



Regional Ground-Ground Data-Link Implementation

Mr. Julio Siu, ICAO NACC Deputy Director

Mr. Onofrio Smarrelli, ICAO SAM CNS Regional Officer

ICAO NACC and SAM Offices

NAM/ CAR/ SAM ATS Datalink Implementation Workshop

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- ✈ Air Navigation Plan in the CAR/SAM Regions eANP (Doc 8733) (Ground-Ground Data-Link Consideration)
- ✈ Performance Based Implementation Plan (Ground-Ground Data-Link Consideration)
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 - ✈ SAM Region
- ✈ GREPECAS Organization (Ground-Ground Data-Link Consideration)
- ✈ Ground-Ground Data-Link Implementation
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Air Navigation Plan in the CAR/SAM Regions (eANP- Doc 8733)

✈ Volume I

✈ Part III – Communication, Navigation and Surveillance (CNS) – 2. General Regional Requirements

✈ Aeronautical Fixed Service (AFS)

2.1 The aeronautical fixed service (AFS) should satisfy the communication requirements of ATS, AIS/AIM, MET and SAR, including specific requirements in terms of system reliability, message integrity and transit times, with respect to printed as well as digital data and speech communications. If need be, it should, following agreement between individual States and aircraft operators, satisfy the requirements for airline operational control.

✈ The Aeronautical Telecommunication Network (ATN)

2.2 The ATN of the Region(s) should have sufficient capacity to meet the minimum requirements for data communications for the services mentioned in paragraph 2.1 above.



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✈ Aeronautical Fixed Service (AFS)

- 2.1 The aeronautical fixed service should comprise the following systems and applications that are used for ground-ground (i.e. point-to-point and/or point-to-multipoint) communications in the international aeronautical telecommunication service:
 - c) the aeronautical fixed telecommunications network (AFTN);
 - d) the common ICAO data interchange network (CIDIN);
 - e) the air traffic services (ATS) message handling services (AMHS); and
 - f) the inter-centre communications (ICC).
- 2.2 To meet the data communication requirements, a uniform high-grade aeronautical network should be provided, based on the aeronautical telecommunication network (ATN), taking into account the existence and continuation of current networks.
- 2.4 AFS planning should permit flexibility in detailed development and implementation. The required AFTN Stations and Centres are listed in the AFTN Plan in Table CNS II-1.



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✈ Volume I

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✈ The Aeronautical Telecommunication Network (ATN)

2.5 The ATN should be able to support:

- a) applications carried by the existing networks;
- b) gateways enabling inter-operation with existing networks; and
- c) ground-ground communications traffic associated with air-ground data link applications.

2.10 In planning the ATN, provisions should be made, where required, for interfacing with other international networks. The Required ATN Infrastructure Routing Plan is described under **Table CNS II-2**.



Air Navigation Plan in the CAR/SAM Regions (eANP- Doc 8733)

✈ Volume I

✈ Part III – Communication, Navigation and Surveillance (CNS) – 2. General Regional Requirements

✈ Network services

- 2.11 The Internet Society (ISOC) communications standards for the Internet Protocol Suite (IPS) should be used for the implementation of AMHS.
- 2.12 The migration from legacy bit-oriented protocols such as X.25 Protocol suite to IPS should be planned.
- 2.13 The migration of international or sub-regional ground networks to the ATN based on Internet Protocol (IP) to support AFS communication requirements, while reducing costs, should be planned.

✈ Network management

- 2.15 An ICAO centralised off-line network management service is provided to participating AFTN/ AMHS centres in the CAR/SAM Regions under the ATS Messaging Centre (AMC).
- 2.16 In the case of integrated communications services procured and shared by several States, organizational provisions should allow for the planning and performing of the management of technical performance, network configuration, fault, security, cost division/allocation, contract, orders and payment.



Air Navigation Plan in the CAR/SAM Regions (eANP- Doc 8733)

Volume II

Part III – Communication, Navigation and Surveillance (CNS)

Regional Requirements (11 tables: 4 General / 7 Specific)





VOLUME II

Part III – Communication, Navigation and Surveillance (CNS) – 2. Specific Regional Requirements

Table CNS II-5
— ATN IPv4
addressing
scheme

Table CNS II-6
— Aeronautical
mobile service
and the AMSS

Table CNS II-7
— Nav aids Plan

Table CNS II-8
— ASTERIX SAC
code
assignment

Table CNS II-9
— Surveillance
Plan

Table CNS II-10
— Geographical
Separation
Criteria

Table CNS II-11
— AM (R) VHF
Sub-bands
Allotment Table

Table CNS II-I Aeronautical Fixed Telecommunications Network (AFTN) Plan

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
ANGUILLA						
Anguilla-S						
Port of Spain	S	LDD/d	2400	None	IA-5	E/CAR
ANTIGUA AND BARBUDA						
Antigua-S						
Port of Spain	S	LDD/d	2400	None	IA-5	E/CAR
ARGENTINA						
Buenos Aires-M						
Asunción	T	SAT/d	2400	None	IA-5	REDDIG
Brazil	M	SAT/d	2400	None	IA-5	REDDIG
La Paz	T	SAT/d	2400	None	IA-5	REDDIG

Table CNS II 2 – Aeronautical Telecommunication Network (ATN) INFRASTRUCTURE Routing plan

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remarks
1	2	3	4	5	6	7	8
Anguilla, Wallblake, UK	IS	Intra-Regional	Trinidad and Tobago (PIARCO)	64 K	IPv4	E/CAR AFS Network	
Antigua and Barbuda, St. John's	IS	Intra-Regional	Trinidad and Tobago (PIARCO)	64 K	IPv4	E/CAR AFS Network	
Argentina/Buenos Aires	BIS	Inter-Regional	AFI/ South Africa (Johannesburg)	64K	IPv6	CAFSAT	
		Intra-Regional	Bolivia (La Paz)	64K	IPv4	REDDIG	
		Intra-Regional	Chile (Santiago)	64K	IPv4	REDDIG	
		Intra-Regional	Brazil (Brasilia)	64K	IPv4	REDDIG	
		Intra-Regional	Paraguay (Asunción)	64K	IPv4	REDDIG	
		Intra-Regional	Peru (Lima)	64K	IPv4	REDDIG	
		Intra-Regional	Uruguay (Montevideo)	64K	IPv4	REDDIG	
Aruba, Oranjestad	IS	Intra-Regional	Curacao, Willemstad	64K	IPv4	MEVA	
		Intra-Regional	Jamaica, Kingston	64K	IPv4	MEVA	
		Intra-Regional	Haiti, Port au Prince	64K	IPv4	MEVA	
Bahamas, Nassau	BIS	Inter-Regional	NAM/ United States (Atlanta)	64K	IPv4	MEVA	
		Intra-Regional	Haiti, Port au Prince	64K	IPv4	MEVA	
Barbados, Bridgetown	IS	Intra-Regional	Trinidad and Tobago (PIARCO)	64 K	IPv4	E/CAR AFS Network	
Belize, Belize	IS	Intra-Regional	Honduras (COCESNA)	64 K	IPv4	CAMSAT	
Bermuda, UK	BIS	Inter-Regional	NAM/ United States (Atlanta)	64K	IPv4		
Bolivia/La Paz	IS	Intra-Regional	Argentina (Buenos Aires)	64K	IPv4	REDDIG	

