SAM/IG/5-WP/13
19/04/10

International Civil Aviation Organization
South American Regional Office

FIFTH WORKSHOP/MEETING OF THE SAM IMPLEMENTATION GROUP (SAM/IG/5)
REGIONAL PROJECT RLA/06/901

Lima, Peru, 10 to 14 May 2010

Agenda Item 7: Operational implementation of new ATM automated systems and integration of the existing systems

FOLLOW-UP TO ATM AUTOMATION IMPLEMENTATION ACTIVITIES IN THE SAM REGION

(Presented by the Secretariat)

Summary

This working paper presents information on the status of interconnection of the automated systems in the SAM Region, as follow-up to the activities taken into account in the action plan for the interconnection of automated systems, updated during SAM/IG/4 meeting. In addition, it proposes that new Memoranda of Understanding (MoU) for the interconnection of automated systems are drafted by States having planned their implementation, as well as the updating, if necessary, of the MoU already established to that end.

References:

- Argentina, Bolivia, Brazil, Paraguay and Uruguay ATM/CNS Multilateral Meeting (Lima, Peru, 14 to 18 September 2009);
- Third workshop/meeting of the SAM Implementation Group (SAM/IG/3); and
- Fourht workshop/meeting of the SAM Implementation Group (SAM/IG/4).

ICAO strategic objective:	*D - Efficiency*

1. Background

1.1 With the aim of supporting SAM States in their plans to implement and interconnect automated systems in the ACCs, RLA/06/901 project has drafted guideline material, as well an action plan, for their implementation.

1.2 GREPECAS/15, taking into account the impact that operational errors have over the safety of air operations in the ATC coordination cycle between adjacent ACCs, considered, in its Conclusion 15/36, that "CAR/SAM States/Territories/International Organizations gradually implement the interface for data exchange among ATC units (AIDC)" and that "ICAO coordinate, provides assistance, and conduct follow-up on the implementation of these corrective measures".

1.3 The analysis of the problem concluded that the solution was based on the intense use of CNS/ATM technology, in accordance with ICAO recommendations, especially those related with the interconnection of automated systems, as described in Document 4444-PANS/ATM, Section 8.1.6: "States should, on the basis of regional air navigation agreements, provide for the automated exchange of coordination data relevant to aircraft being provided with radar services, and establish automated coordination procedures".

1.4 To support SAM States in the interconnection of automated systems, SAM/IG/1 meeting drafted an action plan, which has been updated along the SAM/IG meetings on the basis of implemented activities.

1.5 SAM/IG/3 meeting examined and approved the model MoU for the interconnection of automated systems with the aim that it be used by the States of the Region when interconnecting their automated system with another automated system installed in adjacent ACCs. In this respect, Conclusion SAM/IG/3-8 - *Preparation of specific implementation plans for the interconnection of automated systems*, was formulated.

1.6 The model MoU contains technical, operational, administrative and financial aspects for the interconnection of automated systems, in addition to establishing a chronogram of activities with dates and people responsible for their carrying out.

1.7 For the interconnection management, the MoU establishes the creation of a Management Committee between the two States involved in the interconnection. The structure of the Management Committee will be composed by the following groups:

a) Coordinator group;
b) Technical group; and
c) Operational group.

1.8 Argentina, Brazil and Uruguay, in follow-up to Conclusion SAM/IG/3-8, drafted the following MoU for the interconnection of automated systems:

a) Argentina-Uruguay
b) Argentina-Brazil
c) Brazil-Uruguay

1.9 The above indicated MoUs were drafted and signed during the Argentina, Bolivia, Brazil, Paraguay and Uruguay ATM/CNS Multilateral Meeting, held in Lima, Peru, from 14 to 18 September 2009.

1.10 SAM/IG/4 meeting, with the aim of supporting the States involved in the interconnection of automated systems and had yet not started the drafting of an MoU, adjusted the model MoU presented at SAM/IG/3 meeting in such a manner that States, upon drafting the MoU, need only fill in the information highlighted and related with the specific interconnection. The adjusted model MoU is shown in **Appendix A** to this working paper.

2. **Analysis**

Follow-up to the interconnection activities between automated systems installed in adjacent ACCs

Interconnection of automated systems between Argentina and Uruguay

2.1 The MoU signed between the administrations of Argentina and Uruguay for the interconnection of automated systems establishes that by the end of March 2010, the exchange of radar data would become operational between the Montevideo ACC and the Ezeiza ACC. The exchange of radar data would consist in carrying the secondary radar information from Quilmes (Argentina) to the Montevideo ACC. For the exchange of radar data, the Asterix protocol is foreseen. In turn, Uruguay would be carrying secondary radar information from Durazno to Ezeiza ACC. AIDC implementation between Montevideo ACC and Ezeiza ACC for the automatic hands off flight plan would be effected once AIDC is implemented in Montevideo ACC; Ezeiza ACC already has an AIDC system installed. The features of the AIDC in Argentina have been tested between the Ezeiza ACC and the Cordoba ACC.

2.2 With regard to the progress in the works pertaining to the interconnection of radar data between Argentina and Uruguay, the administration of Argentina has informed that on the week of 12 April 2010 the radar data information from Quilmes was arriving to Uruguay and that work was being carried out to carry the radar information from Durazno to Argentina.

