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South American Regional Office 09/05/2018
Twenty-First Workshop/Meeting of the SAM Implementation Group (SAM/IG/21) - Regional Project RLA/06/901
(Lima, Peru, 21 to 25 May 2018)

Agenda Item 5: Operational implementation of new ATM automated systems and integration of the existing systems

FOLLOW-UP ON THE PERFORMANCE OF THE AIDC OPERATION IN THE SAM REGION

(Presented by the Secretaría)

SUMMARY

This working paper presents updated information on the performance of the AIDC operation in the SAM Region.

References:

- Report on the Meeting of Implementation of AIDC in the NAM/CAR/SAM Regions (Lima, Peru, 16 to 20 April 2018)
- Report on the Third meeting on AIDC implementation (AIDC/3 - Lima, Peru, 24 to 26 April 2017)
- Report on the Twentieth workshop/meeting of the SAM implementation group (SAM/IG/20 Lima, Peru, 16 to 20 October 2017)
- Summary of the teleconferences to follow-up the AIDC implementation (14/12/2017 and 26/01/2018)

ICAO strategic objectives:	*A – Safety* *C – Air navigation capacity and efficiency*

1. Introduction

1.1 The air traffic control centres of the SAM regions have faced difficulties in the proper coordination of air traffic, which has been designated as an important contributing factor to air traffic incidents that could be significantly reduced through the interconnection of automated air traffic control systems.

1.2 In this sense, in the SAM Region, since 2009, a process was initiated for the implementation of the interconnection of ATM automated systems between the adjacent ACCs which its final objective was to:

- Allow the transfer of flight plans between adjacent ATC centres in an automated way through the AIDC.
- Allow the exchange of surveillance data (mainly radar) in areas of common interest.

1.3 To support the implementation of the interconnection of automated systems and thanks to the support of regional projects RLA/98/003 and RLA/06/901, visits were made to the States of the SAM Region to obtain information on the ATM automation status in the ACCs and information of the

surveillance systems and their interfaces. As a result of these visits, the following documents were prepared, which can be found on the following website:
https://www.icao.int/SAM/Pages/eDocumentsDisplay.aspx?area=CNS

- Interface Control Document (ICD) for ATS inter-facility data communications in the Caribbean and South American Regions (CAR/SAM AIDC ICD).
- Interface Control System Document (SICD).
- Initial interconnection regional plan of the automated systems in the ACCs.
- Preliminary document of requirements that must have the automated systems (SSS).
- Memorandum of understanding for the implementation of the interconnection of automated systems between two States that have adjacent ACCs.

1.4 Likewise, the Orientation Guide for the implementation of the AIDC was developed through the interconnection of automated centers. The updated orientation guide can also be found on the website indicated in paragraph 1.3 of this working paper.

1.5 Several courses and seminars were also held. Courses were held on the use of asterix protocols to support the implementation of radar data exchange, on-site courses in Chile, Peru, Ecuador, Colombia, Panama and Paraguay and several surveillance seminars and AIDC.

1.6 In this regard, and thanks to the activities described above, some States of the SAM Region prepared and signed memorandums of understanding (MOU) for the implementation of the interconnection of automated systems. In relation to effective implementation of the interconnection of automated systems, there was little progress to date. There is only radar data exchange between Argentina and Uruguay, radar exchange tests between Venezuela and Brazil, Argentina-Chile and Argentina-Paraguay. In relation to the transfer of flight plan data through the AIDC, these have been implemented operationally between the Brazilian ACCs and in a pre-operational way in many of the States of the Region.

2 Analysis

2.1 As a follow-up to AIDC's performance, the current situation in each of the States of the SAM Region is presented below updated during the Meeting of Implementation of AIDC in the NAM/CAR/SAM Regions:

Argentina

2.2 At national level, the AIDC between the ACC of Córdoba and the ACC of Ezeiza was in the pre-operational phase since 2015, and the letter of operational agreement between these ACCs was amended to introduce the operational use of AIDC as primary means. AIDC training for the controllers of the ACCs of Comodoro Rivadavia, Mendoza and Resistencia had been completed in late September 2017. AIDC was expected to be operational between national ACCs by the second half of 2018. It was estimated that AIDC would be operational with adjacent regional ACCs by 2019.

Bolivia

2.4 It was expected that automation of ATM systems at the main ATS units in Bolivia would become operational by 2019. The automated ATM systems to be installed were Thales Topsky. Once the automation in ATS facilities was operational, Bolivia would start coordinating with the ACCs of adjacent States to conduct AIDC tests.

Brasil

2.5 In the first quarter of 2018, the SAGITARIO entered into operation at the Atlantic ACC. The AIDC was also implemented operationally between the Atlantic ACC with the Recife ACC and the Atlantic ACC with the Amazonian ACC. Thus, Brazil has the AIDC in place and in operation among all its national ACCs, only is pending the AIDC between the Atlantic ACC and the Curitiba ACC that would come into operation during the first semester of 2018. In 2017, Brazil had published a national document for the dissemination of AIDC operation, CIRCEA 100-75 - "AIDC Operation in ATS units".

Chile

2.6 At national level, the AIDC connection between the Punta Arenas ACC and the ACC Puerto Montt and between the Iquique ACC and the Antofagasta APP had been implemented since mid-2017. AIDC positive tests had been carried out between the Iquique ACC and the Córdoba ACC and with the Lima ACC. There were expected to become operational for the period 2018-2019.

Colombia

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

Ecuador

2.8 At national level, the AIDC between the Guayaquil ACC and the Quito APP became operational in February 2017, for which an amendment to the letter of operational agreement had been signed on 1 February 2017 to introduce AIDC as primary means. AIDC positive tests had been carried out between the Guayaquil ACC and the Manta APP and Shell in late 2017. They were expected to become operational by the end of the first semester of 2018.

2.9 At the regional level, the AIDC was pre-operational since August 2015 between the Guayaquil ACC and the Lima ACC and between the Guayaquil ACC and the Bogotá ACC. The letters of operational agreement between these ACCs had been amended with the introduction of AIDC as primary means. They were expected to become operational by the end of the first semester of 2018.

2.10 Positive operational tests had been carried out between the Guayaquil ACC and CENAMER during the first quarter of 2017, expecting it to become operational in 2018.

