



Agenda Item 1: Follow up of air navigation national plans implementation

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

(Presented by the Secretariat)

SUMMARY	
This working paper presents updated information on AIDC operation in the SAM Region since the twenty-second workshop/meeting of the SAM Implementation Group (SAM/IG/22).	
References:	
<ul style="list-style-type: none">- Report of the Twenty-third workshop/meeting of the SAM implementation group (SAM/IG/23) (Lima, Peru, 20-24 May 2019);- Report of the Meeting on AIDC Implementation in the NAM/CAR/SAM Regions (Lima, Peru, 16-20 April 2018); and- Report of the Third meeting on AIDC implementation (AIDC/3 - Lima, Peru, 24-26 April 2017.	
ICAO strategic objectives:	<i>A – Safety</i> <i>C – Air navigation capacity and efficiency</i>

1. Background

1.1 Since 2009, a process was started in the SAM Region for the interconnection of ATM automated systems between adjacent ACCs, whose final objective was to:

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

1.2 In order to support the interconnection of automated systems, and with the support of regional projects RLA/98/003 and RLA/06/901, visits were made to SAM States to obtain information on the status of ATM automation in ACCs, and on 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 communication in the Caribbean and South American Regions (CAR/SAM AIDC ICD).
- System Interface Control Document (SICD).
- Initial plan for regional interconnection of automated systems in ACCs.
- Preliminary document on automated system requirements (SSS).
- Memorandum of understanding for the implementation of the interconnection of automated systems between two States that have adjacent ACCs.

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

1.4 Likewise, several courses and seminars were conducted. Courses were conducted on the use of ASTERIX protocols to support the implementation of radar data exchange, on-site courses were conducted in Chile, Colombia, Ecuador, Panama, Paraguay and Peru, as well as several surveillance and AIDC seminars.

1.5 In this regard, and as a result of the aforementioned activities, some SAM States prepared and signed memorandum of understanding (MoU) for the interconnection of automated systems. In relation to effective interconnection of automated systems, little progress has been made so far. Only 12 AIDC communications are operational, out of 76 AIDC connections planned. The **Appendix A** to this working paper shows all necessary AIDC connections to be established.

2. Discussion

2.1 To monitor AIDC performance, information is provided below on the status in each of SAM States with regard to AIDC implementation between adjacent ACCs, as informed in the last Implementation Group Meeting (SAM/IG/23 – Lima-Peru, 20-24 May 2019):

Argentina

2.2 At the national level, the AIDC between Ezeiza and Aeroparque is in the operational phase. The AIDC between the ACC of Córdoba and the Ezeiza ACC remains in the pre-operational phase since 2015, and among the other internal ACCs since 2018, having being amended the letters of operational agreement between the national ACCs with the introduction of operational use of AIDC as the primary means of coordination. Also, in September 2017, AIDC training was completed for the controllers of the ACCs of Comodoro Rivadavia, Mendoza and Resistencia.

2.3 The AIDC is expected to be operational among all national ACCs by the second semester of 2019. AIDC is expected to be operational with adjacent regional ACCs by 2020.

2.4 Regardless of these plans, the automated systems in Argentina are in a position to proceed with the initiation of technical interconnection tests with the regional ACCs.

2.5 Table 1 presents all AIDC connections between the automated centres of Argentina and adjacent centres.

Centre A	Centre B	General Table	Notes
Córdoba ACC	Iquique ACC	1	
	La Paz ACC	2	
	Ezeiza ACC	3	Pre-operational (Dec 2015)
	Mendoza ACC	4	Pre-operational (Dec 2018)
	Resistencia ACC	5	Pre operational (Dec 2018)

Resistencia ACC	Asuncion ACC	6	
	Curitiba ACC	7	
	Ezeiza ACC	8	Pre operational (Dec 2018)
	Montevideo ACC	9	
Ezeiza ACC	Comodoro Rivadavia ACC	10	Pre operational (Dec 2018)
	Mendoza ACC	11	Pre operational (Dec 2018)
	Puerto Montt ACC	12	
	Johannesburg ACC	13	
	Montevideo ACC	14	
Mendoza ACC	Santiago ACC	15	
Comodoro Rivadavia ACC	Punta Arenas ACC	16	
	Puerto Montt ACC	17	

Table 1 – AIDC connections of Argentina

Bolivia

2.6 An automated Thales ATM Topsy system is being implemented in Bolivia's main ATS units, which is scheduled to enter into operation by the second half of 2020. However, the initial purchase did not include the module that allows AIDC functionality. Bolivia will acquire, as an update to its system, the necessary module to the manufacturer Thales, whose quotation was already negotiated, together with an update of the AMHS. It is planned to start the AIDC interconnection tests with the ACCs of the adjacent States for the second half of 2021.

2.7 Table 2 presents all AIDC connections between the automated centres of Bolivia and adjacent centres.

Centre A	Centre B	General Table	Notes
La Paz ACC	Amazonico ACC	18	
	Asuncion ACC	19	
	Curitiba ACC	20	
	Córdoba ACC	(2)	
	Lima ACC	21	
	Iquique ACC	22	

Table 2 – AIDC connections of Bolivia

Brazil

2.8 Brazil has the AIDC in place and in operation among all its national ACCs.

2.9 At the international level, the AIDC between the Amazonian ACC and the Lima ACC are in the pre-operational phase from September 6, 2018. The interconnections of the Atlantic ACC and Curitiba ACC with the adjacent ACCs of the Region are pending.

2.10 Atech is developing a correction in the method of processing and describing LRM messages, which is expected to be installed for the second half of 2019. After this, it could be moved to the operational phase with the ACC Lima. Next, the intention is to establish the AIDC communication with the adjacent ACCs of Paraguay and Venezuela, which is estimated to enter the pre-operational phase even in 2019.

