Regional Air-Ground Data-Link Implementation

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NAM/ CAR/ SAM ATS Datalink Implementation Workshop

(Philisburg, Sint Maarten, 18-21 April 2016)

CONTENTS

- Air Navigation Plan In The CAR/SAM Regions - eANP (Doc 8733) (Air-Ground Data-Link Consideration)
- Performance Based Implementation Plan (Air-Ground Data-Link Consideration)
  - NAM-CAR Regions
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- GREPECAS Organization
- Air Ground Data Link Implementation
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AIR NAVIGATION PLAN IN THE CAR/SAM REGIONS- - eANP (Doc 8733) (Air-Ground Data-Link Consideration)

- Air navigation plans exposed in detail the facilities, services and procedures required for international air navigation within a specific area.
- These plans contain recommendations that Governments can follow when programming the provision of facilities and air navigation services, with the assurance that the facilities and services provided in accordance with the plan form of the other States an integral system appropriate for the foreseeable future.
- Each Contracting State is responsible for the provision of facilities and services in its territory, in accordance with article 28 of the Convention. The Council has recommended that these facilities and services include those specified in air navigation plans.
- On June 18, 2014, ICAO Council decided that Air Navigation Plan (ANP) will be published in three volumes replacing in this way regional air navigation plans approved by the Council on 26 February 1997 formed a basic ANP and a document on facilities and services (FASID) in two volumes.

AIR NAVIGATION PLAN IN THE CAR/SAM REGIONS- - eANP (Doc 8733) (Air-Ground Data-Link Consideration)

Volume I contains **the stable elements of the Plan**, whose amendment requires the approval of the **Council,** referred to a:

- ✓ the assignment of responsibilities;
- ✓ subject to a regional agreement mandatory requirements;
- ✓ and/or additional requirements specific to the region and are not covered by the SARP.

Partial list of these elements:

- ✓ (Tables and charts) boundaries of flight information regions (FIR);
- ✓ Search and rescue (SRR) regions (tables and charts) boundaries;
- ✓ (VAAC) volcanic ash advisories centers;
- ✓ Warnings of tropical cyclones (CAGR) centers; Volcano observatories (VO);

AIR NAVIGATION PLAN IN THE CAR/SAM REGIONS- - eANP (Doc 8733) (Air-Ground Data-Link Consideration)

Volume II contains the **dynamic elements** of the plan, whose amendment **does not require the approval of the Council** (the approval is for regional agreement of the relevant **PIRG**), a:

- ✓ referred to the assignment of responsibilities;
- ✓ subject to a regional agreement mandatory requirements; and/or
- ✓ additional requirements specific to the region and are not covered by the SARP.

Partial list of these elements:

- ✓ principal flows of air traffic service (ATS) routes ;
- ✓ Meteorological Watch Office (MWO);
- ✓ codes of the Secondary Surveillance Radar (SSR),
- ✓ five letters Name codes
- ✓ VOLMET broadcasts.

AIR NAVIGATION PLAN IN THE CAR/SAM REGIONS- - eANP (Doc 8733) (Air-Ground Data-Link Consideration)

Volume III will contain **dynamic/flexible elements** of the plan, providing guidance for the implementation of its modernization and air navigation systems planning, taking into account emerging programs such as the **ASBU** and **roadmaps** of associated technologies described in the GANP.

Volume III of the ANP will also contain **additional guidance material** appropriate, especially in relation to the i**mplementation**, to **complement** the material contained in **volumes I** and **II** of the ANP.

Volume III amendment would **not require** the approval of the **Council** but a regional agreement (**Secretariat and PIRG**)

AIR NAVIGATION PLAN IN THE CAR/SAM REGIONS- - eANP (Doc 8733) (Air-Ground Data-Link Consideration)

VOLUME I

PART III – COMMUNICATION , NAVIGATION AND SURVEILLANCE (CNS)

2 GENERAL REGIONAL REQUIREMENTS

AIR-GROUND DATA LINK COMMUNICATIONS

2.5 Air-ground data link communications should be implemented in such a way that they are regionally and globally harmonized and make efficient use of available communication means and ensure optimum economy in frequency spectrum use and system automation

VOLUME II

PART III – COMMUNICATION , NAVIGATION AND SURVEILLANCE (CNS)

2 GENERAL REGIONAL REQUIREMENTS

AIR-GROUND DATA LINK COMMUNICATIONS

2.28 A Strategy for the harmonized implementation of the data link communications in the CAR/SAM Regions should be developed based on the Global Operational Data Link Document (GOLD) adopted by ICAO Regions and the Aviation System Block Upgrade (ASBU) methodology.

