INTERNATIONAL CIVIL AVIATION ORGANIZATION
NORTH AMERICAN, CENTRAL AMERICAN AND CARIBBEAN OFFICE

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

FINAL REPORT

MIAMI, UNITED STATES, 13 - 14 JULY 2015

Prepared by the Secretariat

July 2015

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HISTORICAL

ii.1 Place and Date of the Meetings

The 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 were held at the Hyatt Regency Coral Gables Hotel in Coral Gables, Miami, from 13 to 14 July 2015.

ii.2 Opening Ceremony

Ms. Veronica Ramdath, E/CAR/NTG Rapporteur, welcomed the participants, highlighting the achievements and success of the groups and the work to be continued towards the radar data sharing tasks. Mr. Julio César Siu, Regional Officer, Communications Navigation and Surveillance of the North American, Central American and Caribbean (NACC) Office of the International Civil Aviation Organization (ICAO), provided opening remarks and thanked United States, Federal Aviation Administration (FAA) for hosting the meetings, highlighting the targets to be achieved by these meetings with the E/CAR Aeronautical Fixed Service (AFS) network performance evaluation, the E/CAR radar display Request for Proposal preparation and the ICAO "*No Country Left Behind*" (NCLB) campaign. Mr. Raul Chong, International Program Officer, United States, welcomed the participants to the E/CAR/NTG/6 and E/CAR/RD/4 meetings and officially opened the meetings.

ii.3 Officers of the Meetings

The E/CAR/NTG/6 and E/CAR/RD/4 meetings were chaired as plenary by Ms. Veronica Ramdath, E/CAR/NTG Rapporteur, and Mr. Julio Siu, Regional Officer, Communications, Navigation and Surveillance of the ICAO NACC Regional Office acted as Secretary of the meetings.

ii.4 Working Languages

The working language of the meetings was English and working papers, information papers and report of the meetings were available to participants in said language.

ii.5 Schedule and Working Arrangements

It was agreed that the working hours for the sessions of the meetings would be from 09:00 to 16:30 hours daily with adequate breaks. Ad hoc Groups were created during the Meetings to do further work on specific items of the Agenda.

ii.6 Agenda

Agenda Item 1 Approval of Meeting Agenda, Work Method and Schedule

Agenda Item 2: Review of Valid Conclusions from E/CAR/NTG/05-RDS/03, E/CAR/CATG/01 and ECAR/DCA/25 Meetings related to the Work of the NTG and RD

2.1 Follow-up on previous E/CAR/NTG-RD Conclusions and Decisions
2.2 Follow-up on E/CAR/CATG/01 and ECAR/DCA/25 Meetings
2.3 Follow-up to the Air Navigation Implementation Working Group (ANI/WG) and North America, Central American Working Group (NACC/WG) Conclusions

Agenda Item 3: E/CAR Aeronautical Fixed Service (AFS) Network Performance and Operation

3.1 Network performance analysis and general aspects
3.2 New services implemented in the E/CAR Network
3.3 E/CAR AFS Network interconnection to the MEVA Network

Agenda Item 4: Surveillance Sharing Activities

4.1 Follow-up on radar data agreements and teleconferences
4.2 Radar sharing: Trinidad and Tobago – Sint Maarten, San Juan - Sint Maarten
4.3 Implementation of radar data sharing tasks
4.4 Update of Automatic Dependent Surveillance - Broadcast (ADS-B)/Multilateration implementation in Barbados
4.5 ADS-B trials: France and Trinidad and Tobago

Agenda Item 5: Radar Data Display Request for Proposal (RFP)

5.1 Definition of Proposal
5.2 Definition and revision of RFP process

Agenda Item 6: Update of E/CAR/NTG and RDS Terms of Reference and Work Programme

Agenda Item 7: Other Business

ii.7 Attendance

The Meeting was attended by 9 States/Territories from the Eastern Caribbean, 1 International Organization, and the industry totalling 31 delegates as indicated in the list of participants.

ii.8 Conclusions and Decisions

The Meetings recorded their activities as Conclusions and Decisions as follows:

CONCLUSIONS: Activities requiring endorsement by the Directors of Civil Aviation of the Eastern Caribbean (E/CAR/DCA).

DECISIONS: Internal activities of the Eastern Caribbean Network Technical Group (E/CAR/NTG) and the E/CAR Radar Data Sharing Ad hoc Group (E/CAR/RD).

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ii.9 List of Working and Information Papers and Presentations

Refer to the Meeting web page:
http://www.icao.int/NACC/Pages/meetings-2015-ecarntg6.aspx

WORKING PAPERS

Number	Agenda Item	Title	Date	Prepared and Presented by
WP/01	1	Approval of Meeting Agenda, Work Method and Schedule	23/06/15	E/CAR/NTG Rapporteur
WP/02	2.1	Follow-up to valid conclusions and decisions of the E/CAR/NTG-RDS Meetings	07/07/15	E/CAR/NTG Rapporteur
WP/03	2.2	Review of actions concerning the First Eastern Caribbean Civil Aviation Technical Group (E/CAR/CATG/01) Meeting and the Twenty-Fifth Meeting of Directors of Civil Aviation of the Eastern Caribbean (E/CAR/DCA/25) related to the E/CAR Aeronautical Fixed Service (AFS) Network	07/07/15	Secretariat

