



**Agenda Item 4: Regional air navigation planning and implementation performance framework: Review of programmes and projects**

**4.3 Projects under the Automation and ATM Situational Awareness Programme (BO-RSEQ, B0-FICE, B0-SNET, B0-ASUR and B0-SURF)**

**FOLLOW-UP TO THE PROJECT ACTIVITIES OF THE AUTOMATION AND ATM SITUATIONAL AWARENESS PROGRAMME**

(Presented by the Secretariat)

**RESUMEN**

This paper presents the updated information on the implementation status of the activities of Project (C) *Automation and ATM Situational Awareness* in the CAR and SAM Regions.

**Referencias**

- Reports of the SAM Implementation Group Workshop/Meeting (SAM/IG/18, Lima, Peru, 17 to 21 October 2016, SAM/IG/19, Lima, Peru, 22 to 26 May 2017 and SAM/IG/20 Lima Peru, from 16 to 20 October 2017).
- Reports of the AIDC Implementation Meetings (AIDC/2 Lima, Peru, 21 to 23 September 2016 and AIDC/3, from 24 to 26 April 2017).
- Report of the Aeronautical Information Management (AIM), Error Management on Flight Plan (FPL) and Air Traffic Services Inter-facility Data Communication (AIDC) Meeting(AIM/FPL/AIDC) , Tegucigalpa, Honduras, 30 October to 3 November 2017
- Work conducted by the NAM/CAR Task Force for the AIDC Implementation and the monitoring of flight plans with errors  
<https://www.icao.int/NACC/Pages/regional-group-AIDC.aspx>

*Objetivos estratégicos de la OACI:*

*A - Safety  
C - Air Navigation Capacity and Efficiency*

**1. Introducción**

1.1 In relation with the project activities of the Automation and ATM Situational Awareness programme, during the Third Meeting of the GREPECAS Programmes and Projects Review Committee (PPRC/3) and the Fourth Meeting of the Programmes and Projects Review Committee (PPRC/4), significant progress in the operational implementation of Air Traffic Services Inter-facility Data Communication (AIDC) between the Aeronautical Administrative Communication (ACCs) of Cuba, Dominican Republic, Mexico, United States (Miami), and COCESNA, and the pre-operational implementation of AIDC between the ACC of Lima and the ACC of Guayaquil, the ACC of Lima with the ACC of Bogota, the ACC of Guayaquil with the ACC of Bogota, the ACC of Bogota with the ACC of Panama and the ACC of Ezeiza with the ACC of Cordoba were reported; as well as the elaboration of documentation and guidance to support the ADS-B implementation and Multilateralism in the SAM Region.

1.2 In relation with the difficulties identified in the elaboration of the Project activities, the PPRC/3 and PPRC/4 Meetings highlighted the delays in some deliverables due to the lack of response or inputs from the Project members and actions by the involved States.

## 2 Analysis

2.1 The execution of the activities of the Project has been coordinated through communications among the members of the Project, mainly, the Project coordinator and the programme coordinator, via teleconferences and implementation meetings planned in each Regional Office.

2.2 As follow-up of the requirement established in the PPRC/4 Meeting, a Meeting/Workshop of ADS-B Implementation for States of the NAM/CAR and SAM Regions was held in Lima, Peru, from 13 to 16 November 2017. The meeting/workshop was attended by 51 delegates from 19 States of the NAM/CAR and SAM Regions, 1 International Organization and 6 participants of the industry. The event was conducted in 5 working sessions including 32 presentations. All documentation, as well as the event report with the outcomes and recommendations is available in the following website: [https://www.icao.int/SAM/Pages/ES/MeetingsDocumentation\\_ES.aspx?m=2017-ADSB](https://www.icao.int/SAM/Pages/ES/MeetingsDocumentation_ES.aspx?m=2017-ADSB)

2.3 Within the achievements and challenges identified in the execution of the projects since the PPRC/4, the following should be highlighted:

### CAR Region

#### Proyecto C1 – Automation

2.4 During the last years, the NAM/CAR Regions have been implementing two types of protocols for the NAM/ICD automation led by United States and AIDC Version PAC, currently led by Central America. **Appendix A** shows the progress of this implementation.

2.5 As part of the AIDC implementation, the AIDC/FPL Task Force has been working in the Region for more than two years, supporting States in this automated protocol, however, several problems have impeded the effective AIDC implementation in the Region:

1. Incompatibility of the software and the messaging of the Control Centres
2. Once connected, errors in flight plans have been one of the reasons affecting the automatic coordination.

2.6 During the GTE Meeting in 2016, it was observed and concluded that the exchange of radar data and AIDC plays an important role in the reduction of LHD occurrence; therefore, it encourages the implementation of those practices.

2.7 Likewise, the Region is working together with States and Airlines in the benefits measurement of the AIDC implementation, for this purpose, in the last meeting held in November 2017, in Honduras, the following measurement parameters were defined:

Expected Benefit	
Reduction of the controller workload, increase in information integrity, reduction of separations, reduction of costs, increase of situational awareness, reduction of risk between coordination, among others.	The Region and the Task Force members are working in the measurement process of the indicated variables, defining the procedures and data to take into consideration.

### ***Flight Plan Errors***

2.8 The Filed Flight Plan (FPL) Monitoring Ad hoc Group has identified a serial of errors originated by AIS/ARO users, ATM users, Airlines, pilots, among others. Those errors are negatively impacting the operations management and directly affect the automation process in the Region.

2.9 The FPL Ad hoc Group identified the following mitigation measures:

1. Training for the ARO/AIS staff
2. Management of the more trained personnel in the adequate position and in the timing where the flight plans workflow is higher
3. Updates and improvements to the Aeronautical Message Handling System (AMHS) as value added.
4. Continuous supervision and monitoring of Air Traffic Service(s) (ATS) messages sent by the operators.

2.10 During the last year, several measuring have been made identifying flight plan errors from American States, including the air service companies. A NAM/CAR/SAM Meeting will be conducted in Lima, Peru, from 16 to 20 April 2018, in which the participation from all American States is requested to be able to take decisions at a regional level.

2.11 Several States from the NAM/CAR Regions have implemented mechanisms to reject flight plans including errors, Cuba and United States. In the region, Mexico and COCESNA are under process of implementing their flight plan rejecting system. The Meeting agreed that if different systems from different States are working at the same time, this could slow down the operations in the Region. Therefore, ICAO, the FPL Ad hoc Group and IATA, are working together to standardize the messaging communication for the flight plan errors, in which the airlines and the AIS/ARO users can receive the same message of rejection, indicating the same information, and allowing that in this way they can identify the error. Appendix A shows a description of this proposal that currently is under development.

2.12 The minutes of the FPL Ad hoc Group can be found in the ICAO website in the following link : NACC de OACI: <https://www.icao.int/NACC/Pages/regional-group-AIDC.aspx>

2.13 The Meeting also recognized that the flight plan errors play a very important role in the Large Height Deviation (LHD) occurrence, and therefore, recommends that States require to their operators to comply with the ICAO established Standards and the best practices regarding the flight plan processes.

### ***Project C2 – Improvements to ATM Situational Awareness***

2.14 The Region is working in the development of a Regional Plan for the Air Traffic Flow Management (ATFM) implementation.

2.15 The Region is working in a harmonize implementation of Automatic Dependent Surveillance – Broadcast (ADS-B); the goal for all NAM/CAR States is by **1 January 2020**. In this sense, the Region is conducting a series of activities to ensure the appropriate implementation and commissioning.

2.16 Canada and United States are in a high level of ADS-B implementation. Other States of the CAR Region are in the process of the Project development:

- Aruba
- Central America
- Cuba (MLAT)

2.17 There are regional agreements according to the last Regional NAM/CAR/SAM Meeting for the ADS-B implementation, which will be addressed below. However, during this year, 2 seminars will be held focused in strengthen this task.

1. ADS-B Legislation Development Seminar for the NAM/CAR and SAM Regions, to be held in July 2018, in Mexico City, Mexico, aiming to strengthen the legal aspect at the same time that the technical/operational aspect.
2. Seminar on the assessment of the information quality and ADS-B operation, to be held in September 2018.

2.18 Along with this implementation, the Region is working to encourage States to share surveillance data, as a tool which helps to create situational awareness and reduce any risk in the coordination among the different Flight Information Regions (FIRs). Based on the information provided by the LHD Task Force, the need to streamline this exchange among the Caribbean States, Ecuador and COCESNA has been identified.

### **SAM Region**

#### ***Project CI – Automation***

2.19 Regarding the implementation of the AIDC interconnections between the adjacent ACCs of the SAM Region since the PPRC/4, the operational implementation of the AIDC stands out in the following ACC of Brazil:

Curitiba – Recife	July 2016
Recife – Brasilia	June 2016
Curitiba – Brasilia	July 2016
Curitiba – Amazon	July 2016
Amazon – Brasilia	June 2016
Amazon – Recife	May 2016

2.20 At the interregional level, Ecuador and Panama have conducted positive AIDC tests with CENAMER. Likewise, coordination's to initiate testing between the SAM and AFI Region were conducted, specifically between Argentina (ACC Ezeiza) and South Africa (Johannesburg) and Brazil (ACC Atlantic) with Senegal (ACC Dakar) and South Africa (ACC Johannesburg). The tests could not be started since the AIDC in the Atlantic ACC has not been completed yet and in Argentina the ATFN channel of the CAFSAT has been failing continuously. It is expected to continue conducting the tests during 2018.

