



Agenda Item 1: Current situation of the MEVA II / REDDIG networks

MEVA II VSAT NETWORK

(Presented by the Secretariat)

SUMMARY	
This working paper presents the evolution of the MEVA II VSAT Network, its architecture, membership, its characteristics and its plans for improving and optimizing its performance and management.	
References: • MEVA TMG/19 Meeting Report • MR/6 Meeting Report • GREPECAS/15 Meeting Report • ALLPIRG/5 Meeting Conclusions	
Strategic Objectives	<i>This working paper is related to Strategic Objectives A and D.</i>

1. Introduction

1.1 The MEVA Network resulted from the regional collaboration and common effort by States/Territories on advancing Air Navigation services and in planning means and improvements based on performance objectives to satisfy future regional requirements.

1.2 In 1996, several Central Caribbean States and Territories agreed to use new technology to increase the level of safety and regularity of operations among the Caribbean Region with the implementation of a common Regional Telecommunication Network to improve reliability of the Aeronautical Fixed Services (AFS) Telecommunications Service Network. For which a regional VSAT Telecommunication Network was approved and implemented in 1996, providing AFS voice and data communications between the fifteen VSAT nodes in the area of the Central Caribbean and neighboring zones. This Network was named MEVA, standing for its name in Spanish: “Mejoras al Enlace de Voz del ATS” (Improvements to ATS Voice Link).

1.3 A brief description of the MEVA Network is presented in **Appendix A** to this paper.

2. Transition to MEVA II and its projection for the ATN

2.1 In 2000, the MEVA TMG recognized that, although MEVA performed its intended mission adequately, the system was not technically responsive to support ICAO's new and evolving digital communications requirements in the region in an operationally efficient and cost effective manner over the next decade. Because of the growth of the satellite communications industry, the quantities and types of voice and data circuits used by each MEVA end-user resulted in monthly recurring charges that were no longer cost competitive with other types of satellite services now in worldwide use. Newer technologies, such as the Internet Protocol and improved Frame Relay capabilities opened the door for improved services at a better value.

2.2 Considering Global Plan Initiative GPI-22 – *Communication Infrastructure*, ICAO SARPs, and guidance on the need to meet the AFS communications requirements and support CNS/ATM systems with the introduction of the aeronautical telecommunications network (ATN), the States, Territories and International Organization Members of MEVA, recognized the necessity to update the MEVA Network, to facilitate the adoption of services, systems and protocols with common equipment interface based on the Open System Interconnection reference Model (OSI) of the International Organization for Standardization (ISO), and the benefits of the interconnection/interoperability of the MEVA Network with other regional and sub regional digital networks. This initiative was denominated "MEVA II Network Project."

2.3 The MEVA II Network Project was handled by the MEVA TMG assisted by ICAO. The major activities included the studies of the updates needed in the MEVA Network (a three year business case activity), formulation of the Request for Information document (RFI) on 2003 and the request for technical and cost proposals (RFP).

2.4 By December 2004, the Service Provider for the MEVA II Network Project was approved by the Civil Aviation Directors members of MEVA, as well as its corresponding Agreement Document. In 2005, MEVA TMG finalized the technical document that describes the network, and the transition plan towards MEVA II. Based on those documents and conformity with their respective national laws, the MEVA members arranged their contracts with the selected Service Provider. The implementation of the MEVA II nodes was completed in November 2006. The MEVA II members are: Aruba, Bahamas (Nassau and Freeport), Cayman Islands, Cuba, Dominican Republic, Haiti, Jamaica, Netherlands Antilles (Curaçao and St. Maarten), Panama, United States (Miami, Puerto Rico) and the Central American Air Navigation Corporation (COCESNA), whose member States are: Belize, Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua.