AIR NAVIGATION PLAN IN THE CAR/SAM REGIONS- - eANP (Doc 8733) (Air-Ground Data-Link Consideration)

PART III COMMUNICATION , NAVIGATION AND SURVEILLANCE (CNS)

2 GENERAL REGIONAL REQUIREMENTS

AIR-GROUND DATA LINK COMMUNICATIONS

2.29 Where applicable, controller-pilot data link communications (CPDLC), based on ATN VDL data link Mode 2 (VDL2) and/or FANS-1/A, should be implemented for air-ground data link communications.

2.30 Partial or divergent aircraft data link evolutions that result in excluding messages from aircraft systems should not be pursued. Interim steps or phases toward full implementation of the common technical definition in ground systems should only be pursued on a regional basis, after coordination between all States concerned.

2.31 Harmonization of operational procedures for implementation of the above packages is essential. States, Planning and Implementation Regional Groups (PIRGs) and air navigation services providers should adopt common procedures to support seamless ATS provision across FIR boundaries, rather than each State or Region developing and promulgating unique procedures for common functions.

AIR NAVIGATION PLAN IN THE CAR/SAM REGIONS- - eANP (Doc 8733) (Air-Ground Data-Link Consideration)

VOLUME II

PART III COMMUNICATIÓN , NAVIGATION AND SURVEILLANCE (CNS)

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 — Navaids 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-6 AERONAUTICAL MOBILE SERVICE AND AMSS

Country and location	Service or function	VHF voice	VHF data	HF voice	HF data	Satellite voice	Satellite data	Mode S	Remarks
1	2	3	4	5	6	7	8	9	1
ANGUILLA (United Kingdom)									
	TWR	1							
TQPF THE VALLEY/Wall Blake, Anguilla I.									
ANTIGUA AND BARBUDA		1							
	AP	1							
TAPA SAINT JOHNS/ V.C. Bird Antigua I.	P	1							
	TWR	1							
	SMC	1							
ARGENTINA	APP-SR-I D-ATIS	11 2	2	SAM-1 SAM-2	X	X	X		
SAEU BUENOS AIRES		5 5							
	AC	1							
SABE BUENOS AIRES/ Aeroparque Jorge Newbery	C	1							
	GP								
	AP	5							
	P	1							
	TWR	5							
SAEZ BUENOS AIRES/ Ezeiza, Ministro Pistarini		1							
	ATIS	3							
	GP	3							
		2							
	AP	2							
SADF BUENOS AIRES/San Ferna ndo	P	1							
	ATIS	3	1	SAM-1	X	X	X		
	TWR	1							
SARI CATARATAS DEL IGUAZU/My. Carlos Eduardo K.	GP	4							
		4							
	AP	1							

AIR NAVIGATION PLAN IN THE CAR/SAM REGIONS- - eANP (Doc 8733) (Air-Ground Data-Link Consideration)

SURVEILLANCE SYSTEM - TABLE CNS II 9

State(Territory) /Location	ATS Unit Served	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks
		Fun	Cov	Fun	Modes (A,C&	Cover (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
ANGUILLA (UK)										
ANTIGUA & BARBUDA Airport (4 NM North)	V.C. Bird			T	A/C	180				* MSSR
ARGENTINA Bahía Blanca, Airport	APP			E/	A/C/	200				* MSSR 2009
Córdoba, Airport	Ezeiza	T	80	T	S	180				
Ezeiza, Airport	ACC Bahía Blanca	T	90	E	A/C	220				
La Rioja, Airport	TMA Córdoba ACC Ezeiza ACC Córdoba			E	A/C	200				* MSSR 2009
Mar de Plata, Airport	APP Ezeiza ACC Buenos Aires APP Cordoba ACC	T	90 60	E/ T	A/C/	180 180				
Mendoza, Airport	Córdoba ACC La Rioja TMA Ezeiza	T		E E	S A/C	200 180				* MSSR 2008
Neuquen	ACC Mar del Plata			E/	A/C	200				
Paraná, Airport	TMA Mendoza			T	A/C/	200				
Quilmes	TMA Cordoba ACC Ezeiza ACC			E	S A/C	200				* MSSR 2009
San Carlos de Bariloche, Airport	Neuquen TMA Ezeiza			E/ T	A/C/	200				* MSSR 2009
Salta	ACC Córdoba ACC				S	200				* MSSR 2008

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	• Improved ATS coordination • Increased communications availability • Communication misunderstandings avoided • Facilitated utilization of advanced technologies
Continuity	• Improved airspace interoperability and seamlessness • Improved provision of air traffic control services to all aircraft operations
Safety	• Improved airspace and aerodrome safety

Strategy

ATM Component	TASK DESCRIPTION	START-END	RESPON-SIBLE	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 (RPBANIP)

B0-40 TBO

Improved Safety and Efficiency through the initial application of En-Route Data Link

To implement an initial set of data link applications for surveillance and communications in ATC, supporting flexible routing, reduced separation and improved safety.