WORKING PAPERS

Number	Agenda Item	Title	Date	Prepared and Presented by
WP/04	2.3	Review of actions to support ANI/WG and NACC/WG Valid Conclusions related to the E/CAR Aeronautical Fixed Service (AFS) network	09/07/15	Secretariat
WP/05	3.1	Barbados Report on E/CAR Network Performance October 2014 to June 2015	13/07/15	Barbados
WP/06	3.1	Network performance analysis and general aspects	07/07/15	ECCAA
WP/07	3.1	Network Performance Analysis and General aspects	24/06/15	France
WP/08	3.1	Network Performance Analysis and General aspects	07/07/15	Trinidad and Tobago
WP/09	3.2	Improvement to the E/CAR AFS Network	10/07/15	Trinidad and Tobago
WP/10	3.3	MEVA II-E/CAR AFS Network Interconnection Activities	01/07/15	MEVA III TMG Coordinator
WP/11	4.1	Follow-up on radar data agreements and teleconferences	02/07/15	E/CAR/NTG Rapporteur
WP/12	---	Cancelled	----	---
WP/13	4.3	Implementation of Radar Data Sharing activities	07/07/15	Secretariat
WP/14	4.4	Barbados Report on MLAT ADS- B Implementation	13/07/15	Barbados
WP/15	4.3	Radar activities and ADS-B trials	24/06/15	SNA/AG, France
WP/16	4.5	ADS-B trials: Trinidad and Tobago	10/07/15	Trinidad and Tobago
WP/17	5.1	Definition of Proposal	07/07/15	Secretariat
WP/18	5.2	Definition and revision of RFP process	09/07/15	Secretariat
WP/19	6	E/CAR/NTG future Meeting and update to its Terms of Reference and RD Ad hoc group´s tasks	06/07/15	Secretariat
WP/20	7	ICAO Position for the International Telecommunication Union (ITU) World Radiocommunication Conference (WRC-2015)	23/06/2015	Secretariat

INFORMATION PAPERS

Number	Agenda Item	Title	Date	Prepared and Presented by
IP/01	---	List of Working, Information Papers and Presentations	10/07/15	Secretariat
IP/02	4.3	OECS ATS RASA status update	07/07/15	ECCAA

PRESENTATIONS

Number	Agenda Item	Title	Presented by
1	5.2	Procurement Process Briefing	Secretariat
2	3.1	Network Performance analysis and general aspects	TSTT

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Shenneth Phillips
Denise Silston
Audrey Lorraine. Davis
Luana Isaac

BARBADOS

Shirley Iante Ford
Samuel Philgence
Suzanne Griffith

DOMINICA

Jean Williams
Honica Lawrence

FRANCE

Ange Patrick
Jean-Jacques Deschamps

GRENADA

Roselyn Charles
Earl Philip Charles

SAINT KITTS AND NEVIS

Daron Sutton
Kurt Louard

SAINT LUCIA

Lambert Remy
Amy Charles

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Ian Gomez

UNITED STATES

Raul Chong
Stacey Herishen-Smith
Dulce M. Rosés
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Dan Eaves
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Taylor Lewis
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Agenda Item 1 Approval of Meeting Agenda, Work Method and Schedule

1.1 The Secretariat presented WP/01, with the draft agenda and schedule, and referred to IP/01 with the list of associated documentation. The Meeting approved the agenda as presented in the historical section of this report and made minor changes to the schedule.

Agenda Item 2 **Review of Valid Conclusions from E/CAR/NTG/05-RDS/03, E/CAR/CATG/01 and ECAR/DCA/25 Meetings Related to the Work of the NTG and RD**

2.1 Follow-up on Previous E/CAR/NTG-RD Conclusions and Decisions

2.1.1 Under WP/02, the Meeting reviewed and followed-up on the E/CAR/NTG and E/CAR/RD valid conclusions/decisions. All conclusions and decisions were considered completed or superseded as presented in **Appendix A** to the report, except for the following:

Conclusion/Decision	Description	Follow-up	Status
Decision E/CAR/NTG/5/8 COMPLETION of E/CAR AFS NETWORK STANDARD OPERATIONS PROCEDURES (SOP):	That, in order to complete the SOP and start it application, the E/CAR/NTG Rapporteur to finalize the compilation of the E/CAR AFS network Standard Operations Procedures (SOP): MPLS maintenance procedure and service level of agreement including the inputs from United States, France, ECCAA and TSTT and present this final draft document at the follow up teleconference in February 2015.	Work is on-going on this activity with a draft document will be available for review by October 2015.	Valid
Decision E/CAR/NTG/5/12 SURVEILLANCE DATA SHARING IMPLEMENTATION ACTION PLAN	That, to show the latest progress and next future action on surveillance matters, France, Trinidad and Tobago, United States, and ECCAA to develop an update for the surveillance data sharing action Plan including the agreed milestones by: a) Drafting this update for the next Radar Data Sharing teleconference of January 2015; and b) Complete this update for its presentation for the E/CAR/DCA/26 Meeting	a) The surveillance data sharing action plan with the agreed milestones remains unchanged after review. A draft Action Plan was presented. b) will be prepared for the E/CAR/DCA/26 Meeting.	a) Completed b) Valid

2.1.2 To facilitate the homogeneous application of the E/CAR AFS Network contingency procedures, Decision E/CAR/NTG/5/5 was superseded with the following decision:

DECISION
E/CAR/NTG/6-RD/4/1 E/CAR AFS NETWORK CONTINGENCY PROCEDURES INCLUSION TO OPERATIONAL PROCEDURES

That, in order to make official and homogeneously apply the E/CAR AFS Network contingency procedures, E/CAR AFS Members implement/include the following in their operational procedures by the E/CAR/DCA/26 Meeting:

a) in case the E/CAR Network is not available for voice communications: use of PSTN phones; and

b) in case E/CAR Network is not available for Data: use SPATIA web for NOTAM and flight plans.