Table CNS II-5 – ATN IPv4 Addressing Scheme Inter/Intra Regional G-G- Links for NAM/CAR/SAM Regions

Because of the limited availability of public IPv4 addresses, the CAR/SAM Regions, as approved by GREPECAS/14 Meeting, agreed to use a 24-bit block IPv4 private address space in the following address format:

8 bits	4 bits	7 bits	13 bits
Private Addr Prefix (010)	Region ID	State/ Territory	Subnet/Host ID

Nro	State /Territory	Network	Usable addresses	Decimal notation	Binary Notation							
					1st BYTE	2nd BYTE		3rd BYTE	4th BYTE			
					8 bits	4 bits	4 bits	3 bits	5 bits	8 bits		
Network		Subnet			Host							
		Region	State /Territory									
1	Aruba	10.16.0.0/19	HostMin: 10.16.0.1	10 . 16 . 0 . 1	0 0 0 0 1 0 1 0 .	0 0 0 1	0 0 0 0 0 0 0		0 0 0 0 0 . 0 0 0 0 0 0 0 1			
			HostMax: 10.16.31.254	10 . 16 . 31 . 254	0 0 0 0 1 0 1 0 .	0 0 0 1	0 0 0 0 . 0 0 0		1 1 1 1 1 . 1 1 1 1 1 1 0			



NAM/CAR REGIONAL PERFORMANCE-BASED AIR NAVIGATION IMPLEMENTATION PLAN (RPBANIP)

Harmonized implementation of Air Navigation Services and Systems under a Performance Based Approach.

The States, Air Navigation Implementation Working Group (ANI/WG) and other regional implementation groups follow-up this Plan, and formulate detailed Action Plans

ATN ground-ground applications are included under the Regional Performance Objective (RPO) No. 6 Optimization and Modernization of Communication Infrastructure and to support other operational RPOs such as RPO 4. Improvements to Situational Awareness and RPO No. 7 Implementation of AIM.

Version 3.1 of the RPBANIP is ASBU compliant and includes new ICAO ANRFs for monitoring and reporting



<http://www.icao.int/NACC/Pages/namcar-RPBANIP.aspx>



NAM/CAR REGIONAL PERFORMANCE-BASED AIR NAVIGATION IMPLEMENTATION PLAN (RPBANIP)

(RPO) No. 6 Optimization and Modernization of Communication Infrastructure

6. OPTIMIZATION AND MODERNIZATION OF COMMUNICATION INFRASTRUCTURE					
Benefits					
Efficiency	<ul style="list-style-type: none"> Improved ATS coordination Increased communications availability Communication misunderstandings avoided Facilitated utilization of advanced technologies 				
Continuity	<ul style="list-style-type: none"> Improved airspace interoperability and seamlessness Improved provision of air traffic control services to all aircraft operations 				
Safety	<ul style="list-style-type: none"> Improved airspace and aerodrome safety 				
Strategy					
ATM Component	TASK DESCRIPTION	START-END	RESPONSIBLE	STATUS	
AO, TS, CM, AUO AOM, SDM	a) Review the performance status of current AFS services and identify deficiencies or improvements (AFTN, oral ATS services, A/G communications)	2013-2015	States, Territories	Valid	
	b) Implement communication service improvements as required to support current and planned Air Navigation applications, including Required Communication Performance (RCPs).	2014-2018	States, Territories	Valid	
	c) Develop regional ATN planning documents	2013-2015	GREPECAS	Valid	
	d) Coordinate and test ATN G-G application implementation aspects (AMHS, AIDC, etc.)	2013-2018	States, Territories	Valid	
	e) Conduct planning, trial and implementation activities for A-G data applications (DCL, D-ATIS, etc.)	2014-2018	States, Territories	Valid	
	f) Carry out technical review of regional telecommunication networks for ATN implementation	2013-2015	States, Territories	Valid	
	g) Implement available technologies in order to facilitate ground and airborne applications (CPDLC, ADS-C, ADS-B)	2013-2018	States, Territories	Valid	
	h) Implement the necessary communications network for ACDM	2014-2018	States, Territories	Valid	
	i) Support ICAO position during the ITU WRC and ensure regional coordination for the protection of the aviation spectrum	2013-2018	States, Territories	Valid	
	j) Ensure participation of civil aviation experts in State delegations to ITU WRC meetings	2013-2018	States, Territories	Valid	
	k) Disseminate ICAO policy statements on aeronautical radio frequency spectrum requirements	2013-2018	States, Territories	Valid	



NAM/CAR REGIONAL PERFORMANCE-BASED AIR NAVIGATION IMPLEMENTATION PLAN (NAM/CAR RPBANIP)

ASBU B0-25/FICE: Planning Targets and Implementation Progress

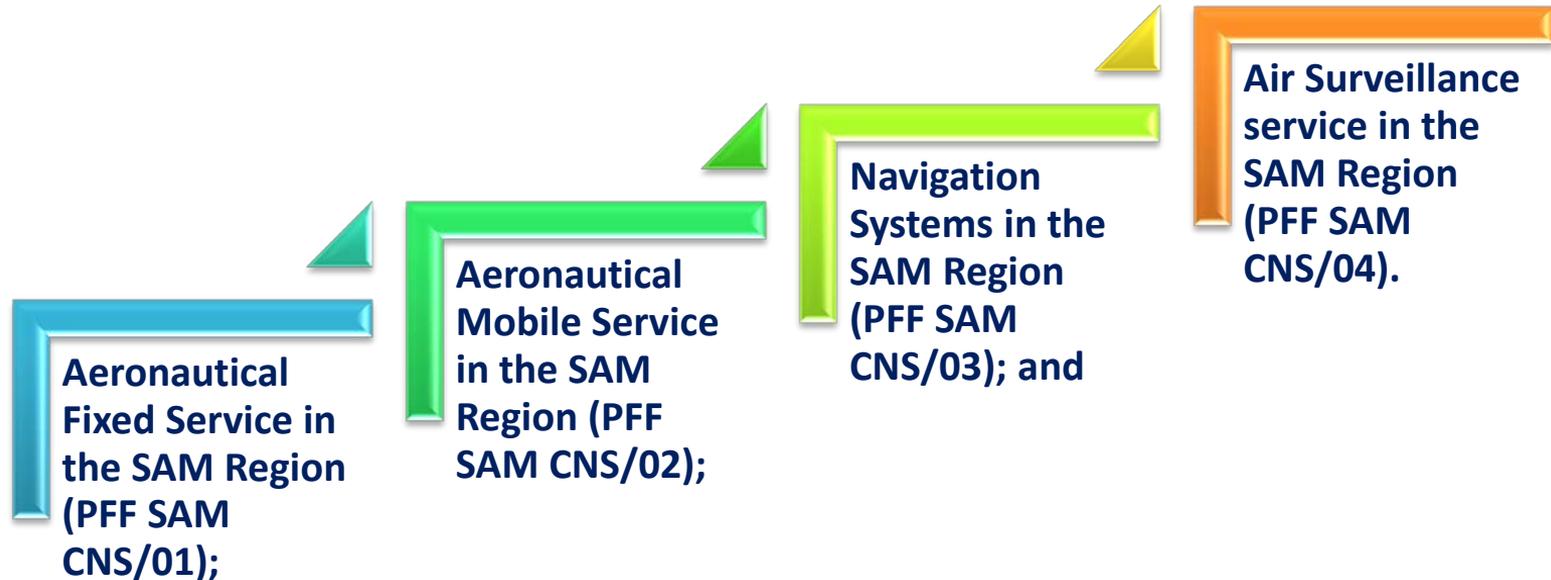
Elements	Targets and Implementation Progress (Ground and Air)
1. MEVA III IP Network Implementation	100% implementation of MEVA III IP Network by MEVA Member States by August 2015
1. AMHS Implementation	4 States with Air Traffic Services Message Handling Services (AMHS) interconnected with other AMHS by December 2014
1. AIDC Implementation *	50% of FIRs within which all applicable ACCs have implemented at least one interface to use AIDC/OLDI with a neighbouring ACC by December 2016.
1. ATN Router Structure Implementation	70% of ATN router structure implemented by June 2016