2.11 Table 3 presents all AIDC connections between the automated centres of Brazil and adjacent centres.

Centre A	Centre B	General Table	Notes
Amazon ACC	Brasilia ACC	23	Operational since 2017
	Bogota ACC	24	
	Cayenne ACC	25	
	Curitiba ACC	26	Operational since 2017
	Georgetown ACC	27	
	La Paz ACC	(18)	
	Lima ACC	28	Pre-operational since 2017
	Maiquetia ACC	29	
	Paramaribo ACC	30	
	Recife ACC	31	Operational since 2016
	Atlantic ACC	32	Operational since 2018
Atlantic ACC	Amazon ACC	(32)	Operational since 2018
	Curitiba ACC	33	Operational since 2018
	Dakar ACC	34	
	Johannesburg ACC	35	
	Luanda ACC	36	

Centre A	Centre B	General Table	Notes
	Montevideo ACC	37	
	Recife ACC	38	Operational since 2018
	Cayenne ACC	39	
Brasilia ACC	Amazon ACC	(23)	Operational since 2017
	Curitiba ACC	40	Operational since 2016
	Recife ACC	41	Operational since 2016
Curitiba ACC	Amazon ACC	(26)	Operational desde 2017
	Asunción ACC	42	
	Brasilia ACC	(40)	Operational since 2016
	La Paz ACC	(20)	
	Montevideo ACC	43	
	Recife ACC	44	Operational since 2016
	Resistencia ACC	(7)	
Recife ACC	Atlantic ACC	(33)	Operational since 2018
	Amazon ACC	(31)	Operational since 2016
	Brasilia ACC	(41)	Operational since 2016
	Curitiba ACC	(44)	Operational since 2016
	Atlantic ACC	(38)	Operational since 2016

Table 3 – AIDC connections of Brazil

Chile

2.12 On 18 August 2018, was established the AIDC connection between Iquique ACC and Lima ACC. Positive AIDC tests have been conducted between the Iquique ACC and the Cordoba ACC, which are expected to become operational during 2019-2020. At national level, AIDC connection is operational between the Punta Arenas ACC and the Puerto Montt ACC, and between the Iquique ACC and the Antofagasta APP since mid-2017.

2.13 It is planned to update the automated system of the Santiago Oceanic ACC by the manufacturer Thales to allow the AIDC functionality, which is expected to be interconnected with the adjacent ACCs by the second half of 2020.

2.14 Table 4 presents all AIDC connections between the automated centres of Chile and adjacent centres.

Centro A	Centro B	General Table	Notes
Santiago ACC	Iquique ACC	45	
	Lima ACC	46	
	Mendoza ACC	(15)	
	Puerto Montt ACC	47	
Iquique ACC	Córdoba ACC	(1)	
	La Paz ACC	(22)	
	Lima ACC	48	Operational since 2018
	Santiago ACC	(45)	
Puerto Montt ACC	Santiago ACC	(47)	
	Punta Arenas ACC	49	
	Ezeiza ACC	(12)	
	Comodoro Rivadavia ACC	(17)	
Punta Arenas ACC	Puerto Montt ACC	(49)	Operational desde 2017
	Comodoro Rivadavia ACC	(16)	

Table 4 – AIDC connections of Chile

Colombia

2.15 At the national level, the AIDC interconnection between the Bogotá ACC - Barranquilla ACC is in the pre-operational phase, and it is planned to move to the operational phase for the second half of 2019.

2.16 At the international level, the AIDC interconnections between ACC Bogotá - ACC Guayaquil, ACC Bogotá - ACC Lima, ACC Bogotá - ACC Panama and ACC Barranquilla - ACC Panama), are in the pre-operational phase since the end of 2015. Letters of operational agreement between the mentioned ACCs were reviewed with the introduction of the use of the AIDC as primary means. In November 2016, an operational agreement letter amendment was signed between the Bogotá ACC and the Lima ACC, and an updated version has been submitted for signature at this meeting. It is expected that the AIDC connections between the ACC Bogotá with the ACC Lima, and ACC Bogotá with ACC Guayaquil enter the operational phase on July 6, 2019, and with the ACC Panama for the first quarter of 2020.

2.17 Training sessions and additional OJT training have been carried out to ATC personnel from ACC Bogota since April 2019 to improve their performance in the operation of AIDC, so that the migration to the operational phase with ACC Lima and ACC Guayaquil is carried out successfully.

2.18 There is a technical drawback that causes the automated Bogotá ACC system to generate LRM RMK/65 errors when it receives an AOC message from the Guayaquil ACC. Efforts are being made for the manufacturer (Indra) to solve this problem in order to be able to move to the operational phase with the Guayaquil ACC.

2.19 At the interregional level, it is planned to initiate interconnection tests with ACC CENAMER during the second half of 2019. No tests have yet been carried out between the Barranquilla ACC and the Kingston ACC.

2.20 Table 5 presents all AIDC connections between the automated centres of Colombia and adjacent centres.

Centre A	Centre B	General Table	Notes
Bogota ACC	Amazon ACC	(24)	
	CENAMER	50	
	Guayaquil ACC	51	Pre-operational since 2015
	Lima ACC	52	Pre-operational since 2015
	Maiquetia ACC	53	
	Panama ACC	54	
	Barranquilla ACC	55	Pre-operational since 2016
Barranquilla ACC	Maiquetia ACC	56	
	Panamá ACC	57	
	Bogota ACC	(55)	Pre-operational since 2016
	Kingston ACC	58	
	Curacao ACC	59	
Rio Negro APP	Panama ACC	(23)	
Cali APP	Panama ACC	(38)	

Table 5 – AIDC connections of Colombia

Ecuador

2.21 On 18 August 2018, the Lima ACC-Guayaquil ACC AIDC migrated to the operational phase. The updated letter of agreement contains the aspects and guidelines related to the coordination protocol signed at the SAM/IG/23 meeting. The implementation between the two centres was successful, reducing ATC workload and improving coordination between the control centres.