Guyana Francesa

2.11 Implementation of AIDC with the ACCs of adjacent States was scheduled for the period 2018-2019. In mid-2017, a new ATM automation system, which included AIDC, had been installed at the Cayenne ACC.

Guyana

2.12 The implementation of AIDC with the ACCs of adjacent States was scheduled for the period 2018-2019. To date, Guyana has no AIDC.

Panamá

2.13 Regarding the progress in Panama, after the software update by Thales company to the automated system TopSky-ATC in July 2017, the problem of congestion in the flight plan processor has been solved. On behalf of Panama we are making small adjustments to the system to improve coordination between other adjacent centers.

2.14 Following this line, the Civil Aviation Authority of Panama is also migrating to the AMHS total connection, since currently the TopSky-ATC system works through the AFTN network. Once the tests under AMHS have been completed, it is expected to resume the pre-operational phases with CENAMER. Through the AFTN connection, we succeeded with the AIDC coordination with CENAMER, although with Bogota and Barranquilla tests were achieved, the tests carried out showed insufficient results, which did not allow to measure the success of the same.

2.15 Operationally, in August of 2017, recurrent courses were provided to the personnel of the control center in Panama for the management of the AIDC system, and in January 2018 a training was also carried out in the database of the Top Sky system to maintain a more dedicated staff that is constantly updating the database to improve the process of the AIDC system.

2.16 It is important to mention that discussions have been held with the AIDC managers of CENAMER, Bogotá and Kingston to begin the establishment of the respective Letters of Agreement between the adjacent centers.

2.17 It is expected that, for the last quarter of 2018, once under full AMHS connection, the pre-operational phases will be resumed between CENAMER, Bogota and Barranquilla, and the operational phase can start in the second quarter of 2019. It should be mentioned that with Rio Negro control, Medellin control has not been tested so far.

Paraguay

2.18 The Paraguayan state is still with the outdated FDP, for that reason we have only reached to do Technical tests with Resistance and Curitiba where the connections between the mentioned ACCs were successfully established, but not the coordination for errors in the system. Currently, the State is launching the call for bids for the purchase of a new ATM System, and taking into account the period of time that the process will take, it is estimated that for the first quarter of 2020 the ATM System will be available to continue with the tests that were postponed.

Peru

2.19 AIDC between the Lima ACC and the Guayaquil ACC and the Bogotá ACC was in the pre-operational phase since August 2015. In this regard, the letters of operational agreement had been amended with the introduction of AIDC as primary means. The upgrading of the automated ATM system of the Lima ACC, which had started in March 2017, had been completed in late 2017. With this upgrade, the Lima ACC was expected to have an operational AIDC with the Guayaquil ACC, the Bogotá ACC and the ACC of Iquique by the end of the first semester of 2018.

Suriname

2.20 AIDC implementation with the ACCs of adjacent States was foreseen for the period 2018-2019. At present, Suriname had no AIDC.

Uruguay

2.21 AIDC implementation with ACCs of adjacent States was foreseen for the period 2018-2019.

Venezuela

2.22 AIDC implementation with ACCs of adjacent States was foreseen for the end of 2019. At present, Venezuela had no AIDC. It was noted that the new ATM automation system bought from ATECH of Brazil (Sagitario system) would become operational by the end of the first quarter of 2019. Once the automated system had been installed and commissioned, Venezuela would start the implementation of the AIDC interconnection with adjacent States.

Other considerations on the follow-up to the implementation of the AIDC interconnection

2.23 The earth-ground data interconnection level requirements (AIDC) and the estimated dates for their operational implementation are presented as **Appendix A** of this Working Paper. Likewise, the action plan for the implementation of the AIDC interconnection in the SAM Region is also included as **Appendix B** and as **Appendix C** is the list of focal points for the coordination of the AIDC interconnection between adjacent ACCs. The information presented in Appendixes A, B and C was updated at the Meeting of Implementation of AIDC in the NAM/CAR/SAM Regions.

2.24 The Meeting of Implementation of AIDC in the NAM/CAR/SAM Regions when analyzing the status of AIDC implementation, made recommendations to urge States to complete the operational implementation of the AIDC, these recommendations are presented as **Appendix D**

3 Suggested action

3.1 The Meeting is invited to:

a) Take note of the information provided in this papera n its appendix;
b) Analyse the performance of the AIDC, the progress in the implementation of the AIDC interconnection between adjacent ACCs in the SAM region and the update of the focal points for the coordination of the implementation of the AIDC interconnection described in section 2 and Appendixes A, B, C and D; y
c) agree on any other actions it may deem appropriate.

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APPENDIX A

(AIDC) GROUND-GROUND DATA INTERCONNECTION LEVEL REQUIREMENTS IN THE SAM REGION

ARGENTINA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels *				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
CORDOBA (AUT. INDRA AIRCON2100) (2007)	IQUIQUE	XI			X	Positive AIDC tests - March 2016 As a result of the tests, the transmission speed has to be incremented from 2400 to 9600 bit/sec AIDC foreseen to be operational at the end of the second semester of 2019.
	LA PAZ	XI			X	AIDC foreseen for period - 2019 -2020
	EZEIZA	XI			XI	AIDC in pre-operational phase since December 2015. Operational phase foreseen by the second semester of 2018
	MENDOZA	XI			X	AIDC pre-operational phase by the second semester of 2018
	RESISTENCIA	XI			X	AIDC pre-operational phase by the second semester of 2018
RESISTENCIA (AUT. INDRA AIRCON2100) (May 2016)	ASUNCION	XI			X	Positive AIDC tests were conducted in 2015 between Ezeiza and Asuncion. Tests between Resistencia and Asuncion were conducted in the end of 2016. AIDC foreseen to be operational by the first semester of 2019.
	CORDOBA	XI			X	AIDC pre-operational by the second semester of 2018
	CURITIBA	XI			X	AIDC foreseen by the first semester of 2019
	EZEIZA	XI			X	AIDC pre-operational by the second semester of 2018