Linkage with B0/FICE

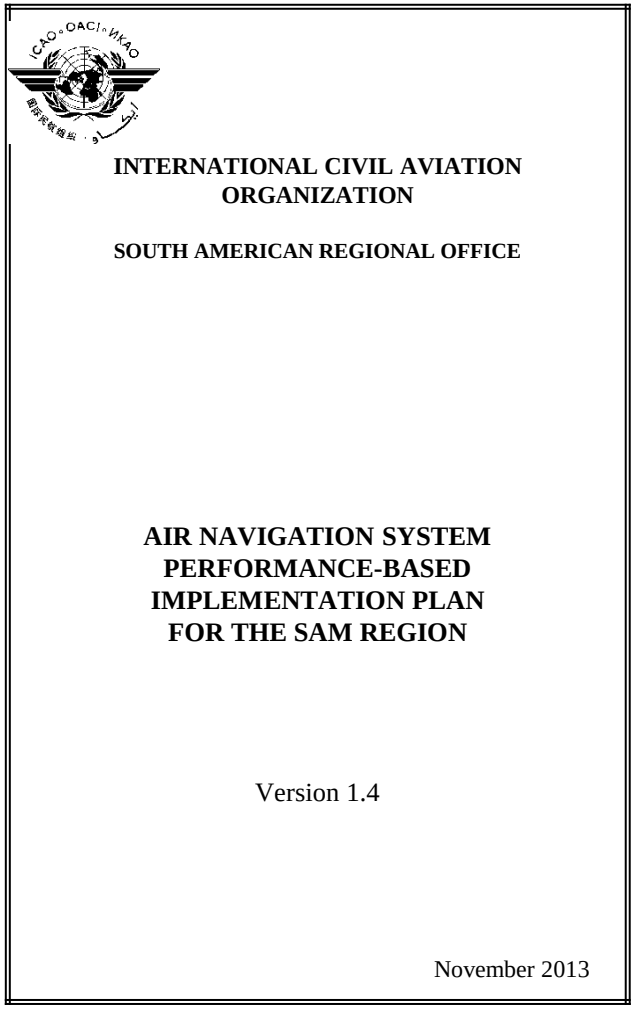
Requires good synchronization of airborne and ground deployment to generate significant benefits, in particular to those equipped. Benefits increase with the proportion of equipped aircraft.

For ground systems, the necessary technology includes the ability to manage ADS-C contract, process and display the ADS-C position messages. CPDLC messages need to be processed and displayed to the relevant ATC unit. Enhanced surveillance through multi-sensor data fusion facilitates transition to/from radar environment.

Global readiness checklist		Status (ready now or estimated date)
	Standards readiness	✓
	Avionics availability	✓
	Ground systems availability	✓
	Procedures available	✓
	Operations approvals	✓

NAM/CAR Regional Performance Based Air Navigation Implementation Plan (RPBANIP)

ASBU B0-40/TBO: Planning targets and Implementation progress	
Items	Implementation targets
1. ADS-C in Oceanic and remote areas	80% in selected FIRs with ADS-C implemented by December 2016
1. CPDLC	80% of selected FIRs with CPDLC implemented by June 2018



