



Agenda Item 6: **Assessment of the operational requirements to determine the implementation of improvements in communication, navigation and surveillance (CNS) capabilities for en-route and terminal area operations**

Follow-up on the activities contemplated in the Programme on Ground-Ground and Ground-Air Communication Infrastructure

WORK PROGRAMME AND ACTIVITIES OF THE PROJECT ON SAM ATN GROUND-GROUND AND GROUND-AIR APPLICATIONS

(Presented by the Regional Project Coordinator)

Summary	
This working paper presents the work done by the Programme on Ground-Ground and Air-Ground Communication Infrastructure – Project D-2 SAM ATN Ground-Ground and Air-Ground Applications.	
References: <ul style="list-style-type: none">• CNS/ATM/SG/1 meeting (Lima, Peru, 15-19 March 2010);• CAR/SAM ATN architecture (Lima, Peru, 19-20 May 2010);• CNS/ATM/SG/2 meeting (Mexico City, Mexico, 16-20 November 2010); and• SAMIG/7 meeting (Lima, Peru, 23-27 May 2011).	
ICAO strategic objectives:	<i>A – Safety</i> <i>C – Environmental protection and sustainable development of air transport</i>

1. Background

1.1 The first meeting of the GREPECAS Communication, Navigation and Surveillance/Air Traffic Management Subgroup (CNS/ATM/SG/1), held in Lima, Peru, on 15-19 March 2010, adopted the project-based methodology for the implementation of CNS/ATM activities, in replacement of the methodology based on activities carried out by task forces. ICAO Offices would coordinate the projects.

1.2 Two projects were created within the framework of the ground-ground and air-ground telecommunication infrastructure:

1.2.1 D-1 CAR/SAM ATN architecture, and

1.2.2 D-2 ATN ground-ground and air-ground applications.

1.3 In this regard, the seventh meeting of the SAM Implementation Group (SAMIG/7), held in Lima, Peru, on 23-27 May 2011, reviewed the activities of the project on *Ground-ground and ground-air applications*, and agreed that the coordinator of said project for the SAM Region would be Mr. Omar Gouarnalusse of Argentina.

1.4 In this respect, this working paper presents the work carried out by the regional coordinator.

2. Discussion

2.1 *Project description:* the description of the project on SAM ATN ground-ground and air-ground applications appears in **Appendix A** to this working paper.

2.2 *Work programme:* the work programme on SAM ATN ground-ground and air-ground applications appears in **Appendix B** to this working paper, in summarised and detailed versions.


2.3 *Temporary activities of the Project:* Although any of the known programmes (Microsoft Project, Gantt Project) could be used, some dates should be defined, at least with certain level of reasonable approximation. In the opinion of the author, taking into account the tentative dates that repeatedly failed to be met (AMHS interconnection), it is venturesome for the coordinator to be the one to define such dates at his/her own discretion, the proposal being that they be discussed in the corresponding setting, that is, the CNS *ad-hoc* Group. For discussion purposes, the Gantt Project file entitled “SAM ATN ground-ground and air-ground applications” is attached separately.

3. Suggested action

3.1 The Meeting is invited to:

- a) take note of the information presented herein;
- b) analyse the elements contained in the Project Description shown in Appendix A;
- c) review the activities of the Work Programme shown in Appendix B, and fill in tentative dates in the attached diagram.
- d) recommend any action it may deem appropriate.

APPENDIX A

	PROJECT DESCRIPTION (DP)		DP N°
			Date: 10/10/2011
Programme on Ground-Ground and Air-Ground Communication Infrastructure		Project Title SAM ATN ground-ground and air-ground applications	Page: 1/3
			Start: 10/10/2011 End:

Objective

Implement ATN ground-ground and air-ground applications in the SAM Region.

Scope

Implementation of the SAM ATN ground-ground and air-ground applications, including, at least:

- Operational integration of international AMHS connections in the SAM Region
- Operational integration of international AIDC connections in the SAM Region
- Study for the implementation of the CPDLC service using VDL in the SAM Region

Strategy

All work will be performed by experts designated by CAR/SAM States and organisations that are members of the project on *CAR/SAM ATN Architecture*, under the direction of the Project Coordinator. Communications among project participants, as well as between the project coordinator and the programme coordinator, will be through teleconferences and the Internet.

Once the studies have been completed, the results will be sent to the ICAO Programme Coordinator in the way of a final consolidated document for analysis, review and approval.