2.1.3 This procedure has already been integrated into local documentation or into Letters of Agreement (LoAs) (for instance between Martinique and Trinidad and Tobago or Martinique and Saint Lucia). Each State is invited to verify the validity of Private Switched Telephone Network (PSTN) numbers identified as back-up phone medium and to upgrade existing LoAs accordingly.

2.2 Follow-up on E/CAR/CATG/01 and ECAR/DCA/25 Meetings

2.2.1 Under WP/03 and WP/04, the Meeting reviewed the valid conclusions related to the E/CAR AFS Network formulated by the First Eastern Caribbean Civil Aviation Technical Group Meeting (E/CAR/CATG/1) and the Twenty-fifth Meeting of Directors of Civil Aviation of the Eastern Caribbean (E/CAR/DCA/25), approving these conclusions based on the progress observed in these meetings.

2.2.2 Similarly, a follow-up to the identified CNS Committee actions involving E/CAR/NTG and E/CAR/RD was made as shown in Appendix C of WP/03.

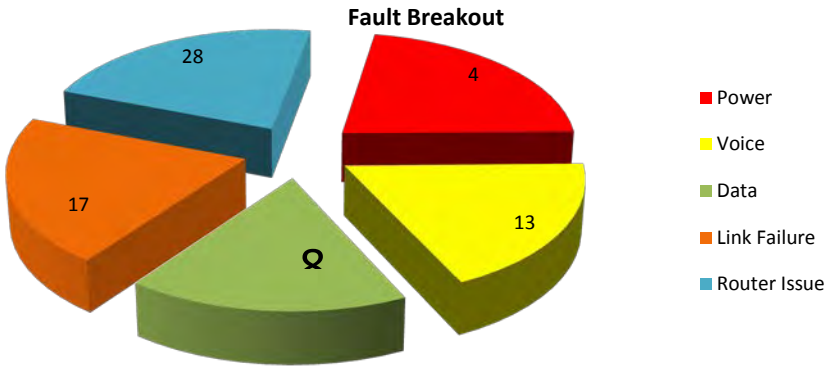
2.3 Follow-up to the Air Navigation Implementation Working Group (ANI/WG) and North America, Central American Working Group (NACC/WG) Conclusions

2.3.1 Under WP04, the Meeting reviewed the E/CAR AFS Network/Radar Data Sharing related conclusions from the Second NAM/CAR Air Navigation Implementation Working Group Meeting (ANI/WG/2) and the Fourth North American, Central American and Caribbean Working Group Meeting (NACC/WG/4) as shown in Appendices A and B of WP/04, concluding that the NTG and RD Groups will take action on the requested conclusions reflecting such activities in their corresponding Action Plans.

Agenda Item 3 **E/CAR Aeronautical Fixed Service (AFS) Network Performance and Operation**

3.1 E/CAR Aeronautical Fixed Service (AFS) Network Performance and Operation

3.1.1 Under P/02, the E/CAR AFS Network Service provider, Telecommunications Services of Trinidad and Tobago (TSTT), provided an overview of the E/CAR Network performance since the E/CAR/NTG/4 Meeting, (October 2014 to June 2015) showing consistently good performance and availability of the network. The failure reporting system registered a total of seventy tickets. As of June 2015, seventy were solved. Of the seventy two failures, seventeen were identified as link failures. The breakout of faults is illustrated as follows:



3.1.2 The Meeting took note of TSTT improvements (challenges) and activities on local equipment operation conditions. Similarly, the Meeting took note of the maintenance procedures timelines and their escalation conditions. The following availability comparison was observed:

Country	% Availability 2014	% Availability 2015
Anguilla	98.9	1.79
Antigua	99.9	99.2
Barbados*	99.9	99.0
Dominica - Canefield	97.4	96.2
Dominica - Melville Hall	99.6	98.8
Grenada*	99.9	99.2
Guadeloupe	99.7	98.4
Martinique*	99.5	98.6
Montserrat	99.9	99.0
Nevis*	98.4	98.4
Saint Kitts	99.3	99.1
Saint Lucia -George F Charles	99.9	99.2
Saint Lucia- Hewanorra	98.7	99.2
St. Vincent and the Grenadines*	98.1	99.2
Tobago*	99.7	99.2
Trinidad*	99.8	99.1
United States of America (San Juan)*	99.7	99.0

3.1.3 The next E/CAR/AFS Network maintenance activity is scheduled for September – October 2015. Oversight visits and maintenance activities of the E/CAR/AFS network and the Aeronautical Message Handling System (AMHS)/Aeronautical Information Service System (AISS) user end equipment were successfully conducted by Trinidad and Tobago over the months of January and February of 2015.

3.1.4 Under WP05, Barbados informed that the E/CAR AFS Network performance was acceptable and identified some problems that will be reviewed by Trinidad and Tobago Civil Aviation Authority (TTCAA) and TSTT.

3.1.5 Under WP06, ECCAA informed that all States have reported significant improvement in the performance of the network. Down times, whether for planned maintenance, or failures were minimal. Feedback on faults from TTCAA and/or TSTT has been excellent, which has provided a high level of confidence in the network. Most of the failures experienced were hardware-related coupled with power issues in some States. These problems were easily resolved by the appropriate authority. Except for the very few reports, the network performance has been good and for the most part has met the objectives. ECCAA commented that there were issues that have not been reported on Topdesk that would require further investigations and that TTCAA will look into:

- infrequent dropouts on the speech line between Grenada and Saint Vincent and the Grenadines
- cross talk on speech line between Martinique and Saint Lucia