2.21 In **Appendix B** of this paper, a summary of the activities conducted in the AIDC interconnections in each of the States of the Region since the PPRC/4 and the foreseen activities is presented.

2.22 In Appendix B, it is also observed that currently and since 2015, there are still some AIDC interconnections in pre-operational phase, since they have been in this phase for a long period, States involved are encouraged to make the needed efforts to migrate to the operational phase as soon as possible.

***Follow-up to the Implementation of Automated Systems for FPL 2012 and analysis of Errors and duplication of Flight Plans in the SAM Region***

***Implementation Status of FPL 2012 Automated Systems***

2.23 Regarding the progress on the implementation of the automated systems for the FPL2012, Bolivia has initiated the implementation of an ATM automation Project in the ATS units of La Paz, Cochabamba, Santa Cruz and Trinidad called CIDACTA. The automated system to be installed in such units is Thales made and is model TopSky, which is expected to be finalized in 2019. Likewise, for the end of the second semester of 2018, the Flight Data Processing (FDP) of the ACCs of Brazil will be able to process FPL 2012, thus eliminating the current converters installed. Chile, has installed AFTN terminals and not AMHS terminals at a national level and they don't have compatible templates with the FPL 2012. At the end of 2017, Peru completed the modernization process of the automated system of the ACC of Lima (AIRCON 2100 de INDRA), which, among other improvements, corrects the limitations in the number of characters in item 10 of FPL 2012. Finally, Paraguay and Venezuela are expecting to have an automated system in the ACCs, which accepts the FPL 2012 for end of 2018.

2.24 As a result of the implementation status of the automated systems in the SAM Region and to comply with Amendment 1 of the t5th Edition of Doc 4444 (FPL2012), it was identified that of the total of ACCs in the SAM Region (27), 67% implemented the update in the FDPs, 22% continue with the use of converters and the rest are still with the manual solution due to the lack of compliance with the FPL 2012 of the current installed automated systems in the ACCs or they don't have automated systems. Regarding the implementation of AMHS/AFTN terminals which have FPL 2012 templates that are able to detect errors in filling, 67 % of States have them available.

2.25 In this sense and up to date, there has not been any progress in the implementation of the automation for the FPL 2012 in respect with the information reported in the PPRC/4. In **Appendix C**, an updated table of the implementation status of the automation to comply with Amendment 1 of 75th Edition of Doc 4444 is presented.

***Procedures for the Mitigation of errors and Duplicity/Multiplicity of Flight Plans***

2.26 A guidance to avoid FPL errors was made during the Second Meeting of AIDC Implementation (AIDC/2). Likewise, possible sources of the errors in flight planning have been identified and recommendations for mitigating the errors in the flight plans, as well as the duplicity/multiplicity have been formulated. Both, the guidance and the list of error sources and recommendations are available in the following website [https://www.icao.int/SAM/Pages/ES/MeetingsDocumentation\\_ES.aspx?m=2016-AIDC2](https://www.icao.int/SAM/Pages/ES/MeetingsDocumentation_ES.aspx?m=2016-AIDC2).

2.27 As a result of the analysis of the procedures used by the States of the SAM Region in the flight plans presentation, duplicity in the international flight plans in the commercial Airlines was observed, most of them are presented by two means: first, through direct transmission by the AFTN network, by the flight planning system hired by Airlines (Lido, Jeppesen), which are addressed to the FDP of the ACC of the departure airport, and the second one through the printed presentation of the flight plans in the ARO/AIS Offices due to the regulatory requirement. Those offices retransmit them by the AFTN/AMHS network to the FDPs of the ACCs to the departure airport producing duplicity at a FDP level, generating rejection or conflict in the flight plans processing.

2.28 In this sense, the AIDC/3 Meeting in order to mitigate the duplicity of flight plans at a FDPs level of the ACCs of the departure airport, recommended that the direct transmission by the AFTN network of the international flight plans issued by the flight planning system hired by the Airlines, be addressed to the corresponding ARO/AIS Offices of the departure airport and that those offices retransmit

them by the AFTN/AMHS network to the FDPs of the ACCs to the departure airport. This process would be maintained for a transition period considered by the States, and once its effectiveness is verified, it would be transmitted directly to FDP copying the corresponding ARO/AIS Offices.

2.29 It was considered that in order to implement the duplicity/multiplicity mitigation procedures of regular and commercial flight plans, the States from the SAM Region should establish the AFTN address AFTN XXXXZPZX as the only address for receiving the corresponding flight plans to the ARO/AIS offices. In this regard, Peru has already implemented this since end of July 2017 (AIC/05/2017), Brazil, Ecuador and Venezuela will be implementing this during 2018.

### ***Project C2 - Improvements to ATM Situational Awareness***

2.30 Regarding the improvement activities in the situational awareness, a draft document for the *Guidance with technical considerations for supporting the ATFM implementation* was elaborated, the draft guidance is presented in the following website: <https://www.icao.int/SAM/eDocuments/Guia%20de%20consideración%20tecnica%20ATFM.pdf>. **Appendix D** of this paper shows the ADS-B implementation status up to date.

### *Description of Projects C1 and C2 of the SAM Region*

2.31 In **Appendix E** of this paper, the updated information of the implementation of the activities of Projects C1 *Automation and C2 ATM Situational Awareness* in the SAM Region is presented.

## **3 Suggested Actions**

3.1 The Meeting is invited to:

- a) take note of the information presented in this paper;
- b) analyze the progress on the implementation of the activities of the programme C Projects of the CAR/SAM Regions described in Section 2 and the Appendices;
- c) participation of all States of the NAM/CAR/SAM Regions in the NAM/CAR/SAM Regions Air Traffic Services Inter-facility Data Communication (AIDC) Implementation Meeting, to be held in Lima, Peru, 16 – 20 April 2018, which is crucial for the decision-making in benefit of the Region; and
- d) extend efforts so that the AIDC service could be operative in a short term in the States in which their system have this facility

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## APPENDIX A

### AIDC OPERATION STATUS AMONG ATS DEPARMENTS IN THE NAM/CAR REGIONAL STATES

#### OPERATIVE STATUS OF THE AUTOMATED APPLICATIONS

The NAM/CAR Region has the following protocols in operation:

1. New version (Version E) of the NAM Interface Control Document (ICD) for the Air Traffic Services Inter-facility Data Communication (AIDC) implementation. Lead by United States and currently functions in the automated connections among United States and its adjacent Flight Information Regions (FIRs) (Canada, Cuba, and Mexico), also implemented by Cuba and COCESNA.
  
2. Protocol AIDC, version Asia/PAC, currently implemented in Central America among the COCESNA Area Control Centre (ACC) and the Approach Control Offices (APPs) from its Member States (El Salvador, Guatemala, and Nicaragua). Likewise, tests have been made among COCESNA and its adjacent FIRs: Colombia (Bogota), Ecuador (Guayaquil), and Panama, so far they are not working correctly.
  
3. Connections in process:
  - Cuba:** Update Process of the NAM Protocol Phase II with United States.
  - Cuba:** NAM Protocol Tests Phase I with Jamaica
  - Dominican Republic:** Implementation process of NAM Protocol Phase I with United States.
  - Jamaica:** Implementation process of the NAM Protocol in Phase I with United States.
  - Mexico:** Update process of the NAM Protocol Phase II with United States.
  - Central America:**
    - Belize:** needs to get connected with COCESNA, Guatemala.
    - Costa Rica:** requires connecting with Nicaragua, Panama and COCESNA.
    - El Salvador:** requires connecting with Guatemala, Nicaragua.
    - Guatemala:** requires connecting with Belize, El Salvador, and Mexico.
    - Honduras:** still without interconnection capacity.
    - Nicaragua: requires connecting with El Salvador and Costa Rica.
    - COCESNA: is using the AIDC Protocol, PAC Version with El Salvador, Guatemala, and Nicaragua.

**COCESNA:** has made connection tests with Colombia, Ecuador, and Panama. It stills without operation.

At a Regional level, Dominican Republic and Jamaica are making very important efforts to automate their operations with United States; however, this effort requires an update of the Software of their Control Centers, which require an economic investment.

At the Central America level, Belize and Costa Rica, have new Control Centers and a greater effort will be required by COCESNA and its Member States, not only to make the interconnections among COCESNA and the Central America States, but also for the interconnection among the Central American States.

At an interregional level, COCESNA keeps making efforts with Colombia, Ecuador and Panama in order this connection is commissioned.

