International Civil Aviation Organization
North American, Central American and Caribbean Office

WORKING PAPER

(E/CAR/NTG/6 & E/CAR/RD/4) WP/09
10/07/15

Sixth Eastern Caribbean Network Technical Group (E/CAR/NTG/6) and Fourth Eastern Caribbean Radar Data Sharing Ad-hoc Group (E/CAR/RD/4) Meetings
Miami, United States, 13 - 14 July 2015

Agenda Item 3: **E/CAR Aeronautical Fixed Service (AFS) Network Performance and Operation**
3.2 New services implemented in the E/CAR Network

IMPROVEMENT TO THE E/CAR AFS NETWORK

(Presented by Trinidad and Tobago)

SUMMARY	
This paper informs the meeting about the improvements made to the E/CAR/AFS Network.	
Action	The suggested actions are presented in Section 3.
Strategic Objectives	• Safety • Air Navigation Capacity and Efficiency
References	Catastrophic failure of E/CAR/AFS Network.

1. Introduction

1.1 On October 21, 2014, a catastrophic failure occurred at the Mausica exchange in Trinidad as a result of a lightning strike that adversely affected the power systems which resulted in a total loss of services on the E/CAR/AFS Network for two and a half (2 ½) hours. During the outage Piarco had no communication (speech and AMHS/AISS) with the States of the E/CAR and San Juan, Puerto Rico (onward transmission to Atlanta for AMHS and New York for voice).

2. Discussion

2.1 Following the restoration of services a high level meeting was held with the Service Provider, Telecommunication Services of Trinidad and Tobago (TSTT) with the objective to design and implement a solution to mitigate against another single point of failure. TSTT's Technical Operations Team met and discussed a proposal of placing another redundant path, directly to the St. Augustine Exchange bypassing Mausica Exchange altogether.

2.2 The E/CAR/AFS Network Resiliency project was approached in stages to minimize the disruption to services. In stage 1 TSTT Outside Plant and Planning department implemented a new path via six (6) cores of dark fiber between Piarco and St. Augustine Exchanges. This reduced the need for Exchange work to return the MPLS and Legacy T1 Transports to service (50% of the T1 Links). LIME

CPE was engaged for the provision of a Cisco 1941 Router, similar to the arrangement to the Core TTCAA router at the Main location.

2.3 In Stage 2, to mitigate against failure of the Mausica exchange, a redundant path was created from the TTCAA premises to the St. Augustine exchange. In the event of failure of the Mausica exchange, the E/CAR/AFS Network will transfer automatically to the St. Augustine exchange. The failover time from the Mausica exchange to the St. Augustine exchange measured at the Acceptance tests was thirty (30) seconds. The design allows for the path to automatically revert when the Mausica exchange is normalized. The transfer from St. Augustine back to Mausica is instantaneous and seamless. The Acceptance tests were successfully conducted on May 14, 2015.

2.4 The International Private Leased Circuits (IPLC) which transports the French radar and the IPLC between Piarco and San Juan will not switch from the Mausica exchange to the St. Augustine exchange. The characteristics of IPLCs do not permit multiple mapping as compared to the Metro-e circuits. In the short term, the integrated French radar (Dacota) was also installed on the E/CAR/AFS Network in Martinique but requires a manual intervention at Piarco to connect it to the ATM system. Connectivity and services to San Juan will continue through the E/CAR/AFS Network via the redundant circuit between Antigua and San Juan.

2.5 The radar sharing network is connected via legacy fractional T1 (IPLCs) and also partially via the MPLS network. In the event the legacy network via Piarco or Mausica is lost, the MPLS path would be restored either manually or automatically depending on agreed implementation.

2.6 For redundancy of radar from the French Civil Aviation, discrete radar feeds will be received at Piarco from Martinique and Guadeloupe over the E/CAR/AFS Network. The existing Dacota feed (integrated Martinique and Guadeloupe radars) will continue over IPLC. The radar routers at Martinique and Piarco will be made redundant. Work is underway to provide two (2) transport mediums between Piarco and Martinique

a) The first through International Private Leased Circuits (IPLC) provided by Telecommunication Services of Trinidad and Tobago (TSTT) and France Telecoms;
b) The second through the E/CAR AFS network. The circuits to Martinique and Guadeloupe on the E/CAR AFS Network are provided by Southern Caribbean Fibre (SCF) and TSTT.

3. Suggested action

3.1 The meeting is invited to:

a) note the network resiliency implemented; and

b) agree to any other actions as deemed appropriate.

-END-