



Agenda Item 4: Assessment of operational requirements in order to determine the implementation of communications, navigation, and surveillance (CNS) capabilities improvement for en-route and terminal area operations

Follow-up to the activities of Project D2 - Ground-ground and air-ground applications in the SAM Region

(Presented by the Coordinator)

SUMMARY	
This working paper presents information on the progress made in the AMHS interconnection.	
REFERENCES	
<ul style="list-style-type: none"> • Report of the Twelfth Workshop/Meeting of the SAM Implementation Group (SAM/IG/12) (Lima, 14 to 18 October 2013); and • Project D2 – Ground-ground and Air-ground applications in the SAM Region. 	
ICAO strategic objectives:	<i>A – Safety</i> <i>E – Environmental protection</i>

1. Background

1.1 The SAM Region started its plan in 2005 to migrate the Aeronautical Fixed Telecommunications Network (AFTN) to the ATS Message Handling System (AMHS). To date, practically all SAM States count with an AMHS implemented, with the exception of French Guiana (France) and Uruguay. Uruguay expects to have its AMHS operational by April 2014.

1.2 The aim of the AMHS interconnection is to replace the current AFTN circuits by new ones, permitting the transmission of greater amount of information (ATS data) at a greater speed, through the use of the REDDIG regional digital network.

2. Analysis

2.1 AMHS interconnection started in 2010, when many SAM States had implemented their AMHS. To date, four AMHS have been interconnected. The connections were carried out through REDDIG, using the IP protocol.

2.2 There have been difficulties in the international operational interconnection between systems from different providers, due to interconnectivity problems. In spite of the efforts that all States involved are carrying out, we have yet to identify the causes hindering the expected results. During the twelfth workshop/meeting of the SAM Implementation Group (SAM/IG/12) (Lima, 14-18 October 2013) the following conclusion was formulated:

Conclusion SAM/IG/12-3 International AMHS interconnection

That, with regard to international operational AMHS interconnections and with the aim of solving apparent incompatibility problems between the systems installed in Argentina, Brazil and Venezuela with the AMHS in Peru, these States carry out corresponding efforts so:

- a) Their providers determine and inform the precise causes preventing the interconnections, and appropriately indicate the procedures to solve them; and
- b) They inform the results of the evaluation at SAM/IG/13 meeting.

2.3 The total AMHS interconnections required are 26. In addition, the goal set by the South American civil aviation authorities (Bogotá, Colombia, 4-6 December 2013, “Bogota Declaration”), is to achieve 100% of the AMHS interconnected by the end of 2016, as per the following distribution: 1 by 2013, 11 by 2014, 5 by 2015 and 5 by 2016. Their implementation, distributed by State, is shown in **Appendix A** to this working paper.

2.4 With the aim of interconnecting the AMHS in Argentina and Brazil, and in compliance with Phase 1 (flight plan exchange only between both States), message submittance trials were conducted with no inconveniences between the following terminals:

- a) AMHS-AMHS;
- b) AFTN-AMHS; and
- c) AMHS-AFTN.

2.5 Also and for operational use, a new channel (Ezeiza/Manaus/Brasilia) will be configured through REDDIG, in addition to the current link (Ezeiza/Curitiba/Brasilia).

2.6 Argentina and Uruguay have started interconnection tests between both States.

2.7 Brazil is updating of the software licenses of its AMHS. In addition, it continues with trials with Peru for the interconnection of their AMHS (different manufacturers). New tests are foreseen for April or May, when representatives from Comsoft (Germany) and Atech (Brazil) will be intervening, in addition to the staff from both States aeronautical administrations.

2.8 **Appendices B and C** to this working paper present an updating to the progress made to Project D2 - *Ground-ground and air-ground applications in the SAM Region*.

3. Action suggested

3.1 The Meeting is invited to:

- a) Take note of the information provided;
- b) Analyse the compliance goals indicated in Section 2 and in Appendix A and start with their updating on the basis of the national action plans established to this end; and
- c) Present any other considerations in this regard that the Meeting might deem necessary.

APPENDIX A / APENDICE A

**AMHS INTERCONNECTION REQUIREMENTS AND DATES OF IMPLEMENTATION
REQUERIMIENTOS DE INTERCONEXIÓN AMHS Y FECHAS DE IMPLEMENTACION**