3.1.6 Under WP/07, France reported that the E/CAR/AFS network is in compliance with operational requirements, but recommended some improvements, in both technical and procedural aspects. Details were provided on the hardware at Guadeloupe and Martinique, noting some action needed to resolve issues. It was noted that the back-up routing path was not operating properly and in case of failure of the direct Antigua – Guadeloupe link, the Aeronautical Fixed Telecommunication Network (AFTN) of Antigua is still routed to Guadeloupe via Martinique. To improve terminal connections in Martinique, French West Indies proposed TTCAA to replace Martinique-Guadeloupe Mediaserv line by a France Telecom line. This observation was noted by TTCAA and the matter is under review. The following improvements were identified:

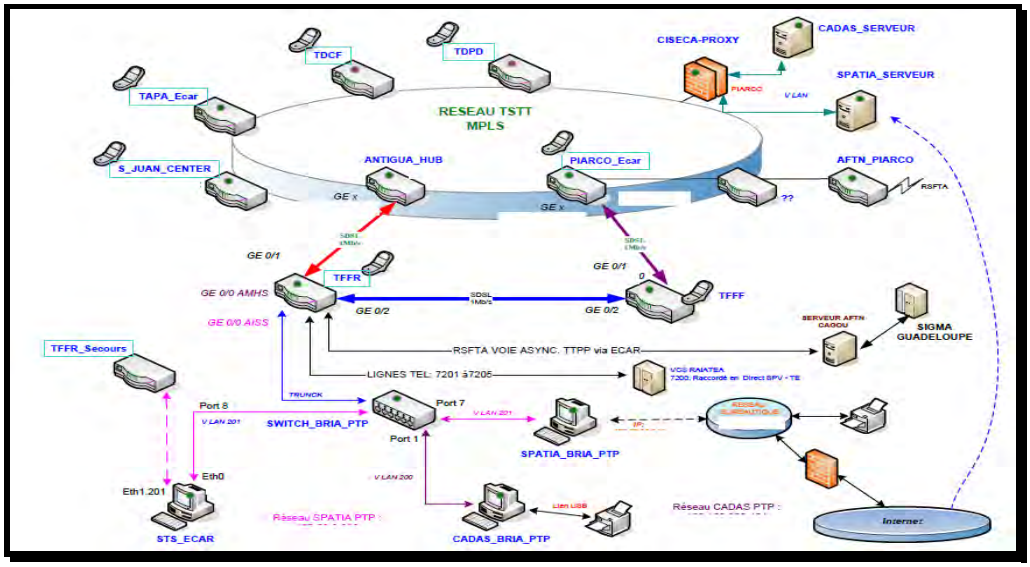
- To complete Guadeloupe routers hardware and to replace fan tray
- To order a France Telecom (Orange) Internet Protocol (IP) line between Guadeloupe and Martinique
- To improve communication (failure feedback) with end users
- To analyze the feasibility to have both routers connected with automatic switch over in case of failure

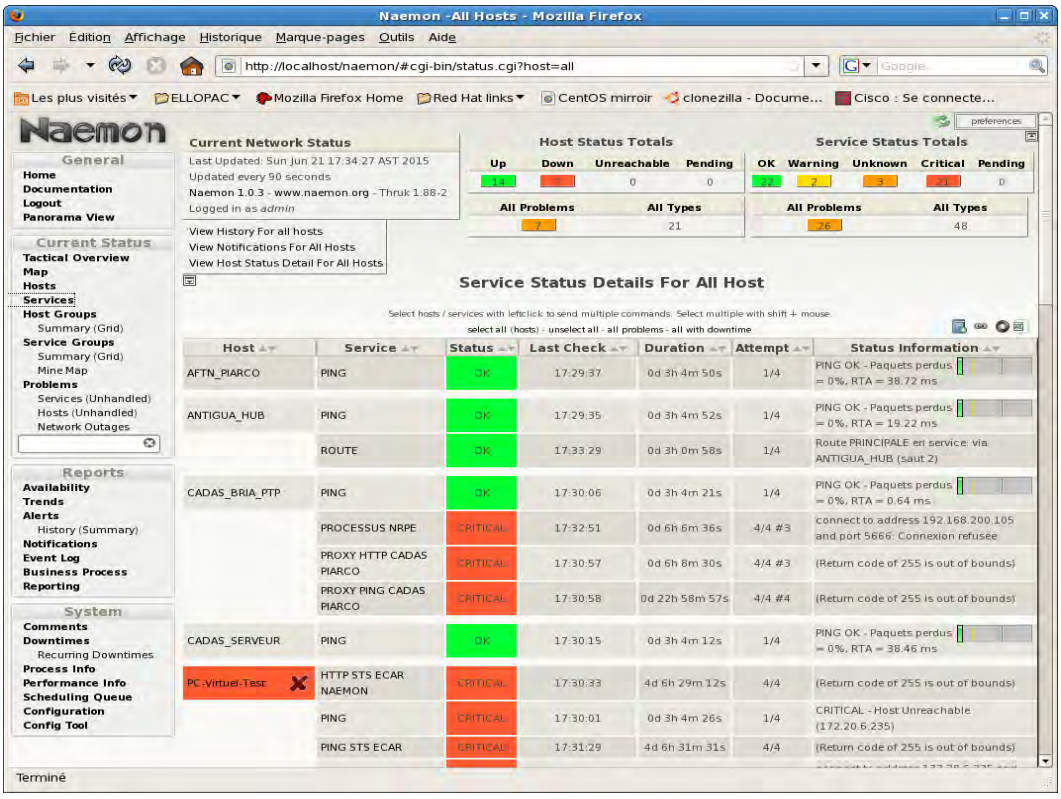
3.1.7 In this regard, the following draft conclusion was proposed:

DRAFT CONCLUSION
E/CAR/NTG/6-RD/4/2 IMPROVEMENT TO E/CAR AFS NETWORK IN TECHNICAL AND PROCEDURAL ASPECTS

That, in order to improve the existing E/CAR AFS operation and procedural aspects, TSTT conduct the improvements mentioned in paragraph 3.1.6 by **15 October 2015**.

