



International Civil Aviation Organization

South American Regional Office

**Fourth Meeting of Air Navigation and Flight Safety Directors  
of the SAM Region**

(Lima, Peru, 2 to 4 October 2017)

AN & FS/4-WP/05

14/09/17

**Agenda Item 1: Follow-up to the implementation of air navigation priorities**

**FOLLOW-UP TO THE IMPLEMENTATION OF AMHS INTERCONNECTION AND  
NATIONAL IP NETWORKS**

(Presented by the Secretariat)

**SUMMARY**

This working paper presents the progress made in the implementation of AMHS interconnection and of national IP networks in the SAM Region since the Third Meeting of Air Navigation and Flight Safety Directors of the SAM Region.

**References**

- Third meeting of Air Navigation and Flight Safety Directors, Lima, Peru, 22-24 October 2016.
- Eighteenth workshop/meeting of the SAM Implementation Group (SAM/IG/18) Lima, Peru, 17-21 October 2016.
- Nineteenth workshop/meeting of the SAM Implementation Group (SAM/IG/19) Lima, Peru, 22- 26 May 2017.
- Summary of AMHS teleconferences held in 2017.

*ICAO strategic  
objectives:*

- *A – Safety*
- *B – Air navigation capacity and efficiency*

**1. Introduction**

1.1 AMHS interconnection is one of the air navigation implementation priorities contemplated in the Declaration of Bogota. The implementation of 26 AMHS interconnections was considered for the period 2014-2016.

1.2 In order to coordinate the implementation of AMHS interconnections, the States designated focal points, listed in the updated list shown in **Appendix A** to this working paper.

1.3 The implementation of national IP networks is also a regional air navigation priority in the Declaration of Bogota, which considered that 80% of SAM States should have a national IP network implemented by the end of 2016. National IP networks will not only be used as a means of transport for AMHS (IP application most commonly used) but also to carry surveillance data, voice over IP, as well as forthcoming aeronautical applications such as FXIM, AIXM and IWXXM.

## 2 Analysis

### *AMHS interconnection*

2.1 Significant progress has been made in the implementation of AMHS interconnections since AN&FS/3. In this sense, the operational implementation of AMHS interconnections between Brasilia and Bogota (May 2017), Brasilia and Montevideo (September 2017), and Lima and Santiago (December 2016) should be highlighted.

2.2 Likewise, the implementation and operation of the AMHS interconnection between the Brasilia MTA and the Madrid MTA (September 2017) should be highlighted, since it represents the first interregional AMHS interconnection in the SAM Region. This interconnection was implemented through CAFSAT, the AFI/SAM/EUR VSAT network that carries voice and data services to support air navigation in the SAT (South Atlantic) Region.

2.3 Successful operational interconnection tests were conducted between the Ezeiza MTA and the Lima MTA, the Brasilia MTA and the Ezeiza MTA, the Ezeiza MTA and the Santiago MTA. Taking into account the positive results of the tests, it is expected that the States involved in these interconnections will proceed to their operation as soon as possible.

2.4 Likewise, operational testing of the AMHS interconnection between the Bogota MTA and the Panama MTA (August 2017) was successfully conducted through the MEVAIII/REDDIG II interconnection. Regarding this connection, the “Organization Name” (O) was accordingly updated in the AMHS CAAS addressing plan for the SAM Region, from MPTO to MPZL corresponding to Panama. The operation of this circuit will take place once Colombia authorises the REDDIG administration to hire a 64-byte circuit from the MEVA III provider and Panama hires the circuit directly from the MEVA III communication provider.

2.5 In this regard, States are reminded that any changes they make in AMHS addressing must be notified to the EUROCONTROL AMC in accordance with the procedure established in ICAO State Letter AN 7/49.1-09/34 of 14 April 2009.

2.6 Communication with the AMC must be through an external operator nominated by the State (more information on the procedure in paragraph 2.5). Not all the States of the Region have nominated or updated the name of their candidate for external operator to the ATS Messaging Management Centre (AMC). Registration can be done through <http://www.eurocontrol.int/amc>. In this regard, the SAM/IG/18 meeting formulated conclusion SAM/18/02 *Nomination and registration of SAM candidates for EUROCONTROL AMC*.