Justification of the Project

The First Meeting of the GREPECAS Communication, Navigation and Surveillance/Air Traffic Management (CNS/ATM/SG/1), held in Lima, Peru, on 15-19 March 2010, approved the project-based methodology for the implementation of CNS/ATM activities, in replacement of the methodology based on activities carried out by the task forces.

ICAO will coordinate the projects. Regarding the ground-ground and ground-air infrastructure programme, two project have been created: CAR/SAM ATN Architecture, and ATN ground-ground and ground-air applications.

The seventh meeting of the SAM Implementation Group (SAMIG/7) reviewed the activities of the project on Ground-ground and ground-air applications, and considered the designation of a coordinator for the SAM Region.

Likewise, a close relationship with other programmes and their respective projects is required in order to define the operational requirements of the cited applications and their respective tentative implementation dates.

Project Coordinator: Omar Gouarnalusse

Inter-related Projects

The following projects were defined at the first meeting of the Communication, Navigation and Surveillance/Air Traffic Management Subgroup (CNS/ATM/SG/1) in relation to the project subject matter of this project document:

- Air navigation systems in support of PBN
- Automation (system interconnection)
- ATFM
- Improvement of ATM situational awareness
- Implementation of the new ICAO flight plan format

Project Deliverables

- Project description document (DP)
- AMHS and AIDC operational integration throughout the SAM Region
- Study for the implementation of CPDLC in the SAM Region (using CDL)

Resources required

Team of experts: to be designated.

Main stakeholders

CAR/SAM States, territories, international organisations.

Assumptions

- Project team focused on the deliverables
- Easy access to the information and documentation requested by ICAO
- Ease of communication amongst the States
- Availability of technical resources for tests

Restrictions

- Meet ICAO standards
- Difficult harmonisation amongst States
- Delivery of the document on the CDPLC implementation study: to be determined

Project risks

- Team of experts not available for providing the service
- Communication problems between team members
- Planning of new actions for the proposals not accepted by ICAO
- Difficulties faced by States for obtaining testing equipment
- Delay in the delivery of project results

PROGRESS MADE IN THE ACTIVITIES OF THE PROJECT ON THE IMPLEMENTATION OF GROUND-GROUND AND AIR-GROUND APPLICATIONS IN THE SAM ATN

Almost all the current services emerging from the requirements of the Caribbean and South American Air Navigation Plan and that are transmitted through REDDIG are working, as described in the following table:

- CNS1A (AFTN Plan)
- CNS1C (ATS direct speech circuit plan).
- CNS2A (Aeronautical mobile service plan)

Likewise, there are some future services for the short, medium and long term that shall be implemented on the ATN, namely:

Ground-ground applications through REDDIG (applications corresponding to other projects, that is, exchange of radar signals and ATFM, are not considered):

- AMHS interconnection requirements, gradually replacing the AFTN service
- AIDC interconnection requirements, gradually replacing the ATS speech service

Air-ground applications transmitted through domestic ATNs (surveillance applications corresponding to other projects are not considered):

- Requirements for DPDL implementation using VDL, gradually replacing the AMS service

Status of implementation of project activities (ground-ground)

- Guidelines for improving communication, navigation and surveillance systems to meet short- and medium-term operational requirements for en-route and terminal area operations (2008)
- National action plans for improving communication, navigation and surveillance systems to meet short- and medium-term operational requirements for en-route and terminal area operations (2008 and 2009)
- Guidelines for the operational interconnection of AMHS systems in the CAR/SAM Regions (2009)
- ATN IP addressing plan
- AMHS Memorandums of Understanding (AMHS MoU) between the following pairs of States (signed or about to be signed):
 - Argentina – Brazil
 - Argentina – Paraguay
 - Argentina – Peru
 - Argentina – Chile
 - Brazil – Venezuela
 - Brazil – Peru
 - Brazil - Colombia
 - Brazil – Paraguay
 - Brazil – Guyana
 - Brazil – Suriname
 - Peru – Colombia
 - Peru – Chile
 - Guyana – Suriname

- AMHS tests between States (under way)
 - Argentina – Brazil (*completed*)
 - Argentina – Paraguay
 - Argentina – Peru
 - Brazil – Peru
 - Peru – Colombia (*completed*)
 - Guyana – Suriname (*completed*)
- Operational integration between
 - Peru – Colombia (*completed*)
 - Guyana – Suriname (*completed*)

Progress in project activities (air-ground)

Practically, no activities have been carried out in this regard.