*: Air Navigation Target in Port of Spain Declaration



SAM Performance Based Implementation Plan

CNS SAM PBIP





SAM Performance Based Implementation Plan – PFF CNS 01 SAM

**REGIONAL PERFORMANCE OBJECTIVE: SAM CNS/01
IMPROVEMENTS TO THE AERONAUTICAL FIXED SERVICE IN THE SAM REGION**

Benefits

Safety	<ul style="list-style-type: none"> •Reduction of operational coordination errors between adjacent ACCs; •Increased ATM situational awareness; and •Reduced pilot and controller workload.
Environmental protection and sustainable development of air transport	<ul style="list-style-type: none"> •Increased capacity and availability of aeronautical fixed service in support of ATS, MET, AIS and SAR applications; and •Support to ATFM / CDM.

Metrics

- Number of AMHS interconnection as per FASID Table 1Bb;
- Number of AIDC interconnections as per FASID Table 1Bb; and
- Percentage of phases completed for the implementation of the new regional network.

*2012 – 2018
Strategy*

ATM OC COMPONENTS	TASKS	PERIOD	RESPONSIBILITY	STATUS
AOM ATM-SDM DCB CM AUO	a)Complete the implementation of AMHS systems in those States that do not have such systems yet	(*) - 2013	States	Valid
	a)AMHS interconnection between adjacent States	(*) - 2014	States	Valid
	a)Implement communication services for the centralised ATFM	2015 - 2018+	States	Valid
	a)Implement AIDC in the automated centres of the SAM Region	(*) - 2013	States	Valid
	a)Operational implementation of AIDC between adjacent ACCs	(*) - 2014	States	Valid
	a)Implementation of new digital network (REDDIG II)	2012 -2015	States	Valid
	a)Monitor implementation progress	2012-2017	GREPECAS	Valid

Relationship with GPIs: GPI/6: ATFM, GPI/9: situational awareness, GPI/ 16: decision support and alerting systems, GPI/18: aeronautical information, GPI/17: data link applications, GPI/19: meteorological systems, GPI/22: communication infrastructure.



SAM Performance Based Implementation Plan – SAM Block 0 Regional Module

Performance Improvement Areas (PIA)	Performance Improvement Area Name	Module	Module Name
PIA 1	Airport Operations	B0-RSEQ	Improve Traffic flow through Runway Sequencing (AMAN/DMAN)
		B0-APTA	Optimization of Approach Procedures including vertical guidance
		B0-SURF	Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)
		B0-ACDM	Improved Airport Operations through Airport-CDM
PIA 2	Globally Interoperable Systems and Data - Through Globally Interoperable System Wide Information Management	B0-FICE	Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration
		B0-DATM	Service Improvement through Digital Aeronautical Information Management
		B0-AMET	Meteorological information supporting enhanced operational efficiency and safety
PIA 3	Optimum Capacity and Flexible Flights – Through Global Collaborative ATM	B0-FRTO	Improved Operations through Enhanced En-Route Trajectories
		B0-NOPS	Improved Flow Performance through Planning based on a Network-Wide view
		B0-ASUR	Initial capability for ground surveillance
		B0-ACAS	ACAS Improvements
		B0-SNET	Increased Effectiveness of Ground-Based Safety Nets
PIA 4		B0 CDO	Improved Flexibility and Efficiency Departure Profiles - Continuous Descend Operations (CDO)
		B0-TBO	Improved Safety and Efficiency through the initial application of Data Link En-Route
		B0-CCO	Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)



SAM Performance Based Implementation Plan – Air Navigation Report Form (ANRF) FICE

REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – B0-FICE : Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration

Performance Improvement Area 2:

Globally Interoperable Systems and Data – Through Globally Interoperable System Wide Information Management

ASBU B0-FICE: Impact on Main Key Performance Areas (KPA)

	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	N	Y	Y	N	Y

ASBU B0-FICE: Implementation Progress

Elements	Implementation Status (Ground and Air)
1.Complete AMHS implementation at States still not counting with this system	December 2014 Services provider
1.AMHS interconnection	December 2014 Services provider
1.Implement AIDC /OLDI at SAM States automated centres	June 2014 Services provider
1.Implement operational AIDC/OLDI between adjacent ACC's	June 2018 Services provider
1.Implement the new regional network (REDDIG II)	June 2014 Services provider

ASBU B0-FICE: Implementation Roadblocks/Issues

Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
1.Complete AMHS implementation at States still not counting with this system	NIL	NIL	NIL	NIL



ICAO

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GREPECAS Organization

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Programme and Project Committee Review

Representative Member

PBN Programme

ICAO Coordinators

Regional Officers
CAR & SAM

Project Coordinators
CAR/SAM States

Project Coordinators
CAR States

Project Coordinators
SAM States

ATFM Programme

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CAR/SAM States

Project Coordinators
CAR States

Project Coordinators
SAM States

Automation and
Situation awareness
Programme

ICAO
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Project
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CAR States

Project
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SAM States

SAR Programme

ICAO
Coordinators

Regional Officers
CAR & SAM

Project
Coordinators
CAR/SAM States

Project
Coordinators
CAR States

Project
Coordinators
SAM States

AGA Programme

ICAO
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Regional Officers
CAR & SAM

Project
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Project
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SAM States

AIM Programme

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Project
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CAR States

Project
Coordinators
SAM States



CAR/SAM ANP

CARSAM Regional Strategy for the deployment of the ATN and its applications

Short term (1/2)

Actions	Implementation Status
Complete the updating of the aeronautical digital communication networks by providing intra and inter-regional interconnection and interoperability.	Completed
implementation of the AMHS to replace the AFTN.	On going
Carry out the strategic deployment of a limited number of ATN routers of the ATN backbone to support other ground-ground and air-ground applications.	On going with Network improvements
The referred ATN routers must provide AFTN/AMHS gateway during the transition phase.	completed
Beginning of implementation of the AIDC within control centres	On going