2.22 In January 2017, the internal AIDC was operationally implemented between the Guayaquil ACC and the Quito APP, with very satisfactory results obtained from coordination efforts.

2.23 Internal AIDC coordination between the Guayaquil ACC and the Manta APP is in the pre-operational phase since February 2018, expected to migrate to the operational phase in June 2019, and with the Shell APP in November 2019.

2.24 The Bogota ACC and the Guayaquil ACC went back to the pre-operational phase on 20 August 2018. After signing the MoU and based on the results of tests conducted in April 2019, it was agreed that the LRM/65 reject message should be analysed and resolved by the manufacturer in the Bogota system in order to move immediately to the operational phase.

2.25 In November 2018, AIDC tests were conducted between the CENAMER ACC and the Guayaquil ACC. Tests continued after the CENAMER automated system was upgraded to a new version of the FDP, which corrected the problem in box 10 and 18 of the flight plan. Since then, the AIDC message cycle has been operating satisfactorily, except for the TOC and AOC message, due to loss of the radar signal in some sectors. The migration to the operational phase is foreseen for September 2019.

2.26 Table 6 presents all AIDC connections between the automated centres of Ecuador and adjacent centres.

Centre A	Centre B	General Table	Notes
Guayaquil ACC	Bogota ACC	(51)	Pre-operational since 2015
	Lima ACC	62	Operational since 2018
	CENAMER	63	Pre-operational since 2015

Table 6 – AIDC connections of Ecuador

French Guiana (France)

2.27 In mid-2017, a new ATM automation system, which included AIDC, was installed in the Cayenne ACC. The implementation of AIDC with the ACCs of adjacent States is foreseen for the period 2019-2020.

2.28 Table 7 presents all AIDC connections between the automated centres of French Guiana and adjacent centres.

Centre A	Centre B	General Table	Notes
Cayenne ACC	Amazon ACC	(25)	
	Paramaribo ACC	64	
	Piarco ACC	65	

	Dakar ACC	66	
	Atlantic ACC	(39)	

Table 7 – AIDC connections of French Guiana

Guyana

2.29 The AIDC functionality is currently disabled in the automated INTELCAN system. Conversations have been initiated with the manufacturer to enable this functionality. The AIDC capacity is expected to be available from 2020.

2.30 Table 8 presents all AIDC connections between the automated centres of Guyana and adjacent centres.

Centre A	Centre B	General Table	Notes
Georgetown ACC	Amazon ACC	(27)	
	Piarco ACC	67	
	Maiquetia ACC	68	
	Paramaribo ACC	69	

Table 8 – AIDC connections of Guyana

Panama

2.31 The Thales Topsky automated system in Panama had updates in July 2017 and October 2018, which allowed improving the functionality of the AIDC and the processing of FPL.

2.32 Coordinations were made with the AIDC managers of Bogotá and Kingston to establish the respective Letters of Agreement between the adjacent ACCs. The Letter of Agreement between the ACC of Panama and CENAMER was signed on February 15, 2019, establishing the use of the AIDC as the primary means of coordination as of that date. At present, the pre-operational phase between the Panama ACC and the Bogotá ACC and Barranquilla ACC has been maintained, and some inconveniences have arisen due to the fact that the operational personnel have not been correctly performing the AIDC pre-operational tests (the manual coordinations were maintained via oral channel without letting AIDC operate automatically).

2.33 It is expected that the necessary agreements will be signed to migrate to the operational phase with Bogotá and Barranquilla for the first quarter of 2020. It should be mentioned that with the APPs Rio Negro and APP Medellín, no tests have been carried out so far.

2.34 The Kingston ACC has not yet been able to start the pre-operational phase due to the fact that during the interconnection tests it was not possible to verify the sending and effective reception of the AIDC messaging by Kingston.

2.35 Table 9 presents all AIDC connections between the automated centres of Panama and adjacent centres.

Centre A	Centre B	General Table	Notes
Panama ACC	Bogota ACC	(54)	Pre-operational since 2017
	Barranquilla ACC	(57)	Pre-operational since 2017
	CENAMER	70	Pre-operational since 2017
	Cali APP	(61)	
	Rio Negro APP	(60)	
	Kingston ACC	71	

Table 9 – AIDC connections of Panamá

Paraguay

2.36 Paraguay has acquired a new ATM System, Atech SAGITARIO, and taking into consideration the period required for the installation and commissioning, the new ATM system is foreseen to be operating by the second semester 2019, to continue with the tests that were postponed. Initially it is planned to perform tests with the Curitiba ACC.

2.37 Table 10 presents all AIDC connections between the automated centres of Paraguay and adjacent centres.

Centre A	Centre B	General Table	Notes
Asuncion ACC	Curitiba ACC	(42)	
	La Paz ACC	(19)	
	Resistencia ACC	(6)	

Table 10 – AIDC connections of Paraguay

Peru

2.38 The ACC of Lima has the AIDC in operational phase with the ACC of Guayaquil (Ecuador) and ACC Iquique (Chile), since August 18, 2018. The AIDC connection with the ACC of Bogotá is still in the pre-operational phase from the month of August 2015, and with the Amazonian ACC from September 6, 2018. It is planned to move to the operational phase with the Bogotá ACC on July 6, 2019, and with the Amazonian ACC by the end of 2019. Also, the indication of the States of Bolivia (ACC La Paz) and Chile (ACC Santiago Oceanic) is expected to start or continue the process of establishing the AIDC interconnections with the Lima ACC.