	MONTEVIDEO	XI			X	AIDC foreseen by the first semester of 2019
EZEIZA (AUT. INDRA AIRCON2100) (2007)	COMODORO RIVADAVIA	XI			X	AIDC pre-operational by the second semester of 2018
	MENDOZA	XI			X	AIDC pre-operational by the second semester of 2018
	PUERTO MONTT	XI			X	AIDC by the first semester of 2019
	CORDOBA	XI			XI	AIDC in pre-operational phase since December 2015. Operational phase foreseen by the second semester of 2018
	RESISTENCIA	XI			X	AIDC pre-operational by the second semester of 2018
	JOHANNESBURG	XI			X	AIDC tests foreseen by the second semester of 2017
	MONTEVIDEO	XI			X	AIDC foreseen by the first semester of 2019
MENDOZA (AUT INDRA AIRCON2100) (May 2016)	EZEIZA	XI			X	AIDC pre-operational by the first semester of 2018
	SANTIAGO	XI			X	AIDC foreseen for 2019
	CORDOBA	XI			X	AIDC pre-operational by the second semester of 2018
COMODORO RIVADAVIA (AUT INDRA AIRCON2100) (June 2016)	EZEIZA	XI			X	AIDC pre-operational by the first semester of 2018
	PUNTA ARENAS	XI			X	AIDC by the end of the second semester of 2018
	PUERTO MONTT	XI			X	AIDC by the end of the second semester of 2018

BRAZIL						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
AMAZÓNICO (MANAUS) AUTO. SAGITARIO ATECH	BRASILIA	XI			XI	AIDC implemented June 2016
	BOGOTÁ	XI			X	AIDC operational foreseen by first semester 2018
	CAYENNE	XI			X	AIDC foreseen for period 2018-2019
	CURITIBA	XI			XI	AIDC implemented July 2016
	GEORGETOWN	XI			X	AIDC foreseen for period 2018-2019
	LA PAZ	XI			X	AIDC foreseen for period 2019-2020

	LIMA	XI			X	AIDC foreseen second semester 2018
	MAIQUETIA	XI	X		X	AIDC foreseen for period 2018-2019
	PARAMARIBO	XI			X	AIDC foreseen for period 2018-2019
	RECIFE	XI			X	AIDC implemented since 2 May 2016
	ATLÂNTICO	XI			X	Second semester 2018
BRASILIA AUTO. SAGITARIO ATECH	AMAZÔNICO	XI			XI	AIDC implemented June 2016
	CURITIBA	XI			XI	AIDC implemented July 2016
	RECIFE	XI			XI	AIDC implemented June 2016
CURITIBA AUTO. SAGITARIO ATECH	AMAZONICO	XI			XI	AIDC implemented July 2016
	ASUNCION	XI			X	AIDC foreseen second semester 2018
	BRASÍLIA	XI			Xi	AIDC implemented July 2016
	LA PAZ	XI			X	AIDC foreseen for period 2019-2020
	MONTEVIDEO	XI			X	AIDC foreseen for the first semester of 2018
	RECIFE	XI			XI	AIDC implemented July 2016
	RESISTÊNCIA	XI			X	AIDC foreseen by the first semester of 2018
	ATLÂNTICO	XI			X	Implemented on the first quarter of 2018
RECIFE AUTO. SAGITARIO ATECH	AMAZÔNICO	XI			XI	AIDC Implemented on 2 May 2016
	BRASÍLIA	XI			XI	AIDC implemented June 2016
	CURITIBA	XI			XI	AIDC implemented July 2016
	ATLÂNTICO	XI			X	Implemented on the first quarter of 2018
ATLÁNTICO AUTO. SAGITARIO ATECH	AMAZÔNICO	XI			X	Second Semester 2018
	CURITIBA	XI			X	Implemented on the first quarter of 2018
	DAKAR	XI			X	AIDC TBD
	JOHANNESBURG	XI			X	AIDC TBD
	LUANDA	XI			X	AIDC TBD
	MONTEVIDEO	XI			X	AIDC foreseen for period 2018-2019
	RECIFE	XI			X	Implemented on the first quarter of 2018

	CAYENNE	XI			X	AIDC foreseen for period 2018-2019

BOLIVIA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
LA PAZ (MANUAL)	AMAZÔNICO	XI			X	AIDC foreseen for period 2019 -2020
	ASUNCION	XI			X	AIDC foreseen for period 2019 -2020
	CURITIBA	XI			X	AIDC foreseen for period 2019 -2020
	CORDOBA	XI			X	AIDC foreseen for period 2019 -2020
	LIMA	XI			X	AIDC foreseen for period 2019 -2020
	IQUIQUE	XI			X	AIDC foreseen for period 2019 -2020

CHILE						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
SANTIAGO (AUTO THALES TOPSKY)	IQUIQUE	XI			X	AIDC foreseen for period 2018-2019
	LIMA	XI			X	AIDC foreseen for period 2018-2019
	MENDOZA	XI			X	AIDC foreseen for period 2018-2019
	PUERTO MONTT	XI			X	AIDC foreseen for period 2018-2019
IQUIQUE (AUTO INDRA AIRCON 2100)	CORDOBA	XI			X	Positive AIDC tests - March 2016. Tests results indicate the requirement of increase transmission speed from 2400 to 9600 bit/sec. AIDC operational foreseen by the first semester of 2019
	LA PAZ	XI			X	AIDC foreseen for period 2019-2020
	LIMA	XI			X	Positive AIDC tests conducted in February 2016.

						AIDC foreseen to be operational by the first semester of 2018
PUERTO MONTT (INDRA AUTOMATED)	SANTIAGO	XI			X	AIDC foreseen for period 2018-2019
	PUNTA ARENAS	XI			X	AIDC operational since mid-2017
	EZEIZA	XI			X	AIDC by the first semester of 2019
	COMODORO RIVADAVIA	XI			X	AIDC by the second semester of 2018
PUNTA ARENAS (INDRA AUTOMATED)	PUERTO MONTT	XI			X	AIDC operational since mid-2017
	COMODORO RIVADAVIA	XI			X	AIDC by the second semester of 2018

COLOMBIA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
BOGOTÁ (AUTO INDRA AIRCON 2100)	AMAZÔNICO	XI			X	AIDC operational foreseen first semester 2018
	CENAMER	XI			X	AIDC foreseen for period 2018-2019
	GUAYAQUIL	XI			XI	Positive AIDC tests conducted AIDC in pre-operational phase (August 2015). Implementation foreseen first semester 2018.
	LIMA	XI			XI	Positive AIDC tests conducted. AIDC pre-operational (August 2015) Operational letter of agreement incorporating AIDC was signed on November 2016 Operational phase foreseen first semester 2018
	MAIQUETIA	XI			X	AIDC foreseen for period 2018-2019
	PANAMA	XI			X	Positive AIDC tests conducted. AIDC foreseen to be operational by first semester 2018.
	BARRANQUILLA	XI			XI	AIDC pre-operational