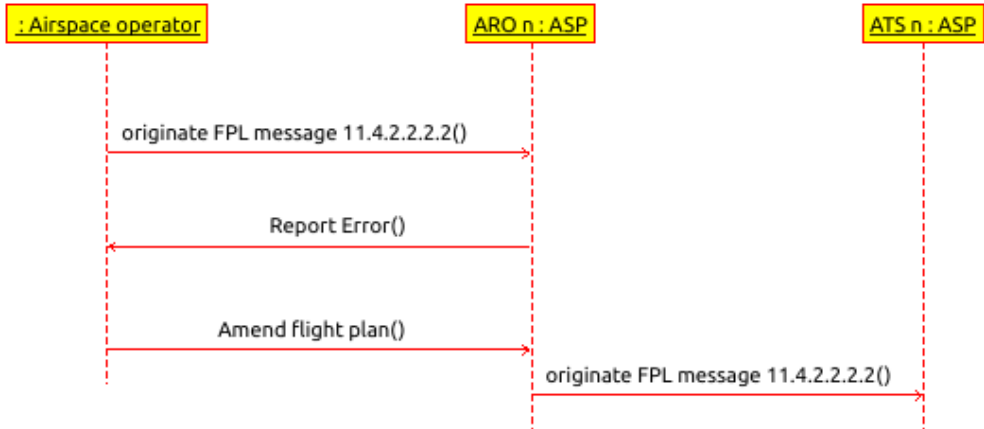
The list of the commissioned AIDC connections and the connections plan currently without operation is presented as follows:

State/Organization	System	Point of contact	Network Bandwidth	Comments	Milestones/Obstacles
Bahamas	INDRA AIRCON 2100*	-	-	-	-
Belize	INDRA AIRCON 2100	Gilberto Torres	AMHS: 64 Kbps	Has class 2 and 3	December – meeting in cocesna January – Training
Canada	CAATS GAATS+ (Gander Oceanic)	Troy Wilton Manager, ATM and ACC Automation (613) 248 6915 wiltont@navcanada.ca	-	-	-
COCESNA	INDRA Aircon 2100 Renovado	Luis Manuel Coello (luis.coello@cocesna.org) Jenny Lee (jenny.lee@cocesna.org)	N/A (the current AFTN circuit speed is 1.2 kbps internally and 9.6 kbps the internationals).  COCESNA planned to change her AFTN network for a new AMHS network in September 2016	-	Class 2 next year waiting for Cuba Update of system – waiting for Cuba
Costa Rica	No - FDP Server must upgrade – Q1 2017	Warren Quirós navegacionaerea.cns@dgac.go.cr +50622314924	AMHS: 64 Kbps	Has class 2 and 3	December – meeting in cocesna January – Training
Cuba	yes - Oracle Version 9 modified by LITA-CUBA	Joao Vázquez Estrada, email: joao.vazquez@aeronav.avianet.cu	AMHS: 64 Kbps*	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	Class 2. Work in progress
Curacao	-	Jacques Lasten, ATS Manager, DC- ANSP, j.lasten@dc-ansp.org	AMHS: 64 Kbps	-	-
Dominican Republic	Yes TopSky-ATC, Thales ATM	Julio Cesar Mejia A. Enc. ATM, jmejia@idac.gov.do, 809 274-4322. Ext. 2103 + Fernando Casso, fernando.casso@idac.gov.do	AMHS: 64 Kbps	-	Signing of phase change agreement - october 2017 Installation of test bed and update operation - September 2018
El Salvador	INDRA Aircon 2100 Renovado	Danilo Ramírez danilo.ramirez@cepa.gob.sv	AMHS: 64 Kbps	-	-
Guatemala	INDRA Aircon 2100 Renovado	Sergio Raul Enrique senriquez@gmail.com David Ascoli davidascoli@gmail.com	AMHS: 64 Kbps	-	-
Haiti	-	Nadia Leopold nleopold@hotmail.com	-	-	-
Jamaica	Thales Topsky In installation	Carl Gaynair – Carl.gaynair@jcaa.gov.jm	64k	85% implementation	Training. Verify if NAM is implemented and how. If classes are as should be. Thales Australia
Mexico	Yes- FDP=Topsky, Producer= THALES ATM, INFO= Four Control Centres, all Mexico covered	Oscar Vargas Antonio ovargasa@sct.gob.mx	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	Class 2 not planned in near future
Nicaragua	INDRA Aircon 2100 Renovado	Jorge Saballos jsaballos@eaai.com.ni	AMHS: 64 Kbps	Has class 2 and 3	December – meeting in cocesna January – Training
Trinidad and Tobago	SELEXATM System	Veronica Ramdath vramdath@caa.gov.tt	64k	-	Approval phase for upgrade Upgrade will be next year. Continue testing phase afterwards.
United States	Yes - Host Automation / En Route Automation Modernization(ERAM) systems. Lockheed- Martin (LMCO) is the prime contractor for the Host/ERAM system. Ocean21 provides its own FDP processing in the oceanic environment. LMCO is also the contractor for Ocean21.	Dan Eaves, Federal Aviation Administration Air Traffic Control Specialist, Dan.Eaves@FAA.gov, 202-385-8492	US- Mexico: NADIN/AFTN 64 kbps X25 US- Cuba : MEVA III 19.2 kbps connection to NADIN	The domestic FDP is integrated into The Host Automation / En Route Automation Modernization (ERAM) systems.. The flight data function of The San Juan Combined Center / Radar Approach Control (CERAP) is integrated into The Miami Air Route Traffic Control Center (ARTCC) Host/ERAM.	Working Class 3 2020 estimated.