3.1.8 Regarding Decision E/CAR/NTG/5/6 - *Simple Network Management Protocol (SNMP) Tool for Local Equipment Supervision*, France informed of their monitoring tool developed by Guadeloupe for supervision with connections and accessing detailed status as shown below.





3.1.9 France offered the software and manuals for any State/Territory that would like to implement the local monitoring solution. These requirements shall be coordinated through the E/CAR/NTG Rapporteur for the necessary interrogations to relevant IP addresses, and possibly to the use of Simple Network Management Protocol (SNMP) (access to the Management Information Base (MIBs)). In this regard, the following draft conclusion was proposed:

DRAFT CONCLUSION
E/CAR/NTG/6-RD/4/3 LOCAL MONITORING IMPLEMENTATION

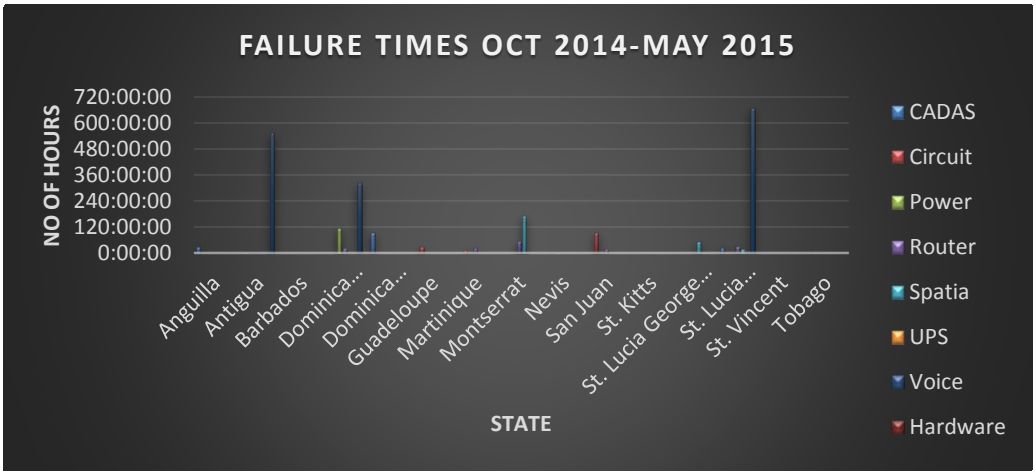
That, considering the kind offer by France on a local monitoring tool of the E/CAR AFS nodes:

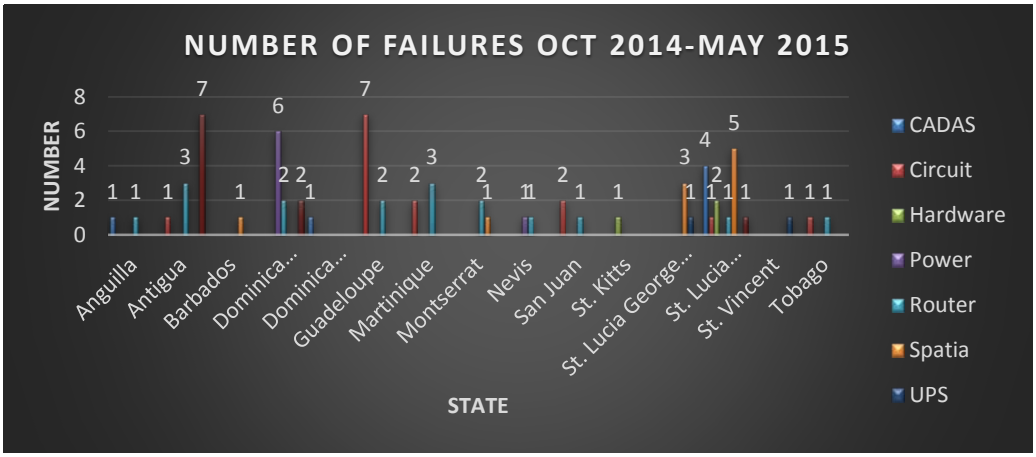
a) France complete Guadeloupe E/CAR monitoring and editing Tool manual;

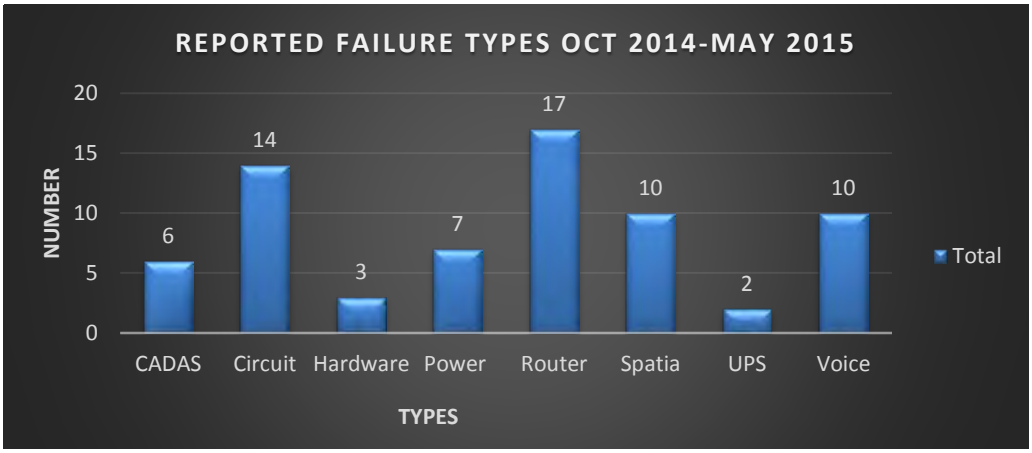
b) States that wish to implement the local SNMP supervision tool send their request to the NTG Rapporteur by **December 2015**;

c) Trinidad and Tobago and the Network Service Provider, TSTT, analyse the integration of the monitoring tool into the web portal, including Pings and Simple Network Management Protocol (SNMP) router interrogations.