						(March 2016)
BARRANQUILLA (AUTO INDRA AIRCON 2100)	MAIQUETIA	XI			X	AIDC foreseen for period 2018-2019
	PANAMA	XI			X	Positive AIDC tests conducted. AIDC foreseen to be operational by first semester 2018.
	BOGOTA	XI			XI	AIDC pre-operational (March 2016)
	KINGSTON	XI			X	AIDC TBD
	CURAÇAO	XI			X	AIDC TBD
APP Rio Negro (AIRCON 2100)	PANAMA	XI			X	Tests on first semester 2018
APP Cali (AIRCON 2100)	PANAMA	XI			X	Tests on first semester 2018

ECUADOR						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
GUAYAQUIL AUTO INDRA AIRCON 2100	BOGOTA	XI			XI	Positive AIDC tests conducted. AIDC pre-operational (August 2015) implementation foreseen first semester 2018
	LIMA				XI	AIDC operational implementation (31 March 2016) Migrated to pre-operational phase since Nov 2016. Resume to operational phase foreseen for first semester 2018.
	CENAMER	XI			X	Positive AIDC tests conducted. AIDC foreseen for period 2018-2019

FRENCH GUIANA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
CAYENNE AUTO	AMAZÔNICO	XI			X	AIDC foreseen for period 2018-2019

ADACEL AIDC not installed	PARAMARIBO	XI			X	AIDC foreseen for period 2017-2019
	PIARCO	XI			X	AIDC foreseen for period 2018-2019
	DAKAR	XI			X	AIDC foreseen for period 2018-2019
	ATLANTICO	XI			X	AIDC foreseen for period 2018-2019

GUYANA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
GEORGETOWN AUTO INTELCAN AIDC not installed	AMAZONICO	XI			X	AIDC foreseen for period 2018-2019
	PIARCO	XI			X	AIDC foreseen for period 2018-2019
	MAIQUETIA	XI			X	AIDC foreseen for period 2018-2019
	PARAMARIBO	XI			X	AIDC foreseen for period 2018-2019

PANAMA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
PANAMA (AUTO THALES)	BOGOTA	XI			X	Still in pre-operational phase. It is required to coordinate letters of agreement based on AIDC. The operational phase of the AMHS connection is foreseen and the tests carried out
	BARRANQUILLA	XI			X	Still in pre-operational phase. It is required to coordinate letters of agreement based on AIDC. The operational phase of the AMHS connection is foreseen and the tests carried out.

	CENAMER	XI			X	Positive AIDC tests have been performed under the AFTN network. The pre-operational phase will now be resumed under the AMHS network.
	APP CALI	XI			X	Tests on second semester 2019.
	APP RIO NEGRO	XI			X	Tests on second semester 2019.
	KINGSTON	XI			X	Waiting for Kingston Control to start with pre operational phase

PARAGUAY						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
ASUNCION AUTO AIRCON 2100 INDRA	CURITIBA	XI			X	AIDC foreseen for second semester 2019
	LA PAZ	XI			X	AIDC foreseen for period 2019-2020
	RESISTENCIA	XI			X	Positive AIDC tests conducted in 2015 between Ezeiza and Asuncion. Tests between Resistencia and Asuncion were conducted in late 2016. AIDC foreseen to be operational by the first semester 2019.

PERU						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
LIMA AUTO AIRCON 2100 INDRA	AMAZONICO	XI			X	AIDC foreseen to be operational by second semester 2018
	BOGOTA	XI			XI	Positive AIDC tests conducted. AIDC pre-operational phase (August 2015). Amendment to the operational agreement

						including the AIDC signed in November 2016. Operational phase foreseen first semester 2018
	SANTIAGO	XI			X	AIDC foreseen for period 2018-2019
	IQUIQUE	XI			X	Positive AIDC tests conducted in February 2016. AIDC foreseen to be operational by the first semester of 2018.
	GUAYAQUIL	XI			XI	AIDC operational (31 March 2016) migrated to pre-operational phase on November 2016. Expected to resume operational phase on the first semester 2018.
	LA PAZ	XI			X	AIDC foreseen for period 2019-2020

SURINAME						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
PARAMARIBO (AUTO INTELCAN) AIDC not installed	AMAZÓNICO	XI			X	AIDC foreseen for period 2018-2019
	GEORGETOWN	XI			X	AIDC foreseen for period 2018-2019
	PIARCO	XI			X	AIDC foreseen for period 2018-2019
	CAYENNE	XI			X	AIDC foreseen for period 2018-2019

URUGUAY						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
MONTEVIDEO (AUTO INDRA AIRCON2100)	CURITIBA	XI			X	AIDC foreseen by first semester 2018
	EZEIZA	XI			X	AIDC foreseen by the first semester 2019
	RESISTENCIA	XI			X	AIDC foreseen by first semester 2019
	ATLANTICO	XI			X	AIDC foreseen for period 2018-2019
	JOHANNESBURG	X			X	AIDC TBD

VENEZUELA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
MAIQUETIA (AUTO ATECH X4000) AIDC not installed	AMAZONICO	XI	XI		X	AIDC foreseen for period 2018-2019
	BOGOTA	XI			X	AIDC foreseen for period 2018-2019
	BARRANQUILLA	XI			X	AIDC foreseen for period 2018-2019
	PIARCO	XI			X	AIDC TBD
	CAYENNE	XI			X	AIDC foreseen for period 2018-2019
	CURAZAO	XI			X	AIDC TBD
	SAN JUAN	XI			X	AIDC TBD

