International Civil Aviation Organization
North American, Central American and Caribbean Office
Special Eastern Caribbean Communication, Navigation and Surveillance Meeting (S-E/CAR CNS)
(Port of Spain, Trinidad and Tobago, 20 to 22 October 2004)

Agenda Item 2: Communication Developments

2.1 Status and interoperability issues of the E/CAR Digital AFS Network

ACTIONS BEING TAKEN TO UPGRADE THE E/CAR DIGITAL AFS NETWORK

(Presented by the Intercaribbean Aeronautical Communications Limited (IACL))

SUMMARY

This working paper addresses the actions being taken to upgrade the E/CAR Digital AFS Network to meet the present and near future requirement of ATS units in the region as it relates to AMHS and Radar Data Sharing.

1. Introduction

1.1 The present E/CAR AFS Digital Network was designed in 1998 and implemented in 2000. Although the design was sound and effective, general performance did not meet the stringent requirements of Air Traffic Control due to the inadequate management capacity of the service provider. Faults which occurred in the network took extremely lengthy periods to resolve. The Dial-up Voice Network uses ISDN technology while the Data Network employed X.25 transport protocol.

1.2 Over the past two years the Region began looking at the establishment of Sharing Radar Data imagery. Many ATS units have rebuilt their Control Towers and AIS facilities and now require multiple AFTN terminals at the airports. Where there are aircraft hand-offs between adjacent TMA's under radar control there is a need for direct voice links. The AFS Network will need to be capable of handling the transition to AMHS.

1.3 In order to effectively correct the deficiencies of the network to ensure that it meets the present and near future requirements for air traffic control, a new service provider with the necessary resources to manage the network has been engaged and will provide the platform that can transport the various facilities protocol across the network and also take into consideration the need for establishing interconnectivity with neighbouring networks.

2. Frame Relay platform

2.1 Frame Relay was chosen as the network's transport protocol because of its ability to handle other older protocols such as X.25, Ethernet, etc. Also, the new service provider has an established modern Frame Relay Management System handling other international traffic. REDDIG, the AFS Network of

South America which also employs Frame Relay which simplifies connectivity with the E/CAR Network as Trinidad needs to communicate with Caracas, Georgetown, Paramaribo and Cayenne, who are in the REDDIG Network.

3. AFTN

3.1 Recently there has been a growing demand for multi-AFTN Terminals at airports, especially where new Control Towers have been built and located away from the AIS. With the new AFTN Switch at Piarco coming on stream soon, its expanded capacity and ability to handle asynchronous, X.25 and TCP/IP protocol, the provision of multiple AFTN terminals at airports is now feasible. The choice of transmission protocol is TCP/IP as this permits the establishment of Local Area Networks at the airport where terminals can be placed in the Control Towers, AIS offices and MET offices. This design is more manageable and easy to expand.

4. Radar Data transmission

4.1 The first implementation of Radar Data Sharing will take place with Martinique providing radar imagery to St. Lucia. The new network shall provide a direct circuit between Martinique and the two airports in St. Lucia, each on a separate circuit. The network routers on either end of the circuits shall be equipped with an Ethernet Card that interfaces with the Local Area Networks used by the Radar Data processing equipment and shall provide for the transport of the radar data using the prescribed protocol across the Frame Relay Network.

4.2 A Radar Data sub-network is envisaged with Martinique as the hub and circuits going out to St. Maarten, Antigua, Barbados, Trinidad, St. Lucia and any other island that may wish to join the network. Also, direct circuits between any two islands are possible bearing in mind that the Service Provide is only responsible for safe transport the Radar Data between the two points, across the Frame Relay Network and will not be involved in the maintenance of the radar data processing equipment at the airports.

5. Direct Voice links

5.1 The advent of radar control between adjacent TMA's calls for the establishment of direct speech circuits. This implementation will be in addition to the already established dial-up voice network and implemented as the need arises.

6. Voice and Data circuits with San Juan

6.1 Discussions are in progress between the FAA and Cable & Wireless with regards to the means of connectivity for voice and Data circuits with San Juan. Presently, the AFTN uses FAA certified X.25 and the voice is on an ISDN service.

7. Network interconnectivity

7.1 There is a need for Piarco ATC to talk to Caracas, Georgetown, Paramaribo and Cayenne and also exchange AFTN traffic with Caracas, the alternate path to NADIN II. This was done through the old analogue speech plus data network called the CM-5 which only exits between Port-of-Spain and Caracas and voice only to Georgetown. As the South American territories are all on REDDIG it is very feasible for Trinidad to install a REDDIG Node which will provide the required connectivity.

8. E/CAR AFS Network protocol

8.1 The new E/CAR AFS Network will Frame Relay transport protocol which has the ability to accommodate other protocols such as ISDN for voice, X.25 for data, TCP/IP, Ethernet so that data integrity is maintained across the network. There will be a main hub in Barbados and a back-up in Trinidad; each hub connecting to all the islands and a T1 connecting the two hubs. Network management shall be conducted in Barbados.

9. Discussion

9.1 The meeting is invited to discuss and comment on the foregoing.

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