3.1.10 Under WP/08, Trinidad and Tobago reported that the Topdesk on-line web-based fault reporting and resolution application is being utilized by users of the Eastern Caribbean AFS network to log faults and receive timely resolution information. The application provides statistics and reports for all States/Territories. Reports and statistics may be generated per State, per period, per type of failure, etc. It was noted that the Air Traffic Control (ATC)/Aeronautical Information Services (AIS) units within the Organization of Eastern Caribbean States (OECS) report all faults to the ECCAA Technical staff that is in turn, logging the fault on Topdesk. The following breakout of reported faults taken from Topdesk for the period October 2014 to May 2015 is presented as follows:



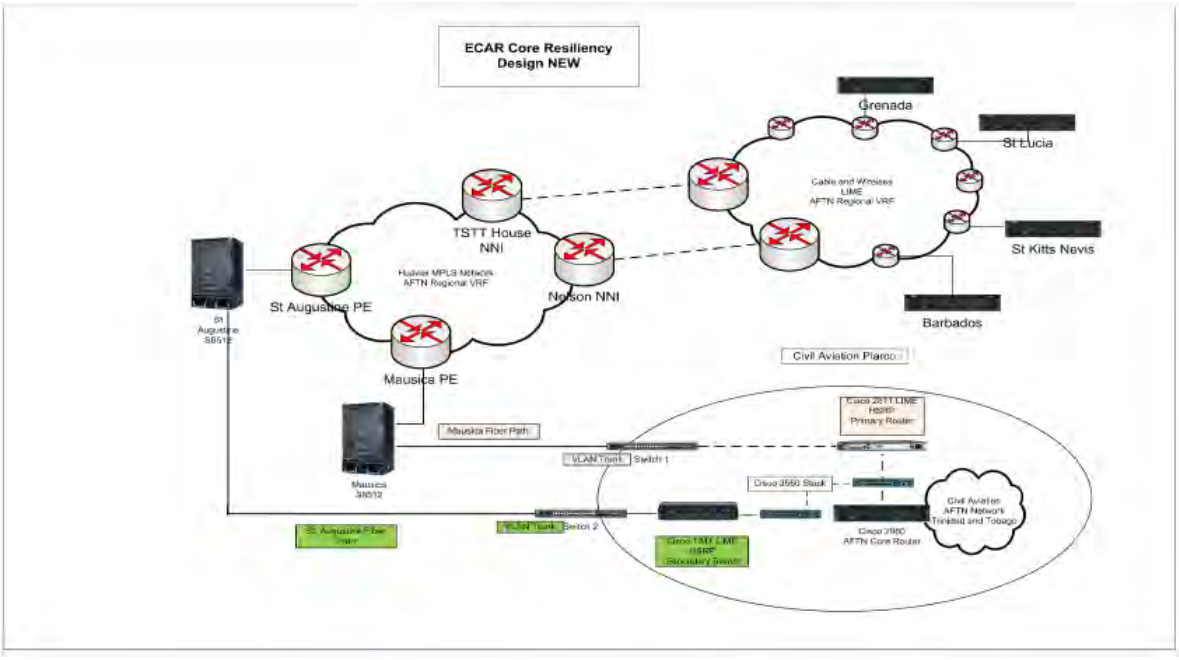




3.1.11 The Meeting noted some discrepancies between the Topdesk statistics and the information provided by TSTT in P/02, for which it was clarified that the discrepancies are due to the different sources of the statistics being Topdesk based on the users' report and not the equipment monitoring. Further improvement will be conducted by TTCAA based on the network statistics.

3.2 Improvement in the E/CAR Network

3.2.1 Under WP/09, Trinidad and Tobago shared the improvements made by TSTT to the network to mitigate against another single point of failure; namely, 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 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 14 May 2015. The improvement is presented as:



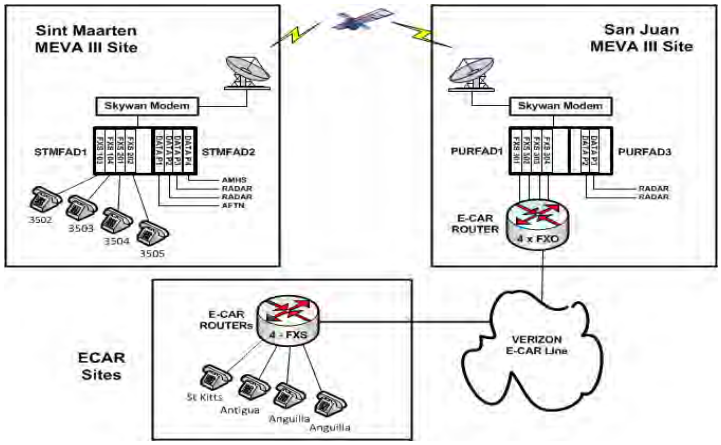
3.2.2 The International Private Leased Circuits (IPLC) which transmits the French radar data and the IPLC between Piarco and San Juan will not switch from the Mausica exchange to the St. Augustine exchange. The characteristics of IPLCs do not permit multiple mapping as compared to the Metro-e circuits.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