*** X PLANNED**
***XI IMPLEMENTED AND IN PRE-OPERATIONAL OR OPERATIONAL PHASE**

APPENDIX B

PLAN OF ACTIVITIES FOR THE IMPLEMENTATION OF THE AIDC INTERCONNECTION BETWEEN ADJACENTS ACCs

Activity	Start	End	Responsible	Status
1. **Establishment of initial activities for completing the technical implementation of AIDC**	**10/10/14**	**16/10/14**	**ICAO**	**Completed** The initial plan of activities for AIDC implementation is scheduled for 2015. The plan of activities contemplates the conduction of AIDC courses for air traffic controllers working at ACCs and the operational implementation of AIDC between adjacent ACCs. These activities will be conducted in Chile, Colombia, Ecuador and Peru. Interconnection tests between the Lima and Bogota ACCs were added to the list shown in paragraph 1.1.1.
1.1 Based on the results of AIDC tests conducted from February 2014 to June 2014, the technical documentation of the automated systems installed in the Region, and the SAM AIDC implementation guide, develop: 1.1.1 Plan of activities to complete technical feasibility tests for AIDC interconnection between: Santiago ACC - Lima ACC Guayaquil ACC - Lima ACC Bogota ACC - Guayaquil ACC 1.1.2 Contents of AIDC course for ATS controllers and programmers of AIDC automated system databases, to be conducted in Chile, Colombia, Ecuador and Peru.	10/10/14	16/10/14	ICAO	
2. Review of activities at the SAM/IG/14 meeting	**09/10/14**	**13/11/14**	**ICAO and SAM/IG group**	**Completed** The SAM/14 reviewed and approved the plan of activities for AIDC implementation
2.1 Submission of the plan of activities and contents of the AIDC course at the SAM/IG/14 meeting	09/10/14	13/11/14	ICAO	
2.2 Review and approval for submission at the Eighth Coordination Meeting of Project RLA/06/901	09/10/14	13/11/14	SAM/IG	
3. Approval of activities by the RCC/8 meeting	**25/02/15**	**27/02/15**	**RLA/06/901 member States**	**Completed** The RCC/8 meeting held in Lima on 25-27 February 2015 approved the activities for initial implementation of AIDC interconnection in Chile,
3.1 Submission of activities, with their respective cost, for approval.	25/02/15	27/02/15	RLA/06/901 member States	

Activity	Start	End	Responsible	Status
				Colombia, Ecuador and Peru.
4. Search and selection of experts	**24/11/14**	**28/01/15**	**ICAO**	**Completed** For the performance of the initial activities, three SAM experts with experience in database programming and operation of ACC automated systems were selected: **Rubén Silva of Argentina, Mauricio Ferrer of Colombia, and Jorge Merino of Peru**.
4.1 Search and selection of 4 experts from SAM States participating in Project RLA/06/901, with experience in the installation, operation and programming of AIDC databases, to perform the activities listed in item 1.	24/11/14	28/01/15	ICAO	
5. Missions to complete AIDC interconnection between States that started tests during the first semester of 2014	**06/04/15**	**01/05/15**	**3 automation experts ICAO**	**Completed** Missions were conducted for training purposes and to complete tests for AIDC interconnection and operation in Chile, Peru, Ecuador and Colombia.
5.1 Mission to Santiago de Chile	06/04/15	10/04/15	3 automation experts ICAO	**Completed** Implementation of AIDC activities at the Santiago ACC • AIDC practical course AIDC interconnection tests between: *Santiago ACC and Lima ACC*
5.1.1 Complete AIDC technical implementation between the Santiago and Lima ACCs	06/04/15	10/04/15	3 automation experts ICAO	**Completed** Two-way communication was established in the AIDC interconnection tests between the Thales Top sky system of the Santiago ACC and the INDRA Aircon 2100 of the Lima ACC. The operational
5.1.2 Conduct AIDC course for ATS personnel of the Santiago ACC	06/04/15	10/04/15		

Activity	Start	End	Responsible	Status
				tests did not have positive results due to the AIDC limitations in the Santiago ACC. The practical course on AIDC and database programming was conducted, providing training to 16 controllers of the Santiago ACC and 2 aeronautical technicians.
5.2 Mission to Lima:	13/04/15	17/04/15	3 automation experts	**Completed** Implementation of AIDC activities in the Lima ACC • AIDC practical course • AIDC interconnection tests between: *Lima ACC - Santiago ACC* *Lima ACC - Guayaquil ACC* *Lima ACC - Bogota ACC*
5.2.1 Conduct AIDC course for ATS personnel of the Lima ACC	13/04/15	17/04/15	3 Automation experts ICAO	**Completed** The practical course on AIDC and database programming was conducted, providing training to 44 controllers of the Lima ACC.
5.2.2 Complete AIDC tests between the Lima ACC and the Guayaquil ACC	13/04/15	17/04/15		**Completed** AIDC tests between the Lima and Guayaquil ACCs were successfully conducted.
5.2.3 Complete AIDC tests between the Lima ACC and the Bogota ACC	13/04/15	17/04/15		**Completed** AIDC tests between the Lima and Bogota ACCs were successfully conducted.

Activity	Start	End	Responsible	Status
5.3 Mission to Guayaquil	20/04/15	24/04/15	3 Automation experts of the SAM Region	**Completed** Implementation of AIDC activities at the Guayaquil ACC • Practical course on AIDC • AIDC interconnection tests and pre-operational implementation: Guayaquil ACC - Lima ACC Guayaquil ACC- Bogota ACC
5.3.1 Complete AIDC technical implementation between the Guayaquil ACC and the Lima ACC	20/04/15	24/04/15	3 automation experts of the SAM Region	**Completed** AIDC technical interconnection was completed, currently in the pre-operational phase.
5.3.2 Complete AIDC technical implementation between the Guayaquil ACC and the Bogota ACC	20/04/15	24/04/15		**Completed** AIDC technical interconnection was completed, currently in the pre-operational phase
5.3.3 Conduct AIDC course for ATS personnel of the Guayaquil ACC	20/04/15	24/04/15		**Completed** The practical course on AIDC and database programming was conducted, providing training to 31 controllers of the Guayaquil ACC.
5.4 ***Mission to Bogota***	**27/04/15**	**01/05/15**	**3 automation experts**	**Completed** Implementation of AIDC activities in the Bogota ACC • Practical course on AIDC • AIDC interconnection tests and pre-operational implementation: *Guayaquil ACC - Lima ACC*