2.39 Peru expects that, if no further delays occur in the adjacent ACCs, the Lima ACC with the 6 adjacent ACCs can be interconnected via the AIDC for the first quarter of 2021.

2.40 Table 11 presents all AIDC connections between the automated centres of Peru and adjacent centres.

Centre A	Centre B	General Table	Notes
Lima ACC	Amazon ACC	(28)	Pre-operational since 2018
	Bogota ACC	(52)	Pre-operational since 2015
	Santiago ACC	(46)	
	Iquique ACC	(48)	Operational since 2018
	Guayaquil ACC	(62)	Operational since 2018
	La Paz ACC	(21)	

Table 11 – AIDC connections of Perú

Suriname

2.41 Suriname has an automated INTELSCAN system that to date does not yet have the AIDC functionality. An update of said system is planned to equip it with this functionality. The implementation of the AIDC with the ACCs of the adjacent States is scheduled for the second half of 2020. It is planned to start the AIDC tests with Guyana, since they have systems from the same manufacturer.

2.42 Table 12 presents all AIDC connections between the automated centres of Suriname and adjacent centres.

Centre A	Centre B	General Table	Notes
Paramaribo ACC	Amazon ACC	(30)	
	Georgetown ACC	(69)	
	Piarco ACC	72	
	Cayenne ACC	(64)	

Table 12 – AIDC connections of Surinam

Uruguay

2.43 Uruguay is waiting to achieve interconnection via AMHS with the adjacent ACCs in order to use AIDC messaging through this medium. The implementation of the AIDC with the ACCs of the adjacent States is scheduled for the first half of 2020.

2.44 Uruguay expressed the convenience and need to carry out a training reinforcement for ATC, AIM, CNS and SMS personnel in the concept, operation and use of AIDC.

2.45 Table 13 presents all AIDC connections between the automated centres of Uruguay and adjacent centres.

Centre A	Centre B	General Table	Notes
Montevideo ACC	Curitiba ACC	(43)	
	Ezeiza ACC	(14)	
	Resistencia ACC	(9)	
	Atlantic ACC	(37)	
	Johannesburg ACC	73	

Table 13 – AIDC connections of Uruguay

Venezuela

2.46 Venezuela has acquired a new automated SAGITARIO system from ATECH of Brazil, which is currently in the SAT testing phase. Once these tests were completed and the system was put into operation, the ACC Maiquetía would be able to start pre-operational tests with the adjacent ACCs, which is expected to be achieved during the second semester of 2019.

2.47 Venezuela expressed the desirability and necessity of training the ATC, AIM and CNS personnel in the concept, operation and use of the AIDC. In this regard, the Secretariat informed that there is a training activity scheduled in Project RLA/06/901 and the confirmation of the administration of Venezuela of the date for the completion of the training is awaited. It is requested that a communication be sent at least 6 weeks before the scheduled date for the start of training.

2.48 Table 14 presents all AIDC connections between the automated centres of Venezuela and adjacent centres.

Centre A	Centre B	General Table	Notes
Maiquetia ACC	Amazon ACC	(29)	
	Bogota ACC	(53)	
	Barranquilla ACC	(56)	
	Piarco ACC	74	
	Curacao ACC	75	
	San Juan ACC	76	

Table 14 – AIDC connections of Venezuela

FOLLOW-UP OF THE ACTIONS THAT MITIGATE THE ERRORS AND THE DUPLICITY / MULTIPLICITY OF FLIGHT PLANS IN THE SAM REGION

2.49 During the SAM/IG/23 Meeting, the SAM Region States presented their initiatives to mitigate flight planes errors, that impact seriously the air navigation services automation.

2.50 The main initiatives adopted were: centralization of the flight planes processing, handling

the errors presented manually or automatically; the establishment of agreements with operators (airlines) to present directly their flight planes, avoiding duplicity; and, implementation of feedback messages to the flight planes originators, by means of ACK and REJ messages.

2.51 There is concern on the part of Peru and other states regarding the lack of a standard in the use of the ACK and REJ messages, which could result in problems of incompatibility in the future, if each State uses a different format. For this reason, the States recognized the need of promoting the standardization of the syntax of the ACK and REJ messages.

2.52 In this sense, the Meeting formulated the following conclusion:

CONCLUSION SAM/IG/23-02		Standardization of the syntax and format of messages ACK and REJ for FPL	
That: The States, through their AIM and CNS Focal Points, form a sub-working group within the INTEROP WG to:		Expected impact:	
<ul style="list-style-type: none"> a) Study the existing formats of ACK and REJ messages of FPL used by the States, evaluating the advantages and disadvantages of each, and the compatibility with user systems (airlines). b) Propose a regional and interregional standard to establish a unique and optimal ACK and REJ message format for FPLs. 		<input type="checkbox"/> Political / Global <input checked="" type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Technical/Operational	
Why: To promote the standardization of the syntax of ACK and REJ messages in order to prevent incompatibility in the future.			
When: Immediately		Status: Adopted by SAM/IG/23	
Who: <input checked="" type="checkbox"/> Coordinators <input checked="" type="checkbox"/> States <input checked="" type="checkbox"/> ICAO Secretariat <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: Users/Industry			

INTEROPERABILITY TASK FORCE – INTEROP TF

2.53 The SAM/IG/22 meeting (Lima, Peru, 19-23 November 2018) highlighted the interoperability problem that existed between systems of different manufacturers, or of the same manufacturer but of different generations or models. This was noted especially during the implementation of AMHS and AIDS in the Region.

2.54 Taking into account the number of new systems required for the automation of aeronautical information management (AIM) services, the SWIM (System Wide Information Management) concept, air traffic management (ATM), air traffic flow management (ATFM), communication, navigation and surveillance (CNS), and meteorology (MET) services, it is felt that a task force must be established to deal with the structure of the SAM Implementation Group (SAM/IG), in order to ensure the interoperability of the implemented systems.