APPENDIX B (SYNTHESIS)

PROGRAMME: GROUND-GROUND AND GROUND-AIR COMMUNICATION INFRASTRUCTURE
PROJECT: SAM ATN GROUND-GROUND AND AIR-GROUND APPLICATIONS
COORDINATOR: Omar Gouarnalusse

No.	Main Task	No.	Secondary Task	No.	Tertiary Task	Start / End	Responsible Party	Status	Deliverables
D.2.1	Project management processes	D.2.1.1	Formalisation	D.2.1.1.1	Description	May 2011/ October 2011	Project D2	Valid	Project document
D.2.2	Project development	D.2.2.1	Analysis of current and future infrastructure and applications	D.2.2.1.1	Analyse current and future ground-ground infrastructure and applications	2009/ Dec 2012	ICAO - Project D2	Valid	Action plan for CNS improvements updated
				D.2.2.1.2	Ground-ground applications implementation plan	---/2014	ICAO - Project D2 - States	Valid	AMHS implementation plan AIDC implementation plan
				D.2.2.1.3	Analyse current and future air-ground infrastructure and applications	2009/ Dec 2012	ICAO - Project D2	Valid	Action plan for CNS improvements updated
				D.2.2.1.4	Air-ground applications implementation plan	2011/2014	ICAO - Project D2 - States	Valid	Study on CPDLC (VDL) implementation Ground-air applications implementation plan VDL trials
D.2.3	Closing of the Project					2014	Project D2	Valid	

APPENDIX B (DETAIL)

PROGRAMME: GROUND-GROUND AND GROUND-AIR COMMUNICATION INFRASTRUCTURE
PROJECT: SAM ATN GROUND-GROUND AND AIR-GROUND APPLICATIONS
COORDINATOR: Omar Gouarnalusse

TASK 1	TASK 2	TASK 3	TASK 4	TASK 5	TASK 6	TASK 7
2.1	Project management processes	Formalisation of the Project	Project description			
2.1.1						
2.1.1.1						
2.1.1.1.1				Election of the Project Coordinator		
2.1.1.1.2				Election of the Project team		
2.1.1.1.3				Analysis of ICAO strategic planning		
2.1.1.1.4				Drafting of Project document		
2.1.1.1.4.1					Project scope	
2.1.1.1.4.2					Project background	
2.1.1.1.4.3					Definition and analysis of assumptions	
2.1.1.1.4.4					Definition and analysis of restrictions	
2.1.1.1.4.5					Definition and analysis of risk	
2.1.1.1.4.6					Definition and analysis of resources required	
2.1.1.1.4.7					Identification and analysis of related projects	
2.1.1.1.5				Define Project scope		
2.1.1.1.6				Define Project frameworks		
2.1.1.1.7				Delivery and approval of the document		

TASK 1	TASK 2	TASK 3	TASK 4	TASK 5	TASK 6	TASK 7	
2.2	Project development	Analysis of current and future infrastructure and applications					
2.2.1							
2.2.1.1			Analyse current and future ground-ground infrastructure and applications				
2.2.1.1.1				CNS deficiencies in the SAM Region			
2.2.1.1.2				Drafting of CNS improvement guide	CNS improvement guide (Completed). Must be kept updated.		
2.2.1.1.2.1					National action plans. Must be kept updated		
2.2.1.1.2.2							
2.2.1.2.			Ground-ground applications implementation plan				
2.2.1.2.1				ATN addressing for ground-ground applications	ATN addressing plan for ground-ground applications (Completed)		
2.2.1.2.1.1							
2.2.1.2.2				AMHS interconnection action plan			
2.2.1.2.2.1					Interconnection guide (Completed)		
2.2.1.2.2.2					Memorandums of Understanding (Completed)		
2.2.1.2.2.3					Tests between States		
2.2.1.2.2.3.1						Argentina - Brazil (Completed)	
2.2.1.2.2.3.2						Argentina - Paraguay	
2.2.1.2.2.3.3						Argentina - Peru	
2.2.1.2.2.3.4						Argentina - Chile	
2.2.1.2.2.3.5						Brazil - Paraguay	
2.2.1.2.2.3.6						Brazil - Peru	