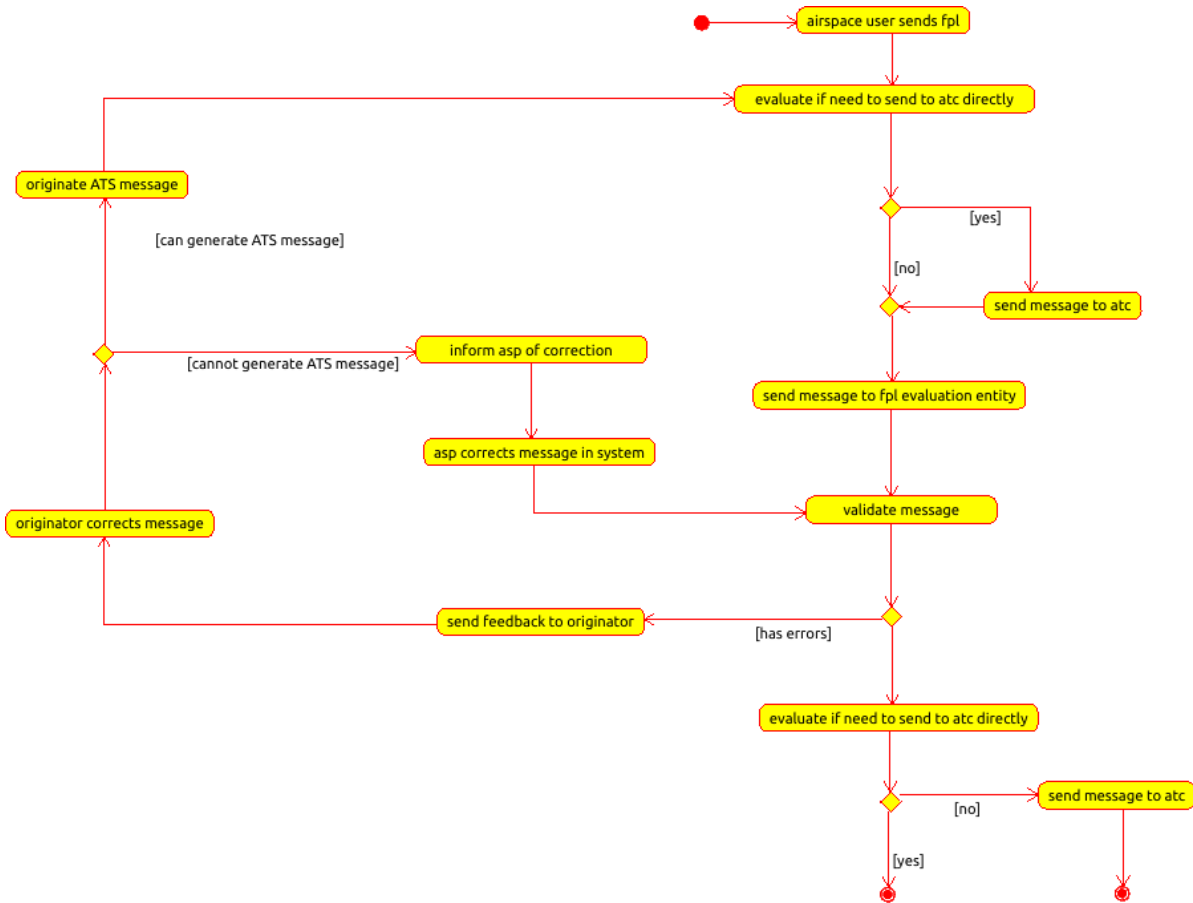
State or Organization	State/Org FIR	Adjacent FIR	Interface Class	Interface Status	Implementation Date	Bilateral Agreement or ICD
Bahamas	Nassau	Miami	N/A	Planned	TBD	NAM-ICD Version D
Canada	Edmonton	Anchorage	Class II	Operational		NAM-ICD Version D
Canada	Edmonton	Reykjavik	Class I	Operational		NAT ICD
Canada	Edmonton	Salt Lake City	Class II	Operational		NAM-ICD Version D
Canada	Edmonton	Seattle	Class II	Operational		NAM-ICD Version D
Canada	Gander	New York	Class II	Operational		NAT ICD
Canada	Gander	Prestwick	Class II	Operational		NAT ICD
Canada	Gander	Reykjavik	Class II	Operational		NAT ICD
Canada	Gander	Santa Maria	Class II	Operational		NAT ICD
Canada	Moncton	Boston	Class II	Operational		NAM-ICD Version D
Canada	Moncton	New York	Class II	Planned	TBD	TBD
Canada	Montreal	Boston	Class II	Operational		NAM-ICD Version D
Canada	Montreal	Cleveland	Class II	Operational		NAM-ICD Version D
Canada	Oakland	Vancouver	Class II	Operational		NAM-ICD Version D
Canada	Toronto	Boston	Class II	Operational		NAM-ICD Version D
Canada	Toronto	Cleveland	Class II	Operational		NAM-ICD Version D
Canada	Toronto	Minneapolis	Class II	Operational		NAM-ICD Version D
Canada	Vancouver	Salt Lake City	Class II	Operational		NAM-ICD Version D
Canada	Winnipeg	Minneapolis	Class II	Operational		NAM-ICD Version D
Canada	Winnipeg	Salt Lake City	Class II	Operational		NAM-ICD Version D
COCESNA	CENAMER	Belize	N/A	Planned	2018	PAC ICD
COCESNA	CENAMER	Bogota	N/A	Testing	2018	PAC ICD
COCESNA	CENAMER	Costa Rica	N/A	Planned	2018	PAC ICD
COCESNA	CENAMER	El Salvador	N/A	Operational	October 2015	PAC ICD
COCESNA	CENAMER	Guatemala	N/A	Operational	December 2015	PAC ICD
COCESNA	CENAMER	Guayaquil	N/A	Testing	TBD	PAC ICD
COCESNA	CENAMER	Havana	Class I	Operational		NAM-ICD Version E
COCESNA	CENAMER	Kingston	N/A	Planned	TBD	
COCESNA	CENAMER	Merida	N/A	Operational	2015	NAM-ICD Version E
COCESNA	CENAMER	Nicaragua	N/A	Operational	September 2015	PAC ICD
COCESNA	CENAMER	Panama	N/A	Operational	2016	PAC ICD
Costa Rica	San José	CENAMER	N/A	Planned	2018	PAC ICD
Costa Rica	San José	Nicaragua	N/A	Planned	2018	PAC ICD
Costa Rica	San José	Panama	N/A	Planned	2018	PAC ICD
Cuba	Havana	CENAMER	Class I	Operational	March/April 2015	NAM-ICD Version E
Cuba	Havana	Kingston	N/A	Planned	TBD	
Cuba	Havana	Merida	Class I	Operational	March 9, 2012	NAM-ICD Version D
Cuba	Havana	Miami	Class I	Operational	December 15, 2011	NAM-ICD Version D
Cuba	Havana	Port au Prince	N/A	Not planned	TBD	
Curacao	Curacao	Kingston	N/A	Planned		NAM-ICD Version D
Curacao	Curacao	Maiquetia	N/A	Planned		
Dominican Republic	Santo Domingo	Curacao	N/A	Planned	TBD	
Dominican Republic	Santo Domingo	Miami	Class I	Implementing	September 2018	NAM-ICD Version E
Dominican Republic	Santo Domingo	Port au Prince	N/A	Not planned	TBD	
El Salvador	El Salvador	Guatemala	N/A	Planned	42522	PAC ICD
El Salvador	El Salvador	Nicaragua	N/A	Planned	42491	PAC ICD
Guatemala	Guatemala	Belize	N/A	Planned	2017	PAC ICD
Guatemala	Guatemala	El Salvador	N/A	Planned	42522	PAC ICD
Haiti	Port-au-Prince	Santo Domingo	N/A	Planned	TBD	NAM-ICD Version D
Mexico	Mazatlán	Albuquerque	Class I	Operational	2005	NAM-ICD Version D
Mexico	Mazatlán	Los Angeles	Class I	Operational	2005	NAM-ICD Version D
Mexico	Mazatlán	Monterrey	Class I	Operational	2005	NAM-ICD Version D
Mexico	Mazatlán	Oakland	N/A	Operational	March 2015	PAN ICD V.1
Mexico	Mérida	CENAMER	Class I	Testing	June 2015	NAM-ICD Version D
Mexico	Mérida	Havana	Class I	Operational	2011	NAM-ICD Version D
Mexico	Mérida	Houston	Class I	Operational	2005	NAM-ICD Version D
Mexico	México	Mazatlan	Class I	Operational	2005	NAM-ICD Version D
Mexico	México	Mérida	Class I	Operational	2005	NAM-ICD Version D
Mexico	México	Monterrey	Class I	Operational	2005	NAM-ICD Version D
Mexico	Monterrey	Albuquerque	Class I	Operational	2005	NAM-ICD Version D
Mexico	Monterrey	Houston	Class I	Operational	2005	NAM-ICD Version D
Mexico	Monterrey	Mérida	Class I	Operational	2005	NAM-ICD Version D
Nicaragua	Nicaragua	Costa Rica	N/A	Planned	2017	PAC ICD
Nicaragua	Nicaragua	El Salvador	N/A	Planned	42491	PAC ICD
Trinidad and Tobago	PIARCO	French Guyanne	N/A	Planned	TBD	???
Trinidad and Tobago	PIARCO	Maiquetia	N/A	Planned	TBD	
Trinidad and Tobago	PIARCO	New York	N/A	Planned	Q4 2018	PAN ICD
Trinidad and Tobago	PIARCO	SAL	N/A	Planned	TBD	NAM-ICD Version D
Trinidad and Tobago	PIARCO	San Juan/Miami	N/A	Planned	TBD	NAM-ICD Version D
United States	Albuquerque	Monterrey	Class I	Operational		NAM-ICD Version D
United States	Anchorage	Edmonton	Class II	Operational		NAM-ICD Version D
United States	Anchorage	Vancouver	Class II	Operational		NAM-ICD Version D
United States	Boston	Moncton	Class II	Operational		NAM-ICD Version D
United States	Boston	Montreal	Class II	Operational		NAM-ICD Version D
United States	Cleveland	Toronto	Class II	Operational		NAM-ICD Version D
United States	Houston	Merida	Class I	Operational		NAM-ICD Version D
United States	Houston	Monterrey	Class I	Operational		NAM-ICD Version D
United States	Los Angeles	Mazatlan	Class I	Operational		NAM-ICD Version D
United States	Miami	Havana	Class II	Planned	2018	NAM-ICD Version D
United States	Miami	Havana	Class I	Operational		NAM-ICD Version D
United States	Miami	Nassau	N/A	Planned	TBD	NAM-ICD Version D
United States	Miami	Santo Domingo	Class I	Planned	September 2018	NAM-ICD Version D
United States	Minneapolis	Toronto	Class II	Operational		NAM-ICD Version D
United States	Minneapolis	Winnipeg	Class II	Operational		NAM-ICD Version D
United States	Oakland	Mazatlán	N/A	Operational	2015	PAN ICD V.1
United States	Oakland	Vancouver	Class II	Operational		NAM-ICD Version D
United States	Salt Lake City	Edmonton	Class II	Operational		NAM-ICD Version D
United States	Salt Lake City	Winnipeg	Class II	Operational		NAM-ICD Version D
United States	San Juan	Santo Domingo	Class I	Planned	September 2018	NAM-ICD Version D
United States	Seattle	Vancouver	Class II	Operational		NAM-ICD Version D

### Proposal of the FPL Regional Procedure

This scenario inserts the role of the ATS Reporting Officer to deal with flight plan errors before they get to the ATC Center. These can follow up on errors and discrepancies by AFTN/AMHS, email, phone or whatever. The control center will only see the correct data.



### Procedure Detail



**APPENDIX B****STATUS OF AIDC OPERATION BETWEEN ATS UNITS IN SAM STATES***Argentina*

At national level, the AIDC between the Córdoba ACC and the Ezeiza ACC is in the pre-operational phase since 2015. The letter of operational agreement between these ACCs has been amended to include the operational use of AIDC as primary means. AIDC training for the controllers of the Comodoro Rivadavia, Mendoza and Resistencia ACCs was completed at the end of September 2017.

AIDC is expected to become operational between national ACCs in 2018, and with adjacent regional ACCs during the period 2018-2019. Positive AIDC tests were conducted between the Córdoba ACC and the Iquique ACC (Chile).

*Bolivia*

It is expected that ATM automation will become operational in 2019 at the main ATS units of Bolivia. The ATM automated systems to be installed are Thales Topsy. Once automation is operational at ATS units, Bolivia will start coordination with the ACCs of adjacent States for AIDC testing.

*Brazil*

AIDC between all adjacent ACCs of Brazil is in the operational phase since mid-2016, except with the Atlántico ACC. AIDC between the Atlántico ACC and the other national ACCs of Brazil is foreseen to become operational during the second half of 2018. In 2017, Brazil published a national document for the dissemination of AIDC operations, CIRCEA 100-75 - "*Operation of AIDC at ATS units*".

*Chile*

At national level, AIDC is already implemented between the Punta Arenas ACC and the Puerto Montt ACC and between the Iquique ACC and the Antofagasta APP since mid-2017. Positive AIDC tests were conducted between the Iquique ACC and the Córdoba ACC and with the Lima ACC. These are expected to become operational by the end of the first half of 2018.

*Colombia*

AIDC interconnections implemented at national level (Bogota ACC – Barranquilla ACC) and at the intra-regional level (Bogota ACC – Guayaquil ACC, Bogota ACC – Lima ACC and Bogota ACC – Panama ACC) are in the pre-operational phase since the end of 2015. The letters of operational agreement between the aforementioned ACCs were revised to include the use of AIDC as primary means. The amendment to the letter of operational agreement between the Bogota ACC and the Lima ACC was signed in November 2016. The aforementioned AIDC connections are expected to become operational by the end of the first half of 2018.

*Ecuador*

At national level, AIDC is operational since February 2017 between the Guayaquil ACC and the Quito APP. An amendment to the letter of operational agreement was signed on 1 February 2017 to introduce AIDC as the primary means. Positive AIDC tests were carried out between the Guayaquil ACC and the Manta APP and Shell at the end of 2017. They are expected to become operational on the first half of 2018.