INTERNATIONAL CIVIL AVIATION ORGANIZATION

SOUTH AMERICAN REGIONAL OFFICE

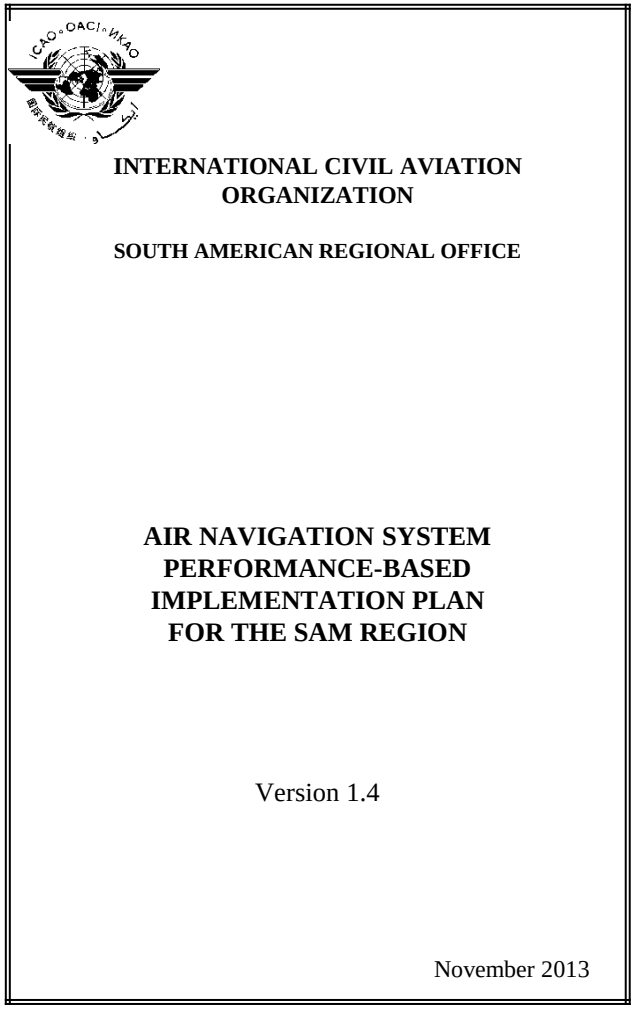
AIR NAVIGATION SYSTEM PERFORMANCE-BASED IMPLEMENTATION PLAN FOR THE SAM REGION

Version 1.4

November 2013

Chapter 1	Foreword
Chapter 2	Air Traffic in the SAM Region
Chapter 3	Planning Considerations
Chapter 4	Air Traffic Management (ATM)
Chapter 5	Communications, Navigation and Surveillance (CNS)
Chapter 6	Meteorology
Chapter 7	Search and Rescue (SAR) Services
Chapter 8	Aeronautical Information Services
Chapter 9	Aerodromes and Ground Aids / Aerodrome Operational Planning (AGA/AOP)
Chapter 10	Development of Human Resources and Competence Management
Chapter 11	Safety
Chapter 12	Performance Improvement Areas (PIA), modules and Air Navigation Report Forms (ANRF)

SAM PERFORMANCE BASED IMPLEMENTATION PLAN



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Version 1.4

November 2013

ATTACHMENT A -	Traffic forecasts in the SAM Region
ATTACHMENT B -	Global plan initiatives and their relationship with the main groups
ATTACHMENT C -	Performance framework form (PFF)
ATTACHMENT D -	Description of modules considered for the SAM Region
ATTACHMENT E -	Air navigation report forms (ANRF)
ATTACHMENT F -	Glossary of acronyms
ATTACHMENT G –	MET information provided by MET units
ATTACHMENT H -	List of reference documents

SAM PERFORMANCE BASED IMPLEMENTATION PLAN

CNS SAM PBIP

- Aeronautical Fixed Service in the SAM Region (PFF SAM CNS/01);
- **Aeronautical Mobile Service in the SAM Region (PFF SAM CNS/02);**
- Navigation Systems in the SAM Region (PFF SAM CNS/03); and
- **Air Surveillance service in the SAM Region (PFF SAM CNS/04).**

PFF CNS 02 SAM

REGIONAL PERFORMANCE OBJECTIVE: SAM CNS/02 IMPROVEMENTS TO THE AERONAUTICAL MOBILE SERVICES IN THE SAM REGION	
Benefits	
Safety	• Reduction of operational coordination errors between adjacent ACCs, making ATS coordination more efficient; and • Reduction of pilot and controller workload.
Environmental protection and sustainable development of air transport	• Assured coverage and quality of communications in ATS service; • Increased availability of communications for the ATS service; • Support to AIM/MET service; and • Assured radio frequency spectrum assigned to aviation for the communication service.
Metrics	
• Percentage of compliance with FASID Table 2-A; • Number of CPDLC systems implemented; • Number of DCL systems implemented; • Number of D-ATIS systems implemented, and • Number of VOLMET systems implemented.	

2012 - 2018
Strategy

ATM OC COMPONENTS	TASKS	PERIOD	RESPONSIBILITY	STATUS
AOM ATM-SDM DCB CM	a) Complete the implementation of the services required in Table CNS 2-A "Aeronautical Mobile Service - AMSS"	(*) - 2014	States	Valid
	a) Continental en-route: Complete coverage of VHF communications in the lower airspace, when operations so require	2012- 2015	States	Valid
	a) Implement oceanic area CPDLC, maintaining HF service as back-up	(*) - 2018	States	Valid
	a) Implement CPDLC in selected continental area	2012- 2018	States	Valid
	a) Terminal area: Implementation of different VHF channels for control tower and APP services at all airports where a single channel is used for APP and control tower services	(*) - 2015	States	Valid
	a) Implementation of DCL services at selected aerodromes	2016-2018	States	Valid
	a) Implementation of D-ATIS services at selected aerodromes.	2012-2017	States	Valid
	a) Implementation of VOLMET services (voice and data)	(*) - 2018	States	Valid
	a) Guarantee protection of the radio frequency spectrum used for current and foreseen communication services	(*) - 2018	States ICAO	Valid
	a) Monitor implementation progress	2012-2018	GREPECAS	Valid
Relation-ship with GPIs	GPI/6: ATFM, GPI/9: Situational awareness, GPI/17: Data link applications, GPI/19: Meteorological systems, GPI/22: Communication infrastructure, GPI 23: Aeronautical radio spectrum.			