Activity	Start	End	Responsible	Status
				Guayaquil ACC - Bogota ACC
5.4.1 Complete AIDC technical implementation between the Bogota ACC and the Guayaquil ACC	27/04/15	01/05/15	3 automation experts of the SAM Region	**Completed** The AIDC technical interconnection was completed, currently in pre-operational phase
5.4.2 Complete AIDC technical implementation between the Bogota ACC and the Lima ACC	27/04/15	01/05/15		**Completed** The AIDC technical interconnection was completed, currently in pre-operational phase
6. First meeting of the AIDC operational implementation working group during the SAMIG/15 meeting	**11/05/15**	**15/05/15**	**RLA/06/901 member States**	**Completed.** As a result of AIDC technical implementation, the SAM/IG/15 established a group of activities to migrate from the pre-operational phase to the operational between the ACC Bogota, Guayaquil and Lima. Additionally, the AIDC messages to be used were defined.
6.1 It is proposed that, as a matter of priority, the SAM/IG/15 meeting do the follow-up of AIDC implementation. Accordingly, the AIDC operational implementation working group will hold its first meeting.	11/05/15	15/05/15	RLA/06/901 member States	
7. AIDC operational implementation **ACC Guayaquil ACC Lima** **ACC Bogota ACC Guayaquil** **ACC Lima ACC Bogota** **ACC Lima ACC Santiago**	**18/05/15**	**31/12/18**	**Involved States**	
7.1 Definition of the parameters of the AIDC database for the to AID operational interconnection between Colombia, Ecuador and Peru	25/05/15	29/05/15	Involved States	**Completed.**
7.2 Amend letter of operational agreement to include the AIDC for the coordination between the ACC Lima with AAC Bogota, ACC	15/06/15	30/06/18	Involved States	**Valid.** Letter of operational agreement

Activity	Start	End	Responsible	Status
Bogota with ACC Guayaquil and ACC Lima with ACC Guayaquil				between the ACC Guayaquil and ACC Lima was amendent and signed. (Oct 2015). On Nov 2016, final review and sign of letter of operational agreement between ACC Lima and ACC Bogota was completed. Pending amendment of letter of agreement between ACC Bogota and ACC Guayaquil.
7.3 Teleconferences to coordinate and follow-up the migration from the AIDC pre-operational phase to the operational for Colombia, Ecuador and Peru	June 2014	Monthly Tele-conferences at the beginning of each month until end 2018 depending on the progress, telecon-ference will be conducted upon needs	Involved States ICAO	**Valid.** Teleconferences are been carried out on monthly basis since June 2014. On 2016 teleconferences were conducted on: 19 January 23 May 19 February 3 June 18 March 6 September On 2017 teleconferences were held on March 2, June 28, August 24 and December 14. On 2018 one teleconference was held on January 26.
7.4 Complete courses for the ACC Lima and Guayaquil, Bogotá ATS staff as well as staff ARO/AISe	18/05/15	30/12/17	Involved States	**Completed.**
7.5 Preoperational and operational Implementation of AIDC Guayaquil ACC - Lima ACC Bogota ACC - Guayaquil ACC Lima ACC - Bogota ACC Lima ACC – Santiago ACC*	18/05/15	31/12/17	States involved	**Valid.** Letter of operational agreement with corrections on AIDC between ACC Colombia, Ecuador, Panama and Peru were amended (October 2015).

Activity	Start	End	Responsible	Status
				Letter of operational agreement between AAC Lima and Guayaquil with the inclusion of AIDC was signed on 23 October 2015. Letter came into force on 31 March 2016. Establishing of a pre-operational period completing the ATS staff training. Operational implementation. AIDC between ACC Lima - ACC Guayaquil in operational phase from August 3, 2015, became operative on 31 March 2016. AIDC operations interrupted on September 2016 due to AIRCON 2100 system problems in Lima ACC. Automated system of Lima was completed by the end of 2017. The AIDC between the ACC Bogota and the ACC Lima and ACC Guayaquil is still in pre-operational phase since May, 2015. * The AIDC operational implementation between the ACC Lima and ACC Santiago has postponed in view of the

Activity	Start	End	Responsible	Status
				delay in the modernization of the ACC Santiago automated Center (2017-2019).
8. Other AIDC implementations **Bogota ACC - Panama ACC** **Ezeiza ACC - Montevideo ACC** **Resistencia ACC - Asunción ACC** **Curitiba ACC – Resistencia ACC** **Iquique ACC – Lima ACC** **Cordoba ACC – Iquique ACC** **Amazonico ACC – Bogota ACC** **Amazonico ACC – Lima ACC** **Asuncion ACC – Curitiba ACC**	18/05/15	31/12/18	States involved	
8.1 Definition of parameters of the AIDC database for the operational interconnection of the AIDC		29/12/16	States involved	**Valid** Defined for AIDC between: Bogota ACC-Panama ACC, Iquique ACC-Cordoba ACC and Resistencia ACC-Asuncion ACC.
8.2 Amendment of letter of operational agreement to include the AIDC for coordination between ACCs.		30/06/18	States involved	**Valid**
8.3 Carry out teleconferences for coordination and follow-up to the migration from the AIDC pre-operational to operational fase		Monthly tele-conferences at the begining of each month until the end of 2018 Depending on the progress tele-	States involved ICAO	**Valid** Teleconferences conducted 19 January 23 May 19 February 3 June 18 March 6 September For 2017 teleconferences are foreseen for March, (made on 3 March) July, September and December.

Activity	Start	End	Responsible	Status
		conferences will be conducted upon need		
8.4 Practical courses addressed to the ATS AIS CNS personnel of the ACC involved, interconnection AIDC		30/11/16	States involved OACI	**Completed** AIDC Course (Panamá 22 -26 June) 2015 AIDC Course (Paraguay 28 November to 2 December 2016).
8.5 Conduction of AIDC interconnection test between adjacents ACCs		30/12/17	States involved	**Valid** Successful AIDC interconnection tests between Bogota and Panama. (June 2015). Tests will continue during 2017 in view of the improvement made in the automated system of Panama ACC. AIDC tests Iquique ACC and Lima ACC were successfully conducted on December 2015 and continued until the end of 2017. AIDC tests Iquique ACC and Cordoba ACC were made in February 2016 with positive results but the ABI message. Tests will continue one end-2017 since Argentina reported that AIDC domestic operations

Activity	Start	End	Responsible	Status
				will be completed first. AIDC tests Amazonico ACC and Lima ACC were conducted on the second semester of 2018 with problems with ABI messages at the beginning which were overcome by the Company Atech. Tests will continue on first semester 2018. AIDC tests Ezeiza ACC and Montevideo ACC (first semester 2018). AIDC tests Asuncion ACC and Resistencia ACC were made during the week of 28 November 2016 and will restart at the beginning of 2020. AIDC tests Curitiba ACC and Resistencia ACC (end of the second semester 2017). AIDC tests Curitiba ACC and Asuncion ACC (first semester 2017). AIDC tests Bogota AAC and Amazonico ACC (First semester 2018)

Activity	Start	End	Responsible	Status
8.6 Implantation of pre-operational and operational AIDC		31/12/17	States involved	**Valid** AIDC between Bogota ACC and Panama ACC is in pre-operational phase since October 2015. Operational phase foreseen by the end of the second semester 2019. AIDC between Ezeiza ACC and Montevideo ACC in pre-operational phase foreseen by june 2018 and in operational phase by the end of the second semester 2019. AIDC between Asuncion ACC and Resistencia ACC in pre-operational phase and operational by the end of first semester 2019. AIDC between Iquique ACC and Lima ACC will be in pre-operational phase on May 2018 and operational phase on the end of first semester 2018. AIDC between Iquique ACC and Cordoba ACC in pre-operational phase and will be on operational phase by the end of first semester 2019.