2.7 Likewise, Argentina and Spain conducted IP interconnectivity tests between the Ezeiza MTA and the Madrid MTA. This circuit is not contemplated in the CAR/SAM Air Navigation Plan (Doc 8733). For the conduction of these tests, Argentina and Spain implemented an MPLS circuit through local communication providers. **Appendix B** to this working paper contains a table that shows AMHS interconnection requirements, target implementation dates, and status of implementation.

2.8 According to the Declaration of Bogota, the goal was to implement 26 AMHS interconnections by the end of 2016. To date, 14 AMHS interconnections have been implemented, 10 of which are in the operational phase, and the remaining are in the pre-operational phase. Accordingly, 58% implementation has been achieved. According to the table shown in Appendix B to this working paper, AMHS interconnections are to be completed by June 2019, including the 26 contemplated in the Declaration of Bogota, in addition to the remaining AMHS interconnections included in Table CNS II-1

of Volume II of the CAR/SAM Air Navigation (Doc 8733). This table contains all AFTN interconnections required in the Region, and which need to migrate to AMHS connections.

***Implementation of national IP networks***

2.9 Regarding the implementation of national IP networks, these have been implemented in Argentina, Brazil, Colombia, Chile, Ecuador, Paraguay, Uruguay, and Venezuela. This represents 62% of the implementations expected for the end of 2016. According to the Declaration of Bogota, 80% implementation was expected by the end of the period 2014-2016, and 100% implementation by the end of the period 2018-2019. The status of implementation of national IP networks, by State, is shown in **Appendix C** to this working paper.

**3 Suggested action**

3.1 The Meeting is invited to:

- a) take note of the information contained herein; and
- b) review and discuss the activities for the implementation of AMHS interconnection and national IP networks listed in section 2 of this working paper and its respective appendices, and report on the plans for meeting the AMHS and national IP network implementation goal.

- END -

## APÉNDICE A / APPENDIX A

**NATIONAL FOCAL POINTS/PUNTOS FOCALES NACIONALES  
IMPLEMENTATION OF INTERCONNECTION OF AMHS SYSTEM /IMPLANTACIÓN INTERCONEXIÓN DE SISTEMAS AMHS**

<b>STATE/ ESTADO</b>	<b>ADMINISTRATION/ ADMINISTRACIÓN</b>	<b>NAME/ NOMBRE</b>	<b>POST/ CARGO</b>	<b>TELEPHONE/ TELEFONO</b>	<b>E-MAIL</b>
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## APPENDIX B

## AMHS INTERCONNECTION REQUIREMENT AND DATE OF IMPLEMENTATION

STATES	AMHS INTERCONNECTION REQUIREMENTS	DATE OF IMPLEMENTATION	COMMENTS
Argentina	Bolivia	Dec 2018	Pending initial coordination
	Brazil	Nov 2017	Final operational tests for AMHS interconnection between Brasilia and Ezeiza were successfully completed on 18 May 2016. Pending decision from authorities of Argentina and Brazil for operational implementation.
	Chile	Nov 2017	Positive operational tests carried out on mid December 2016. Pending decision from authorities of Argentina and Chile for operational implementation.
	Paraguay	Mar 2012	Implemented and operational
	Peru	Nov 2017	Positive operational tests carried out at the end of 2016. Pending decision from authorities of Argentina and Peru for operational implementation.
	South Africa	Jun 2019	Coordination began on December 2016. Interconnection implementation will be made through CAFSAT. Modernization of CAFSAT node Ezeiza is foreseen by mid-2018.
	Uruguay	Dec 2017	Connectivity in Protocol P1 level between MTA Ezeiza – Montevideo. Pending completion of operational tests.
	Venezuela	Dec 2017	Implemented and operational (out of service- failure in AMHS Venezuela) since Dec 2016. Operational implementation when new AMHS system starts operations in September 2017.
Bolivia	Argentina	Dec 2018	Pending initial coordination
	Brazil	Jun 2018	Pending initial coordination
	Peru	Mar 2018	IP connectivity between La Paz and Lima MTAs achieved.
Brazil	Argentina	Nov 2017	Final operational tests for AMHS interconnection between Brasilia and Ezeiza were successfully completed on 18 May 2016. Pending decision from authorities of Argentina and Brazil for operational implementation.
	Bolivia	Jun 2018	Pending initial coordination
	Colombia	May 2017	Operational May 2017.
	Spain	Sep 2017	Operation foreseen mid-September 2017. AMHS circuit implemented through CAFSAT.