CAR/SAM ANP - references

CARSAM Regional Strategy for the deployment of the ATN and its applications

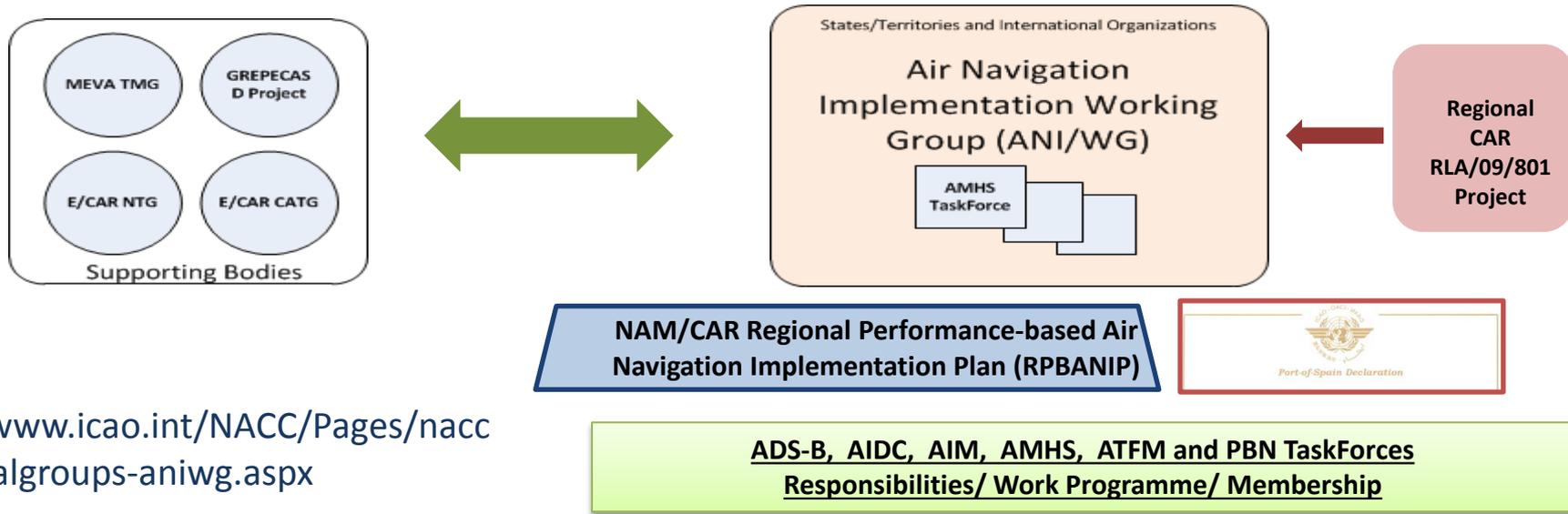
Short term (2/2)

Actions	Implementation Status
undertake the training of operational and technical personnel in order to provide the necessary knowledge to introduce the ATN and its ground-ground applications (AMHS and AIDC).	On going
Based on the relevant deployment of the ATN ground-to-ground infrastructures and ground applications, gradual introduction of ATN air-ground applications is suggested	2015 onwards
Implementation will be in full agreement with SARPs, ICAO PANS and GREPECAS guide.	completed



NAM/CAR Ground-Ground Data Link Implementation

NAM/CAR Implementation supporting and implementing Bodies



<http://www.icao.int/NACC/Pages/nacc-regionalgroups-aniwg.aspx>

Monitoring and Follow-up: NACC NCLB Strategy

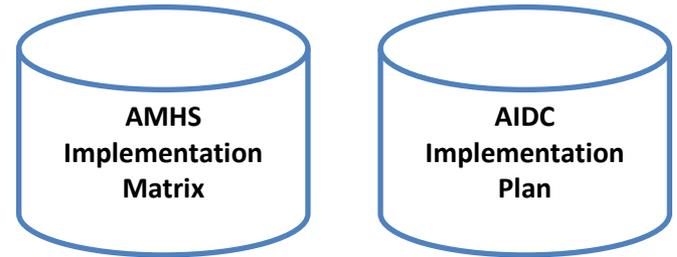


NAM/CAR Ground-Ground Data Link Implementation

Due to the implementation of the New Flight plan format (2012), several States have speed up the implementation of their ATS Automation Systems

With the recognition of the operation benefits achieved through the implementation of CPL-LAM functionalities, more States are requiring the AIDC implementation

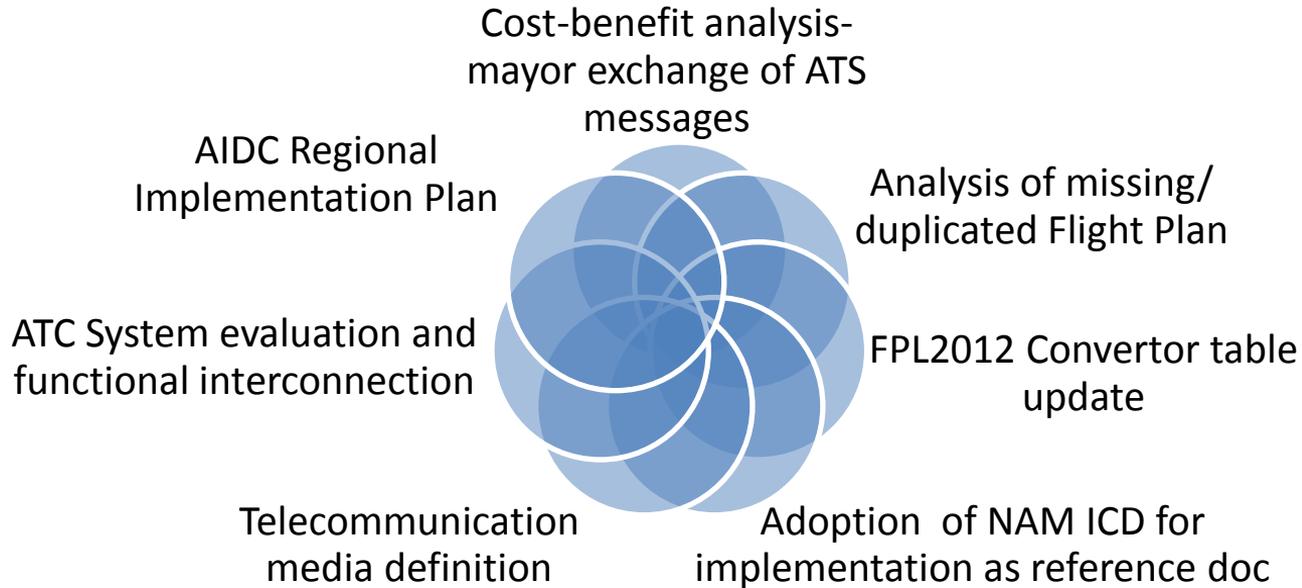
The modernization of the MEVA, E/CAR, CAMSAT and other regional telecommunication networks is facilitating the implementation of ATN applications



eANP Requirement (ATN, AFTN) Table by States



NAM/CAR Ground-Ground Data Link Implementation: AIDC REGIONAL IMPLEMENTATION





NAM/CAR Ground-Ground Data Link Implementation: AIDC Regional Implementation

<http://www.icao.int/NACC/Pages/edocs-cns.aspx>

Automation (AIDC, CPDLC, and other System applications)