2.55 The SAM/IG/22 meeting approved Conclusion SAM/IG/22-3 on the creation of the Interoperability Task Force (Interop TF), with the main objective of ensuring the interoperability among automated systems used in the AIM, MET, ATM, ATFM, and CNS areas, within the context of the implementation of the elements designated in the SAM-PBIP.

2.56 The Meeting urged the States to complete their list of participants to make up the Interoperability Task Force, who should be planners and implementers of systems supporting air navigation services.

2.57 Regarding the “Terms of reference of the Interoperability Task Force” presented by the Secretariat at the SAM/IG/23 meeting, Brazil noted that each State should designate its representatives to a Coordination Group tasked with defining and approving the Terms of Reference, and defining the required subgroups. The Meeting also deemed it advisable to hold a teleconference for designating a rapporteur for the Interop TF. The Secretariat shall organize a teleconference, as soon as possible after nomination of participants for the Coordination Nucleus (NC) by the States. Figure depicts the proposed structure for the Interop TF.

2.58 The participants at the AN&FS/6 meeting are requested to nominate Coordination Nucleus members and also support the work assigned to the Subgroups, in each specific subject.

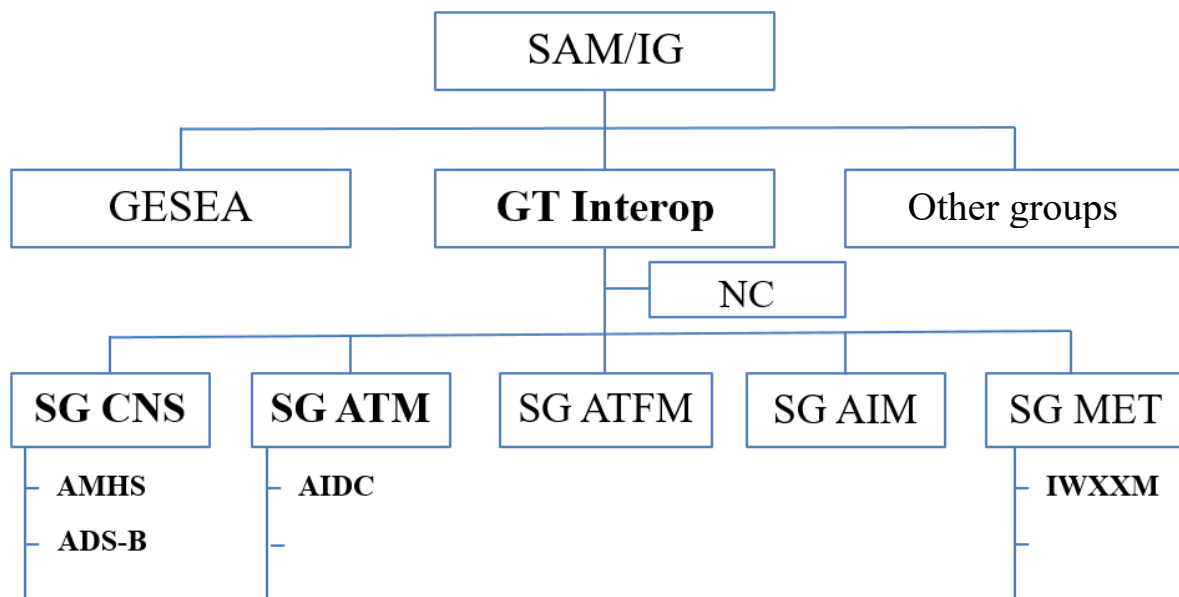


Figure 1 – Interop TF proposed structure

IMPLEMENTATION OF ADS-B IN THE SAM REGION

2.59 During the SAM/IG/23 meeting, the States presented initiatives related to surveillance, with specific emphasis to ADS-B implementation.

GROUND ADS-B IMPLEMENTATION INITIATIVES

2.60 With respect to ground based ADS-B implementations, Brazil, Colombia, Ecuador, French Guiana, Guyana, Panama, Peru, Uruguay and Venezuela have indicated their initiatives.

2.61 At this moment, only Brazil has an operational implementation, mainly to support aircraft operations in the Macaé TMA, a place of interest for oil operations, characterised by the movement of helicopters between the continent and the platforms or vessels anchored in this basin, in the oceanic zone, for transporting persons and cargo.

2.62 Six ADS-B stations were installed in the Macaé TMA airspace to serve Cuenca de Campos, four stations in offshore platforms and two in the continent. This infrastructure, made up by the existing radar network that supports air traffic control in this region, allows for surveillance in the entire TMA airspace at 500 feet and above.

SATELLITE ADS-B IMPLEMENTATION INITIATIVES

Argentina

2.63 Argentina is arranging for a Memorandum of Understanding (MoU) to be signed with the satellite ADS-B provider, AIREON, for the conduction of tests in order to determine the coverage that could be hired and to assess safety aspects.

Bolivia

2.64 Official operation of the radar system in Bolivia is scheduled to start in 2020. Once the actual coverage with the RADAR surveillance system is confirmed, plans will be made to use the ADS-B system for sectors lacking radar coverage, based on the information resulting from the Study on the convenience and feasibility of using satellite ADS-B.

Brazil

2.65 Brazil signed a technical and operational cooperation agreement with AIREON for the collection of data on the surveillance of aircraft using the airspace under the responsibility of DECEA, in order to make a decision on the adoption of the satellite ADS-B service.