STATES	AMHS INTERCONNECTION REQUIREMENTS	DATE OF IMPLEMENTATION	COMMENTS
	United States	Jun 2018	Coordination began between Brazil and United States. Circuit implementation will be made through MEVAIII/REDDIGII.
	Guyana	Sep 2017	Operations in Protocol P1 level begun on 16 December 2016 at 17:00 UTC. On mid-February 2017 returned to AFTN configuration. AMHS tests resume on May 2017. Connection resume on July 2017.
	French Guiana	Dec 2018	Operation of an AMHS (CONSOFT) system is schedule by January 2018. AMHS interconnection scheduled October 2018.
	Paraguay	Dec 2017	Positive P1 connectivity tests were carried out. Pending operational tests by October 2017.
	Peru	Dec 2015	Implemented and operational 14 December 2015
	Senegal	Dec 2018	Coordination began between Brazil and Senegal (Dec 2016). Interconnection will be made through AFISNET satellite network which Brazilian node was installed in Recife.
	Sita (Atlanta)	Sep 2017	Successful operational and IP interoperability tests carried out in August 2017. Operation foreseen by last quarter of 2017.
	Suriname	Mar 2018	Entered into operation on 15 Dec 2016 at 17:00 UTC. On mid-February 2017 returned to AFTN configuration. Pending updating of AMHS system by Suriname.
	Uruguay	Sep 2017	IP connectivity completed. (First week October 2016). IP Protocol tests successfully concluded the week of 28 Nov 2016 (30 Nov and 1 Dec). Positive operational tests made in August 2017 and commissioning in September 2017.
	Venezuela	Dec 2017	Positive connectivity in Protocol P1 level between Brasilia and Caracas (Oct 2016). Pending operational tests foreseen Sep 2017, once new AMHS system is installed in Venezuela.
Chile	Argentina	Nov 2017	Positive operational tests carried out in mid-December 2016. Pending decision from authorities of Argentina and Chile for operational implementation.
	Peru	Dec 2016	Began operations on mid-December 2016.

STATES	AMHS INTERCONNECTION REQUIREMENTS	DATE OF IMPLEMENTATION	COMMENTS
Colombia	Brazil	May 2017	Operational May 2017.
	Ecuador	Dec 2017	Successful IP connectivity tests Pending resume of operational tests
	Panama	Mar 2018	Circuitual interconnection has been configured through MEVA III/REDDIG II (Mid-February 2017). Positive operational tests August 2017. Operational implementation will be carried out once Colombia and Panama contract the AMHS circuit with MEVA III communication provider in MEVAIII/REDDIGII interconnection.
	Peru	Sep 2010	Implemented and operational
	Venezuela	Dec 2017	Pending operational tests September 2017 when Venezuela implemented its new AMHS system.
Ecuador	Colombia	Dec 2017	IP connectivity tests successfully made. Pending resume of operational tests.
	Peru	Jul 2012	Implemented and operational
	Venezuela	Dec 2017	Pending operational tests September 2017 when Venezuela has implemented its new AMHS system.
French Guiana (France)	Brazil	Dec 2018	French Guiana has scheduled for January 2018 the commissioning of an AMHS (CONSOFT) system. AMHS interconnection foreseen to begin on October 2018.
	Venezuela	Dec 2018	French Guiana has scheduled for January 2018 the commissioning of an AMHS (CONSOFT) system. AMHS interconnection foreseen to begin on October 2018.
Guyana	Brazil	Jul 2017	Began operations on 15 Dec 2017 at 17:00 UTC. At mid-February 2017 returned to AFTN configuration. AMHS tests resumed on May 2017. Operational connection resumed on July 2017.
	Suriname	Jun 2011	Implemented and operational
	Trinidad & Tobago	Dec 2018	Pending coordination
	Venezuela	Dec 2017	Pending operational tests in September 2017 when Venezuela had implemented its new AMHS system.
Panama	Colombia	Mar 2018	Circuitual interconnection has been configured through MEVA III/REDDIG II (mid-February 2017). Positive operational tests made on August 2017. Operational implementation will