Interconnection of automated systems between Argentina and Brazil

2.3 In accordance with the MoU signed between the administrations of Argentina and Brazil, the interconnection of automated systems would be carried out between the Resistencia and Curitiba ACCs. The exchange of radar data (secondary radar) is scheduled to be completed by October 2010, and the AIDC automatic hands off flight plan, by October 2011. With regard to the exchange of radar data, Argentina would be carrying information from the Resistencia secondary radar to Curitiba, while Brazil could carry information from the Santiago and Foz de Iguazu secondary radars to Resistencia. Asterix protocol will be used for the exchange of radar data. As to the implementation and operational use of AIDC in Brazil, same is scheduled for 2011, with the implementation of the new Sagitario automated system.

Interconnection of automated systems between Brazil and Uruguay

2.4 The interconnection of automated systems between Brazil and Uruguay consists in the short term implementation (June 2010) of radar data exchange, and the automatic hands off flight plans through the AIDC application, in July 2011, in accordance with the MoU signed between Brazil and Uruguay. For the exchange of radar data, information will be carried from the Durazno secondary radar to the Curitiba ACC, and information from the Santiago and Congucu secondary radars to the Montevideo ACC. Asterix protocol will be used for the exchange of radar data.

Other automated systems interconnection plans in the SAM Region

2.5 Automated systems interconnection trials were carried out in September 2006 between the Amazonico (Manaos) and Maiquetia ACCs. The results of the tests were successful. From Venezuela, information from the Maiquetia secondary radar was sent to the Manaos ACC; and to the Maiquetia ACC, integrated radar data information was sent from the Amazonico ACC. In this respect, the administrations of Venezuela and Brazil should examine the results of the trials carried out and make the interconnection operational, through the drafting of an MoU in that regard.

2.6 **Appendix B** to this working paper presents an action plan for the interconnection of automated systems currently installed or soon to be installed in the SAM Region; the plan was updated during SAM/IG/4 meeting.

2.7 With the aim of starting the implementation activities specified in the action plan, the States involved in the interconnection of automated systems, and that have indicated their intention towards their implementation, should draft MoUs taking as reference the model in Appendix A to this working paper.

2.8 For this Meeting, States that have already drafted and agreed upon the MoU for the interconnection of automated systems, should inform on the progress made towards this implementation and revise, if necessary, the mentioned document.

2.9 In addition, new MoUs for the interconnection of the automated systems indicated in the action plan (Appendix B) could be drafted during SAM/IG/5 meeting.

Training in support of automated systems implementation

2.10 SAM/IG/4 meeting considered it necessary, in view of the interconnection of automated systems in the short and medium term in the SAM Region, to carry out a course to support States in the interconnection of automated systems, specifically oriented towards the considerations necessary for the exchange of radar data (ASTERIX) and flight plans (OLDI, AIDC).

2.11 In this respect, thanks to the collaboration of Atech Brazil, courses on Asterix and OLDI AIDC have been prepared, whose programmes are shown in Appendix C to this working paper. The courses will be dictated in the ICAO South American Regional Office in Lima, Peru, from 5 to 17 de July 2010. Fellowships for each RLA/06/901 project member State are foreseen. In this respect, all SAM States are invited to assist to the mentioned courses.

3. **Action suggested**

3.1 The Meeting is invited to:

a) Take note of the information presented;

b) Update the action plan in Appendix B to this working paper and proceed, if necessary, in amending the MoUs drafted by the concerned States;

c) Draft initial MoUs between those States involved in the interconnection and indicated in the action plan (Appendix B to this working paper), taking as model the MoU in Appendix A to this paper;

d) Examine the contents of the Asterix and OLDI/AIDC courses in Appendix C to this working paper; and

e) Analyze other matters in this respect deemed necessary.

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APPENDIX A

MEMORANDUM OF UNDERSTANDING FOR THE INTERCONNECTION OF THE AUTOMATED SYSTEMS OF AAA AND BBB

AAA Logo	***MEMORANDUM OF UNDERSTANDING FOR THE INTERCONNECTION OF THE AUTOMATED SYSTEMS OF AAA AND BBB***		BBB Logo
Effective date: 17 SEP 2009		**Pages:** 2 of 24	

Preface

This document defines the Memorandum of Understanding that will allow AAA and BBB to interconnect their air traffic control automation systems. It is based on the documents prepared by ICAO experts on automation.

The two States can revise this document as necessary.

<table>
<tr><td>AAA Logo</td><td colspan="2">MEMORANDUM OF UNDERSTANDING FOR THE INTERCONNECTION OF THE AUTOMATED SYSTEMS OF AAA AND BBB</td><td>BBB Logo</td></tr>
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Approval

MEMORANDUM OF UNDERSTANDING FOR THE INTERCONNECTION OF THE AUTOMATED SYSTEMS OF AAA AND BBB

For AAA **For BBB**

Revisions

Revision / Date	Description	Revised pages
Rev. 0		

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1. Section 1 - Introduction and Purpose

1.1. Introduction

GREPECAS/15, taking into account the impact that operational errors of the ATC loop between adjacent ACCs have on the safety of air operations, considered, in Conclusion 15/36, that "CAR/SAM States, Territories, and International Organisations should gradually implement the interface for ATC interfacility data communication (AIDC);" and that "ICAO should coordinate, provide assistance for, and do the follow-up on, the implementation of such corrective measures."