2.66 The assessment of the technical and operational performance of satellite ADS-B surveillance based on the AIREON solution applied to DECEA airspace will consist of two phases:

PHASE - 1 – Tracking of specific aircraft

AIREON will provide aircraft tracking during the test period in the area of interest of DECEA, in order to test satellite ADS-B capabilities.

PHASE - 2 – Real-time tracking

Collection and real-time delivery of data through a virtual private network ("VPN") server connected to the internet, ADS-B-equipped aircraft, and flying in test areas previously selected by DECEA. These tests will seek to extend the analyses conducted in Phase 1 to all the FIRs under the jurisdiction of DECEA and continue testing the satellite ADS-B services.

2.67 Possible benefits of the implementation of satellite ADS-B technology, which will be subject to the assessment proposed in this Agreement, include, but are not limited to:

- Increased coverage of the surveillance service in oceanic areas and/or supplementary coverage in continental airspace, wherever an operational demand is identified and where use of the ground surveillance infrastructure is not possible or feasible;
- Improved air traffic management in the airspace managed by DECEA, and airspace optimisation to increase air traffic capacity through more direct routes and/or application of reduced aircraft separation minima;
- Improved air traffic flow management in Brazilian airspace;
- Improved search and rescue (SAR) operations in the airspace management by DECEA;
- Better understanding of the technical characteristics of the satellite ADS-B service offered by AIREON.

Colombia

2.68 Colombia considers that a technical and financial assessment is required in order to determine the advantages of using the satellite ADS-B service compared to ground ADS-B, especially to cover gaps in its airspace. In this regard, the SAM Region already has conducted a study on the convenience and feasibility of satellite ADS-B in a regional implementation, which could be taken into account.

Peru

2.69 Peru is arranging for a Memorandum of Understanding (MoU) to be signed with the satellite ADS-B provider, AIREON, for the conduction of tests to identify the benefits of contracting the satellite ADS-B service.

Uruguay

2.70 Uruguay arranging for a Memorandum of Understanding (MoU) to be signed with the satellite ADS-B provider, AIREON, for the conduction of tests to identify the benefits of contracting the satellite ADS-B service.

Other States

2.71 The SAM Region continues analysing the advantages of adopting the satellite ADS-B service at the regional level compared with its individual adoption by each State. States are expected to express their position regarding this strategy in order to save costs in the Region.

2.72 AIREON proposed the implementation of a VPN box via internet through the ICAO SAM Office in order to provide satellite ADS-B information to interested States, for the purpose of conducting operational tests in each airspace of interest. The States interested in this proposal can contact AIREON directly at:

Ana Persiani, Regional Director Latin America and Caribbean, ana.persiani@aireon.com

2.73 Technical and logistic aspects of this implementation and tests will be discussed and agreed by the interested States.

IMPLEMENTATION OF OPMET MESSAGE EXCHANGE IN IWXXM FORMAT

2.74 WXXM is a format or reporting meteorological information in XML/GML language of the World Meteorological Organization (WMO). IWXXM includes XML/GML-based representations for products standardised in ICAO Annex 3 and WMO No. 49, Vol. II, such as METAR/SPECI, TAF, SIGMET, AIRMET, tropical cyclone advisories, and volcanic ash advisories. IWXXM products are used for the operational exchange of meteorological information for use in aviation.

2.75 Amendment 78 to ICAO Annex 3 (approved on 7 March 2018, effective 16 July 2018) introduces IWXXM (ICAO Meteorological Information Exchange Model), among other elements. The Manual on the digital exchange of aeronautical meteorological information (Doc 10003) contains guidance on the use of IWXXM.

2.76 Regarding IWXXM, Amendment 78 stated the following:

- a) Until 4 November 2020, it is recommended that all advisory messages (volcanic ash, tropical cyclones, space weather) and OPMET messages (METAR, SPECI, TAF, SIGMET, AIRMET) be disseminated in IWXXM GML format;
- b) As of 5 November 2020, dissemination in IWXXM GML format becomes a standard.
- c) Regarding space weather advisory messages, the recommendation applies as of 7 November 2019

2.77 On this regards, the Meeting considered that the implementation of the of the exchange of OPMET messages in IWXXM format is linked to the migration of AFTN users to AMHS environment as soon as possible. Likewise, the Meeting deemed convenient the need to adequate the AMHS terminals of meteorological users for the transmission and reception of AMHS messages with content (meteorological information) in the new IWXXM GML format.

2.78 Taking into consideration the aforementioned aspects, the Meeting agreed on the following conclusion:

CONCLUSIONSAM/IG/23-03		Adaptation of AMHS terminals of aeronautical meteorology users	
That, Pursuant to the standard requiring the implementation of the exchange of OPMET messages in IWXXM GML format by 5 November, States should:		Expected impact:	
<ul style="list-style-type: none"> a. Adjust AMHS terminals of aeronautical meteorology users so that they may transmit and receive OPMET messages in IWXXM GML format b. Implement the necessary AMHS interconnections in order to facilitate the transmission and reception of OPMET messages in IWXXM GML format c. States in a position to do so should conduct OPMET message exchange trials in IWXXM GML format 		<input checked="" type="checkbox"/> Political / Global <input checked="" type="checkbox"/> Inter-regional <input checked="" type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Technical/Operational	
Why: To meet the provisions of amendment 78 to ICAO Annex 3			
When: Immediately		Status: Adopted by SAM/IG/23	
Who: <input type="checkbox"/> Coordinators <input checked="" type="checkbox"/> States <input type="checkbox"/> ICAO Secretariat <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other: Users/Industry			

3 Suggested action

3.1 The Meeting is invited to:

- a) take note of the information contained in this working paper;
- b) analyze AIDC performance, the progress made in AIDC interconnection between adjacent ACCs in the SAM Region, and the information related to other systems supporting the air navigation services automation; and
- c) discuss any other matter it may deem appropriate.