Activity	Start	End	Responsible	Status
				AIDC between Curitiba ACC and Resistencia ACC in pre-operational and operational phases by the first semester 2019. AIDC between Amazonico ACC and Lima pre-operational phase on second semester 2018. AIDC between Amazonico ACC and Bogota ACC foreseen operational phase by the end of first semester 2018. AIDC between Asunccion ACC and Curitiba ACC operation phase foreseen by second semester 2021.
9. Workshop/Seminars on implementation of ATM automation	**22/09/15**	**31/12/19**		
9.1 Workshop/Seminars on implementation of ATM automation	22/09/15	23/10/15		**Completed** NAM/CAR/SAM Workshop held in Panama from 22 to 25 September 2015. The implementation of interregional AIDC interconnections was analysed.
9.2 Workshops/Seminars on AIDC implementation		June 2019	**ICAO**	**Valid**.
10. Second meeting of the AIDC operational implementation working group during SAMIG/16	**19/10/15**	**23/10/15**	**ICAO**	**Completed**

Activity	Start	End	Responsible	Status
10.1 It is proposed, as a matter of priority, the SAM/IG/16 meeting do the follow-up of AIDC implementation. Accordingly, the second meeting of the AIDC operational implementation working group will be held.	19/10/15	23/10/15	ICAO	**Completed** Follow-up was made on the operational implementation and programming of activities for operational implementation in 2016.
11. **AIDC Implementation meetings 2018-2020**	**01/01/18**	**31/12/20**	**Involved States ICAO**	**Valid**
11.1 Implementation of remaining AIDC interconnections at inter-regional level (Chart CNS II-3 – Plan of ATS voice circuits of the CAR/SAM Air Navigation Regional Plan Volume II eANP) and 8 inter-regional distributed as follows: Colombia (Barranquilla-Kingston, Barranquilla-Curazao and Bogota-CENAMER), Ecuador (Guayquil-CENAMER) and Venezuela (Maiquetia-Piarco, Josefa Camejo – Aruba and Maiquetia-San Juan).	01/01/17	31/12/19	Involved States ICAO	**Valid**
11.2 Inter-regional AIDC interconnections between SAM and AFI Regions: Argentina (1), Brazil (2), French Guiana (1) and Uruguay (1)	01/01/17	31/12/20	Involved States ICAO	**Valid**
12. **Introduction of FF ICE concept**	**18/04/17**	**31/12/19**		
12.1 Analysis of the application of B1-FICE Module in the Region: Increasing interoperability, efficiency and capability through FF ICE. First stage of application before exit.	18/04/18	31/12/2019	SAM Region States and ICAO	Valid
13. **Monitoring to the AIDC interconnection implementation**	**2015**	**2020**	**ICAO**	
13.1 **AIDC Implementation Meeting** ✓ First AIDC Implementation Meeting ✓ Second AIDC Implementation Meeting ✓ Third AIDC Implementation Meeting ✓ Fourth AIDC Implementation Meeting ✓ Fifth AIDC Implementation Meeting	March 2016	September 2020	ICAO	**Valid** AIDC/1 (Lima, Peru, 28-30 March 2016) AIDC/2 (Lima, Peru, 21-23 September 2016) AIDC/3 (Lima, Peru, 24-26 April 2017) Approved by

Activity	Start	End	Responsible	Status
✓ Sixth AIDC Implementation Meeting				RCC/10 AIDC/4 (Lima, Peru, 16-20 April 2018) AIDC/5 (Lima, Peru, September 2019) AIDC/6 (Lima, Peru, September 2020)

APPENDIX C / APÉNDICE C

NATIONAL FOCAL POINTS IN SAM REGION / PUNTOS FOCALES NACIONALES EN REGIÓN SAM

IMPLEMENTATION OF INTERCONNECTION OF AUTOMATED SYSTEMS / IMPLANTACIÓN INTERCONEXIÓN SISTEMAS AUTOMATIZADOS

STATE/ ESTADO	ADMINISTRATION / ADMINISTRACIÓN	NAME/ NOMBRE	POST/ CARGO	TELEPHONE/ TELEFONO	E-MAIL
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		Osvaldo Oscar Godoy	Jefe ANS Subregional Ezeiza	(5411) 4480 2309 Cel (54911) 2883 6444	ogodoy@eana.com.ar
		Daniel Coria	Coordinador nacional sistema automatizados	Cel (54911) 3594 2686	dcoria@eana.com.ar
		Mario Correa	Jefe sistemas automatizados ATS	(5411) 4320 3955 Cel (54911) 5460 9199	mccorrea@eana.com.ar
	ANAC	Diego Agüero	Técnico automatización	(5411) 5941 3000 Ext.69-128 Cel (54911) 2258 7836	daguero@anac.gob.ar
BOLIVIA	DGAC	Jaime Yuri Álvarez Miranda	Jefe Unidad CNS	(5912) 2444450 Ext. 2651	jalvarez@dgac.gob.bo
BRAZIL/ BRASIL	DECEA	Luiz Antonio dos Santos	Asesor ATM	(5521) 2101 6088	luizantoniolas@decea.gov.br
		Murilo Loureiro	Asesor sistemas automatizados	(5521) 2101 6658	loureiromal@decea.gov.br
		Rochelly de Miranda Correa -	Especialista ATC – SUBDEPARTAMENTO DE OPERAÇÕES (SDOP)	(5521) 21016197	rochellyrmc@decea.gov.br