The analysis of the problem led to the conclusion that the solution involved an intense use of CNS/ATM technologies, in keeping with ICAO recommendations, especially those concerning the interconnection of automated systems, as described in Document 4444-PANS/ATM, in Section 8.1.6: "*States should, on the basis of regional air navigation agreements, provide for the automated exchange of coordination data relevant to aircraft being provided with ATS surveillance services, and establish automated coordination procedures*".

In this regard, studies were conducted under Projects RLA/98/003 and RLA /06/901 with a view to having an overview of this issue, including obstacles and required action, as well as of the implementation strategy.

The resulting documents are described in Annexes 1, 2 and 3 to the Appendix to this Memorandum.

The main body of this document consists of ten (10) sections and one (1) appendix. The contents of the sections and appendix are summarised below:

a) Section 1 - Presents a brief overview and a statement of purpose;
b) Section 2 – Describes the basic principles guiding the development of this document;
c) Section 3 – Considers the cases in which this Memorandum applies;
d) Section 4 – Describes the version control process;
e) Section 5 – Lists the relevant legislation;

f) Section 6 – Establishes criteria and restrictions for the use of the information shared by two countries;

g) Section 7 – Presents the operational aspects that must be considered for the interconnection of the automated systems;

h) Section 8 - Presents the technical aspects that must be taken into account for the interconnection of the automated systems;

i) Section 9 - Presents the administrative aspects that must be taken into account for the interconnection of the automated systems;

j) Section 10 - Presents the financial aspects that must be taken into account for the interconnection of the automated systems;

k) Appendix 1 – Technical-Operational Agreement

1.2. Purpose

The goal of this MoU is to provide the planning for the interconnection of the automated systems of the XXXXX ACC in AAA, and the YYYY ACC in BBB, establishing standard procedures covering the respective operational, technical, administrative, and financial aspects.

2. Section 2 - Principles

The following aspects have been taken into account when preparing this document:

1. This Memorandum is a guide for States to enter into bilateral agreements; and

2. This document takes into account the aspects contained in the automated system interconnection documents prepared by Projects RLA/98/003 and RLA 06/901, as well as GREPECAS recommendations.

3. Section 3 - Application

This document applies only to the interconnection of the automated systems of AAA and BBB.

4. Section – Organisation

This is a document through which the participating States will agree, as necessary, to revise or modify its details.

The revision to this Memorandum, or changes to its paragraphs will be coordinated by the participating States.

5. Section 5 - References

This Memorandum follows ICAO recommendations contained in the following documents:

a) Annex 11 to the Convention on International Civil Aviation

b) Doc 4444

c) Doc 7030

d) Doc 9426

e) Doc 9694

f) Doc 9880 part IIa (AIDC)

g) RLA/98/003 project document

h) RLA/06/901 project document

i) Final reports of the SAM/IG/1 and SAM/IG/2 meetings

6. Section 6 - Confidentiality

Each participating State must take all the necessary measures to ensure the safety, integrity, and confidentiality of the information.

Disclosure of these data to organisations other than those contemplated in this Memorandum may proceed only if previously authorised by the participating States.

7. Section 7 - Operational Aspects

The implementation of this Memorandum may require adjustments to the Operational Agreements that exist between the States.

The Administrations undertake to instruct the staff of the ACCs involved, on the appropriate sections of this MoU.

Priority will be given to automatic hand-off, through the transmission of the required data between automated systems, according to the specifications contained in the Appendix to this MoU.

However, other means of communication can be used for the transfer when automatic hand-off is not possible.

8. Section 8 - Technical Aspects

The technical aspects to be taken into account by States for the establishment of the interconnection scenarios, the implementation strategy, the implementation of the solution, the supervision of the operation, and the personnel training aspects that will best meet their requirements are shown in Section 6 of the Appendix to this Memorandum.

9. Section 9 - Administrative Aspects

For the orderly implementation of the interconnection solution adopted, the participating States agree to the creation of an administrative structure based on an Interconnection Management Committee, whose functions, detailed composition, and activities are described in Section 7 of the Appendix to this Memorandum.

The States must designate their representatives, members of their respective groups, to make up the basic structure of the aforementioned Committee.

The States must select a forum for discussing cases of non-compliance and for resolving conflicts.

This is an ongoing Memorandum that can be interrupted at any time by common agreement of the parties involved.

10. Section 10 - Financial Aspects

The participating States, as individual administrations, will be responsible for any financial obligation to cover direct or indirect expenditures related to the implementation of this Memorandum, including those associated with the acquisition of equipment, spare parts, training of technical and operational personnel, lines of communication, and others.

Each State will be responsible for its respective portion of expenditures concerning upgrades to the REDDIG to address traffic increases, according to the guidance provided by the REDDIG Administration.

The parties to this Memorandum understand that they will not commit to any action that could result in a financial obligation for the other parties, without first obtaining the written consent by all the other parties involved.