Subject	Language	
Guidelines for ATM Automated Systems / Directrices para Sistemas Automatizados ATM	en	
ATS Inter-facility Data Communication (AIDC)		
AIDC Regional Plan	en	
Interface Control Document for Data Communications Between ATS Units in the Caribbean and South American Regions (CAR/SAM ICD). Version 1.0 – 13 November 2006	en	
North American (NAM) Common Coordination Interface Control Document (ICD) VOLUME 1: Area Control Center (ACC) to ACC	en	
Orientacion General Oct 2011- Implementación del AIDC y Aplicaciones por Enlace de Datos (ADS y CPDLC)		es

- AIDC IMPLEMENTATION CHECKLIST
- Samples of Contents for Letter of agreements for AIDC Implementation



NAM/CAR Ground-Ground Data Link Implementation AIDC Regional Implementation: FPL2012 Converter Status Table

Date	Solution	
	AFTN Terminal –FPL	ATC Automated System - FDP
Anguilla	Implemented	Manual
Antigua and Barbuda	Implemented	Manual
Aruba	Implemented	Implemented
Bahamas	AMHS (FPL2012) terminals implementation date to be defined (TBD)	Full upgrade planned (converter is use)
Barbados	Implemented	Implemented
Belize	Implemented	Full upgrade planned (converter is use)
Bermuda	Implemented	Manual
British Virgin Islands	Implemented	Manual
Canada	Implemented	Implemented
Cayman Islands	Implemented	Implemented
COCESNA	Implemented	Implemented
Costa Rica	Implemented	Full upgrade planned (converter is use)
Cuba	Implemented	Implemented

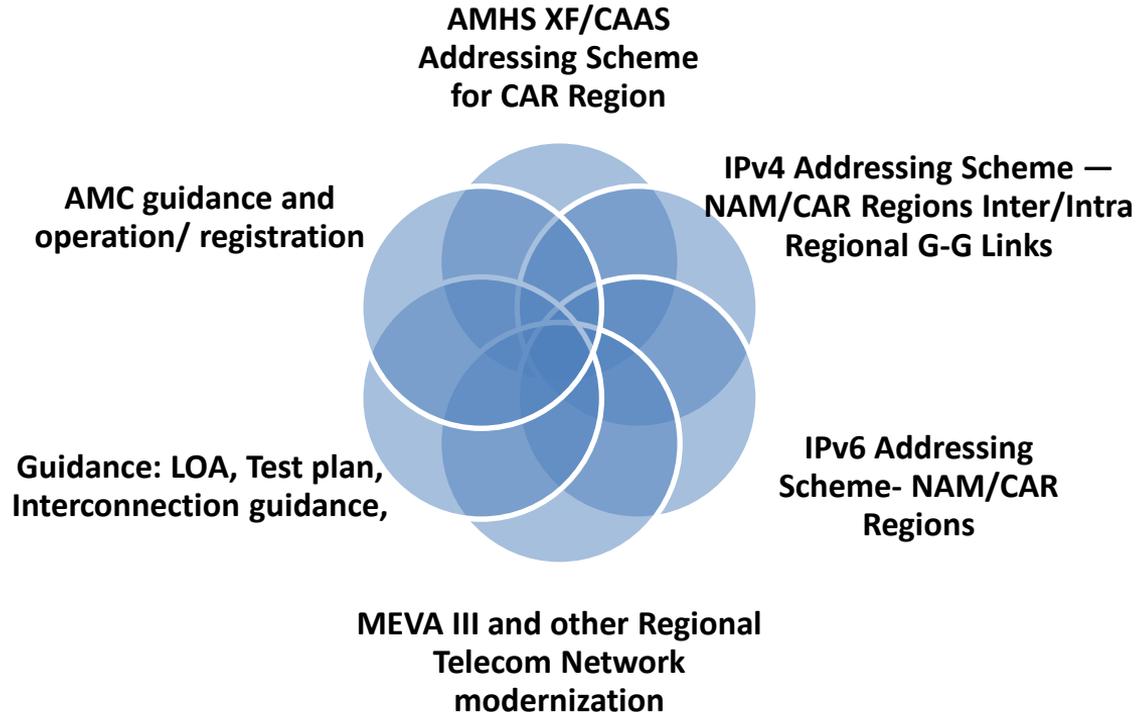


NAM/CAR Ground-Ground Data Link Implementation: AIDC Regional Implementation: Regional Plan

	1	2	3	4	5	6	7
State	Does your current Flight Data Processing System (FDP) have the capacity to process CPL-LAM messages? (Y/N) If not, when will your FDP have this capacity? Indicate date If yes, please indicate FDP model, manufacturer and any relevant equipment information to identify the system.	Indicate with what adjacent FIR/ATS Unit is the CPL-LAM implementation required:	Please indicate intended date for CPL-LAM testing and implementation:	Please provide Point of Contact for further CPL-LAM coordination (name, title, e-mail, phone number)	If CPL-LAM has been implemented, please provide bilateral agreement(s) for its operation, if applicable (for example ICD document)	CPL-LAM messages are transmitted through AFTN circuits, what is the current AFTN circuit speed and, if any, upgrade for CPL-LAM implementation:	Provide comment or concerns for CPL-LAM implementation
Cuba	yes - Oracle Version 9 modified by LITA-CUBA	FIR Miami	With Miami was started in 15 December 2011. Merida started in 9 March 2012.	Manuel Vega Rodríguez, Operations Management Havana ACC (537) 649-7281 manuelvega@aeronav.ecasa.aviane.t.cu, Víctor Manuel Machado Sánchez, Operation Management Havana ACC (537)-649-7281, email: victormachado@aeronav.ecasa.avia.net.cu	NAM-ICD Version D	19200 BPS	We received many mistakes from the users in the FPL, in almost all fields. We have detected changes in the FPL forwarded by ACC's or ANSP offices related to FPL's presented by operators
		FIR Merida					
		FIR Kingston	TBD				
		FIR CENAMER	Segundo semestre del 2014				
		FIR Haiti	TBD				
Dominican Republic	Yes - For mid 2013 yes- TopSky-ATC, Thales ATM	KZMA/Miami ARTCC	Q2 - Ready to test	Julio Cesar Mejia A. Enc. ATM, jmejia@idac.gov.do, 809 274-4322. Ext. 2103 + Fernando Casso, fcasso@idac.gov.do	NAM-ICD Versión D	AMHS: 64 Kbps	
		TJZS/San Juan CERAP	Q2 - Ready to test				
		TNCF/Curazao ACC	Q2 - Ready to test				
		MTEG/Port au Prince ACC	TBD				
Mexico	Yes- FDP=EUROCAT-X.V3 Model, Producer= THALES ATM, INFO= Four Control Centres, all Mexico covered	Central America (COCESNA/CENAMER)	Mexico FDP system available	Ing. Jose de Jesus Jimenez Director de Sistemas Digitales SENEAM/SCT/MÉXICO xxxxx@sct.gob.mx 55 57 86 55 32	NAM-ICD Versión D	19200 bps	Mexico already counts with the implementation of CPL/LAM information exchange between: MZT ≤ ≥ LAX, MZT ≤ ≥ ABQ, MTY ≤ ≥ ABQ, MTY ≤ ≥ HOU, MID ≤ ≥ HOU, MID ≤ ≥ HAB