3.3 E/CAR AFS Network Interconnection to the MEVA Network

3.3.1 Under WP/10, the MEVA TMG Coordinator reported that during the Thirtieth MEVA Technical Management Group Meeting (MEVA/TMG/30) held in Oranjestad, Aruba from 27 to 29 May 2015, and under Conclusion MEVA TMG 30/21 – *Action for MEVA III – E/CAR AFS Network Interconnection*, it was agreed that in order to track and assist the implementation of the MEVA III-E/CAR AFS Network interconnection, Sint Maarten and United States would inform the TMG on the accomplishment of the agreed action by **30 June 2015**. A teleconference among representatives from all three mentioned States was held on 23 June 2015, to further coordinate the implementation. The required hardware (four Foreign Exchange Station (FXS) cards at the MEVA III Multiplexer and four Foreign Exchange Office (FXO) cards in the E/CAR router in San Juan are already installed. The Table below shows the voice circuits to be implemented:

	ATS Units	Technical details
SINT MAARTEN/ JULIANA APP	Anguilla (Clayton J. Lloyd International)	2 PBX service from ECAR-analogue voice line
	Antigua (V. C. Bird APP)	1 PBX service from ECAR-analogue voice line
	Saint Kitts (Robert L. Bradshaw TWR)	1 PBX service from ECAR-analogue voice line
	San Juan ACC/PIARCO ACC	1 Serial line, RS232, radar circuit

3.3.2 The drawing below provided by the MEVA III Service Provider, COMSOFT, shows the interconnections required:



3.3.3 The new dedicated MEVA circuit required for the radar data exchange between San Juan and Sint Maarten, and the voice circuits to Anguilla, Antigua and Saint Kitts and Nevis are already installed. The configuration of the E/CAR/AFS router in San Juan is completed. United States has agreed to complete the necessary wiring in San Juan between the E/CAR router and the MEVA III router. In this regard, the following actions and dates were agreed:

- In order to test all voice connections, namely Anguilla, the wiring will be done in the second week in August after the routers in Anguilla are replaced in the last week of July 2015
- Coordination for the testing shall include Anguilla, Antigua, Saint Kitts and Nevis, Sint Maarten, Trinidad and Tobago, United States and TSTT
- Both FAA and TSTT will be on site in San Juan during the testing

3.3.4 In this regard the following Draft conclusion was adopted:

DRAFT CONCLUSION
E/CAR/NTG/6-RD/4/4 MEVA III-ECAR AFS NETWORK INTERCONNECTION- VOICE CIRCUITS

That, to complete the voice circuits implementation in the MEVA III – E/CAR AFS Network interconnection:

a) Trinidad and Tobago replace the routers in Anguilla by **July 2015**;

b) United States complete the wiring between the MEVA III and E/CAR AFS Node by **14 August 2015** after the routers in Anguilla are replaced; and

c) for the testing, Anguilla, Antigua, Saint Kitts and Nevis, Sint Maarten, Trinidad and Tobago, United States, COMSOFT and TSTT coordinate the corresponding actions.

Agenda Item 4 Surveillance Sharing Activities

4.1 Follow-up on Radar Data Agreements and Teleconferences

4.1.1 Under WP/11 the E/CAR/NTG Rapporteur recalled the demonstration made by Trinidad and Tobago on the Piarco Multi Radar Tracker (MRT) and the French radars exported from Trinidad over the E/CAR/AFS Network, and displayed on a standalone laptop and one of the IRMA computers donated by the French Civil Aviation respectively during the E/CAR/NTG/5 and E/CAR/RD/3 Meetings from 22 to 24 October 2014.

4.1.2 To follow-up the E/CAR Radar Data Sharing conclusions and activities, the identify CNS Committee Rapporteur conducted two teleconferences with the assistance of ICAO since the last E/CAR/RD Meeting. The process and documents to request the IRMA CPUs offered by France for trial purposes have been formalized since last year and emphasized by ICAO, through State letter Ref: EMX0827 on the Procedure for Donation of CPUs for Radar Display. At the 10th teleconference, a request was made by Saint Kitts and Nevis for one IRMA CPU. The French Civil Aviation agreed to provide a CPU to Saint Kitts and Nevis. This puts the count of donated IRMA CPUs from ten to eleven.

4.1.3 The following Table shows the status of the French IRMA computers:

State/Territory	No. of CPUs	Installation Date	Comments
Antigua	2	19 March 2015	Completed
Grenada	1	17 April 2015	Completed
St. Vincent	1	27 April 2015	Completed
Montserrat	1	18 May 2015	Completed
Dominica	1	15 June 2015	Completed
Barbados	1	18 June 2015	Completed
Nevis	1	26 June 2015	Completed
Saint Kitts	1	26 June 2015	Completed
Anguilla	1	TBD	Installation of IRMA CPU on hold until the E/CAR/AFS Network routers and UPS are replaced. The replacement routers and UPS were shipped on 30/06/2015 to Anguilla.
Trinidad and Tobago	1	TBD	

4.1.4 Under WP/15, it was commented that the French radar data (Dakota MRT and the two Monopulse Secondary Surveillance Radars (MSSRs) are now connected in Martinique to the E/CAR network. Trinidad and Tobago receives these radar data through two channels providing redundancy and enhancing the availability of the data to Trinidad and Tobago, and in turn to IRMA2000 users:

- One via a France Telecom 64 kbps leased line
- One via ECAR2 network (via 1 Mbps GCN connection)

4.1.5 The Meeting was informed that two old international leased lines are feeding Saint Lucia radar display systems (on the two airports) with French radar data. These lines are points of weakness. In June 2015, one system was fed through E/CAR AFS network in George Charles airport. Data sent through E/CAR is non correlated data: only squawk is displayed, as in St Lucia, Flight ID is displayed due to correlation information sent by Martinique. Saint Lucia needs to keep Flight ID so that data should be sent to the E/CAR AFS network too. France, in coordination with Saint Lucia and Trinidad and Tobago, will conduct configuration changes and tests on these matters. In this regard, the following decision was adopted:

DRAFT CONCLUSION
E/CAR/NTG/6-RD/4/5 FRENCH RADAR/DAKOTA DATA ADJUSTMENTS

That, in order to show the correlated flight plan and radar data in the Radar Data displays with Dakota Data feed from the E/CAR AFS Network, by **21 August 2015** France coordinate with TTCAA and Saint Lucia to:

a) transfer the radar back to the International Private Leased Circuits (IPLCs) while the issue of the Flight ID is being resolved; and

b) conduct latency checks of the data and data adjustments.