The States can establish financial mechanisms to carry out the interconnection, for example, through ICAO Technical Cooperation Projects.

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APPENDIX TO THE MEMORANDUM OF UNDERSTANDING

TECHNICAL-OPERATIONAL AGREEMENT FOR THE INTERCONNECTION OF THE AUTOMATED SYSTEMS OF AAA AND BBB

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11. Purpose

To provide a detailed description of the technical, operational, and administrative aspects of the Memorandum of Understanding required for the interconnection of the automated systems of AAA and BBB.

12. Summary

ICAO Projects RLA/98/003 and RLA/06/901 identified resources for the conduction of studies, in order to have a full vision of the interconnection of automated systems, including obstacles, required action, and implementation strategy.

The work carried out included:

- Drafting of the Initial Action Plan – July 2006;
- Concept Test – BBB Trial -Venezuela – September 2006;
- Data collection – Phase 1 – survey of countries – current interfaces;
- Data collection – Phase 2 – missions to the States – details of the interfaces – 2007
  - ✓ 1st mission: Peru, Ecuador, and Venezuela – September 2007;
  - ✓ 2nd mission: Colombia, Panama, and COCESNA – October 2007;
  - ✓ 3rd mission: Chile, AAA, and Uruguay - November 2007
- Drafting of the Interconnection Plan – February 2008;
- Drafting of the SICD document (System Interface Control Document) – March 2008;
- Drafting of the SSS document (System Subsystem Specification) – September 2008

The generated products cover, in summary, the following aspects:

1. SICD: contains all the data collected from the SAM States that have automated systems, as well as a description of their interfaces, providing an overview of the current situation and recommendations for the adoption of the necessary measures for their interconnection.

2. Interconnection plan: contains the objectives, concepts, strategies, and the action required to meet the operational requirements for the hand-off between adjacent ACCs in the SAM Region.

3. SSS: contains the requirements--especially those that are mandatory--for ACC automation systems, to be used as a reference for future implementations of new air traffic control automated systems and their upgrades, as necessary.

The SICD, the Interconnection Plan, and the SSS documents were submitted for analysis and approval at the following events:

- Interconnection Plan and SICD:
  - ✓ Project RLA 06/901 - First meeting of the SAM Implementation Group (SAM/IG/1),
  - ✓ Sixth meeting of the GREPECAS ATM/CNS Subgroup; and
  - ✓ Seminar/Workshop on ATM Automation – Rio – BBB;
- SSS:
  - ✓ Project RLA/06/901 - Second meeting of the SAM Implementation Group (SAM/IG/2)

13. Reference

This Agreement follows ICAO recommendations contained in the following documents:

a) Annex 11 to the Convention on International Civil Aviation
b) Doc 4444
c) Doc 7030
d) Doc 9426
e) Doc 9694
f) Doc 9880 part IIa (AIDC)
g) RLA/98/003 project document
h) RLA/06/901 project document
i) Final reports of the SAM/IG/1 and SAM/IG/2 meetings

14. Security

Each State must ensure that its communication networks involved in the interconnection have the protection required for this type of service, taking into account, at least, the following aspects:

- Protection from invasion by unauthorised individuals and/or systems;
- Protection from the attack of computer viruses; and
- Use of the equipment exclusively for the interconnection of the automated systems.

15. Operational Aspects

The Administrations undertake, within their respective jurisdiction, to directly inform the staff of the ACCs involved about the contents of this Memorandum of Understanding.

Priority will be given to automatic hand-off and the provision of radar control service through the transmission of the required data between the automated systems, as specified in this Agreement.

However, other means of communication can be used for the transfer when automatic hand-off is not possible.

Likewise, through the respective operational agreements, the provision of non-radar control services should be coordinated for hand-off between adjacent ACCs when the signals of the radars involved in this Agreement are not available.

The interconnection option chosen implies that the States will have to establish specific operational procedures, taking into account the functionalities available in each automated system, selecting the message set to be used, but complying with the specifications and requirements contained in the documents associated to the solution adopted.

The States agree to jointly define the transition area for the exchange of surveillance data between adjacent ACCs, considering a distance of 55 NM from the boundary of the FIRs involved, for both States.

Special attention must be given to the training of controllers in the use of the tools available in the automated systems concerning automatic hand-off between adjacent FIRs.

16. Technical Aspects

The interconnection must meet the following requirements:

- It should allow for the automatic transfer of flight plans between adjacent ACCs;
- It should allow for surveillance data sharing in areas of common interest.

The main aspects are:

1) Analysis of the current scenario

According to the information contained in the reference documents, the current status in BBB and AAA is as follows:

1) AAA

a) Automated System

The XXXXXX ACC uses an extension of the XXXX system, installed in XXX, which has the functionality required for the provision of radar surveillance services throughout the XXX FIR, and for the automated processing of flight plans, as described in the SICD.

The XXXX system has automatic flight plan “hand-off” capability, using the messages of ICAO Doc 4444, and can process OLDI and AIDC protocols. It is expected to have Asterix 62/63 capability by XXXX.

b) Radar Display

Radar coverage is currently available in the XXX FIR.

c) Data Network

The XXXXX ACC has access to the REDDIG for oral communication with adjacent ACCs.