STATE ESTADO	AMHS INTERCONNECTION REQUIREMENT/ REQUERIMIENTO DE INTERCONEXION AMHS	DATE OF IMPLEMENTATION/ FECHA IMPLEMENTACION	REMARKS/ OBSERVACIONES
Argentina	Bolivia	Mar 2016	
	Brasil	Dic 2013	
	Chile	Dic 2014	
	Paraguay	Mar 2012	Implemented/Implantado
	Perú	Jul 2014	
	Uruguay	Dic 2015	
Bolivia	Argentina	Mar 2016	
	Brasil	Abr 2016	
	Perú	May 2016	
Brazil/Brasil	Argentina	Dic 2013	
	Bolivia	Abr 2016	
	Colombia	Dic 2014	
	Guyana	Mar 2015	
	French Guiana/ Guyana Francesa	TBD	AMHS implementation pending/ Falta Implantación AMHS
	Paraguay	Jul 2014	
	Perú	Jul 2014	
	Surinam	Mar 2016	
	Uruguay	Dic 2015	
	Venezuela	Dic 2014	
Chile	Argentina	Dic 2014	
	Perú	Dic 2014	
Colombia	Brasil	Dic 2014	
	Ecuador	Dic 2014	
	Panamá	Dic 2014	
	Perú	Sep 2010	Implemented/Implantado
	Venezuela	Mar 2015	
Ecuador	Colombia	Dic 2014	
	Perú	Julio 2012	Implemented/Implantado
	Venezuela	May 2015	

STATE ESTADO	AMHS INTERCONNECTION REQUIREMENT/ REQUERIMIENTO DE INTERCONEXION AMHS	DATE OF IMPLEMENTATION/ FECHA IMPLEMENTACION	REMARKS/ OBSERVACIONES
French Guiana (France)/ Guyana Francesa (Francia)	Brasil	TBD	AMHS implementation pending/ Falta Implantación AMHS
	Venezuela	TBD	AMHS implementation pending/ Falta Implantación AMHS
Guyana	Brasil	Mar 2015	
	Surinam	Jun 2011	Implemented/Implantado
	Venezuela	Dic 2014	
Panamá	Colombia	Dic 2014	
Paraguay	Argentina	Mar 2012	Implemented/Implantado
	Brasil	Jul 2014	
Perú	Argentina	Jul 2014	
	Bolivia	May 2016	
	Brasil	Jul 2014	
	Chile	Dic 2014	
	Colombia	Sep 2010	Implemented/Implantado
	Ecuador	Jul 2012	Implemented/Implantado
	Venezuela	Dic 2014	
Suriname	Brasil	Mar 2016	
	Guyana	Jun 2011	Implemented/Implantado
	Venezuela	Mar 2016	
Uruguay	Argentina	Dic 2015	
	Brasil	Dic 2015	
Venezuela	Brasil	Dic 2014	
	Colombia	Mar 2015	
	Ecuador	May 2015	
	Guyana	Dic 2014	
	French Guiana Guyana Francesa	TBD	AMHS implementation pending/ Falta Implantación AMHS
	Perú	Dic 2014	
	Surinam	Mar 2016	

APPENDIX B

SAM Region	PROJECT DESCRIPTION (PD)	PD N° D2	
Programme	Project Title	Starting Date	Ending Date
Ground-ground and Air-ground Telecommunications Infrastructure <i>(Programme Coordinator: Onofrio Smarrelli)</i>	ATN Ground-ground and Air-ground Applications in the SAM Region <i>Project Coordinator: Gustavo Chiri (Argentina)</i> <i>Contributing experts: Javier Vittor (Argentina), Ruben Guillermo Silva (Argentina)</i> <i>Andres Jansen (Brazil)</i>	May 2010	Diciembre 2016
Objective	Develop the implementation of ATN ground-ground and air-ground applications in the SAM Region		
Scope	Implementation of SAM ATN ground-ground and air-ground applications, including, at least: <ul style="list-style-type: none"> • Operational integration of international AMHS connections in the SAM Region • Operational integration of international AIDC connections in the SAM Region • Guidelines for the implementation of ground-air data in the SAM Region • Guideline for the implementation of AIDC 		
Metrics	<ul style="list-style-type: none"> • Number of AMHS interconnections as per CAR/SAM FASID Table 1Bb • Number of AIDC interconnections as per CAR/SAM FASID Table 1Bb • Drafting of following guidelines: Guideline for the implementation of AIDC / Guideline for the implementation of ground-air data links in terminal, approach and aerodrome areas / DCL, DATIS and DVOLMET / CPDLC service through VDL in the SAM Region 		
Strategy	<ul style="list-style-type: none"> • All tasks will be conducted by experts nominated by States and organizations of the SAM Region members of the project <i>ATN Ground-ground and Air-ground Applications in the SAM Region, and States of the SAM Region</i>, under management of the project coordinator, in coordination with the programme coordinator. Communications among Project members, as well as between the Project coordinator and programme coordinator, shall be carried out through teleconferences and the Internet. In addition, the programme coordinator, together with the project coordinator and the contributing experts, can convene at SAM/IG implementation meetings • Once studies are completed, the results will be submitted to the ICAO programme coordinator as a final consolidated document for its analysis, review, approval and presentation at the GREPECAS PPRC 		