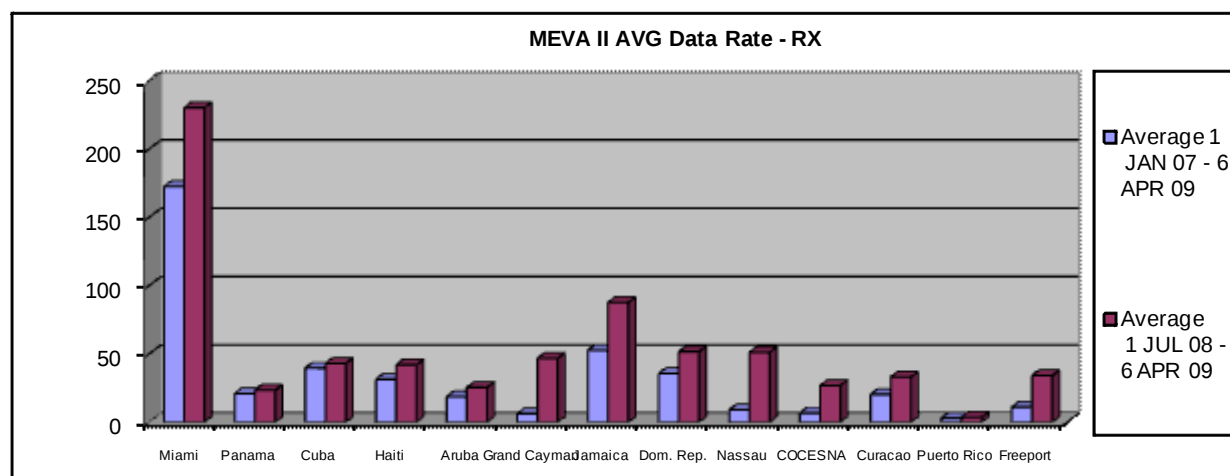
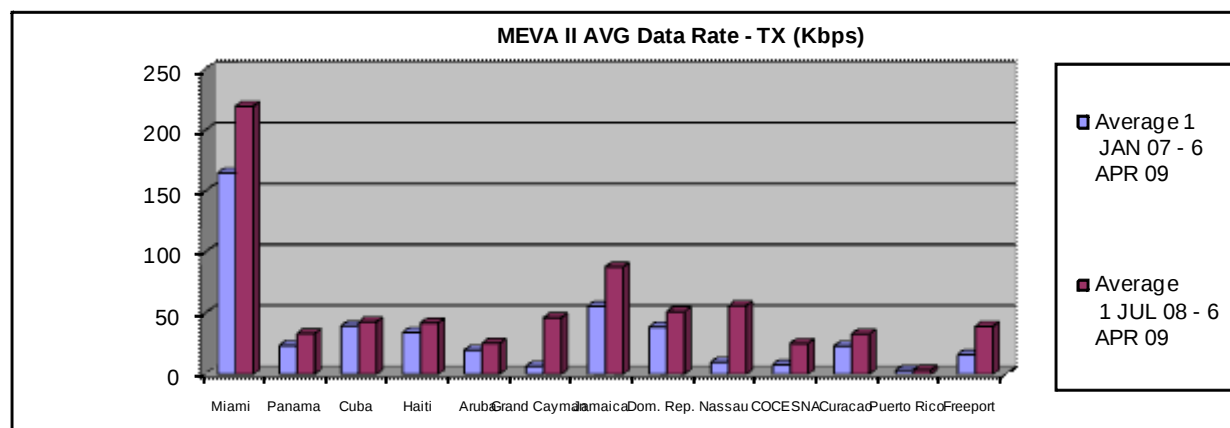
2.5 A general description of the characteristics and architecture of the MEVA II Network is given in **Appendix B** to this paper.

2.6 The implementation of the MEVA II Network Project represented a change in the operation and management of the network, optimum bandwidth usage, higher reliability and better monitoring capability. At each VSAT node site, all electronic and RF components were replaced with the latest COTS versions. Each site's reliability is maintained by annual preventive maintenance visits. The MEVA II Network utilizes a Website for dissemination of public information as well as means for MEVA members to share information and performance status monitoring (<http://www.mevaii.net>)

3. MEVA II Network Operations

Performance Evaluation

3.1 According to the conclusions of the MEVA TMG/19 Meeting, held in 2008, the overall system performance of the MEVA II Network over its first years of operation has been satisfactory. The MEVA II Network has maintained a 99.9% availability requirement, factoring in annual preventive maintenance allotment and outage caused by force major and site hurricane preparedness (temporary shut down and stow of antenna). This satisfactory operation coincides with training activities and the development of a Contingency Plan, among other activities.



MEVA interconnection with other Regional Networks

3.2 In consideration of ALLPIRG Conclusion 5/16 *Implementation of VSATs* on the expansion of existing VSAT networks, as planned in its MEVA II requirements (technical similarities and common satellite architecture) for solving or improving certain present and future requirements for the communications between the regions NAM, CAR and SAM, the States, Territories and International Organizations of the CAR/SAM regions agreed to form a common MEVA II / REDDIG Coordination Group with the participation of both Network members.