Radars will transmit data through the Ethernet and the domestic network, using the Asterix protocol.

The AMHS system has been/will be installed at domestic level and has been operating since/will operate starting in 20xx.

2) BBB

a) Automated System

The XXXXXX ACC uses an extension of the XXXX system, installed in XXX, which has the functionalities required for the provision of radar surveillance services throughout the XXX FIR, and for automated processing of flight plans, as described in the SICD.

The XXXX system has the automatic flight plan hand-off capability, using the messages of ICAO Doc 4444, and can process the OLDI and AIDC protocols. It is expected to have Asterix 62/63 capability by XXXX.

b) Radar Display

Radar coverage is currently available in the XXX FIR.

c) Data Network

The XXXXX ACC has access to the REDDIG for oral communication with adjacent ACCs.

Radars will transmit data through the Ethernet and the domestic network, using the Asterix protocol.

The AMHS system has been/will be installed at domestic level and has been operating since/will operate starting in 20xx.

2) Selection of the exchange scenario

Based on the interconnection levels that exist in the XXXX ACC and XXXX ACC facilities, AAA and BBB agree to adopt the following interconnection possibilities in the short and medium term:

1) Short term: Automatic exchange of surveillance data only;

2) Medium term: Automatic exchange of surveillance data and flight plan data.

The States agree to adopt flight plan transfer based on the ICAO OLDI/AIDC, as foreseen in Section 5 (Concepts for Automated ATC Systems Interconnection) of Annex 2 to this Appendix.

The States also agree to adopt the exchange of surveillance data based on the Asterix protocol, according to Section 5 (Concepts for Automated ATC Systems Interconnection) of Annex 2 to this Appendix.

3) Implementation Strategy

The interconnection will be carried out in (two) phases:

- Short term: Exchange of radar data using the Asterix protocol, around XXX; and
- Medium term: Automatic flight plan hand-off using the AIDC protocol, and exchange of radar data using the Asterix protocol, around XXXX.

The implementation strategy adopted by the 2 (two) States must take into account the following aspects:

1.1. Analysis of the impact on existing systems;

1.2. Definition of interfaces and means of communication;

1.3. Configuration of logical and physical connections;

1.4. Hardware and software adjustments; and

1.5. Interconnection tests

These aspects will be analysed by the technicians of the Interconnection Management Committee, as established in this Memorandum, and will be described in the corresponding document.

For the short-term phase, the following radars will be used:

- XXXX secondary radar, as described in paragraph 6.1.1.b of this document; and
- Secondary radars of XXXX.

The radar data contained in the transition area described in Appendix “A” to this document will be transmitted.

The States undertake to provide the necessary technical details for the transmission and reception of the radar signals in each automated system.

Communication between the States will be through the REDDIG.

The medium-term phase will be established by XXX, once the States have the operational capability of using AIDC for automatic hand-off of flight plans.

4) Implementation

The Interconnection Management Committee will carry out the implementation, based on the guidelines issued by common agreement by the States, defining implementation dates, the outsourcing of services, and the distribution of responsibilities, among other relevant matters.

5) Supervision of the Operation

Each State must supervise the operation of its systems, including the maintenance of its equipment and systems, ensuring the required availability, performance, safety, and efficiency.

All the problems of uncertain origin will be jointly analysed by the States through the Interconnection Management Committee, which will coordinate the actions required for their resolution.

However, each State must take all possible steps to implement the actions for which it is responsible, reporting their implementation to the Interconnection Management Committee.

In all cases, the Interconnection Management Committee must be informed at all times about anomalies, regardless of their origin.

6) Training

The participating States must draft training plans for the technical teams responsible for system maintenance, taking into account length, frequency, and technological evolution.

7) Maintenance

Teams must be prepared to face contingencies and be technically capable of analysing anomalies.

Each State must draft its Action Plan that defines the technical information required for the interconnection with adjacent ACCs, covering, at least, the following:

- the topology of the networks involved, with the technical details about the required bandwidth, availability, latency, and redundancy;
- the specification of the equipment used;
- the maintenance requirements;
- the maintenance procedures--preventive, predictive, and corrective---; and
- all of the related technical documents;

The States agree that the means of communication for the implementation of the interconnection will be the REDDIG.

17. Administrative Aspects

This Agreement is a dynamic document that can be revised at any moment, based on the technological evolution of the automated systems and of the communication networks of the participating States.

The Interconnection Management Committee created by the two (2) States will manage the interconnection, based the following:

1. Organisational Structure

In order to carry out its activities, the Committee will be organised as follows:

1.Coordinator

The names of the coordinators of the interconnection between the systems of AAA and BBB are shown in Annex A.

Coordinators will be responsible for the general coordination of all the activities of the technical and operational groups, as well as for the contacts with other organisations to address matters related to the interconnection.

2. Technical Group

Made up by technicians designated by the two States, with proven skills in their respective areas, especially in communication networks and computer automation systems.

It will be responsible for the implementation and/or coordination, in their respective countries, of the technical activities required for the implementation, maintenance, and support of automated systems, communication networks, and interconnection equipment.