STATES	AMHS INTERCONNECTION REQUIREMENTS	DATE OF IMPLEMENTATION	COMMENTS
			take place once Colombia and Panama contract AMHS circuit to the MEVA III communications provider in MEVAIII/REDDIGII interconnection.
Paraguay	Argentina	Mar 2012	Implemented and operational
	Brazil	Dec 2017	IP interconnectivity tests began mid July 2016. Pending of operational tests on October 2017.
Peru	Argentina	Nov 2017	Positive operational tests carried out at the end of 2016. Pending decision from authorities of Argentina and Chile for operational implementation.
	Bolivia	Mar 2018	Successful IP connectivity between La Paz MTA and Lima MTA.
	Brazil	Dec 2015	Implemented 14 December 2015
	Chile	Dec 2016	Entered into operations the second half of Dec 2016.
	Colombia	Sep 2010	Implemented
	Ecuador	Jul 2012	Implemented
	United States	Dec 2018	Initial coordination has begun for the AMHS connection through the MEVAIII/REDDIGII interconnection.
	Venezuela	Dec 2017	Pending operational tests when Venezuela has implemented its new AMHS system
Suriname	Brazil	Mar 2018	Began operations on 15 Dec 2016 at 17:00 UTC. At mid-February 2017 returned to AFTN configuration. Pending Suriname AMHS system updating.
	Guyana	Jun 2011	Implemented and operational
	Venezuela	Mar 2018	Pending operational tests to be made when Venezuela has implemented its new AMHS system (September 2017) and Suriname has updated its AHMS system (date TBD).
Uruguay	Argentina	Dec 2017	Positive P1 connectivity between Ezeiza and Montevideo achieved. Operational tests in July 2017.
	Brazil	Sep 2017	IP connectivity tests completed (first week October 2016) Protocol P1 successfully concluded the week of 28 November 2016 (30 November and 1 December). Positive operational test made on August 2017. Commissioning September 2017.

STATES	AMHS INTERCONNECTION REQUIREMENTS	DATE OF IMPLEMENTATION	COMMENTS
Venezuela	Argentina	Dec 2017	Implemented and operational (out of service- failure in AMHS Venezuela) Pending operational tests when new AMHS system starts operations on August 2017.
	Brazil	Dec 2017	Pending operational tests when new AMHS system starts operations on September 2017.
	Colombia	Dec 2017	Pending operational tests when new AMHS system starts operations on September 2017.
	Spain	Dec 2018	Pending initial coordination. Interconnection will be made through a communication circuit rented to a local provider.
	United States	Dec 2018	Pending initial coordination. AMHS circuit will be implemented through MEVAIII/REDDIGII interconnection.
	Ecuador	Dec 2017	Pending operational tests when new AMHS system starts operations on September 2017.
	Guyana	Dec 2017	Pending operational tests (Sep 2017) when Venezuela implement its new AMHS system
	French Guiana	Dec 2018	French Guiana has scheduled for January 2018 the commissioning of an AMHS (CONSOFT) system. AMHS interconnection foreseen to begin on October 2018.
	Peru	Dec 2017	Pending operational tests when new AMHS system starts operations on September 2017.
	Suriname	May 2018	Pending operational tests to be made when Venezuela has implemented its new AMHS system (September 2017) and Suriname has updated its AHMS system (date TBD).
	Trinidad & Tobago	Dec 2018	Pending initial coordination

**Green highlighted:** AMHS interconnection operative

**Light green:** almost operational

## APPENDIX C / APENDICE C

IMPLEMENTATION OF DOMESTIC IP NETWORKS /  
IMPLANTACION DE REDES IP NACIONALES

STATE/ESTADO	IP APPLICATIONS IMPLEMENTED/ APLICACIONES IP IMPLANTADAS	IMPLEMENTATION DATE OF DOMESTIC IP NETWORK FOR ALL IP APPLICATIONS/ FECHA DE IMPLANTACION DE RED IP NACIONAL PARA TODAS LAS APLICACIONES EN IP
Argentina	AMHS, DATA RADAR, IP VOICE/VOZ IP	2005
Bolivia	AMHS	2016
Brazil/Brasil	AMHS, DATA RADAR, IP VOICE/VOZ IP	2015
Chile	AMHS	2015
Colombia	AMHS, RADAR	2016
Ecuador	AMHS, RADAR	2014
French Guiana (France) / Guyana Francesa (Francia)	No	2018
Guyana	AMHS	2018
Panamá	AMHS, RADAR	2016
Paraguay	AMHS	2014
Perú	AMHS, RADAR	2016
Suriname/Surinam	AMHS	2018
Uruguay	AMHS RADAR	2014
Venezuela	AMHS	2010

Green = Implemented

Verde = Implantada

- END / FIN -