TASK 1	TASK 2	TASK 3	TASK 4	TASK 5	TASK 6	TASK 7			
2.2.1.2.2.3.7	Project development	Analysis of current and future infrastructure and applications	Ground-ground applications implementation plan	AMHS interconnection action plan	Tests between States	Brazil - Colombia			
2.2.1.2.2.3.8						Brazil - Venezuela			
2.2.1.2.2.3.9						Brazil - Guyana			
2.2.1.2.2.3.10						Brazil - Suriname			
2.2.1.2.2.3.11						Peru - Colombia (Completed)			
2.2.1.2.2.3.12						Peru - Chile			
2.2.1.2.2.3.13						Guyana - Suriname (Completed)			
2.2.1.2.2.3.14						Others			
2.2.1.2.2.4					Test analysis				
2.2.1.2.2.5					Recommendations for integration				
2.2.1.2.2.6	Project development	Analysis of current and future infrastructure and applications	Ground-ground applications implementation plan	AMHS interconnection action plan	Operational integration				
2.2.1.2.2.6.1						Argentina - Brazil			
2.2.1.2.2.6.2						Argentina - Paraguay			
2.2.1.2.2.6.3						Argentina - Peru			
2.2.1.2.2.6.4						Argentina - Chile			
2.2.1.2.2.6.5						Brazil - Paraguay			
2.2.1.2.2.6.6						Brazil - Peru			
2.2.1.2.2.6.7						Brazil - Colombia			
2.2.1.2.2.6.8						Brazil - Venezuela			

TASK 1	TASK 2	TASK 3	TASK 4	TASK 5	TASK 6	TASK 7
2.2.1.2.2.6.9						Brazil - Guyana
2.2.1.2.2.6.10						Brazil - Suriname
2.2.1.2.2.6.11						Peru - Colombia (Completed)
2.2.1.2.2.6.12						Peru - Chile
2.2.1.2.2.6.13						Guyana - Suriname (Completed)
2.2.1.2.2.6.14						Others
2.2.1.2.2.7					Updating of Table CNS 1Bb	
2.2.1.2.3	Project Development	Analysis of current and future infrastructure and applications	Ground-ground applications implementation plan	AIDC interconnection action plan		
2.2.12.3.1					Interface control document - ICD	
2.2.1.2.3.2					Memorandums of Understanding (Completed)	
2.2.1.2.3.3					Tests between States	
2.2.1.2.3.4					Test analysis	
2.2.1.2.3.5					Recommendations for integration	
2.2.1.2.3.6					Operational integrations	
2.2.1.3						
2.2.1.3.1			CNS deficiencies in the SAM Region			
2.2.1.3.2			Analysis of current and future air- ground infrastructure and applications	Drafting of CNS improvement guide		
2.2.1.3.2.1					CNS improvement guide (Completed)	
2.2.1.3.2.2					National action plans (Completed)	

TASK 1	TASK 2	TASK 3	TASK 4	TASK 5	TASK 6	TASK 7
2.2.1.4			Air-ground applications implementation plan			
2.2.1.4.1				ATN addressing for air-ground applications		
2.2.1.4.1.1					ATN addressing plan for air-ground applications	
2.2.1.4.2				Strategy for the implementation of ground-air communication systems in the SAM Region		
2.2.1.4.2.1					Document on the Strategy for the implementation of ground-air communication systems in the SAM Region	
2.2.1.4.3	Project development	Analysis of current and future infrastructure and applications	Air-ground applications implementation plan	VDL action plan		
2.2.1.4.3.1					Survey of the fleet flying in the SAM Region	
2.2.1.4.3.2					Survey of the routes used by this fleet	
2.2.1.4.3.3					National VDL trials	
2.2.1.4.3.3.1						Argentina
2.2.1.4.3.3.2						Brazil
2.2.1.4.3.3.3						Colombia
2.2.1.4.3.3.4						Chile
2.2.1.4.3.3.5						Peru
2.2.1.4.3.3.6						Uruguay
2.2.1.4.3.3.7						Paraguay
2.2.1.4.3.3.8						Bolivia
2.2.1.4.3.3.9						Ecuador
2.2.1.4.3.3.10						Venezuela

TASK 1	TASK 2	TASK 3	TASK 4	TASK 5	TASK 6	TASK 7
2.2.1.4.3.3.11						Guyana
2.2.1.4.3.3.12						Suriname
2.2.1.4.3.3.13						Cayenne
2.2.1.4.3.3.14						Panama
2.2.1.4.4	Project development	Analysis of current and future infrastructure and applications	Air-ground applications implementation plan	CDPLC implementation action plan		
2.2.1.4.4.1					Implementation guide	
2.2.1.4.4.2					Definition of routes to be implemented	
2.2.1.4.4.3					National implementations	
2.3	Closing of the Project					