NAM/CAR Ground-Ground Data Link Implementation: AMHS Regional Implementation





NAM/CAR Ground-Ground Data Link Implementation: AMHS Regional Implementation

<http://www.icao.int/NACC/Pages/edocs-cns.aspx>

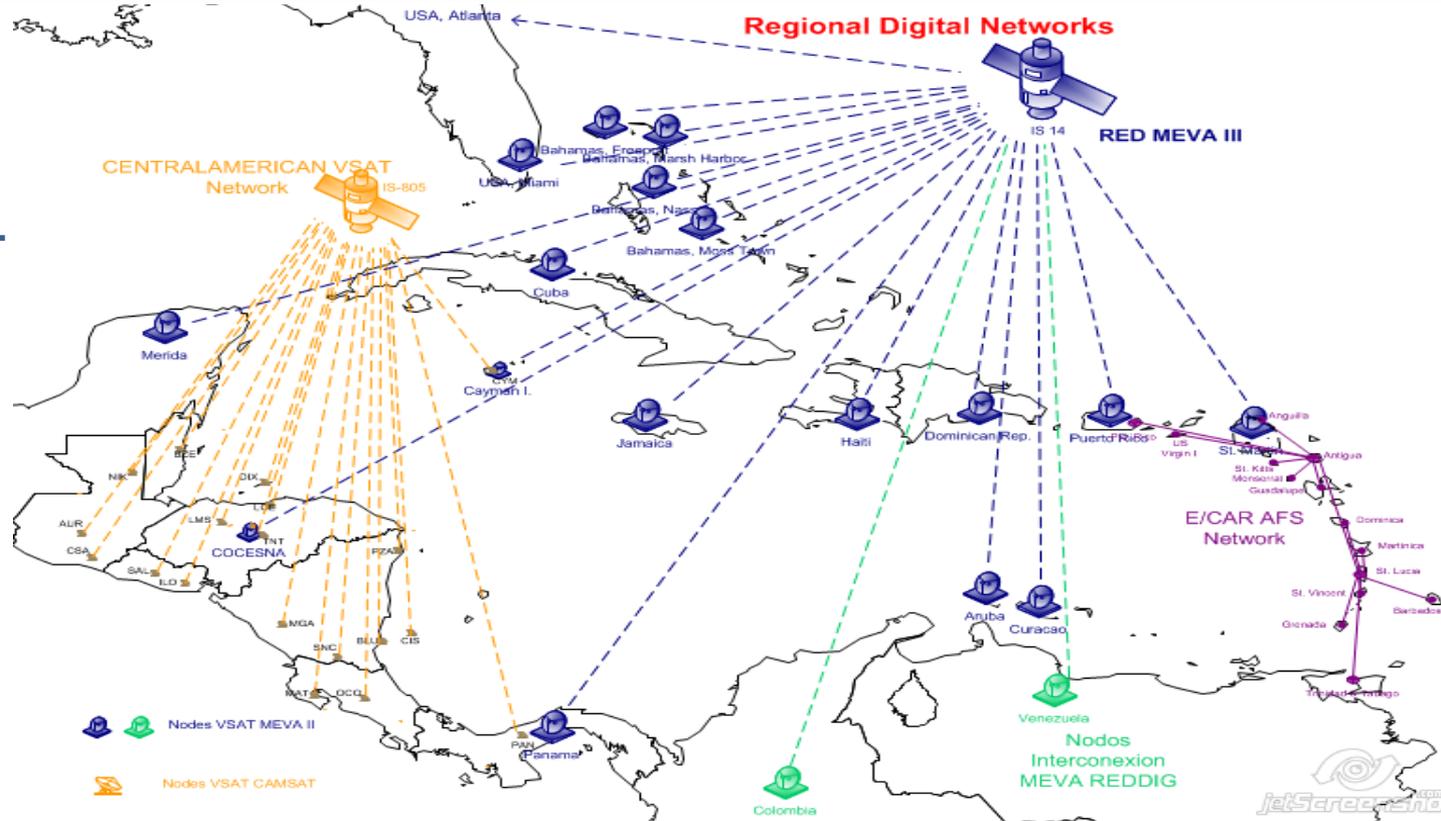
Communications

Subject	Language	
CARSAM Regional Program for the implementation of the Air Ground Data Links	en	
CARSAM Regional Activities Plan for Planning and Implementation of Air Ground Data Links	en	
CARSAM Regional Strategy for the deployment of the ATN and its applications	en	
GREPECAS 14 Template for CNS Table 1Bc	en	es
Guidelines on Performance of VSAT Networks	en	
IPv4 Addressing Scheme Ver 1.1 — NAM/CAR Regions Inter/Intra Regional G-G Links	en	
IPv4 Addressing Scheme — SAM Region Inter/Intra Regional G-G Links	en	
AMHS Register for the CAR/NAM Regions	en	
Proposal for CAAS Addresses for the CAR Region	en	
Global Operational Data Link Document (GOLD)	en	

AMHS

Subject	Language	
CAR Regions AMHS Implementation Matrix, Ver. NACC/WG/04	en	
AMHS Interoperability Test Plan v1.0	en	
AMHS Implementation Workshop Web Page 2012		Link
III Workshop/Meeting on the Follow-up to the Implementation of the ATS Message Handling System (AMHS) in the NAM/CAR Regions (III AMHS-IMP) Santo Domingo, Dominican Republic, 24 to 26 September 2013		Link
List of participants Web	en	
Draft Technical Letter of Agreement for AMHS	en	
FAA Transition Process for AMHS implementation	en	
ATS Messaging Management Centre (AMC) Users Training Including AMC Phase 2 functions	en	

NAM/CAR Ground- Ground Data Link Implementation: AMHS Regional Implementation





NAM/CAR Ground-Ground Data Link Implementation: AMHS Regional Implementation: Implementation Matrix