At regional level, AIDC between the Guayaquil ACC and the Lima ACC, and between the Guayaquil ACC and the Bogota ACC are in the pre-operational phase since August 2015. The letters of operational agreement between these ACCs were amended to introduce AIDC as primary means. It is expected that they will become operational by the end of the first half of 2018.

Positive operational tests were conducted between the Guayaquil ACC and CENAMER during the first quarter of 2017, and are expected to become operational in 2018.

*French Guiana*

AIDC implementation with the ACCs of the adjacent States is scheduled for the period 2018-2019. A new ATM automation system, which includes AIDC, was installed at the Cayenne ACC in 2017.

*Guyana*

AIDC implementation with the ACCs of adjacent States is scheduled for the period 2018-2019. To date, Guyana has not implemented AIDC.

*Panama*

The aeronautical administration of Panama signed a technical support contract with Thales for the review and updating of software in the automated system installed in the Panama ACC, which includes the solution of AIDC issues (freezing of the application due to message backlog) as well as technical and operational training. This process was completed in late 2017. AIDC connections between the Panama ACC and the Bogota ACC and between the Panama ACC and the CENAMER ACC are expected to become operational on the first half of 2018.

*Paraguay*

AIDC operational tests between the Asunción ACC and the adjacent regional ACCs (Resistencia ACC and Curitiba ACC) will take place once the modernisation of the ATM automation system of the Asunción ACC, expected for mid-first half of 2018, is completed.

*Peru*

The Lima ACC has AIDC in the pre-operational phase with the Guayaquil ACC and with the Bogota ACC since August 2015. In this sense, the letters of operational agreement have been amended to include AIDC as primary means. The updating of the ATM automated system of the Lima ACC, which started in March 2017, was completed in late 2017. With this modernisation, it is expected that the Lima ACC will have AIDC operational with the Guayaquil ACC and the Bogota ACC by the end of the first half of 2018.

*Suriname*

AIDC implementation with the ACCs of adjacent States is foreseen for the period 2018-2019. At present, Suriname has not implemented AIDC.

*Uruguay*

AIDC implementation with the ACCs of adjacent States is scheduled for the period 2018-2019.

*Venezuela*

AIDC implementation with the ACCs of adjacent States is scheduled for the period 2018-2019. So far, Venezuela has not implemented AIDC.

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## APPENDIX C / APÉNDICE C

STATUS OF THE AUTOMATION IMPLEMENTATION TO GIVE EFFECT TO THE  
AMENDMENT TO THE FLIGHT PLAN FORMAT/ESTADO DE IMPLANTACION DE LA AUTOMATIZACIÓN PARA DAR CUMPLIMIENTO  
DE LA ENMIENDA EN EL FORMATO DEL PLAN DE VUELO

STATE/ ESTADO	ACC	AFTN/AMHS (Template FPL 2012)	FDP /FPL2012
<b>Argentina</b>	Comodoro Rivadavia	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated /Automatización Implemented June 2016/Implementado Junio 2016
	Cordoba	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated / Automatizado
	Ezeiza	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated / Automatizado
	Mendoza	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated /Automatización Implemented June 2016/Implementado Junio 2016
	Resistencia	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated /Automatización Implemented June 2016/Implementado Junio 2016
<b>Bolivia</b>	Cochabamba /La Paz	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Manual  It is foreseen by the end of 2019 an ATM automated system compatible with FPL/12 in the new Cochabamba ACC and La Paz ACC (back up) / Se tiene previsto para finales de 2019 un sistema automatizado ATM compatible con el FPL/12 en el nuevo ACC de Cochabamba y La Paz. ACC (respaldo)

STATE/ ESTADO	ACC	AFTN/AMHS (Template FPL 2012)	FDP /FPL2012
<b>Brazil / Brasil</b>	Amazónico	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated /Automatizado (use of converter) / (uso de convertidor centralizado)
	Atlántico	Implemented (AMHS terminal) / Implantado (terminal AMHS)	An update in Sagitario ATM automated system (from ATECH Brazil) which includes the new FPL/12 flight plan format to deactivate the centralized inverter is scheduled for the end of 2017 in the ACC
	Brasilia	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Amazonico, Atlantico, Brasilia, Curitiba and Recife./ Para finales de 2017 está prevista una actualización en Sagitario (sistema automatizado ATM de Brasil de la empresa ATECH) que incluye el nuevo formato de plan de vuelo FPL/12 y desactivar el convertidor centralizado.
	Curitiba	Implemented (AMHS terminal) / Implantado (terminal AMHS)	
	Recife	Implemented (AMHS terminal) / Implantado (terminal AMHS)	
<b>Chile</b>	Iquique	Not implemented (AFTN terminal) / No Implantado (terminal AFTN)	Automated /Automatizado
	Punta Arenas	Not implemented (AFTN terminal) / No Implantado (terminal AFTN)	Automated /Automatizado
	Puerto Montt	Not implemented (AFTN terminal) / No Implantado (terminal AFTN)	Automated /Automatizado
	Santiago	Not implemented (AFTN terminal) / No Implantado (terminal AFTN)	Automated/Automatizado
	Santiago Oceanico	Not implemented (AFTN terminal) / No Implantado (terminal AFTN)	Automated/Automatizado
<b>Colombia</b>	Barranquilla	Not implemented (AMHS terminal) No implantado (terminal AMHS)	Automated /Automatizado
	Bogotá	Not implemented (AMHS terminal) No implantado (terminal AMHS)	Automated /Automatizado

<b>STATE/ ESTADO</b>	<b>ACC</b>	<b>AFTN/AMHS (Template FPL 2012)</b>	<b>FDP /FPL2012</b>
<b>Ecuador</b>	Guayaquil	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated /Automatizado
<b>French Guiana (France) Guyana Francesa (Francia)</b>	Rochambeau	No Implemented (AMHS terminal) / No Implantado (terminal AMHS)	Automated / Automatizado
<b>Guyana</b>	Timehri	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated / Automatizado
<b>Panama</b>	Panama	Implemented / implantado (AMHS terminal) )	Automated / Automatizado
<b>Paraguay</b>	Asunción	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Manual Automated at the middle of 2018/Automatizado a mediados de 2018
<b>Peru</b>	Lima	Implemented (AMHS terminal)/ Implantado (terminal AMHS)	Update automation system made at the end of third quarter 2017/Actualización Sistema automatizado realizado a finales del tercer trimestre de 2017
<b>Suriname/Surinam</b>	Paramaribo	Implemented (AMHS terminal)/ Implantado (terminal AMHS)	Automated (out of service, working manually) / Automatizado (fuera de servicio, trabajando manualmente)
<b>Uruguay</b>	Montevideo	Implemented (AMHS terminal)/ Implantado(terminal AMHS)	Automated / Automatizado
<b>Venezuela</b>	Maiquetia	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated/Automatizado (use of converter) / (uso de convertidor) By the end of 2018 it is foreseen a new automation system in Maiquetía ACC/ Para finales del 2018 se estima operación del nuevo sistema automatizado del ACC de Maiquetía

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**APPENDIX D****STATUS OF ADS-B IMPLEMENTATION IN THE SAM REGION****Argentina**

There are short-term plans to install three ADS-B stations to support surveillance in the Buenos Aires-Santiago route. In the medium term, it is expected that 7 additional ADS-B receivers will be available to cover routes toward the North of the country. Likewise, with the installation of these ADS-B stations Argentina also intends to ensure, in connection with the planned installation of radars, the non-existence of "blind area".

**Bolivia**

No information is available on ADS-B implementation.

**Brazil**

Brazil has installed ADS-B stations in Cuenca De Campos. In this regard, Aeronautical Information Circular AIC-N 22/2011 was issued, specifying the technical and operational requirements of the ADS-B at Cuenca de Campos. For the period 2018-2020, there are plans to implement ADS-B all over Brazil in support of en-route operations over FL245. In this regard, a draft of the AIC that will be circulated shortly is already available.

**Chile**

No information is available on ADS-B implementation.

**Colombia**

There are plans to maintain radar systems, while the use of ADS-B concurrently with radar systems is being considered, taking into account the extended use of ADS-B. This clearly constitutes a safe but expensive plan.

The deployment of ADS-B started with 11 systems installed at national level in San Andrés, Barranquilla, Montería, Cerro Kennedy, Santa Elena, Tasajero, Mitú, Carimagua, San José, Tumaco, and Santana. Likewise, an MLAT/WAM system is being installed in Bogota and two WAM systems are planned for SKMD and SKCC, with ADS-B functionalities.

Mandatory use of ADS-B out on board aircraft is contemplated as of 1 January 2020 through the installation of a Mode S 1090 Mhz Extended Squitter transponder, as established in aeronautical information circular (AIC) "*Proceso de implementación de vigilancia dependiente automática – radiodifusión ADS B*" CO4/16, dated 15 February 2016.

For this mandate to be effective, it is important for the Aviation Administration of Colombia to inform the aviation community of the need to start the process of installation of the Mode S 1090Mhz Extender Squitter transponder, rather than waiting until it gets close to the operational start-up date, mainly due to the fact that installation firms have queuing considerations.

**Ecuador**

There is no information available about the implementation of ADS-B stations. There are two WAM systems in Loja and Latacunga.

**French Guiana**

The installation of 5 ADS-B stations at the airports of Rochambeau, en Mont Matoury, Maripasoula, Mana, and Saint Georges is scheduled for 2018.

