



ICAO

**Twenty-Second Meeting of the AFI Planning and Implementation Regional Group
(APIRG/22)
(Accra, Ghana, 29 July – 2 August 2019)**

Agenda Item 4: Other Air Navigation Issues

4.5: Regional and Interregional Activities

CNS Systems Interoperability in the AFI Region

(Presented by ASECNA.)

SUMMARY	
<p>To facilitate seamless operations within the AFI region, ASECNA in the framework of MoU with Organizations/ANSPs has developed several programs.</p> <p>This paper presents the progress made to improve interconnection and interoperability of CNS systems in the region and makes proposals for development of procedures for common systems implementation, validation and performance monitoring.</p> <p>Action by the Meeting is presented in § 3.</p>	
<i>Strategic Objectives</i>	<p>This Working Paper is related to Strategic Objectives:</p> <p><i>A: Safety – Enhance global civil aviation safety.</i></p> <p><i>E: Efficiency: Enhance the efficiency of aviation operations.</i></p> <p><i>D: Continuity: Maintain the Continuity of aviation operation.</i></p>

1 INTRODUCTION

1.1 Interoperability and interconnectivity between CNS systems in the AFI Region is necessary to perform seamless operations.

1.2 For efficient operations, cooperation between ANSPs is needed to improve air navigation services such as VHF/ADS-B coverage in FIR boundaries, Surveillance data sharing between ACCs and AMHS/AIDC circuits Implementation.

1.3 AFI Aeronautical networks interconnection is a key enabler for CNS systems Interconnection between ANSPs.

1.4 This working paper presents the progress made by ASECNA to ensure Interconnection and Interoperability of CNS systems within the AFI region and makes proposals for development of procedures for common systems implementation, validation and performance monitoring.

2. DISCUSSION

2.1 Networks interconnection

2.1.1 The provision of air navigation services relies on the various regional VSAT networks interconnected and interoperable.

2.1.2 According to APIRG/16 Conclusion 16/16, ASECNA in coordination with ATNS successfully implemented interconnection of SADC-2, NAFISAT and AFISNET networks in 2010.

2.1.3 In 2015, according to SAT/18 CNMC3 Conclusion 3/6, ASECNA, in coordination with French Civil Aviation Authority (DGCA), Trinidad and Tobago Civil Aviation Authority (TTCAA) and Brazil performed AFISNET extension which improved significantly Aeronautical Fixe Services between Atlántico, Sal, Dakar, Cayenne, Santa Maria and Piarco FIRs. The Table in Appendix A summarizes the services supported in these links.

2.1.4 In order to comply with the current and future aeronautical telecommunications services, as well as the evolution of the satellite technology, each network is developing an upgrade program of its network based on the migration towards IP-based digital communication network. This migration rises the issue of the safety and security of the critical information flowing in and between the networks. States and ANSP have to address the threats related to IP technology and take measures to contend them to ensure a safe operation of the aeronautical VSAT networks.

2.2 VHF/ADS-B coverage

2.2.1 The extension of VHF/ADS-B coverage over the boundaries of neighboring FIRs offers the opportunity to share remote equipment for the benefit of ATC.

2.2.2 Cooperation between ASECNA and DGAC has allowed to extend VHF coverage of Antananarivo FIR in Saint Denis within the facilities of the DGCA in the Colorado site of La Réunion. The station is fully operational since June 2019. Radio Coverage extension in this air space is presented in Appendix B.

2.2.3 Discussion are also ongoing with ENAIRE to share radio coverage in the north of Dakar FIR by installing common stations in Nouadhibou and Las Palmas.

2.2.4 Sharing of common facilities to extend radio coverage can allow to achieve better services and reduce investment and operation cost. However, ANSP need to assess the risk, mainly regarding harmful interferences.

2.3 AIDC

2.3.1 AIDC provides automated coordination and significantly reduces the workload of Air Traffic Controller while impacting positively on safety, including reducing:

- need for oral coordination between ATS units;
- controller workload;
- repetition/read back errors during coordination.

2.3.2 Since 2017, ASECNA started interoperability tests to establish AIDC connexions with neighboring centers. AIDC connexion was successfully established between Abidjan and Accra in March 2019 and tests are planned with Atlántico by the end of 2019.

2.4 Interconnection and Interoperability challenges

2.4.1 The CNS/ATM environment is an integrated system including physical systems (hardware, software and communication network), human elements (pilots, controller and engineers), operational and technical training, airspace design and the operational procedure for its implementation. Therefore, states and ANSP needs to harmonize their framework for new common systems implementation and performance monitoring according to the related SARPs.

2.4.2 To validate these systems and fulfill all safety requirements, performance requirements need to be specified on a common basis. These specified performance requirements need to be mutually agreed between the stakeholders.

2.4.3 Procedures should be developed to ensure system performance by validation, reporting and tracking of possible problems revealed during system monitoring with appropriate follow up actions.

3 ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) Take note of the information provided in the working paper;
- b) Encourage cooperation between States/ANSPs to improve radio coverage by sharing common interest stations;
- c) Consider the necessity for states and ANSP to have an harmonized framework for common systems implementation;
- d) Take recommendations to develop guidance materials for system implementations in the specific APIRG project teams.