Update: Sep 2015		CAR Region AMHS Implementation Matrix										
Administration	STATUS	System Description				System implementation milestones				(COM CHART) Connection with	POC	Remarks
		Location of Facility	AMHS Facility Type	AMHS Vendor	Current Facility Type	AMHS System Procurement Date	AMHS System Implementation Date	AMHS Interoperability Test	AMHS Service Cutover			
Aruba	Under Study	Aruba				diff	diff	diff	diff	United States	Joselito Andrade	5-2015 In the process of changing AFTN PAD. No projected date for AMHS
Bahamas	AMHS equipment installed	Nassau	AMHS/ MTA/ UA	IDS/Ubitech	AFTN switch	1Q 2012	TBD	TBD	TBD	United States	Keith Simonette	
Cayman Islands	Establishment of Testing Circuit	Grand Cayman	MTA + UA	Frequentis	AFTN switch	end 1Q2011	1Q2012 4Q 2014	2Q2015 4Q2015	TBD	United States	Wayne DaCosta	5-2015 System implemented but not operational. Interoperability testing in process I 9/1/15 - Comsoft activated line to start testing. Configuration Parameters sent out. Next coordination meeting scheduled for 9/16/15
Dominican Republic	Implemented	Santo Domingo	AMHS - MTA/UAs	Ubitech	AFTN Switch	already	Jan2011	May 2012	Sep 2012	United States	Fernando Casso	Originally implemented on MEVA II. Successfully transitioned to MEVA III
Cuba	Interoperability Testing in process	La Habana	AMHS - MTA/UAs	ISODE/ In-house	AFTN Switch	N/A	TBD	2014Q4 - 2015Q2	TBD Sept 2015	United States	Carlos Jimenez y Layla Rodriguez, Carmen de Armas	5 2015 Parts of the Interoperability Testing was performed over a test circuit on MEVA II; Testing resumed once the test circuit was migrated to MEVA III 8-2015 Interoperability testing successfully completed.
Haiti	Under Study	Port-au-Prince	TBD	TBD	AFTN User	10/15	03/16	05/16	03/16	United States	Emmanuel Jacques	06/15 - Current vendor needs to be verifig. Updated system implementation milestone.



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Implementation of Ground-Ground Data Link SAM Region – RLA/06/901 Project SAM/IG Meeting

**PBN and Airspace Route
Organization
Implementation**

**ATFM
Implementation**

**Assessment of operational
requirements to
determine the
implementation of
improvements in CNS
capabilities for operations
in route and terminal area**

ATS automation

Implementation of Ground-Ground Data Link SAM Region – Regional Priorities – **Bogota Declaration Implementation 2014-2016**

- Have 80% of effective implementation (EI) in the SAM Region
- Reduce the SAM regional accident rate gap in 50% with regard to the global accident rate
- Reduce runway excursions in 20% with regard to the average rate of the region (2007 – 2012)
- Have 20% of the international aerodromes certified
- Reach 67% of SSP Implementation. and 100% of the service providers SMS oversight capacity

Safety



- Full compliance Assembly Resolution A37-11 (APV)
- 60% SID and STAR PBN implementation
- 40% of CCO and CDO implementation
- Reach 40,000 tons of regional CO₂ emissions reduction per year in en-route PBN implementation
- 100% ATFM implementation
- 100% phase 1 transition AIS to AIM (aeronautical)
- **100% of the Air Traffic Services Message Handling Services (AMHS) regionally interconnected. (23 interconnection)**
- **100% Interconnection of automated systems (ATS interfacility data communications (AIDC) exchange) (15 interconnection)**
- **80% of the States with national IP communications networks implemented**

Air Navigation





Implementation of Ground-Ground Data Link SAM Region – Status of Implementation of AMHS and their Interconnection in the SAM Region

STATE	MANUFACTURER	YEAR OF INSTALLATION	REMARKS (INTERCONNECTION INFORMATION)
ARGENTINA	RADIOCOM	2005	Three MTAs installed: Ezeiza, Cordoba and Comodoro Rivadavia AMHS interconnected with P1 protocol: Brazil, Paraguay (operational), Peru, Argentina
BOLIVIA	THALES	2011	Installation completed at the end of 2011 one MTA installed in La Paz No AMHS interconnections
BRAZIL	RADIOCOM	2009	Two MTA installed Brasilia and Manaus. AMHS Brasilia connected with P1 protocol: Argentina, Peru (Operational), Spain
CHILE	THALES	2010	The AMHS system was completed by the end of 2010 . At the national level all the terminals are connected with AFTN circuits. No AMHS interconnection
COLOMBIA	COMSOFT	2009	AMHS interconnected with Peru (Operational)
ECUADOR	THALES	2012	AMHS interconnected with Peru (Operational)
GUYANA	SKYCOM	2011	Operational since May 2011 . AMHS interconnected with Surinam (Operational)
FRENCH GUIANA			No AMHS implemented
PANAMA	THALES	2012	AMHS installed at the end of 2012. No AMHS interconnection
PARAGUAY	RADIOCOM	2007	Interconnected with Argentina (Operational)
PERU	COMSOFT	2009	AMHS interconnected with P1 protocol: Argentina, Brazil (Operational), Colombia (Operational), Ecuador (Operational), Venezuela
SURINAME	SKYCOM	2011	Operational since May 2011 . AMHS interconnected with Guyana (Operational)
URUGUAY	FREQUENTIS	2013	No AMHS interconnection
VENEZUELA	RADIOCOM	2010	AMHS interconnected with P1 protocol: Argentina, Peru



Implementation of Ground-Ground Data Link SAM Region – AMHS Interconnection Plan

STATE	AMHS INTERCONNECTION REQUIREMENT	DATE OF IMPLEMENTATION	REMARKS
Argentina	Bolivia	Mar 2016	
	Brazil	Dec 2015	MTA connected with P1 protocol
	Chile	Dec 2016	
	Paraguay	Mar 2012	Operational
	Peru	Nov 2015	MTA connected with P1 protocol
	Uruguay	Jun 2016	
Bolivia	Argentina	Mar 2016	
	Brazil	Apr 2016	
	Peru	May 2016	
Brazil	Argentina	Dec 2015	MTA connected with P1 protocol
	Bolivia	Apr 2016	
	Colombia	Jul 2016	Depending upon progress of Bogota REDDIG II node transferring
	Guyana	Mar 2016	
	French Guiana	TBD	AMHS implementation pending
	Paraguay	Jun 2016	
	Peru	Nov 2015	Operational
	Suriname	Dec 2016	
	Uruguay	Dec 2015	
	Venezuela	Dec 2016	
Chile	Argentina	Dec 2016	
	Peru	Dec 2015	
Colombia	Brazil	Jul 2016	Depending upon progress of Bogota REDDIG II node transferring
	Ecuador	Jul 2016	Depending upon progress of Bogota REDDIG II node transferring
	Panama	Dec 2016	Depending upon progress of Bogota REDDIG II node transferring
	Peru	Sep 2010	Operational
Ecuador	Venezuela	Jun 2016	Depending upon progress of Bogota REDDIG II node transferring
	Colombia	Jul 2016	Depending upon progress of Bogota REDDIG II node transferring
	Peru	Jul 2012	Operational
French Guiana (France)	Venezuela	Dec 2016	
	Brazil	TBD	AMHS implementation pending
Guyana	Venezuela	TBD	AMHS implementation pending
	Brazil	Mar 2016	
	Suriname	Jun 2011	Operational