**Guyana**

At present, an ADS-B station operates in Timehry and 4 additional ADS-B stations are being installed (SYAN, SYKA, SYKM and SYPK), which are expected to come on line by late July 2017. An AIP supplement has been published (26 May 2016) *Commencement of Testing and Operational Trials for Aeronautical Surveillance Service using Automatic Dependent Surveillance Broadcast (ADS-B) out Operations within Georgetown Flight Information Region (SYGC CTA)*. This SUP supersedes AIPSUP 02/16. Operational use of ADS-B for flights above FPL245 is in effect since 12 November 2015. By 26 July 2017 at 00:00 UTC, all aircraft that wish to operate in the Georgetown FIR below FPL245 must be equipped with ADS-B.

**Panama**

There is an ADS-B system installed in Cerro Jefe. Three additional stations are scheduled to be installed in the period 2017-2018.

**Paraguay**

Regarding the implementation of advanced surveillance systems, there are 6 ADS-B stations installed to meet radar coverage requirements in support of the main Mode S radar surveillance system. At present, the ADS system has not been fully implemented. The existing AIRCON 2100 version does not support the ADS-B asterix 21 radar data protocol, and thus cannot be integrated into the automated system. The solution being considered is the updating of the AIRCON 2100 system to the latest version that supports asterix 21 processing. By mid-2018 the implementation of a new ATM automated system is expected in Asuncion AAC which will be able to integrate ADS-B surveillance stations.

**Peru**

There are two ADS-B stations installed, one at the airport of Pisco and the other in Lima integrated with the secondary radar information in the Lima ACC since end-2017 when the updating of the ATM automation system in Lima AAC was completed.

**Suriname, Uruguay, and Venezuela**

There is no information available on the implementation of ADS-B stations.

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**APPENDIX E**  
**CAR REGION PROJECTS C**

CAR Region	PROJECT DESCRIPTION	DPN° C	
<i>Programme</i>	Title of the Project	Start	End
AUTOMATION AND ATM SITUATIONAL AWARENESS  (ICAO programme coordinator: Julio Siu)	<p style="text-align: center;"><b>AUTOMATION AND IMPROVED ATM SITUATIONAL AWARENESS IN THE CAR REGION</b></p> Project Coordinator: Carlos M. Jimenez (Cuba) Fernando Casso Dulce Roses Experts contributing to the project: Carlos Miguel Jimenez, Jorge Centella (Cuba) Julio Cesar Mejia (Dominican Republic) Dulce Roses (United States) Jenny Lee (COCESNA) ANI/WG	October 2011	June 2019
<b>Objectives</b>	Based on the NAM/CAR Regional Performance-Based Air Navigation Implementation Plan (RPBANIP) regional performance objectives: 1. Support NAM/CAR States with implementation of automated systems and interconnection at a regional level. 2. Support the implementation of Situational Awareness improvements at CAR Region ATS units.		
<b>Scope</b>	The scope of the project foresees the assessment and identification of the main levels of automation, production of guidelines for the use of existing capabilities, proposed improvements to automation levels to enhance operations and safety, development of studies and guidelines for automation and operational use of capabilities to reach these situational awareness improvements, supporting the implementation of different applications, such as: common display of traffic, common display of meteorological conditions, and communications in general.		
<b>Metrics</b>	<ul style="list-style-type: none"> <li>• Number of States/ANSPs participating in regional automation tests</li> <li>• Number of States/ANSPs implementing ATC automation functionalities between systems</li> <li>• Complete proposals and guidance material for the reduction of operational errors with before and after effective date of implementation guides for the CAR/NAM Region</li> <li>• Number of States/ANSPs reporting a reduction of incidents resulting from implementing improvements in electronic ground and air alerts</li> <li>• Number of States/ANSPs conducting ADS-B data using the guides developed</li> </ul>		

CAR Region	PROJECT DESCRIPTION		DPN° C	
<i>Programme</i>	Title of the Project		Start	End
<b>Goals</b>	<p>With this Project is expected to support States with the operational improvement implementation resulting from the implementation of ATM systems:</p> <ul style="list-style-type: none"> <li>• NAM/CAR RPBANIP ASBU-ASUR</li> <li>• NAM/CAR RPBANIP ASBU-SNET</li> <li>• NAM/CAR RPBANIP ASBU-FICE AIDC Target</li> <li>• Improvement of the ATM Situational Awareness</li> </ul>			
<b>Strategy</b>	<ul style="list-style-type: none"> <li>• The Project activities execution will be coordinated among the project members, the project coordinator, and the programme coordinator, mainly through teleconferences and meetings held from time to time in accordance with the activities work programme.</li> <li>• The project coordinator will coordinate, as necessary, with the Programme Coordinator, the requirements for other projects and information from the NAM/CAR implementation Working Groups. Additional experts have been included according to the tasks and specialised works.</li> </ul>			
<b>Justification</b>	<p>With the emergence of new technologies in ATM automated systems, as well as the standardization of communication protocols, data exchange in ATS units is actually viable in different ways. Available protocols in the systems such as OLDI and AIDC allow ATS units to establish automated coordination, improving operational reliability and procedural effectiveness.</p> <p>Likewise, the standardization in processing surveillance data in ASTERIX format allows easy radar data exchange between FIRs.</p> <p>These automated exchanges will result in a significant reduction of ATS incident rates and operational errors.</p> <p>Improving situational awareness facilitates coordination, improves efficiency and safety, and ensures that the different members of the ATM community have the same information when adopting decisions collaboratively.</p>			
<b>Related projects</b>	This project is related with Programme D Project (ATN and its ground-ground and air-ground applications)			

Project Deliverables	Relationship with the regional performance-Objectives (RPO) and ASBU B0 modules	Responsible Party	Status of Implementation	Date of Delivery	Comments
Level of automation existing in the CAR Region	RPO 4 and 6 of NAM/CAR RPBANIP/ RSEQ-SURF-ASUR-SNET-TBO-ACDM-FICE	ICAO - Carlos Jimenez, Cuba		Completed	
Guidance material and considerations for the drafting of automation agreements/ Sample of MoU for automation between States	RPO 4 and 6 of NAM/CAR RPBANIP/ RSEQ-SURF-ASUR-SNET-TBO-ACDM-FICE	Carlos Jiménez, Cuba		Completed	Several MOU proposals are available.
Proposals or guidelines for improving the operation and performance of flight plan data processing system, and automatic exchange of ATS messages	RPO 4 of NAM/CAR RPBANIP/ RSEQ-SURF-ASUR-SNET-TBO	Jenny Lee COCESNA Fernando Casso Dominican Republic		December 2018	According with the AIDC TF activities
Implementation of the errors regional plan of the flight plan	RPO 4 of the NAM/CAR RPBANIP/ RSEQ-SURF-ASUR-SNET-TBO	Fernando Casso – Dominican Republic		December 2018	According with the AIDC TF activities
Implementation of the standardization of the rejects message of the flight plan for the Region	RPO 4 of the NAM/CAR RPBANIP/ RSEQ-SURF-ASUR-SNET-TBO	Dan Evans/FAA		December 2018	According with the AIDC TF activities
Proposals and guidance on the use and benefits of additional/advanced automation support tools to increase aeronautical information sharing	RPO 4 of the NAM/CAR RPBANIP/ RSEQ-SURF-ASUR-SNET-TBO	Dulce Roses/FAA		June 2019	New date for June 2018 is proposed due to lack of responses
Monitor the implementation of ATM automation and surveillance data exchange – Progress Report	RPO 4 of NAM/CAR RPBANIP/ RSEQ-SURF-ASUR-SNET-TBO	Fernando Casso – Dominican Republic		Completed	An AIDC implementation regional plan has been developed as part of the ATM automation.

Project Deliverables	Relationship with the regional performance-Objectives (RPO) and ASBU B0 modules	Responsible Party	Status of Implementation	Date of Delivery	Comments
Monitor that the AIDC implementation plan in each State has the capacity to use this facility.	RPO 4 of the NAM/CAR RPBANIP/RSEQ-SURF-ASUR-SNET-TBO	Jenny Lee COCESNA Fernando Casso Dominican Republic		December 2018	Jenny Lee for Central America Fernando Casso for the Caribbean
Guidelines for the operational implementation of ADS-B and data exchange	RPO 4 and 6 of NAM/CAR RPBANIP/RSEQ-SURF-ASUR-SNET-TBO-ACDM-FICE	Carlos Jimenez – Cuba		November 2018	CONOPS of ADS-B implementation under development. The ADS-B CONOPS initial draft is available
Guidance on the use of AIDC to reduce coordination errors	RPO 4 and 6 of NAM/CAR RPBANIP/RSEQ-SURF-ASUR-SNET-TBO-ACDM-FICE	Fernando Casso – Dominican Republic		November 2018	Date adjusted to the AIDC TF
Encourage States to share radar data	RPO 4 and 6 del NAM/CAR RPBANIP/RSEQ-SURF-ASUR-SNET-TBO-ACDM-FICE	Carlos Jimenez – Cuba		June 2019	According to the working program of the Surveillance Group of the NAM/CAR region.
<b>Resources needed</b>	<ul style="list-style-type: none"> <li>• Designation of experts for the execution of the deliverables</li> <li>• Implement required facilities that allow interconnection of automated systems according to the established dates in the elaborated and signed MoU, respectively.</li> </ul>				