Num.	Centro A / Centre A	Centro B / Centre B	Operativa en / Operational in	Observaciones / Notes
1	Córdoba ACC INDRA AIRCON 2100 (2007)	Iquique ACC INDRA AIRCON 2100		Pruebas positivas (marzo de 2016)/Positive tests (March 2016)
2	Córdoba ACC INDRA AIRCON 2100 (2007)	La Paz ACC Thales TopSky		Previsión para 2020-2021/Estimation for 2020-2021
3	Córdoba ACC INDRA AIRCON 2100 (2007)	Ezeiza ACC INDRA AIRCON 2100 (2007)		Pre-operacional (Dic 2015)/Pre-operational (Dec 2015)
4	Córdoba ACC INDRA AIRCON 2100 (2007)	Mendoza ACC INDRA AIRCON 2100 (2016)		Pre-operacional (Dic 2018)/Pre-operational (Dec 2018)
5	Córdoba ACC INDRA AIRCON 2100 (2007)	Resistencia ACC INDRA AIRCON 2100 (2016)		Pre-operacional (Dic 2018)/Pre-operational (Dec 2018)
6	Resistencia ACC INDRA AIRCON 2100 (2016)	Asuncion ACC ATECH SAGITARIO (2019)		Previsión para 2020/Estimation for 2020
7	Resistencia ACC INDRA AIRCON 2100 (2016)	Curitiba ACC ATECH SAGITARIO		Previsión para 2020/Estimation for 2020
8	Resistencia ACC INDRA AIRCON 2100 (2016)	Ezeiza ACC INDRA AIRCON 2100 (2007)		Pre-operacional (Dic 2018)/Pre-operational (Dec 2018)
9	Resistencia ACC INDRA AIRCON 2100 (2016)	Montevideo ACC INDRA AIRCON 2100		Previsión para 2019/Estimation for 2019
10	Ezeiza ACC INDRA AIRCON 2100 (2007)	Comodoro Rivadavia ACC INDRA AIRCON 2100 (2016)		Pre-operacional (Dic 2018)/Pre-operational (Dec 2018)
11	Ezeiza ACC INDRA AIRCON 2100 (2007)	Mendoza ACC INDRA AIRCON 2100 (2016)		Pre-operacional (Dic 2018)/Pre-operational (Dec 2018)
12	Ezeiza ACC INDRA AIRCON 2100 (2007)	Puerto Montt ACC INDRA AIRCON 2100		Previsión para 2019/Estimation for 2019
13	Ezeiza ACC INDRA AIRCON 2100 (2007)	Johannesburg ACC		Previsión para 2020/Estimation for 2020
14	Ezeiza ACC INDRA AIRCON 2100 (2007)	Montevideo ACC INDRA AIRCON 2100		Previsión para 2019/Estimation for 2019
15	Mendoza ACC INDRA AIRCON 2100 (2016)	Santiago ACC Thales TopSky		Previsión para 2019/Estimation for 2019
16	Comodoro Rivadavia ACC INDRA AIRCON 2100 (2016)	Punta Arenas ACC INDRA AIRCON 2100		Previsión para 2019/Estimation for 2019
17	Comodoro Rivadavia ACC INDRA AIRCON 2100 (2016)	Puerto Montt ACC INDRA AIRCON 2100		Previsión para 2019/Estimation for 2019

Num.	Centro A / Centre A	Centro B / Centre B	Operativa en / Operational in	Observaciones / Notes
18	La Paz ACC Thales TopSky	Amazónico ACC ATECH SAGITARIO		Previsión para 2020-2021/Estimation for 2020-2021
19	La Paz ACC Thales TopSky	Asunción ACC ATECH SAGITARIO (2019)		Previsión para 2020-2021/Estimation for 2020-2021
20	La Paz ACC Thales TopSky	Curitiba ACC ATECH SAGITARIO		Previsión para 2020-2021/Estimation for 2020-2021
21	La Paz ACC Thales TopSky	Lima ACC INDRA AIRCON 2100 (2016)		Previsión para 2020-2021/Estimation for 2020-2021
22	La Paz ACC Thales TopSky	Iquique ACC INDRA AIRCON 2100		Previsión para 2020-2021/Estimation for 2020-2021
23	Amazónico ACC ATECH SAGITARIO	Brasilia ACC ATECH SAGITARIO	2017	
24	Amazónico ACC ATECH SAGITARIO	Bogotá ACC INDRA AIRCON 2100		Previsión para 2020/Estimation for 2020
25	Amazónico ACC ATECH SAGITARIO	Cayenne ACC ADACEL		Previsión para 2020/Estimation for 2020
26	Amazónico ACC ATECH SAGITARIO	Curitiba ACC ATECH SAGITARIO	2017	
27	Amazónico ACC ATECH SAGITARIO	Georgetown ACC INTELCAN		Previsión para 2020/Estimation for 2020
28	Amazónico ACC ATECH SAGITARIO	Lima ACC INDRA AIRCON 2100		Previsión para 2019/Estimation for 2019
29	Amazónico ACC ATECH SAGITARIO	Maiquetía ACC ATECH SAGITARIO (2019)		Previsión para 2019/Estimation for 2019
30	Amazónico ACC ATECH SAGITARIO	Paramaribo ACC INTELCAN		Previsión para 2020/Estimation for 2020
31	Amazónico ACC ATECH SAGITARIO	Recife ACC ATECH SAGITARIO	2016	
32	Amazónico ACC ATECH SAGITARIO	Atlántico ACC ATECH SAGITARIO (2017)	2018	
33	Atlántico ACC ATECH SAGITARIO (2017)	Curitiba ACC ATECH SAGITARIO	2018	
34	Atlántico ACC ATECH SAGITARIO (2017)	Dakar ACC		Previsión para 2020/Estimation for 2020