REGIONAL PERFORMANCE OBJECTIVE: SAM CNS/04 IMPROVEMENTS TO THE ATS SURVEILLANCE SERVICE IN THE SAM REGION				
Benefits				
Safety	• Increased ATM situational awareness; • Improved ATS coordination, reducing coordination errors between adjacent ACCs; and • Reduction of pilot and controller workload.			
Environmental protection and sustainable development of air transport	• Facilitates ATS planning; • Increased airspace capacity; • Supports the implementation of PBN and random routes; and • Optimisation of information sharing resources.			
Metrics				
• Number of ADS-C systems implemented in oceanic FIRs; • Number of adjacent ACCs with exchange of ATS surveillance data, • Percentage of ensure airspace for upper levels with ADS-B coverage, and • Number of A-SMGS systems implemented.				
2012 – 2018 ***Strategy***				
ATM OC COMPONENTS	**TASKS**	**PERIOD**	**RESPONSIBILITY**	**STATUS**
AOM AO TS CM ATM-SDM	a) implement ADS-B and/or MLAT systems in en-route areas	2012-2018+	States	Valid
	a) Implement surface movement guidance and control systems (A-SMGCS) at airports where previous study indicates its requirement	2013- 2018+	States	Valid
	a) Implement the ADS-C service in all States with responsibility over an oceanic FIR	(*) - 2018	States	Valid
	a) Implement the exchange of ATS surveillance data between adjacent ACCs	(*) - 2018+	States	Valid
	a) Guarantee the protection of the radio frequency spectrum used for current and future radio navigation services	(*) - 2018	States ICAO	Valid
	a) Monitor implementation progress	2012-2018	GREPECAS	Valid
Relation-ship with GPIs	GPI/5: RNAV and RNP; GPI/6: ATFM; GPI/9: situational awareness; GPI/10: terminal area design and management; GPI/11: RNP and RNAV SIDs and STARs with; GPI/12: functional integration of ground and on-board systems; GPI/13: aerodrome design and management; GPI/14: runway operations; GPI/17: data link applications, GPI/22: communication infrastructure, GPI 23: aeronautical radio spectrum.			

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)

AIR NAVIGATION REPORT FORM (ANRF) TBO

REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – B0-TBO: Improved Safety and Efficiency through the initial application of Data Link Performance Improvement Area4: Efficient Flight Path – Through Trajectory-based Operations					
ASBU B0-TBO: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	N	Y	Y	Y	Y

ASBU B0-TBO: Implementation Progress	
Elements	**Implementation Status (Ground and Air)**
1. ADS-C over oceanic and remote areas	June 2018 Service provider
2. Continental CPDLC	June 2018 Service provider

ASBU B0-40: Implementation Roadblocks/Issues				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
1. ADS-C over oceanic and remote areas	NIL	Implementation of ADS general aviation pending	Implementation of GOLD procedures pending	Lack of duly trained inspectors for approval of operations
2. Continental CPDLC	NIL	Implementation of CPDLC general aviation pending	Implementation of GOLD procedures pending	Lack of duly trained inspectors for approval of operations

ASBU B0-TBO: Performance Monitoring and Measurement (Implementation)	
Elements	**Performance Indicators/Supporting Metrics**
1. ADS-C over oceanic and remote areas	Indicators: Percentage of FIRs with ADS C implemented Supporting metric: Number of ADS C approved procedures over oceanic and remote areas
2. Continental CPDLC	Indicators: Percentage of CPDLC implemented at oceanic and remote area FIRs Supporting metric: Number of CPDLC approved procedures over oceanic and remote areas

ASBU B0-TBO Performance Monitoring and Measurement (Benefits)	
Key Performance Areas	**Benefits**
Access & Equity	NA
Capacity	A better localization of traffic and reduced separation allow increased capacity. Reduced communication workload and better organization of controller tasks allowing increasing sector capacity.
Efficiency	Routes/tracks and flights can be separated by reduced minima, allowing to apply flexible routings and vertical profiles closer to the user-preferred ones
Environment	Reduced emissions as a result of reduced fuel burn
Safety	ADS-C based safety nets supports cleared level adherence monitoring, route adherence monitoring, danger area infringement warning and improved search and rescue. Reduced occurrences of misunderstandings; solution to stuck microphone situations.