3. Operational Group

Made up by personnel specialised in air traffic control, designated by the two States, with proven skills in their respective areas, especially in the automated systems used in the ACCs.

2. Faculties

The Committee is responsible for coordinating the planning, implementation, maintenance, and support of the operation of the systems and equipment involved in the interconnection of the automated systems.

It must guarantee the safety of the information exchanged between the automated systems involved in the interconnection.

Its faculties include the control and updating of all the technical and operational documentation.

It is also responsible for proposing the network topology to be used in the interconnection, which shall be approved by the two (2) States.

The implementation of the interconnection shall be coordinated and controlled by the Committee, based on action plans previously approved by the two (2) States.

The Committee must advise the States about the need for the technological evolution of the equipment and systems involved in the interconnection, taking into account, *inter alia*, the technical requirements contained in Annex 3 – SSS, to this Appendix.

Its teams must monitor the performance, stability, reliability, and integrity parameters of the equipment and systems involved in the interconnection, and propose and supervise the corrective action. To this end, it must use tools for analysing anomalies, such as radar protocol and communication line analysers.

The Committee shall establish the necessary procedures for correcting failures.

It shall also provide, together with the participating States, for the resolution of the problems encountered.

3. Management Process

In order to carry out its activities, the Interconnection Management Committee will apply the following system:

1. Periodical meetings and discussions to identify requirements and preferred technical solution(s), alternatives, and options for the interconnection of the automated systems;
2. The exchange of technical reports and documents, plans and programmes to ensure the successful and timely culmination of these efforts.
3. Joint planning, technical coordination, and development of activities between the two (2) States.

18. Financial Aspects

With respect to financial aspects, the States agree to the following:

1. Acquisition of equipment, components and systems

The equipment required for the interconnection will be acquired by each State, in keeping with the technical specifications approved by the Interconnection Management Committee;

2. Acquisition of spare parts

Spare parts for the equipment used in the interconnection will be acquired by each State, according to its specific needs, but in keeping with the maintenance guidelines issued by the Interconnection Management Committee.

3. Acquisition of services from third parties

Each State agrees to cover the expenditures involved in the hiring of third-party services, such as software adaptations, projects, and implementation of communication networks.

Each State will be responsible for its respective portion of any expenditure concerning upgrades to the REDDIG to support traffic growth, according to the guidelines of the REDDIG Administration.