Num.	Centro A / Centre A	Centro B / Centre B	Operativa en / Operational in	Observaciones / Notes
35	Atlántico ACC ATECH SAGITARIO (2017)	Johannesburg ACC		Previsión para 2020/Estimation for 2020
36	Atlántico ACC ATECH SAGITARIO (2017)	Luanda ACC		Previsión para 2020/Estimation for 2020
37	Atlántico ACC ATECH SAGITARIO (2017)	Montevideo ACC INDRA AIRCON 2100		Previsión para 2020/Estimation for 2020
38	Atlántico ACC ATECH SAGITARIO (2017)	Recife ACC ATECH SAGITARIO	2018	
39	Atlántico ACC ATECH SAGITARIO (2017)	Cayenne ACC ADACEL		Previsión para 2020/Estimation for 2020
40	Brasilia ACC ATECH SAGITARIO	Curitiba ACC ATECH SAGITARIO	2016	
41	Brasilia ACC ATECH SAGITARIO	Recife ACC ATECH SAGITARIO	2016	
42	Curitiba ACC ATECH SAGITARIO	Asuncion ACC ATECH SAGITARIO (2019)		Previsión para 2019/Estimation for 2019
43	Curitiba ACC ATECH SAGITARIO	Montevideo ACC INDRA AIRCON 2100		Previsión para 2020/Estimation for 2020
44	Curitiba ACC ATECH SAGITARIO	Recife ACC ATECH SAGITARIO	2016	
45	Santiago ACC Thales TopSky	Iquique ACC INDRA AIRCON 2100		Previsión para 2019/Estimation for 2019
46	Santiago ACC Thales TopSky	Lima ACC INDRA AIRCON 2100		Previsión para 2019/Estimation for 2019
47	Santiago ACC Thales TopSky	Puerto Montt ACC INDRA AIRCON 2100		Previsión para 2019/Estimation for 2019
48	Iquique ACC INDRA AIRCON 2100	Lima ACC INDRA AIRCON 2100	2018	
49	Puerto Montt ACC INDRA AIRCON 2100	Punta Arenas ACC INDRA AIRCON 2100	2017	
50	Bogotá ACC INDRA AIRCON 2100	CENAMER		Previsión para 2019/Estimation for 2019
51	Bogotá ACC INDRA AIRCON 2100	Guayaquil ACC INDRA AIRCON 2100		Pre-operacional desde 2015/Pre-operational since 2015

Num.	Centro A / Centre A	Centro B / Centre B	Operativa en / Operational in	Observaciones / Notes
52	Bogotá ACC INDRA AIRCON 2100	Lima ACC INDRA AIRCON 2100		Pre-operacional desde 2015/Pre-operational since 2015
53	Bogotá ACC INDRA AIRCON 2100	Maiquetía ACC ATECH SAGITARIO (2019)		Previsión para 2019-2020/Estimation for 2019-2020
54	Bogotá ACC INDRA AIRCON 2100	Panamá ACC Thales TopSky		Previsión para 2019/Estimation for 2019
55	Bogotá ACC INDRA AIRCON 2100	Barranquilla ACC INDRA AIRCON 2100		Pre-operacional desde 2016/Pre-operational since 2016
56	Barranquilla ACC INDRA AIRCON 2100	Maiquetía ACC ATECH SAGITARIO (2019)		Previsión para 2019-2020/Estimation for 2019-2020
57	Barranquilla ACC INDRA AIRCON 2100	Panamá ACC Thales TopSky		Previsión para 2019/Estimation for 2019
58	Barranquilla ACC INDRA AIRCON 2100	Kingston ACC		
59	Barranquilla ACC INDRA AIRCON 2100	Curacao ACC		
60	Rio Negro APP INDRA AIRCON 2100	Panamá ACC Thales TopSky		Previsión para 2019/Estimation for 2019
61	Cali APP INDRA AIRCON 2100	Panamá ACC Thales TopSky		Previsión para 2019/Estimation for 2019
62	Guayaquil ACC INDRA AIRCON 2100	Lima ACC INDRA AIRCON 2100	2018	
63	Guayaquil ACC INDRA AIRCON 2100	CENAMER		Situación de la Casilla 18 en el mensaje ABI/Field 18 of ABI message
64	Cayenne ACC ADACEL	Paramaribo ACC INTELCAN		Previsión para 2019-2020/Estimation for 2019-2020
65	Cayenne ACC ADACEL	Piarco ACC		
66	Cayenne ACC ADACEL	Dakar ACC		Previsión para 2019-2020/Estimation for 2019-2020
67	Georgetown ACC INTELCAN	Piarco ACC		
68	Georgetown ACC INTELCAN	Maiquetía ACC ATECH SAGITARIO (2019)		Previsión para 2019-2020/Estimation for 2019-2020

Num.	Centro A / Centre A	Centro B / Centre B	Operativa en / Operational in	Observaciones / Notes
69	Georgetown ACC INTELCAN	Paramaribo ACC INTELCAN		Previsión para 2019-2020/Estimation for 2019-2020
70	Panamá ACC Thales TopSky	CENAMER		Previsión para 2019/Estimation for 2019
71	Panamá ACC Thales TopSky	Kingston ACC		
72	Paramaribo ACC INTELCAN	Piarco ACC		
73	Montevideo ACC INDRA AIRCON 2100	Johannesburg ACC		Previsión para 2019-2020/Estimation for 2019-2020
74	Maiquetia ACC ATECH SAGITARIO (2019)	Piarco ACC		
75	Maiquetia ACC ATECH SAGITARIO (2019)	Curacao ACC		
76	Maiquetia ACC ATECH SAGITARIO (2019)	San Juan ACC		