3.3 The activities and its advances of this interconnection are discussed on the following Agenda Items of the meeting. This Coordination Group also agreed on an integration phase of MEVA II and REDDIG networks. However, due to the two VSAT networks' current administrative and operational schemes differences, the integration phase could take place after a period of five years. The preparation and study of the integration phase is an on-going task of this Coordination Group.

4. Future Works in MEVA II

4.1 As part of the main objectives of MEVA II, the network provides flexibility and capability for the MEVA members to implement their planned ATN Applications and automation data exchange to achieve seamless interoperability of local and regional data networks in the region.

4.2 MEVA II provides the enabling infrastructure to allow the automated exchange of radar data, AMHS connectivity, flight information, and other important operational data across borders, thereby reducing operational errors, improving safety, and increasing efficiency:

- a) radar and surveillance data exchange agreements are ongoing among the Caribbean States, Territories, and International Organizations, in which MEVA II is the main telecommunication mean for this data exchange;
- b) with the modernization of AFTN systems, several AMHS systems have been implemented in the Caribbean region and ATN router connectivity assessment is planned; and
- c) several CAR Region States/Territories/International Organizations possess a high level progress in ATM automation. Considerable processing capacity and several automated functionalities, together with the surveillance data exchange would allow additional operational benefits regarding safety and efficiency, improved airspace utilization and mutual backup between adjacent ATS units, thereby significantly improving airspace harmonization.

4.3 In the upcoming MEVA TMG/20 meeting to be held on Mexico City on June 8 to 9, 2009, several plans and works are to be agreed, among the most relevant:

- revision of Operation and Performance of the MEVA II Network;
- action Plan for Satellite change;
- considerations on obsolete or out of production equipment renewal;
- new services and expansion of the network; and
- MEVA II / REDDIG Interconnection and considerations for integration phase.

5. **Suggested Actions**

5.1 The Meeting is invited to:

- a) take note of the evolution and changes in the MEVA Network and its update to MEVA II;
- b) consider the implications of MEVA II future works on the interconnection issues of MEVA II and REDDIG;
- c) analyze the impact of equipment renewal on MEVA II and other associated topics in the operation of the interconnection of the networks; and
- d) consider any other action as the meeting estimates appropriate.

APPENDIX A

MEVA Network Description

The MEVA Network operated in the 4-6 GHz C band on satellite PAS-1R, with SCPC (single channel per carrier) and DAMA (Demand Assigned Multiple Access) technologies to allow a voice or data circuit user anywhere in the network to communicate with any other user in the network via a single satellite hop. The system was capable of providing a full mesh connectivity, dynamic reconfigurability, and service on demand using distributed network control architecture. The MEVA Network had a Network Management and Control Facility (NM&C) that allowed the monitoring of real-time operational status, end-to-end circuit performance and security of all ground and space elements of the system on a 24/7 basis. The MEVA equipment was composed of tropicalized commercial off-the-shelf (COTS) equipment, software and related supplies, with a guaranteed replacement availability of 10 years.

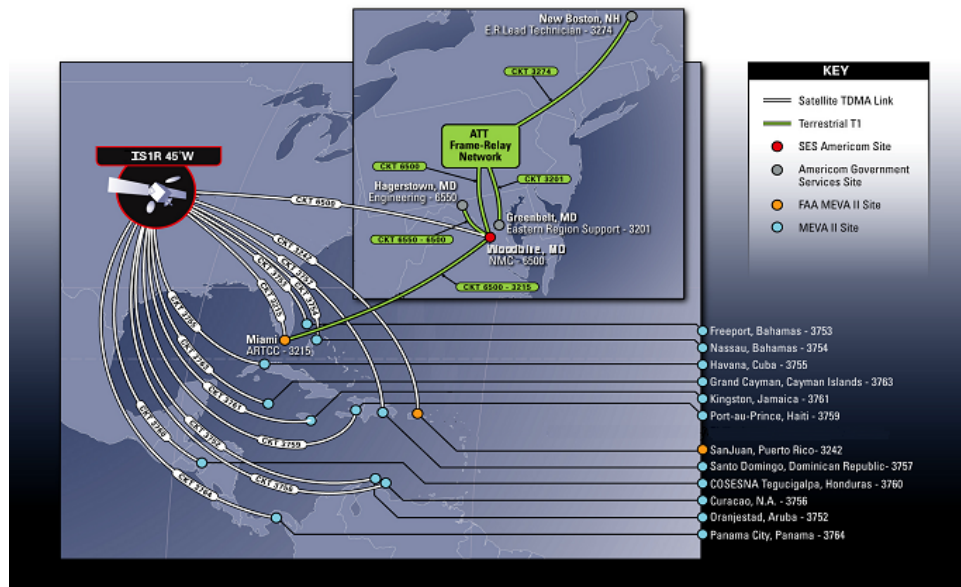
All system voice and data circuits provided a high percentage of availability. The MEVA Network made possible the implementation and improvement of the AFTN and voice circuits established in the CAR/SAM Regional Air Navigation Plan and solved the COM deficiencies that were identified in the Central Caribbean Region.