19. Attachments

1. Preliminary System Interface Control Document for the Interconnection of ACC Centres of the CAR/SAM Regions – SICD;

2. CAR/SAM Automated ACC Interconnection Plan;

3. Preliminary Reference System/Subsystem Specification SSS for the Air Traffic Control Automation System.

ANNEX A

AUTOMATED SYSTEM INTERCONNECTION MANAGEMENT COMMITTEE

AAA

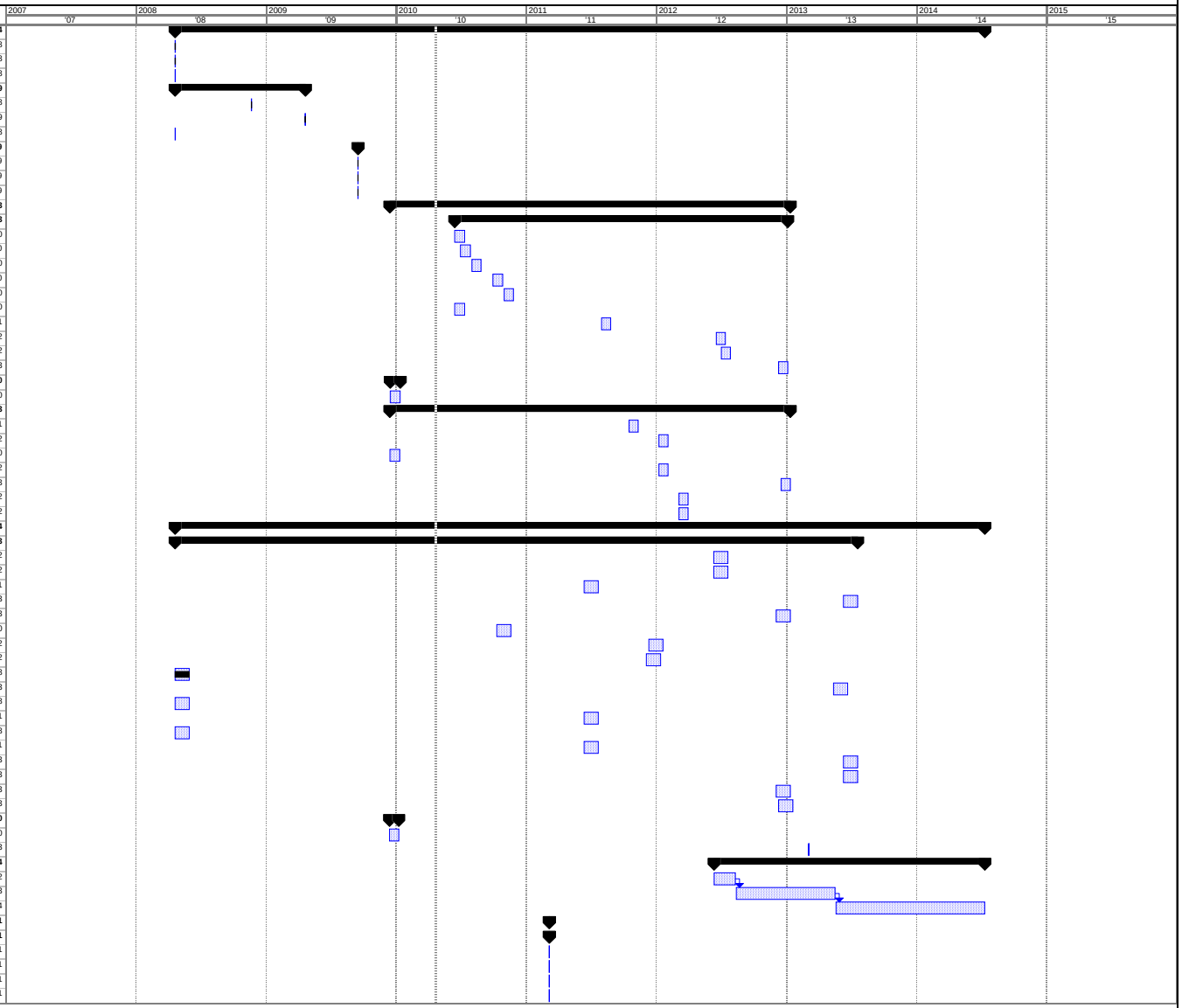
BBB

ANNEX B

RADAR DATA TRANSITION AREA BETWEEN THE XXX AND THE YYY ACCs

APPENDIX B / APENDICE B

ID	Nome da tarefa	Duration	Start	Finish
1	**Plan de Interconexión Región SAM**	**1625 days?**	**Mon 4/21/08**	**Fri 7/11/14**
2	Aprobación del Plan	1 day?	Mon 4/21/08	Mon 4/21/08
3	Creación de la Equipo de Gestión	1 day?	Mon 4/21/08	Mon 4/21/08
4	Ejecución	1 day?	Mon 4/21/08	Mon 4/21/08
5	**Reuniones de coordinación**	**262 days?**	**Mon 4/21/08**	**Tue 4/21/09**
6	SAM/IG/2	1 day?	Fri 11/21/08	Fri 11/21/08
7	SAM/IG/3	1 day?	Tue 4/21/09	Tue 4/21/09
8	SAM/IG/4	1 day?	Mon 4/21/08	Mon 4/21/08
9	**Establecimiento de MoU**	**1 day?**	**Wed 9/16/09**	**Wed 9/16/09**
10	Argentina - Uruguay	1 day?	Wed 9/16/09	Wed 9/16/09
11	Argentina - Brasil	1 day?	Wed 9/16/09	Wed 9/16/09
12	Brasil - Uruguay	1 day?	Wed 9/16/09	Wed 9/16/09
13	**Interconexión de Plan de Vuelo**	**804 days**	**Tue 12/15/09**	**Fri 1/11/13**
14	**OLDI**	**669 days**	**Tue 6/15/10**	**Fri 1/4/13**
15	EZEIZA-SANTIAGO	20 days	Tue 6/15/10	Mon 7/12/10
16	BOGOTA - GUAYAQUIL	20 days	Thu 7/1/10	Wed 7/28/10
17	BOGOTA - PANAMA	20 days	Mon 8/2/10	Fri 8/27/10
18	BOGOTA - BARRANQUILLA	20 days	Thu 9/30/10	Wed 10/27/10
19	BARRANQUILLA - PANAMA	20 days	Mon 11/1/10	Fri 11/26/10
20	SANTIAGO - CORDOBA	20 days	Tue 6/15/10	Mon 7/12/10
21	AMAZÓNICO-BOGOTÁ	20 days	Mon 8/1/11	Fri 8/26/11
22	LIMA - SANTIAGO	20 days	Mon 6/18/12	Fri 7/13/12
23	LIMA - GUAYAQUIL	20 days	Mon 7/2/12	Fri 7/27/12
24	LIMA - BOGOTA	20 days	Mon 12/10/12	Fri 1/4/13
25	**DOC 44444**	**20 days**	**Wed 12/16/09**	**Tue 1/12/10**
26	AMAZONICO - MAIQUETIA	20 days	Wed 12/16/09	Tue 1/12/10
27	**AIDC**	**804 days**	**Tue 12/15/09**	**Fri 1/11/13**
28	CURITIBA-EZEIZA	20 days	Mon 10/17/11	Fri 11/11/11
29	CURITIBA - MONTEVIDEO	20 days	Mon 1/9/12	Fri 2/3/12
30	EZEIZA-CORDOBA	20 days	Tue 12/15/09	Mon 1/11/10
31	EZEIZA - MONTEVIDEO	20 days	Mon 1/9/12	Fri 2/3/12
32	LIMA - AMAZONICO	20 days	Mon 12/17/12	Fri 1/11/13
33	ASUNCIÓN - CURITIBA	20 days	Mon 3/5/12	Fri 3/30/12
34	ASUNCIÓN - EZEIZA	20 days	Mon 3/5/12	Fri 3/30/12
35	**Intercambio de Datos Radar**	**1625 days?**	**Mon 4/21/08**	**Fri 7/11/14**
36	**Conexión Directa al Centro - ASTERIX**	**1370 days**	**Mon 4/21/08**	**Fri 7/19/13**
37	CORDOBA – SANTIAGO	30 days	Mon 6/11/12	Fri 7/20/12
38	MENDOZA – SANTIAGO	30 days	Mon 6/11/12	Fri 7/20/12
39	EZEIZA – PUERTO MONTT	30 days	Mon 6/13/11	Fri 7/22/11
40	PUNTA ARENAS – C. RIVADAVIA	30 days	Mon 6/10/13	Fri 7/19/13
41	AMAZONICO – BOGOTA	30 days	Mon 12/3/12	Fri 1/11/13
42	CURITIBA – MONTEVIDEO	30 days	Mon 10/11/10	Fri 11/19/10
43	BOGOTA – GUAYAQUIL	30 days	Mon 12/12/11	Fri 1/20/12
44	BOGOTA – PANAMA	30 days	Mon 12/5/11	Fri 1/13/12
45	BOGOTA – BARRANQUILLA	30 days	Mon 4/21/08	Fri 5/30/08
46	BOGOTA – LIMA	30 days	Mon 5/13/13	Fri 6/21/13
47	BOGOTA – MAIQUETÍA	30 days	Mon 4/21/08	Fri 5/30/08
48	BARRANQUILLA – PANAMA	30 days	Mon 6/13/11	Fri 7/22/11
49	BARRANQUILLA – MAIQUETÍA	30 days	Mon 4/21/08	Fri 5/30/08
50	LIMA – SANTIAGO	30 days	Mon 6/13/11	Fri 7/22/11
51	LIMA – GUAYAQUIL	30 days	Mon 6/10/13	Fri 7/19/13
52	LIMA – AMAZONICO	30 days	Mon 6/10/13	Fri 7/19/13
53	ASUNCIÓN – CURITIBA	30 days	Mon 12/3/12	Fri 1/11/13
54	ASUNCIÓN – EZEIZA	30 days	Mon 12/10/12	Fri 1/18/13
55	**ICD Propietário**	**20 days**	**Mon 12/14/09**	**Fri 1/8/10**
56	AMAZONICO - MAIQUETIA	20 days	Mon 12/14/09	Fri 1/8/10
57	Inter-Centro ASTERIX 62,63 (TBD)	1 day?	Mon 3/4/13	Mon 3/4/13
58	**RADNET (TBD)**	**544 days**	**Tue 6/12/12**	**Fri 7/11/14**
59	Especificación	44 days	Tue 6/12/12	Fri 8/10/12
60	Adquisición	200 days	Mon 8/13/12	Fri 5/17/13
61	Instalación	300 days	Mon 5/20/13	Fri 7/11/14
62	**OTRAS**	**1 day?**	**Mon 3/7/11**	**Mon 3/7/11**
63	**SISTRASAG (TBD)**	**1 day?**	**Mon 3/7/11**	**Mon 3/7/11**
64	LA PAZ	1 day?	Mon 3/7/11	Mon 3/7/11
65	GEORGETOWN	1 day?	Mon 3/7/11	Mon 3/7/11
66	PARAMARIBO	1 day?	Mon 3/7/11	Mon 3/7/11
67	ROCHAMBEAU	1 day?	Mon 3/7/11	Mon 3/7/11