Implementation of Ground-Ground Data Link SAM Region – AMHS Interconnection Plan

STATE	AMHS INTERCONNECTION REQUIREMENT	DATE OF IMPLEMENTATION	REMARKS
Panama	Colombia	Dec 2016	Depending upon progress of Bogota REDDIG II node transferring
Paraguay	Argentina	Mar 2012	Operational
	Brazil	Jun 2016	
Peru	Argentina	Nov 2015	MTA connected with P1 protocol
	Bolivia	May 2016	
	Brazil	Nov 2015	Operational.
	Chile	Dec 2015	
	Colombia	Sep 2010	Implemented
	Ecuador	Jul 2012	Implemented
	Venezuela	Jun 2016	MTA connected with P1 protocol
Suriname	Brazil	Dec 2016	
	Guyana	Jun 2011	Implemented
	Venezuela	Jun 2016	
Uruguay	Argentina	Jun 2016	
	Brazil	Dec 2015	
Venezuela	Brazil	Dec 2016	
	Colombia	Jun 2016	Depending upon progress of Bogota REDDIG II node transferring
	Ecuador	Dec 2016	
	Guyana	Dec 2016	
	French Guiana	TBD	AMHS implementation pending.
	Peru	Jun 2016	MTA connected with P1 protocol
	Suriname	Jun 2016	



Implementation of Ground-Ground Data Link SAM Region

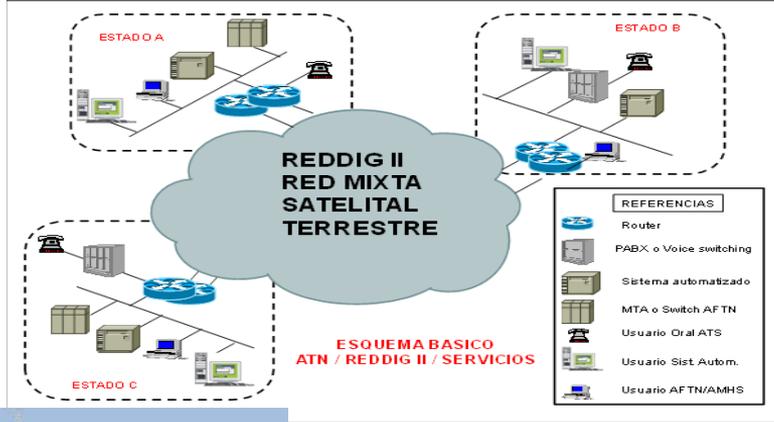
State	AIDC interconnection requirement	Implementation date	Remarks
Argentina	Bolivia	TBD (2017-2019)	Bolivia does not count with automated systems.
	Brazil/Brasil (1)	Second Semester 2016	Brazil reported AIDC operation second semester of 2016.
	Chile (2)	Second quarter 2016	Positive AIDC trials were made between ACC Iquique and ACC Cordoba.
	Paraguay (3)	Second Quarter 2016	Positive trial was made between ACC Asuncion and ACC Ezeiza.
	Uruguay (4)	Second Quarter 2016	Initial AIDC coordination was made
Bolivia	Argentina	TBD (2017-2019)	Bolivia does not count with automated systems /
	Brazil/Brasil	TBD (2017-2019)	
	Paraguay	TBD (2017-2019)	
	Peru	TBD (2017-2019)	
Brazil	Argentina	Second Semester 2016	Brazil reported AIDC operation second semester of 2016
	Bolivia	TBD (2017-2019)	Bolivia does not count with automated systems/.
	Colombia (5)	Second Semester 2016	Brazil reported AIDC operation second semester of 2016
	Guyana	TBD (2017-2018)	Guyana does not count with AIDC.
	French Guiana	(2016-2017)	French Guiana does not count with AIDC.
	Paraguay (6)	Second Semester 2016	Brazil reported AIDC operation second semester of 2016
	Peru(7)	Second Semester 2016	Initial AIDC trial was made
	Surinam	TBD (2017-2019)	Suriname does not count with AIDC implemented.
	Uruguay (8)	Second Semester 2016	Brazil reported AIDC operation second semester of 2016
Venezuela (9)	(2017-2019)	Venezuela does not count with AIDC	
Chile	Argentina	Second quarter 2016	Positive AIDC trials were made between ACC Iquique and ACC Cordoba..
	Peru (10)	Second quarter 2016	Positive AIDC trials were made between ACC Iquique and ACC Lima..
Colombia	Brazil	Second Semester 2016	Brazil reported AIDC operation second semester of 2016
	Ecuador (11)	End second quarter 2016	AIDC in pre operational phase.
	Panamá (12)	End second quarter 2016	AIDC in pre operational phase.
	Peru (13)	End second quarter 2016	AIDC in pre operational phase..
	Venezuela (14)	(2017-2019)	Venezuela does not count with AIDC



Implementation of Ground-Ground Data Link SAM Region

State	AIDC interconnection requirement	Implementation date	Remarks
Ecuador	Colombia	End second quarter 2016	AIDC in pre operational phase..
	Peru (15)	August 2015	AIDC operational phase since 31 March 2016
French Guiana	Brazil	TBD (2016-2017)	French Guiana does not count with AIDC.
	Suriname/Surinam	TBD (2017-2018)	French Guiana and Suriname do not count with AIDC.
Guyana	Brazil/Brasil	TBD (2017-2018)	Guyana does not count with AIDC.
	Surinam	TBD (2017-2018)	Guyana does not count with AIDC.
	Venezuela	TBD (2017-2018)	Guyana and Venezuela do not count with AIDC.
Panama	Colombia	End second quarter 2016	AIDC in pre operational phase.
Paraguay	Argentina	Second Quarter 2016	Positive trial was made between ACC Asuncion and ACC Ezeiza.
	Bolivia	TBD (2017-2019)	Bolivia does not count with automated systems.
	Brazil/Brasil	Second Semester 2016	Brazil reported AIDC operation second semester of 2016
Peru	Bolivia	TBD (2017-2019)	Bolivia does not count with automated systems.
	Brazil/Brasil	Second Semester 2016	Initial AIDC trial was made
	Colombia	End second quarter 2016	AIDC in pre operational phase.
	Chile	End second quarter 2016	Positive AIDC trials were made between ACC Iquique and ACC Lima.
	Ecuador	August /Agosto 2015	Operational since 31 March 2016
Surinam/Suriname	Brazil/Brasil	TBD (2017-2019)	Suriname does not count with AIDC implemented..
	French Guiana	TBD (2017-2019)	Suriname and French Guiana have not AIDC implemented.
	Guyana	TBD (2017-2019)	Suriname and Guyana not have AIDC implemented..
Uruguay	Argentina	Second Quarter /2016	Initial AIDC coordination was made between Argentina and Uruguay.
	Brazil/Brasil	Second Semester 2016	Brazil reported AIDC operation second semester of 2016
Venezuela	Brazil/Brasil	(2017-2019)	Venezuela does not count with AIDC
	Colombia	(2017-2019)	Venezuela does not count with AIDC.
	Guyana	TBD (2017-2019)	Guyana and Venezuela do not count with AIDC.

Implementation of Ground-Ground Data Link SAM Region



**REDDIG II Network
Dual Network
VSAT and Ground MPLS Network**



**VSAT network
17 nodes
2 Master Station
Manaus Ezeiza**



**MPLS Ground
Network LEVEL 3**



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