Appendix A

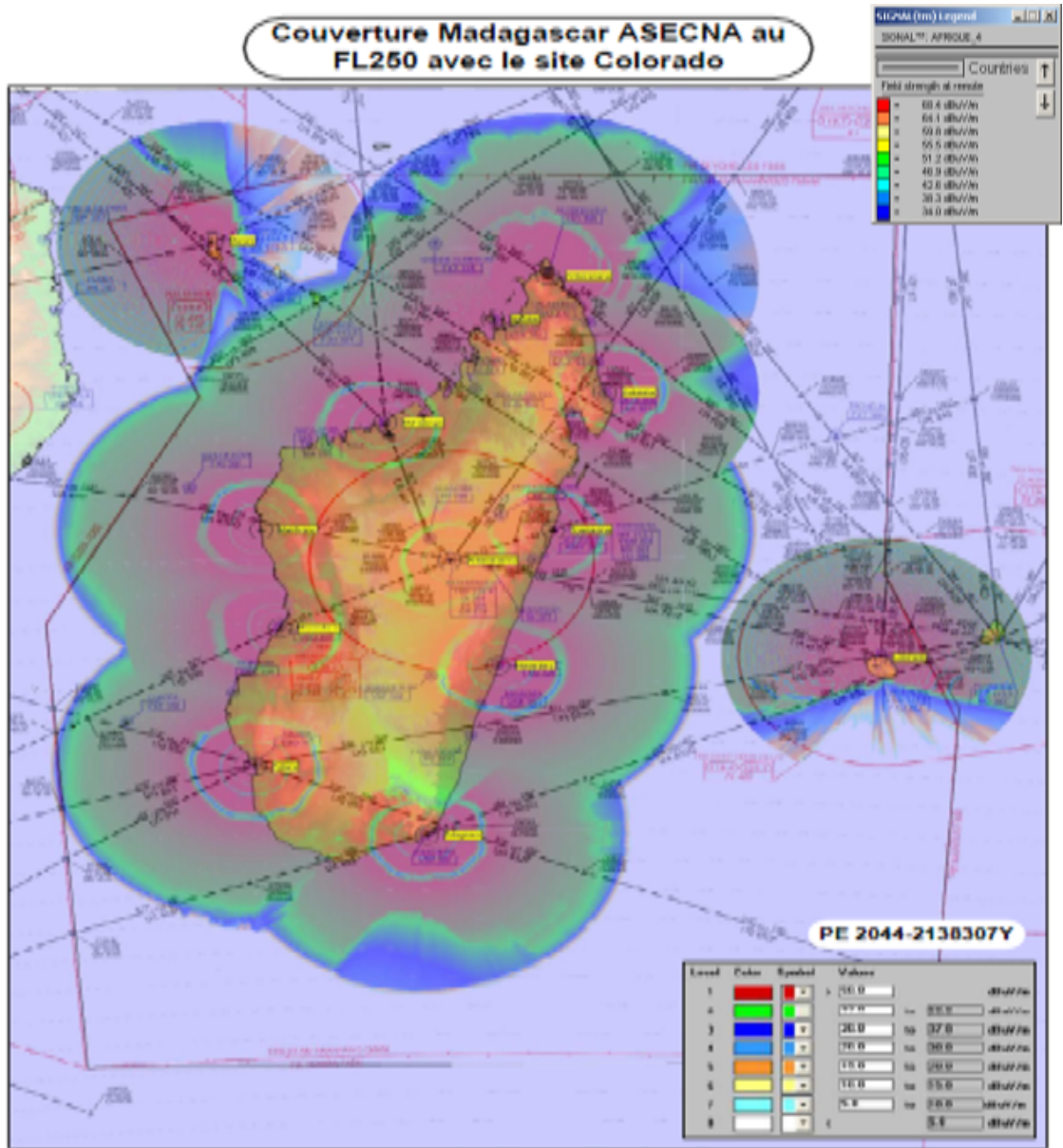
AFISNET – NAFISAT – SADC - CAFSAT Interconnection

Node I	Node II	Active Services	Observations
Dakar	Cayenne	ATS/DS	AIDC Planned
	Piarco		
Dakar	Recife	ATS/DS AFTN	AIDC Planned AMHS Planned
Abidjan		ATS/DS	AIDC Planned
Cayenne			
Piarco			
Ndjamena			Tripoli
	Khartoum	AIDC Planned	
	Alger	AFTN	AMHS Planned
Niamey	Tripoli	ATS/DS AFTN	
	Addis Ababa		AIDC Planned
	Alger		AMHS Planned
Brazzaville	Khartoum	ATS/DS	
	Nairobi	AFTN	
	Luanda	ATS/DS AFTN	AIDC and AMHS Planned
	Kinshasa	ATS/DS and AIDC AFTN	AMHS Planned
	Johannesburg	ATS/DS AFTN	AIDC and AMHS Planned
Antananarivo	Johannesburg	ATS/DS AFTN	AIDC and AMHS Planned
	Baera	ATS/DS	
	Dar es Salam	ATS/DS	
	Plaisance	ATS/DS	
	Maya	ATS/DS	
Nouakchott	Las Palmas	ATS/DS	AIDC Planned
Nouadhibou	Las Palmas	ATS/DS	AIDC Planned
Dakar	Casablanca	ATS/DS AFTN	
	Sal	ATS/DS	

		AFTN	
	Las Palmas	ATS/DS AFTN	
	Johannesburg	AFTN	AMHS Planned
	Alger	AFTN	AMHS Planned
Abidjan	Luanda	ATS/DS AFTN	AIDC and AMHS Planned

Appendix B

VHF Coverage in the Upper Airspace of Antananarivo FIR with Colorado station in La Réunion



FIN.