STATE/ ESTADO	ADMINISTRATION / ADMINISTRACIÓN	NAME/ NOMBRE	POST/ CARGO	TELEPHONE/ TELEFONO	E-MAIL
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		Eugenio Espinoza	Controlador ACC Guayaquil Radar	(593) 981269823	eugenio.espinoza@aviacioncivil.gob.ec
		Boris Argudo	Analista AIS	(593) 2947400 ext 2130	boris.argudo@aviacioncivil.gob.ec
GUYANA					
GUYANA FRANCESA / FRENCH GUIANA	Service de la Navigation Aérienne aux Antilles-Guyane (SNA-AG)	Michel Areno	Head French Guiana ACC	(594) 6944 55617	michel.areno@aviation-civile.gouv.fr

STATE/ ESTADO	ADMINISTRATION / ADMINISTRACIÓN	NAME/ NOMBRE	POST/ CARGO	TELEPHONE/ TELEFONO	E-MAIL
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		Bernabé Rodríguez	Controlador Tránsito Aéreo Panamá ACC	(507) 315 9850/52 (507) 666 10967	bernaber@aeronautica.gob.pa
		Arístides Villarreal	Gerente de estación de servicio de vuelo Tocumen	(507) 238 2603 (507) 621 81043	avillarreal@aeronautica.gob.pa
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PERÚ	CORPAC	Johnny Ávila	Jefe Área de sistemas de vigilancia aérea	(511) 230-1000 Ext.1267	javila@corpac.gob.pe

STATE/ ESTADO	ADMINISTRATION / ADMINISTRACIÓN	NAME/ NOMBRE	POST/ CARGO	TELEPHONE/ TELEFONO	E-MAIL
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		Giuliano Guzman Vera	Inspector de navegación aérea	511 6157880	gguzman@mtc.gob.pe
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SURINAM/ SURINAME					
URUGUAY	DINACIA	Antonio Lupacchino	Especialista CNS sistemas automatizados	(598) 2604-0408 Ext.4520	alupacch@yahoo.com.ar

STATE/ ESTADO	ADMINISTRATION / ADMINISTRACIÓN	NAME/ NOMBRE	POST/ CARGO	TELEPHONE/ TELEFONO	E-MAIL
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APPENDIX D

RECOMMENDATIONS FORMULATES DURING THE MEETING OF IMPLEMENTATION OF AIDC IN THE NAM/CAR/SAM REGIONS (Lima, Peru, 16 to 20 April 2018) **TO COMPLETE THE OPERATIONAL IMPLEMENTATION OF AIDC**

RECOMMENDATION AIDC/1.- Increase efforts to complete AIDC operational implementation

That NAM/CAR/SAM States, taking into account the information provided by the GREPECAS GTE that shows the significant contribution of AIDC to the reduction of LHDs, increase their AIDC implementation efforts, aiming at the operational implementation of AIC systems. Likewise, that States, through their task forces, promote the exchange of lessons learned regarding AIDC implementation.

RECOMMENDATION AIDC/2.- Consider the recommendations of manufacturers and States regarding AIDC implementation

That NAM/CAR/SAM States examine and use as a reference the document containing the integrated recommendations made at the Meeting by Indra Systems, Thales, and ATECH, which is shown in Appendix D of the Meeting Report, as well as the weaknesses identified by the regional AIDC implementation working groups, with a view to expediting and coordinating the implementation of AIDC interconnections.

RECOMMENDATION AIDC/3.- List of AMHS staff

That the NAM/CAR/SAM States update the contact information of the AMHS technicians of their States/FIRs to have an updated version of the AMHS technical management contact list and that the ICAO NAM/CAR and SAM Offices ensure that this information is available on their WEB pages with the aim of obtaining an updated version to coordinate, as soon as possible, any necessary action with those centers with which messaging is exchanged and traffic is permanently monitored, establishing maximum time between consecutive messages processed, as well as how to check permanently reports of non-delivery reports (NDR) generated by messaging systems, mainly those that are not related to unknown addresses.

- *See Appendix E on the next page of this Appendix*

APPENDIX E

INTEGRATED RECOMMENDATIONS FROM INDRA SYSTEMS, THALES AND ATECH

Recommendations for the implementation of AIDC in the latest generation systems of suppliers:

- Indra Systems SA and ATECH recommend that Brazil establish a work plan in conjunction with Colombia and Peru in order to coordinate tests as of mid-July 2018 when the new ATECH system is implemented in the Amazonian FIR, which has latest software version "SAGITARIO" and which has among its improvements the management capacity of FPL2012 and the latest implementations in the AIDC protocol. Currently the Indra Systems of Colombia and Peru have technical support and guarantee.

- According to our experience, we consider that the new software versions of the systems contemplate all the necessary parameters for the correct coordination of the systems with the AIDC protocol. If any State considers that some parameter should be implemented in the future, it can make its consultation or suggestion so that the suppliers can indicate if they have this possibility or if it can be implemented as per request within a new contract.

- Indra Systems SA will study in the short term two lines of work to be presented to ICAO.
    - Will study improvement formulas for the training of qualified personnel in their systems.
    - Proposal for homologation of systems to a common target

Recommendations before bidding:

- Clearly define the protocol, version to be used, and establish in the specification the level of coordination with which it should communicate with each adjacent state.
- It is recommended to specify in the specifications any operational case that is considered to be implemented.

Short-term recommendations for states:

- That all states have systems with FPL2012 capacity.
- Have specific contracts of support and guarantee for the AIDC operational implementation.

Recommendations to ICAO for the prior validation of a system:

- It is recommended that ICAO develop a semantic validation tool for different protocols and versions that allows providers to validate their systems autonomously.
- Incorporate technical and operational courses to the working meetings of the states.

For the certification of technicians:

- It is recommended that technicians have continuous training. These courses of refreshment should be oriented mainly to the operation staff of the systems that will in turn give greater support to the controllers.
- It is recommended that technicians be more involved in operational and conceptual aspects of the operation of an ATC system.
- Theoretical-practical exam in specific operating systems in the country or control center.

- Theoretical-practical exam of the working mode of the installed system (supplier application).

Recommendations to ICAO regarding queries from system suppliers:

- The NACC and SAM Offices should designate a focal point to respond to clarification requests regarding ICD specifications from the system suppliers. ICAO clarifications should be distributed to all providers of AIDC systems.