**C1 SAM PROJECT DESCRIPTION**

<b>SAM Region</b>	<b>PROJECT DESCRIPTION (DP)</b>	<b>PD N° C1</b>	
<b>Programme</b>	<b>Project Title</b>	<b>Starting Date</b>	<b>Ending Date</b>
Automation and ATM Situational Awareness (Programme Coordinator: Onofrio Smarrelli)	Automation  <i>Project Coordinator: Alessander Santoro (Brazil)</i> <i>Contributing experts: Omar Gouarnalusse (Argentina), Ruben Silva (Argentina), Murilo Loureiro (Brazil), Jorge Merino (Peru), Johnny Avila (Peru), Mauricio Ferrer (Colombia) and SAM/IG ATM Automation Group</i>	May 2008	December 2019
<b>Objective</b>	Support States of the SAM Region in the implementation of automated systems, and in their regional interconnection		
<b>Scope</b>	The scope of the project includes the initial drafting of guidelines, trials for the identification of the automation level required at the Region's ATS units in the short and medium term, and the implementation of automation systems and their interconnection through the VSAT based South American digital network (REDDIG)		
<b>Metrics</b>	<ul style="list-style-type: none"> <li>• Drafting of the following documents: <ul style="list-style-type: none"> <li>✓ Guidance document on automated systems requirements at ATS units (SSS)</li> <li>✓ Guideline for the implementation of integrated automated systems</li> <li>✓ Action plan for the interconnection of automated systems</li> <li>✓ Preliminary interface control document (ICD) between systems for the interconnection of ACCs in the SAM Region</li> <li>✓ Memorandum of Understanding (MoU) model for the interconnection of automated systems</li> </ul> </li> <li>• Interconnection of automated systems between adjacent ACCs in the SAM Region:</li> <li>• Reduction in number of operational errors, including LHD in the SAM Region</li> </ul>		
<b>Strategy</b>	<ul style="list-style-type: none"> <li>• All tasks will be conducted by experts nominated by States and organizations of the SAM Region members of the Project <i>Automation, industry and SAM States</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. In addition, the programme coordinator, together with the project coordinator and the contributing experts, can convene at SAM/IG implementation meetings</li> <li>• 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</li> </ul>		

<b>goals</b>	<ul style="list-style-type: none"> <li>• Initial drafting of 15 MoU for the interconnection of automated systems 6 MoU period 2009-2013 (implemented) 9 MoU period 2013-2019</li> <li>• Implementation of the interconnection of automated systems Flight plan (AIDC) 15 AIDC interconnections period 2014-2016 (Declaration of Bogota)</li> <li>• Asterix protocol radar data 8 radar data exchanges using Asterix protocol period 2017-2019 1 radar data exchange owner for 2013 (implemented)</li> </ul>
<b>Justification</b>	<ul style="list-style-type: none"> <li>• The CAR/SAM air traffic control centres have had difficulties in duly coordinating air traffic, an important factor contributing in air traffic incidents. The air traffic control automated centres' interconnection will permit a coordinated automated air traffic for the transfer of responsibilities between CAR/SAM adjacent area control centres, thus reducing the risk in aeronautical incidents generated by undue coordination activities and improving, at the same time, the planning phases for an efficient control of flights from/to corresponding Flight Information Regions (FIR).</li> <li>• The interconnection of automated systems would be facilitated, in view of REDDIG II (SAM VSAT regional network with support terrestrial network MPLS), which has the necessary capability to transport automated systems applications</li> <li>• This project contributes towards the implementation of modules B0 FICE, B0 ASUR and B0 SNET of ASBU Block 0 and the PFF SAM CNS 04, ATM 05, ATM 06, ANRF B084 (ASUR), ANRF B025 (FICE) and ANRF B0 102 (SNET) of the <i>Air Navigation System Performance-Based Implementation Plan for the SAM Region (SAM PBIP)</i></li> </ul>
<b>Related Projects</b>	<ul style="list-style-type: none"> <li>• ATFM</li> <li>• Improve ATM Situational Awareness</li> </ul>

Project Deliverables	Relationship with Performance Based Regional Plan (PFF) and ASBU Block 0 Modules	Responsible	Status of Implementation <sup>1</sup>	Delivery Date	Remarks
<p>Regional guideline document for the automation level required according to the ATM service provided in airspace and international aerodromes, assessing</p> <ul style="list-style-type: none"> <li>operational architecture design,</li> <li>characteristics and attributes for interoperability,</li> <li>data bases and software FPL, CPL, CNL, RLA, etc., and</li> <li>technical requirements.</li> </ul>	<p>PFF SAM CNS 04</p> <p>PFF SAM ATM 05</p> <p>PFF SAM ATM 06 ANFR</p> <p>B0 ASUR (84) ARFN</p> <p>B0 SNET (102)</p> <p>ANRF BO.FICE(25)</p>	<p>Project Coordinator and ATM Automation Group</p>		<p>Completed June 2011</p>	<p>The System and Subsystem Specifications (SSS) document has been drafted for the identification of automated requirements necessary at ATS units (ACC), and a revision process has been conducted with the support of RLA/06/901 project and SAM/IG ATM Automation Group.</p> <p>Document published in site <a href="http://www.icao.int/SAM/Pages/eDocumentsDisplay.aspx?area=CNS">http://www.icao.int/SAM/Pages/eDocumentsDisplay.aspx?area=CNS</a></p>

<sup>1</sup> **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) and ASBU Block 0 Modules	Responsible	Status of Implementation <sup>1</sup>	Delivery Date	Remarks
Guideline for the integration of automated systems and corresponding action plan	PFF SAM CNS 04  PFF SAM ATM 05  PFF SAM ATM 06  ARFN B0 ASUR (84) ARFN B0 SNET (102)	Project Coordinator and ATM Automation Group		Completed October     Completed May 2012	The following has been drafted: Guideline for the integration of automated systems and revision process. Action plan revision for the integration of automated systems and continuous revision. Both documents drafts with the support of RLA/06/901 project and the SAM/IG ATM Automation Group. Document published in site <a href="http://www.icao.int/SAM/Pages/eDocumentsDisplay.aspx?area=CNS">http://www.icao.int/SAM/Pages/eDocumentsDisplay.aspx?area=CNS</a>
Preliminary interface control document (SICD) between systems for the interconnection of ACCs in the SAM Region	PFF SAM CNS 04  PFF SAM ATM 05  PFF SAM ATM 06  ANRF B0 FICE (25)  ANRF B0 ASUR (84)	Programme Coordinator, Project Coordinator and ATM Automation Group		Completed October     December	Document ICD drafted. Document elaborated with the support of RLA/98/003 and later, RLA/06/901. Document published in site <a href="http://www.icao.int/SAM/Pages/eDocumentsDisplay.aspx?area=CNS">http://www.icao.int/SAM/Pages/eDocumentsDisplay.aspx?area=CNS</a> The ICD document is under updating process and is expected to be completed by mid-December 2016.

Project Deliverables	Relationship with Performance Based Regional Plan (PFF) and ASBU Block 0 Modules	Responsible	Status of Implementation <sup>1</sup>	Delivery Date	Remarks
Guidelines for elaboration of Memorandum of Understanding (MoU) for the implementation of the automation system interconnection	PFF SAM CNS 04 ANRF  B0 FICE (25)  B0 ASUR (84)	Project Coordinator and ATM Automation Group		Completed October	A model MoU for the interconnection of automated systems has been developed, with the support of RLA/06/901 project and SAM/IG ATM Automation Group. The MoU model is published in site <a href="http://www.icao.int/SAM/Pages/eDocumentsDisplay.aspx?area=CNS">http://www.icao.int/SAM/Pages/eDocumentsDisplay.aspx?area=CNS</a>
Elaboration of Understanding (MoU) for the interconnection of automated systems	PFF SAM CNS 04 ANRF  B0 FICE(25) ANRF B0 ASUR (84)	SAM States		April 2016	Six MoU have been drafted during the 2009-2013 period. Nine MoU would be implemented during the 2013-2019 period.  No new MoU have been drafted since 2013 but interconnection tests have been conducted between adjacent ACCs both in pre-operational and operational phases.

Project Deliverables	Relationship with Performance Based Regional Plan (PFF) and ASBU Block 0 Modules	Responsible	Status of Implementation <sup>1</sup>	Delivery Date	Remarks
Interconnection of automated systems between adjacent ACCs	PFF SAM CNS 04  PFF SAM ATM 05  PFF SAM ATM 06 ANRF  B0 FICE (25)  B0 ASUR (84)	SAM States		December 2019	AIDC interconnections were implemented between:  ACC Bogota–ACC Guayaquil (pre-operational) ACC Bogota–ACC Lima (pre-operational) ACC Lima–ACC Bogota (pre-operational) ACC Bogota–ACC Panama (pre-operational) ACC Ezeiza–ACC Cordoba(pre-operational) ACC Lima–ACC Iquique (pre-operational) ACC Cordoba–ACC Iquique (pre-operational) ACC Amazonico–ACC Lima (pre-operational) ACC Asuncion–ACC Resistencia (operational Jul 2016) ACC Curitiba-ACC Recife (operational Jun 2016) ACC Recife-ACC Brasilia (operational Jul 2016) ACC Curitiba-ACC Brasilia (operational Jul 2016) ACC Curitiba-ACC Amazonica (operational Jul 2016) ACC Amazonico-ACC Brasilia (operational Jun 2016) ACC Amazonico-ACC Recife (operational May 2016)