The network and operations-related topics is managed by the MEVA Technical Management Group (TMG), composed of experts of the MEVA members and the MEVA Service provider. The MEVA TMG usually met on an annually basis assisted by ICAO

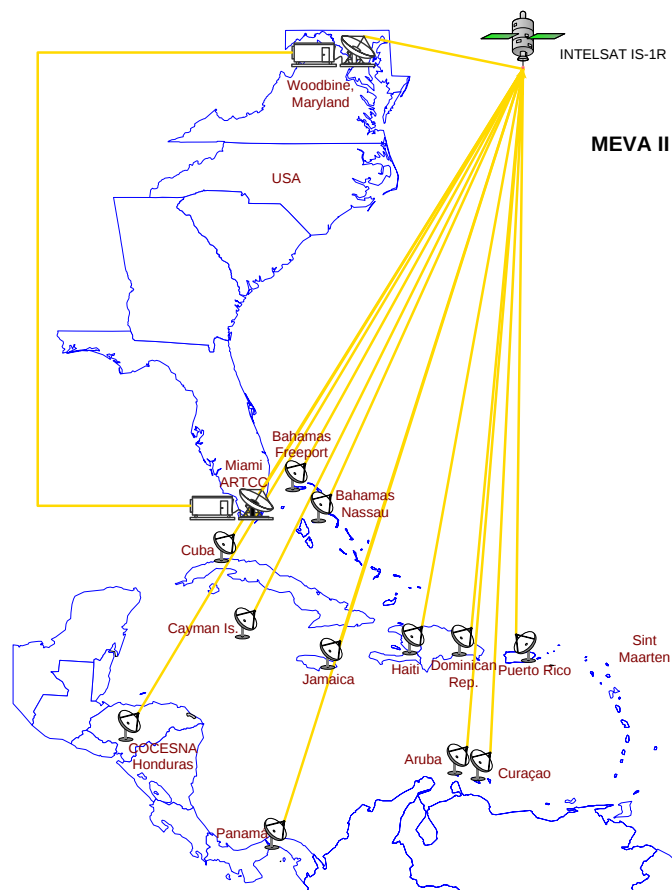
APPENDIX B

MEVA II NETWORK Characteristics

The MEVA II Network is a TDMA satellite-based frame relay network connecting air traffic control facilities and civilian airports throughout the Central Caribbean and adjacent Flight Information Regions (FIRs). The network uses satellite IS 1R's directed beam on the United States/Latin America, with operation frequencies in C band and vertical linear polarization. MEVA II provides voice and data communication between control towers in Aruba, Curacao, Jamaica, Grand Cayman, Puerto Rico, Dominican Republic, Haiti, Honduras, Panama, Freeport and Nassau, Bahamas, Miami, and Cuba. The Service Provider in coordination with MEVA members and MEVA TMG, manage network operations, perform preventive and corrective maintenance functions, and conduct advanced training sessions for interested MEVA member-states.



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The MEVA II Network Project permitted several improvements to the network/system capacity and performance:

- Improved satellite bandwidth capacity availability for future services and network expansion to continue satisfying AFS communications, facilitate the implementation of ATN sub networks and to contribute to the implantation of new CNS/ATM systems and applications.
- Support and compliance with new and future OACI requirements with respect to digital communications in the air traffic control regions of the Caribbean and South America, via operationally and cost-efficient means during the next decade.
- The use of multiple access by division in time (TDMA), with satellite bandwidth on demand (BoD) and the implantation of Frame Relay, IP solution or IP over Frame Relay, proved beneficial in reducing monthly service costs as well as allocating more efficient bandwidth usage.
- COTS equipment, architecture design and real time monitoring of Network Status permitted more flexibility, a higher level of services and increased availability of the Aeronautical services.
- South American Regional VSAT Network (REDDIG) compatibility with designated MEVA II VSAT Nodes for the interconnection of the two networks.

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