Agenda Item 2: Communications, navigation and surveillance (CNS)

2.3 **Interoperability between aeronautical VSAT networks and potential use of digital VSAT networks to support ATM applications**

(Presented by the Secretariat)

SUMMARY

This working paper presents a proposal for the implementation of ATS speech circuits' trials between the CAR/SAM Regions and the AFI Region through the REDDIG and CAFSAT networks.

References:

- MEVA II / REDDIG coordination meetings reports; and
- CAR/SAM Air Navigation Plan, Part II – FASID, Table CNS 1C.

ICAO Strategic Objectives:	*A – Safety; and* *C–Environmental protection and sustainable development of air transport*

1. Introduction

1.1 In the SAM Region, all the intraregional AFS services (AFTN and ATS voice) specified in the CAR/SAM Air Navigation Plan (Doc 8733) are supported by the REDDIG network. The REDDIG network since its initial operation in September 2003 counts with a 99.98% availability.

1.2 The rate of the above indicated availability is mainly due to the redundancy of the equipment composing the REDDIG network, the availability of spare parts and the preventive and corrective maintenance tasks co-ordinately carried out between the REDDIG Administrator and the technical personnel assigned by the REDDIG member States for the maintenance of the REDDIG nodes.

1.3 The user services are connected to the REDDIG network through a Frame Relay Access Device. The FRAD provides voice and data switching functions allowing both permanent and switched operations. The FRAD defines a unique multiprotocol packet encapsulated in a permanent virtual circuit route for every possible destination.

The bearer WAN network is provided by satellite terminal equipment which implements the Muti Frequency Time Division Multiple Access (MF-TDMA) protocol. The satellite used is the INTELSAT IS 14.

1.4 In March 2010, the REDDIG VSAT network was interconnected to the MEVA II VSAT network. The MEVA II network has the same technical characteristics of REDDIG and uses the same satellite. The interconnection consisted in the installation of a REDDIG satellite MODEM in a MEVA II node (Tegucigalpa, Honduras) and the installation of a MEVA II MODEM in two REDDIG nodes (Caracas, Venezuela and Bogotá, Colombia). All the AFS services requirements specified in the CAR/SAM ANP between the SAM and CAR Regions were implemented through the MEVA II / REDDIG interconnection.

2. **Analysis**

2.1 Some ATS voice circuits implemented through the MEVA II / REDDIG interconnection use double hoop satellite circuits, as the circuits between San Andres APP (Colombia)-Panama ACC, Cali ACC (Colombia)-Panamá ACC, and Medellin ACC (Colombia)-Panamá ACC. The quality of the communications is acceptable for the controller and operations are normal. The double hoop is formed by one hoop through an SCPC Colombian VSAT network (Medellin-Bogota, San Andres–Bogota, Cali-Bogota) and the other hoop through the MEVA II / REDDIG interconnection that uses an MF TDMA satellite access (Bogota-Panama).

2.2 According to CAR/SAM ANP FASID Table CNS 1C - *ATS direct speech circuits plan*, the following ATS speech circuits are required between the CAR/SAM and AFI Regions:

a) Atlantico ACC-Dakar ACC;
b) Atlantico ACC–Johannesburg ACC;
c) Ezeiza ACC-Johannesburg ACC;
d) Montevideo ACC-Johannesburg ACC;
e) Piarco ACC–Santa Maria ACC; and
f) Rochambeau ACC –Dakar ACC.

2.3 The Atlántico ACC-Dakar ACC, Atlántico ACC-Johannesburg ACC and Ezeiza ACC-Johannesburg ACC circuits are implemented through the CAFSAT network, the rest of the above described circuits are implemented using the international direct dialling (IDD) telephone calls.

2.4 The ATS speech circuits that nowadays use IDD would be implemented through the REDDIG and CAFSAT VSAT networks. Considering that the implementation of the ATS speech circuits using the REDDIG and CAFSAT network represents a double hoop satellite link, trials would be carried out in order to verify the quality of the ATS speech circuits.

2.5 In this respect, the Meeting could analyze the implementation of the above mentioned trials and approve the action plan for the trials presented in the **Appendix** to this working paper.

3. **Action required**

3.1 The Meeting is invited to:

a) take note of the information contained in this working paper;
b) analyze the possibility of carrying out ATS speech circuits trials using a double hoop satellite link through the REDDIG and CAFSAT networks, through the action plan present in the Appendix to this working paper ; and
c) analyze any other aspect related with this matter that the Meeting might consider necessary.

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APPENDIX

ACTION PLAN FOR THE IMPLMEMENTATION OF TRIALS FOR ATS SPEECH CIRCUITS THROUGH THE REDDIG CAFSAT NETWORK

ACTIVITY	RESPONSIBLE	IMPLEMENTATION DATE	REMARKS
Nomination of focal point to coordinate the implementation of local circuit connection to the respective VSAT node in the REDDIG and CAFSAT network	Argentina, Brazil, French Guyana (France), Santa Maria, Senegal, South Africa, Trinidad & Tobago and Uruguay	20 May 2011	
Implementation of the local circuit connection to the respective REDDIG VSAT node	French Guyana (France), Trinidad & Tobago and Uruguay	30 June 2011	
Implementation of the local circuit connection to the respective CAFSAT VSAT node	Santa Maria, Senegal and South Africa	30 June 2011	
Verification of availability of interface in the REDDIG nodes in order to implement the ATS speech circuits	REDDIG Administrator	20 May 2011	
Verification of availability of interface in the CAFSAT nodes in order to implement the ATS speech circuits	CAFSAT Administration	20 May 2011	
Program the following PVC in the REDDIG network: • Piarco –Recife • Rochambeau- Recife • Montevideo – Ezeiza	REDDIG Administrator	30 June 2011	
Program the following PVC in the CAFSAT network: • Recife Santa Maria • Recife Dakar • Ezeiza Johannesburg	CAFSAT Administrator	30 June 2011	
Implementation of the local connection in Recife from the REDDIG node to CAFSAT node	Brazil	15 July 2011	
Implementation of the local connection in Ezeiza from the REDDIG node to CAFSAT node	Argentina	15 July 2011	

ACTIVITY	RESPONSIBLE	IMPLEMENTATION DATE	REMARKS
Implementation of operational trials in the following circuits through the REDDIG CAFSAT interconnection**:** • Montevideo ACC-Johannesburg ACC • Piarco ACC –Santa Maria ACC • Rochambeau ACC –Dakar ACC	French Guyana (France), Santa Maria, Senegal , South Africa, Trinidad Tobago and Uruguay REDDIG Administrator and CAFSAT Administrator	29 July 2011	

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