					<p>For the operation of the AIDC, from 2015 to date six AIDC practical courses for controllers have been delivered in Chile, Colombia, Ecuador, Paraguay, Panama and Peru. Around 200 controllers were trained. The practical course in Paraguay was delivered in 2016 and all previous in 2015.</p> <p>A guidance document was developed to mitigate errors in FPL as well as its duplicity/multiplicity (September 2016).</p>
Radar data exchange using Asterix protocol	<p>FFPP SAM CNS04</p> <p>PFF SAM ATM 05</p>	SAM States	Pending beginning	Dec 2019	The implementation of the radar data exchange using Asterix Protocol 62-63 hasn't been possible yet given that the majority radar data processing systems of the Region do not allow the fusion of surveillance systems with such protocols. The implementation of interconnection of radar data using Asterix Protocol 1, 2, 34 and 48 has not been possible since some States do not allow send signal radar with these protocols, therefore the implementation of interconnection was postponed for the period 2017-2019.
Monitor implementation progress of automation activities in the SAM Region		Programme Coordinator and Project Coordinator		May 2008 – December 2019	
Resources necessary	Implement facilities required by SAM States permitting the interconnection of automated systems in accordance with the dates established in the MoUs drafted and signed to this end				

## C2 SAM PROJECT DESCRIPTION

SAM Region	PROJECT DESCRIPTION (PD)	PD N° C2	
Programme	Project Title	Starting Date	Ending Date
ATM Automation and Situational Awareness <i>(Programme Coordinator: Onofrio Smarrelli)</i>	<p>Improve ATM Situational Awareness in the SAM Region</p> <p><i>Project Coordinator: Paulo Vila (Peru)</i></p> <p><i>Contributing experts: Murilo Loureiro (Brazil); José Rubira, Marcos Vidal and Jorge Otiniano (Peru); Javier Vittor (Argentina), André Jansen (Brazil) Ivan Salas (Ecuador)</i></p>	October 2011	December 2020
<b>Objective</b>	Develop guidelines supporting the implementation of improvements in the situational awareness of ATS units in the South American Region and follow-up to ADB-B implementation		
<b>Scope</b>	<p>Guidelines supporting the implementation of various applications, such as common traffic visualization, common meteorological conditions visualization and communications in general</p> <ul style="list-style-type: none"> <li>• Analysis of the current surveillance infrastructure and identification of necessary improvements to support en route and terminal airspaces, airspace classification, PBN and ATFM</li> <li>• Implementation of ADS-B, ADS-c and/or MLAT surveillance systems at selected airspaces</li> <li>• Minimum common electronic information and data bases required in support of decision-making process and alert systems towards an interoperable situational awareness among centralized ATFM units</li> <li>• Implement flight plan data process systems (new FPL format) and data communications tools among ACC's</li> <li>• Implement advanced automation support tools to contribute towards the sharing of aeronautical information</li> <li>• Follow-up to ADB-B implementation</li> </ul>		
<b>Metrics</b>	<p>Drafting of following documents:</p> <ul style="list-style-type: none"> <li>• Regional surveillance strategy for the implementation of systems in support of improvement of situational awareness – revised</li> <li>• Evaluation of the surveillance systems coverage in the SAM Region - completed</li> <li>• Guideline on technical/operational considerations for ADS-B implementation – completed</li> <li>• Guideline on technical/operational considerations for MLAT implementation - completed</li> <li>• Guideline on technical considerations in support of ATFM implementation – completed</li> <li>• Guideline for the presentation of MET products in graphic format – completed</li> <li>• Action plan for ADS-B implementation in the SAM Region</li> <li>• Number of ADS-B stations installed</li> </ul>		
<b>Strategy</b>	<ul style="list-style-type: none"> <li>• All tasks will be conducted by experts nominated by States and organizations of the SAM Region members of the Project <i>Improve ATM situational awareness in the SAM Region</i>, under management of the project coordinator. Communications among project members, as well as between the project coordinator and programme coordinator, shall be carried out through teleconferences and the Internet.</li> <li>• 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</li> </ul>		

<b>Goals</b>	<ul style="list-style-type: none"> <li>• Regional surveillance strategy for the implementation of systems in support to situational awareness improvement for July 2012 (completed)</li> <li>• Guideline on technical/operational considerations for ADS-B implementation for October 2012 (completed)</li> <li>• Guideline for the drafting of SIGMET in graphic format (December 2013) (completed)</li> <li>• Guideline for technical/operational considerations for MLAT implementation for March 2015 (completed)</li> <li>• Guideline for technical considerations in support of ATFM implementation (By May 2017)</li> <li>• Action plan for ADS-B implementation in the SAM Region (November 2014) (completed)</li> <li>• 60% of continental regional air space superior FLP 245 covered with ADS-B by end 2020</li> </ul>
<b>Justification</b>	<ul style="list-style-type: none"> <li>• Improve situational awareness has been identified as a great support for ATM, contributing in the increase of safety and in flight efficiency</li> <li>• In addition, a close relationship with the other programmes and their respective projects is necessary, with the aim of collecting the operational requirements demanded by the mentioned applications and their respective tentative implementation dates</li> <li>• This project contributes to the implementation of modules B0 ASUR, B0 SURV, B0 NOPS and B0 AMET of the <i>Air Navigation System Performance-Based Implementation Plan for the SAM Region (SAM PBIP)</i></li> </ul>
<b>Related Projects</b>	<ul style="list-style-type: none"> <li>• Air Navigation Systems in Support of PBN</li> <li>• Automation</li> <li>• ATFM</li> <li>• ATN Ground-ground and Air-ground Applications</li> </ul>

Project Deliverables	Relationship with Performance Based Regional Plan aligned with ASBU	Responsible	Status of Implementation <sup>2</sup>	Delivery Date	Remarks
<i>Evaluation of surveillance infrastructure and identification of surveillance systems improvements</i>					
Evaluation of surveillance systems coverage in the SAM Region	PFF SAM CNS 04 ANRF B0 ASUR	Paulo Vila (Peru)		Completed October 2012	The evaluation of coverage was carried out in connected to the drafting activities of the Guideline on technical/operational considerations for ADS-B implementation. The results are presented as Appendix A to the Guideline and can be downloaded from site <a href="http://www.icao.int/SAM/Pages/eDocumentsDisplay.aspx?area=CNS">http://www.icao.int/SAM/Pages/eDocumentsDisplay.aspx?area=CNS</a>
<i>Drafting of regional plan for ADS-B and MLAT implementation</i>					
Guideline on technical/operational considerations for ADS-B implementation	PFF SAM CNS 04 ANRF B0 ASUR	José Rubira (Peru) Marco Vidal (Peru)		Completed October 2012	The Guideline was approved for use in the interested States of the SAM Region, by the Eleventh Workshop/Meeting of the SAM Implementation group (SAM/IG/11) held in Lima from 13 to 17 May 2013 and can be downloaded from the following website <a href="http://www.icao.int/SAM/Pages/eDocumentsDisplay.aspx?area=CNS">http://www.icao.int/SAM/Pages/eDocumentsDisplay.aspx?area=CNS</a>
Guideline on technical/operational considerations for MLAT implementation	PFF SAM CNS 04 ANRF B0 ASUR	Ivan Salas (Ecuador)		Completed October 2015	The Guideline was presented in the Fifteenth Workshop/Meeting of the SAM Implementation Group (SAM/IG/15) held in Lima from 11 to 15 May 2015 for initial review and was circulated to all SAM Region States. The final approval is foreseen for the Sixteenth Workshop/Meeting of the SAM Implementation Group (SAM/IG/16) to be held in Lima from 19 to 23 October 2015.

<sup>2</sup> **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 aligned with ASBU	Responsible	Status of Implementation <sup>2</sup>	Delivery Date	Remarks
Guideline on technical considerations in support of ATFM implementation	PFF SAM ATM 05 B0 NOPS	Murilo Loureiro		May 2017	The preliminary guideline was prepared on early 2016 and is presented for Meeting review.
Guideline for the presentation of MET products in graphical format	PFF SAM MET 03  ANRF B0 AMET	Jorge Otiniano (Peru)		Completed October 2014	The document guideline was delivered to the Secretariat (MET) of SAM Region for its review by the corresponding meteorology specialists. The Guideline was review by the OPMET information exchange Meeting of SAM Region (27 – 29 October 2014) and will be used as guideline for the implementation of SIGMET graphic in Argentina, Chile, Ecuador, Paraguay and Peru by the second half of 2015 sponsored by the technical cooperation regional project RLA/06/901.
Action plan for ADS-B implementation in SAM Region	ANRF B0 ASUR	Paulo Vila (Peru)		Completed November 2014	The action plan for the regional implementation of the ADS B was presented an approved in the Fourteenth Workshop/Meeting of the SAM Implementation Group (SAM/IG/14) Lima, Peru, from 10 to 14 November 2014. The document can be downloaded from the following website <u>as part of the final report of the SAM/IG/14 (Appendix C, Agenda Item 7)</u> <a href="http://www.icao.int/SAM/Pages/MeetingsDocumentation.aspx?m=2014-SAMIG14">http://www.icao.int/SAM/Pages/MeetingsDocumentation.aspx?m=2014-SAMIG14</a>
Follow-up to ADS-B implementation in SAM Region States	ANRF B0 ASUR	Paulo Vila (Peru)		December 2020	Status of implementation of ADS-B in the SAM Region is presented in <b>Appendix D</b> of this WP
Monitoring activities for the implementation of improvement to the ATM Situational Awareness in the SAM Region		Programme Coordinator and Project Coordinator		October 2011 December 2020	
Resources necessary	Experts in the carrying out of the deliverables				