Goals	<ul style="list-style-type: none"> • Complete all AMHS interconnections by July 2016 • Complete the drafting of MoU for the interconnection of AMHS by mid-2013 • Complete the migration towards the implementation of AMHS interconnection through IP protocol by July 2016 • Complete AIDC installation between adjacent ACCs by December 2016 • Complete the drafting of MoU for AIDS systems interconnection by the end of 2014 • Complete AIDC installation between adjacent FIRs by December 2016 • Complete the drafting of guideline material for the implementation of AIDC; for the installation of ground/air data links in terminal, approach and aerodrome areas; DCL, DATS and DVOLMET; CPDLC service through VDL in the SAM Region by December 2013.
Justification	<ul style="list-style-type: none"> • The implementation of ground-ground and air-ground data communications infrastructure will contribute to the reduction of air traffic control incidents, increasing the capacity of the transition of information with regard to the currently analogue based applications • This project contributes to the implementation of the ASBU modules B0 FICE, B0 TBO, B0 AMET and B0 DATM and SAM PFF SAM CNS 01, CNS 02, ATM 05, ATM 06, MET 03, MET04 and AIM 02 of the <i>Air Navigation System Performance-Based Implementation Plan for the SAM Region (SAM PBIP)</i>
Related Projects	<ul style="list-style-type: none"> • Automation (systems interconnection) • ATFM • Improve ATM Situational Awareness

Project Deliverables	Relationship with Performance Based Regional Plan (PFF)	Responsible	Status of Implementation ¹	Delivery Date	Remarks
Review of the regional strategy for the implementation of ground-ground and air-ground applications in the SAM Region	PFF SAM CNS 01 CNS 02 B0 FICE B0 TBO	Omar Gouarnalusse (Argentina)		June 2012	An initial review of the strategy was presented at SAM/IG/8 meeting (Lima, Peru, 10-14 October 2011). In July 2012, the Project Coordinator presented a preliminary version of the Guide, which was reviewed by the Programme Coordinator and presented at SAM/IG/10 implementation meeting for its review and approval
Guideline for the use of AIDC with the aim of reducing coordination errors	PFF SAM CNS 01 ATM 06 B0 FICE	Javier Vittor (Argentina) Ruben Guillermo Silva (Argentina)		April 2013	The guideline was drafted and presented at SAM/IG/11 meeting (13-17 October 2013) and circulated to SAM States for review.
Guideline for the implementation ground-air data links in the SAM Region	PFF SAM CNS 02 ATM 06 B0 TBO	Andrés Jansen (Brazil)		October 2013	The guideline was drafted and presented at SAM/IG/12 meeting (Lima, October 2013) and circulated to SAM States for review.

¹ **Gray:** Activity has not started
Green: Activity has or will deliver planned milestone as scheduled
Yellow: Activity is behind schedule on milestone, but still within acceptable parameters to deliver milestone on time
Red: Activity has failed to deliver milestone on time, mitigation measures need to be identified and implemented

Project Deliverables	Relationship with Performance Based Regional Plan (PFF)	Responsible	Status of Implementation ¹	Delivery Date	Remarks
Operational integration of AMHS among States	PFF SAM CNS 01 ATM 05 ATM 06 MET 03 MET 04 AIM 02 B0 FICE B0 AMET B0 DATM	States / Project Coordinator / Programme Coordinator		July 2016	Of all the AMHS installed in the Region, the following are interconnected in AMHS (P1 Protocol) Argentina-Paraguay, Colombia-Peru, Guyana-Suriname and Ecuador-Peru. Other States are in the process of implementation, having drafted and signed MoUs to this end Follow-up to the implementation of AMHS integration is carried out at SAM/IG meetings
Operational integration of AIDC service between adjacent ACCs	PFF SAM CNS 01 ATM 06 B0 FICE	States / Project Coordinator / Programme Coordinator		December 2016	To date no AIDC interconnection trials have been held between the Ezeiza and Cordoba ACCs. The integration is still not being used operationally Many States of the Region have drafted and signed MoUs to carry out the integration
Monitor the implementation of ATN ground-ground and air-ground applications activities in the SAM Region		ICAO		March 2010- Diciembre 2016	
Resources necessary	Implementation of AIDC operational integration by the States of the Region				

GRUPO REGIONAL CAR/SAM DE PLANIFICACION Y EJECUCION / CAR/SAM REGIONAL PLANNING AND IMPLEMENTATION GROUP (GREPECAS)