Projeto: PLAN ACCIÓN INTERCONEX
Data: Tue 4/20/10

Tarefa | Divisão | Andamento | Etapa | Resumo | Resumo do projeto | Tarefas externas | Etapa externa | Prazo final

APPENDIX C

BASIC COURSE ON ASTERIX CAT 1/2, CAT 34/48 AND 62/63

(Lima, Peru, 5 to 9 July 2010)
(*Total duration 1 week – 30 hours*)

TENTATIVE PROGRAMME

1.1) Objective of the course (explain the significance of ASTERIX Cat 1/2, 34/48 and 62/63); and

1.2) Contents of the course:

a) Introduction to the ASTERIX protocol general format;
b) Description of the Cat 1 ASTERIX field and its features;
c) Description of the Cat 2 ASTERIX field and its features;
d) Description of the Cat 34 ASTERIX field and its features;
e) Description of the Cat 48 ASTERIX field and its features;
f) Description of the Cat 62 ASTERIX field and its features; and
g) Description of the Cat 63 ASTERIX field and its features.

BASIC COURSE ON AIDC AND OLDI

(Lima, Perú, 12 to 16 July 2010)
(*Total duration 1 week – 30 hours*)

TENTATIVE PROGRAMME

2.1) Objective of the course (explain the significance of OLDI/AIDC);

2.2) Contents of the course:

a) Introduction to the concepts of notification, coordination and transfer;
b) Description of AIDC messages
c) AIDC transition status
d) Examples of AIDC message sequences
e) Description of OLDI messages OLDI
f) OLDI transition status
g) Examples of OLDI message sequences
h) Case study: summary of the application and necessary communications means.

2.3) Automatin applications in the SAM Region

a) Presentation on uses in Brazil – SAGITARIO; and
b) Other applications in the SAM Region.

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