPS	TBD/ Por determinar	
		Peru	IPS	TBD/ Por determinar	
	AIDC	Venezuela	IPS	TBD/ Por determinar	
		Peru	IPS	TBD/ Por determinar	
		Venezuela	IPS	TBD/ Por determinar	
French Guiana, Cayenne Guyana Francesa, Cayena	AMHS	Brazil	IPS	TBD/ Por determinar	
		Venezuela	IPS	TBD/ Por determinar	
	AIDC	Brazil	IPS	TBD/ Por determinar	
		Venezuela	IPS	TBD/ Por determinar	

ATN GROUND-GROUND APPLICATIONS PLAN / PLAN DE APLICACIONES TIERRA-TIERRA					
Administration and Location/ Administración y localidad	Application Type/ Tipo de Aplicación	Conneted with Administration & Location of/ Conectada con Administración y Localidad de	Used Standard / Norma usada	Implementation Date/ Fecha de Implementación	Remarks/ Observaciones
1	2	3	4	5	6
Guyana, Georgetown	AMHS	Brazil	IPS	TBD/ Por determinar	
		Suriname	IPS	TBD/ Por determinar	
		Trinidad Tobago	IPS	TBD/ Por determinar	
		Venezuela	IPS	TBD/ Por determinar	
	AIDC	Brazil	IPS	TBD/ Por determinar	
		Trinidad Tobago	IPS	TBD/ Por determinar	
		Venezuela	IPS	TBD/ Por determinar	
Panamá, Panamá	AMHS	Colombia	IPS	2011	
		NAM	IPS	TBD/ Por determinar	
	AIDC	Colombia	IPS	TBD/ Por determinar	
Paraguay, Asunción	AMHS	Argentina	IPS	2010	
		Brazil	IPS	2010	
	AIDC	Argentina	IPS	TBD/ Por determinar	
		Brazil	IPS	TBD/ Por determinar	
Peru, Lima	AMHS	Argentina	IPS	2010	
		Bolivia	IPS	TBD/ Por determinar	
		Brazil	IPS	2010	
		Chile	IPS	2011	
		Colombia	IPS	2010	
		Ecuador	IPS	TBD/ Por determinar	
		Venezuela	IPS	2011	
		NAM	IPS	TBD/ Por determinar	
	AIDC	Argentina	IPS	2012	
		Bolivia	IPS	TBD/ Por determinar	
		Brazil	IPS	2012	
		Chile	IPS	TBD/ Por determinar	
		Colombia	IPS	TBD/ Por determinar	
		Ecuador	IPS	TBD/ Por determinar	

ATN GROUND-GROUND APPLICATIONS PLAN / PLAN DE APLICACIONES TIERRA-TIERRA					
Administration and Location/ Administración y localidad	Application Type/ Tipo de Aplicación	Conneted with Administration & Location of/ Conectada con Administración y Localidad de	Used Standard / Norma usada	Implementation Date/ Fecha de Implementación	Remarks/ Observaciones
1	2	3	4	5	6
Suriname, Paramaribo	AMHS	Brazil	IPS	TBD/ Por determinar	
		Guyana	IPS	TBD/ Por determinar	
		Venezuela	IPS	TBD/ Por determinar	
	AIDC	Brazil	IPS	TBD/ Por determinar	
		French Guyana	IPS	TBD/ Por determinar	
		Venezuela	IPS	TBD/ Por determinar	
Uruguay, Montevideo	AMHS	Argentina	IPS	TBD/ Por determinar	
		Brazil	IPS	TBD/ Por determinar	
	AIDC	Argentina	IPS	2012	
		Brazil	IPS	2012	
Venezuela, Caracas	AMHS	Brazil	IPS	2012	
		Colombia	IPS	2011	
		Ecuador	IPS	TBD/ Por determinar	
		Guyana	IPS	TBD/ Por determinar	
		Guyana Francesa	IPS	TBD/ Por determinar	
		Peru	IPS	2011	
		Suriname	IPS	TBD/ Por determinar	
		NAM	IPS	TBD/ Por determinar	
		CAR	IPS	TBD/ Por determinar	
		EUR	IPS	TBD/ Por determinar	
	AIDC	Brasil	IPS	TBD/ Por determinar	
		Colombia	IPS	TBD/ Por determinar	
		Guyana	IPS	TBD/ Por determinar	
		Surinam	IPS	TBD/ Por determinar	
		CAR	IPS	TBD/ Por determinar	