GREPECAS ORGANIZATION

CAR/SAM ANP references

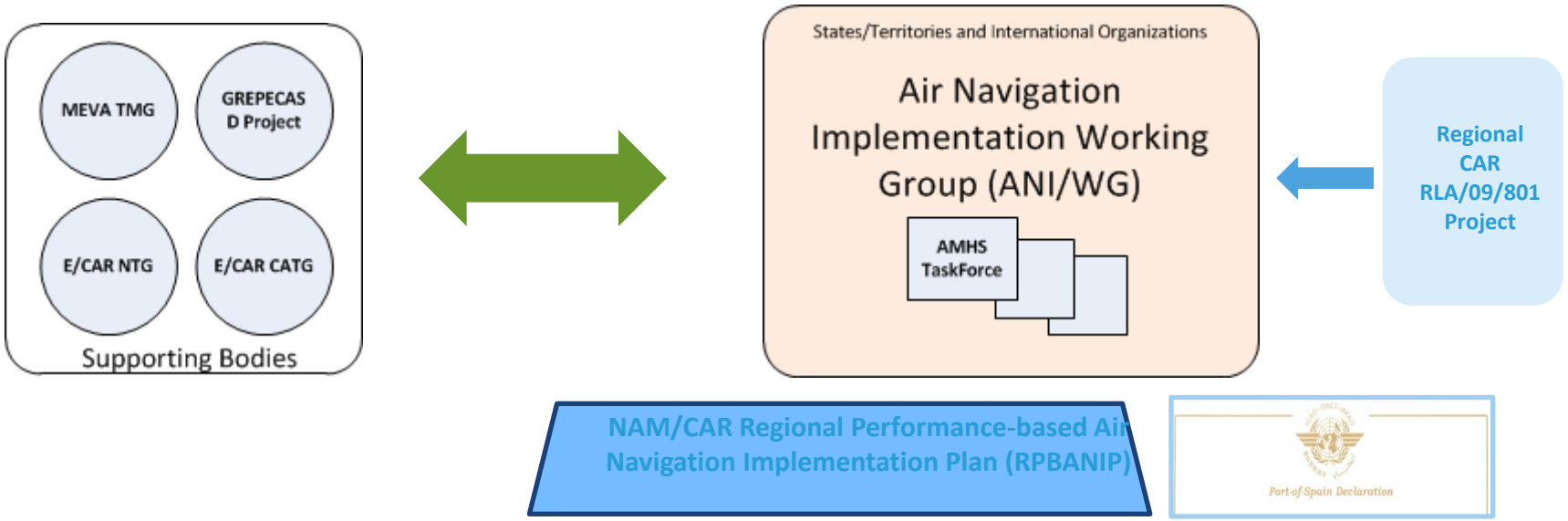
ADOPTED BY GREPECAS 13 Meeting

CAR/SAM REGIONAL PROGRAM FOR THE IMPLEMENTATION OF THE AIR – GROUND DATA LINKS *		
TERM	**GOALS IN THE IMPLEMENTATION OF INFRASTRUCTURE**	**SERVICES**
Near Term (2005–2009)	To implement ACARS, FANS, VDL-Mode 2 and HFDL based on SARPs and ICAO guidance.	Make maximum use of: - pre-departure dispatch; - oceanic dispatch; - D-ATIS; - other flight and routine information messages; and - automatic position reporting on the part of the operating aircrafts.
Medium Term (2009–2014)		- more complex safety related information can be exchanged, including ATC clearances.
Long Term (after 2014)	Implement Data links as the future evolution and based on the new SARPs and ICAO guidance.	- The use will include down linking of aircraft flight parameters for use by the ATM system; and - uplink of traffic data for improved situational awareness in the cockpit.

GREPECAS ORGANIZATION

NAM/CAR Air - Ground Data Link Implementation

NAM/CAR Implementation supporting and implementing Bodies



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

ADS-B, AIDC, AIM, AMHS, ATFM and PBN TaskForces
Responsibilities/ Work Programme/ Membership

Monitoring and Follow-up: NACC NCLB Strategy

NAM – CAR AIR GROUND DATA LINK IMPLEMENTATION

80% of CPDLC implemented in the selected FIRs by June 2018

ADS-C over oceanic and remote areas: 80% of selected FIRs with ADS-C implemented by December 2016.

Selected FIRs	Region	ADS-C implemented?
Central American	CAR	N
Curacao	CAR	N
Mazatlan Oceanic	CAR	N
Miami Oceanic	CAR	Y
New York Oceanic (W)	CAR	Y
PIARCO	CAR	N
Edmonton	NAM	N
Gander Domestic	NAM	N
Montreal Domestic	NAM	N
Vancouver Domestic	NAM	N
Anchorage /Anchorage A	NAM	Y
Anchorage continental O	NAM	Y
Oakland Oceanic	NAM	Y

IMPLEMENTED:	5	
TOTAL FIRS:	13	
IMPLEMENTATION RATE:		38.46%

Selected FIRs	Region	CPDLC implemented?
Central American	CAR	N
Curacao	CAR	N
Mazatlan Oceanic	CAR	N
Miami Oceanic	CAR	Y
New York Oceanic (W)	CAR	Y
PIARCO	CAR	N
Edmonton	NAM	Y
Gander Domestic	NAM	Y
Montreal Domestic	NAM	Y
Vancouver Domestic	NAM	Y
Anchorage /Anchorage Artic	NAM	Y
Anchorage continental Oceanic	NAM	Y
Oakland Oceanic	NAM	Y
Winnipeg Domestic	NAM	Y
Moncton Domestic	NAM	Y
Toronto	NAM	Y