ID	Task Name	Duration	Start	Finish	2009		2010		2011		2012		2013		2014		2015		2016		2017	
					H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2
1	Aplicaciones Tierra–tierra y Aire–tierra de la ATN en la Región SAM / ATN Ground-ground and Air-ground Applications in the SAM Region	1735 days	Mon 10/05/10	Fri 30/12/16																		
2	Documento de estrategia regional para la implantación de aplicaciones tierra - tierra y aire – tierra de la Región SAM/ Regional strategy document for the implementation of ground-ground and air-ground applications in the SAM Region	240 days	Mon 01/08/11	Fri 29/06/12																		
3	Recolectar información / Collect information	50 days	Mon 01/08/11	Fri 07/10/11	<p>OACI/ICAO ,Omar Gouarnalusse / Argentina (CP) 01/08 07/10</p>																	
4	Entrega de propuesta de borrador / Delivery of draft proposal	103 days	Mon 10/10/11	Wed 29/02/12	<p>Omar Gouarnalusse / Argentina (CP) ,OACI/ICAO 10/10 29/02</p>																	
5	Revision de la propuesta borrador / Review of draft proposal	82 days	Thu 01/03/12	Fri 22/06/12	<p>Omar Gouarnalusse / Argentina (CP) ,OACI/ICAO ,Estados SAM 01/03 22/06</p>																	
6	Entrega documento final / Delivery of final document	5 days	Mon 25/06/12	Fri 29/06/12	<p>Omar Gouarnalusse / Argentina (CP) 25/06 29/06</p>																	
7	Guía de orientación para el uso del AIDC con la finalidad de reducir errores de coordinación / Guideline for the use of AIDC with the aim of reducing coordination errors	174 days	Tue 08/01/13	Fri 06/09/13																		
8	Recolectar información / Collect information	44 days	Tue 08/01/13	Fri 08/03/13	<p>Javier Vittor (Argentina),Ruben Guillermo Silva (Argentina) 08/01 08/03</p>																	
9	Entrega de propuesta de borrador / Delivery of draft proposal	37 days	Mon 11/03/13	Tue 30/04/13	<p>Javier Vittor (Argentina),Ruben Guillermo Silva (Argentina) 11/03 30/04</p>																	
10	Revision de la propuesta borrador / Review of draft proposal	87 days	Thu 02/05/13	Fri 30/08/13	<p>Omar Gouarnalusse / Argentina (CP) ,OACI/ICAO ,Estados SAM 02/05 30/08</p>																	
11	Entrega documento final / Delivery of final document	5 days	Mon 02/09/13	Fri 06/09/13	<p>Javier Vittor (Argentina),Ruben Guillermo Silva (Argentina) 02/09 06/09</p>																	
12	Guía de orientación para el establecimiento de enlaces de datos tierra-aire en la Región SAM / Guideline for the establishment of ground-air data links in the SAM Region	91 days	Mon 03/06/13	Sun 06/10/13																		
13	Recolectar información / Collect information	46 days	Mon 03/06/13	Mon 05/08/13	<p>Andre Eduardo Jansen (Brasil) 03/06 05/08</p>																	
14	Entrega de propuesta de borrador / Delivery of draft proposal	23 days	Tue 06/08/13	Thu 05/09/13	<p>Andre Eduardo Jansen (Brasil) 06/08 05/09</p>																	
15	Revision de la propuesta borrador / Review of draft proposal	0 days	Fri 20/09/13	Fri 20/09/13	<p> 20/09</p>																	
16	Entrega documento final / Delivery of final document	0 days	Sun 06/10/13	Sun 06/10/13	<p> 06/10</p>																	
17	Integración operacional del servicio AMHS entre Estados / Operational integration of AMHS among States	1604 days	Mon 10/05/10	Thu 30/06/16																		

GRUPO REGIONAL CAR/SAM DE PLANIFICACION Y EJECUCION / CAR/SAM REGIONAL PLANNING AND IMPLEMENTATION GROUP (GREPECAS)

ID	Task Name	Duration	Start	Finish	2009		2010		2011		2012		2013		2014		2015		2016		2017					
					H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2				
18	AMHS operational integration / Implantacion de la integración operacional de sistemas AMHS	1604 days	Mon 10/05/10	Thu 30/06/16																						
19	Integración operacional del servicio AIDC entre ACC's adyacentes / Operational integration of AIDC service between adjacent ACCs	1361 days	Fri 14/10/11	Fri 30/12/16																						
20	AIDC operational integration / Implantación de la integración operacional del AIDC	1361 days	Fri 14/10/11	Fri 30/12/16																						
21	Monitorear las actividades de implantación de las aplicaciones tierra-tierra y aire-tierra de la ATN en la Región SAM / Monitor the implementation of ATN ground-ground and air-ground applications activities in the SAM Region	1735 days	Mon 10/05/10	Fri 30/12/16																						
22	Monitorear las actividades de implantación de las aplicaciones tierra-tierra y aire-tierra de la ATN en la Región SAM / Monitor the implementation of ATN ground-ground and air-ground applications activities in the SAM Region	1735 days	Mon 10/05/10	Fri 30/12/16																						