IMPLEMENTED:	12	
TOTAL FIRS:	16	
IMPLEMENTATION RATE:		75.00%

NAM – CAR AIR GROUND DATA LINK IMPLEMENTATION

CPDLC/ADS-C Regional Implementation

Advantages of Communications by data links
Identification of benefits

- ✓ Safety improvements by reducing reception of erroneous message
- ✓ Reduction of congestion of voice communications
- ✓ Reduction of radiotelephony work load for the pilot and controller
- ✓ More availability of voice communications
- ✓ Reduction of delayed transfer of communications
- ✓ Reduction of retransmissions generated by misunderstood communications
- ✓ Less stress for the controller
- ✓ Reduction on the required time for controller communication

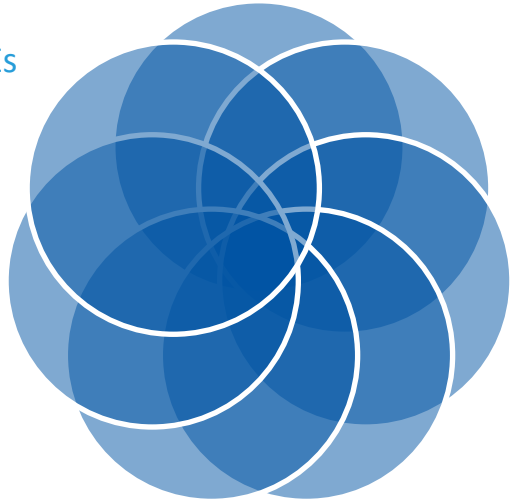
NAM – CAR AIR GROUND DATA LINK IMPLEMENTATION

CPDLC/ADS-C Regional Implementation

Regional Agreement for remote and oceanic air spaces

CPDLC Support from RLA/09/801 TEAM SMEs

Cost-Benefit Analysis - Greater position ADS-C/CPDLC messages reports exchange



Regional Implementation: Central American FIR, Curaçao FIR, Mazatlan FIR and PIARCO FIR

HF Communication as an alternate/back-up mean

ATC System review and functional interconnection

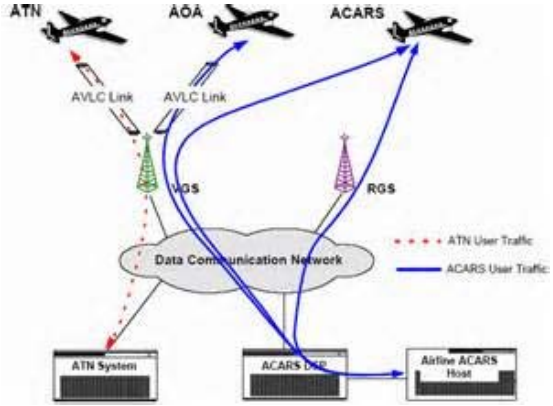
Global Operational Data Link Document (GOLD) document adoption for the NAM/CAR regions

NAM – CAR AIR GROUND DATA LINK IMPLEMENTATION

Regional Implementation

- COCESNA – current activities on CPDLC/ADS-C in the Pacific sector of the Central American FIR by CENAMER and the tests carried out since the second semester of 2014
- Trinidad and Tobago –implementation of ADS-C/ CPDLC in oceanic sector of PIARCO FIR by end of 2016
- Curacao and Mexico - study of ADS-C implementation at the northeast of the Curacao FIR and in Mazatlán FIR

- Other A-G Datalinks services (like Departure clearance) implemented at TMA/APP



NAM – CAR AIR GROUND DATA LINK IMPLEMENTATION

CPDLC/ADS-C Regional Implementation

Recent regional guidance developed by ANI/WG:

- Considerations for the implementation of Controller-Pilot Data Link Communications (CPDLC)
- Action plan template for the CPDLC/ ADS-C implementation

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Considerations for CPDLC Implementation

Regulatory/Regional Coordination/Approval			Details and Examples
This category involves any coordination with State or Regional stakeholders such as regulatory authorities or PIRGs	1.	Advise purpose and use within present ATM concept	The specific use of CPDLC for ATC functions would be described.
	2	Establish and reference GOLD as the source guidance material	This would be necessary so that the State can be aware of the guidance for procedures and monitoring requirements.
	3	Coordinate safety implementation activities	Incorporation of CPDLC would normally follow SMS practices for changes to operating procedures.
Air Traffic Management Considerations			
This category involves activities to support overall ANSP system readiness	1.	ATC and Technical Operations training	To be determined by implementer - Example, 2 hours (1 hour theory, 1 hour practice in simulator).
	2.	Decision on which messages to support	To be determined by implementer.
	3.	Pre-implementation live system testing	To be determined by implementer.
	4.	Performance monitoring	As per GOLD guidance
State/Operator Awareness			
This category involves activities to coordinate and advertise the addition of CPDLC services, includes procedures, flight planning, etc	1.	State Letter development and promulgation.	Advisory to States
	2.	State AIP - Document amendment - Aeronautic Information Circular development and publication	Should contain all procedures, including coverage area, implementation timelines, AFN logon address, etc

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Action plan template for the CPDLC/ADS-C implementation

Task Name	Duration	Start	Finish
CPDLC CONOPS			
use of GOLD Document as official guidance material			
Initial concept: scope/purpose within current ATM OPS concept			
Safety assessment of the CPDLC Concept			
Approval of CPDLC concept			
CPDLC Implementation			
Decision on which messages to support			
System evaluation for compliance and improvements			
Review of operational procedures regarding CPDLC			
Contracting of Data service provider			
ATC Training regarding CPDLC			
Technical Operations training regarding CPDLC			
State letter development and promulgation			
Pre-implementation live system testing			
AIP publication- AIC			
Evaluation of tests and preparation for operational use			
CPDLC operation start			
Performance Monitoring			

IMPLEMENTATION OF AIR 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

SAM STATUS ADS C CPDLC IMPLEMENTATION IN OCEANIC AREA

ACC/STATE	IMPLEMENTATION STATUS / TARGET DATE	REMARK
ATLANTICO (RECIFE)/BRAZIL	IMPLEMENTED/AUGUST 2009	FULL OPERATIONAL
BOGOTA/COLOMBIA	PLANNED /2018	
CAYENNE /FRENCH GUIANA	IMPLEMENTED MARCH 2011	FULL OPERATIONAL
COMODORO RIVADAVIA / ARGENTINA	INSTALLED/DECEMBER 2010	PRE OPERATIONAL PHASE THERE IS NO ESTABLISHED DATE FOR COMMENCEMENT OF OPERATIONAL TRIALS
EZEIZA/ARGENTINA	INSTALLED/DECEMBER 2010	PRE OPERATIONAL PHASE THERE IS NO ESTABLISHED DATE FOR COMMENCEMENT OF OPERATIONAL TRIALS
LIMA/PERU	PLANNED/2018	
MONTEVIDEO/URUGUAY	INSTALLED/DECEMBER 2014	PRE.OPERATIONAL
SANTIAGO OCEANIC/CHILE	IMPLEMENTED/	FULL OPERATIONAL

SAM STATE CONSIDERATIONS FOR DATA LINK IMPLEMENTATION

- The establishment of an **ATM operational concept** in a State is the starting point for data link implementation. The States are **not isolated** and in the seamless airspace concept, regional and global initiatives (in that order) must be considered. (SAM PBIP) and the Fourth Edition of the Global Air Navigation Plan (GANP) (Doc 9750) should be taken into account from the beginning.

- The institutions related to air traffic management (CAA, ANSP) should develop **an evolutionary strategy** aimed at providing **benefits to the ATM community**, through an **orderly, safe, and cost-efficient implementation**. It should be noted that the evolutionary implementation of the concept is related to the **installed capacity on board aircraft**.

- The possibility of **implementing the air-ground architecture**, whereby VHF equipment may **belong** to the **CAA** or the **DSP service provider**. It also addresses the decision of **Brazil** of modernising the data link platform through the **concession of services**.

- Regarding technical aspects, the decision regarding the **flight level (FL**) to be covered throughout a State's territory is crucial, since it determines **the number of remote stations to be installed**. **Brazi**l decided to have coverage in **FL 245**. also addresses the implementation of VHF equipment (ACARS, VDL Mode 2).

SAM STATE CONSIDERATIONS FOR DATA LINK IMPLEMENTATION (CONT.)

- Studies to **use REDDIG II SAM Regional Network** as a partial ground network to transport the **air ground data link information to the central processor of SITA in Rio de Janeiro from the Santiago Oceanic ACC**. Santiago Oceanic ACC use REDDIG II to transport ADS C CPDLC to SITA processor in Rio since October 2015 (Under test monitoring performance)

- The main applications that should be considered by CAAs for continental area are **D-VOLMET, D-ATIS, and DCL**. Service implementation involves the **installation of servers** that may be **owned by a CAA, ANSP or DSP.**

- The decision to **implement servers** must take into account **economic, technical, and operational aspects**. It should be noted that as long as only **few airports have data link functionalities**, **local servers for D-ATIS and DCL could be used**. If the **number of airports is significant**, consideration should be given to the **implementation of central servers** to receive information from remote units and send it to remote stations through the central processor.

- Regarding D-VOLMET, it is felt advisable to install a **central data bank**, like the OPMET bank of Brazil, to receive information from airports and send it, upon request, to aircraft, through the central processor.

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THANK YOU