4.1.6 France commented on Saint Lucia Air traffic controller (ATCO) training as follows:

- ATCOs from Saint Lucia will be trained by SNA/AG in Saint Lucia in mid-August for three weeks
- Six training sessions will be performed (30 ATCOs) in compliance with ECCAA requirements. That training should give ATCO licence for using radar situational awareness
- Training for Saint Lucia ATCOs with the ATC simulator in Martinique is being studied

4.1.7 Finally, France commented on the need to complete the corresponding LoA for the Radar CPU implementation with Anguilla and Montserrat. LoAs are to be signed with United Kingdom (UK - ASSI). In this regard, the following draft conclusion was agreed:

DRAFT CONCLUSION
E/CAR/NTG/6-RD/4/6 SIGNING OF LOA REGARDING THE FRENCH RADAR CPUS

That, in order to complete the corresponding LoA for the Radar CPU implementation, Anguilla and Montserrat (UK-ASSI) to complete the LoA for the delivery of the IRMA computers under the terms and conditions of the French radar donation by the E/CAR/DCA/26 Meeting.

4.2 Radar sharing: Trinidad and Tobago – Sint Maarten, San Juan - Sint Maarten

4.2.1 Under WP/10, the Meeting was informed of the MEVA III-E/CAR/AFS Networks Interconnection Radar sharing activities from Sint Maarten to Trinidad and Tobago, as well of follow up on the TSTT/TTCAA/FAA on-site mission in San Juan (1 to 7 June 2014) and at the MEVA TMG/30 Meeting, highlighting that i) COMSOFT confirmed the readiness of the two radar lines for testing with end user equipment; ii) the radar agreement is under review by FAA; and iii) Trinidad and Tobago and Sint Maarten are to work on the radar sharing LOA.

4.3 Implementation of Radar Data Sharing Tasks

4.3.1 Under WP/13, the Secretariat recalled that the agreement for the Central Radar Data server and the agreement for sharing/using radar data between the E/CAR States and Territories, represent an important improvement on safety and efficiency on ATC situational awareness in the Region. Radar data sharing activities represent the commitment of the Region for achieving the foreseen ATM situational awareness improvements and promoting future improvements in air traffic control services.

4.3.2 The Meeting also recalled that the Surveillance Data Sharing Implementation Action Plan shall consider the recent events in radar data sharing matters, such as:

- The Request for Information (RFI) Process results
- The French donated CPUs implementation - hands-on experience and practical view for using radar data displays
- Availability of the radar data within the E/CAR AFS Network
- Availability of the MRT data in each user site
- Availability of Radar-Assisted-Situational-Awareness (RASA) guidance on OECS States
- Review of radar data coverage in the area (Antigua, Barbados, Guadeloupe, Martinique, Sint Maarten and Trinidad and Tobago)
- Radar data from United States sites
- Analysis of real radar coverage in States as done for Grenada and Saint Vincent and the Grenadines

4.3.3 Similarly, the Meeting reminded that in the Surveillance Data Sharing Implementation Action Plan, the following milestones should be included and reviewed:

- RFI E/CAR Radar Display process completion
- Radar Data sharing - Data integration
- Integration of Barbados Radar: January- March 2015
- Integration of Antigua Radar: June-December 2015
- Integration of Sint Maarten Radar: April- October 2015
- Evaluation of integrating United States radars: January-August 2015
- Other radar integration (Venezuela): March 2015-December 2015
- Installation of French donated CPUs: December-April 2015
- Configuration of switches for donated CPU installation: November- December 2014

(Maintenance visits)

- E/CAR radar display acquisition
- E/CAR Radar Display Tender- preparation of RFP: June-October 2015
- E/CAR RD Tender- process: January-March 2016
- E/CAR RD Selection: April 2016
- E/CAR RD Implementation: July-December 2016
- Preparation for Automatic dependent surveillance – broadcast (ADS-B) trials: October 2015-November 2016

4.3.4 Also, the Meeting noted that from the E/CAR/NTG/5 Meeting, it was agreed that the RDS Task Force shall conduct the recollection of the users' requirements and the development of the RFP document.

4.3.5 Some updates to the surveillance data activities since the E/CAR/NTG/5 and E/CAR/RD/3 Meetings are:

- Saint Kitts and Nevis completed their formal request for the French Donated CPU - Radar Data Displays
- Most French donated CPU installed in 2Q 2015
- MRT radar data and multicasting of the radar data is available in the E/CAR AFS Network
- ADS-B Trial conducted by Trinidad and Tobago: Automatic Dependent Surveillance – Broadcast (ADS-B) Implementation Meeting (ADS-B/IMP) Mexico City, Mexico, 27-29 April 2015
- Regional adoption of some ADS-B guidance like the ADS-B Station Technical Reference and the initial ADS-B Operational Concept (CONOPS) Document as adopted by the ANI/WG/2 Meeting
- Radar Data Sharing Group name changed to Surveillance Data Sharing Group

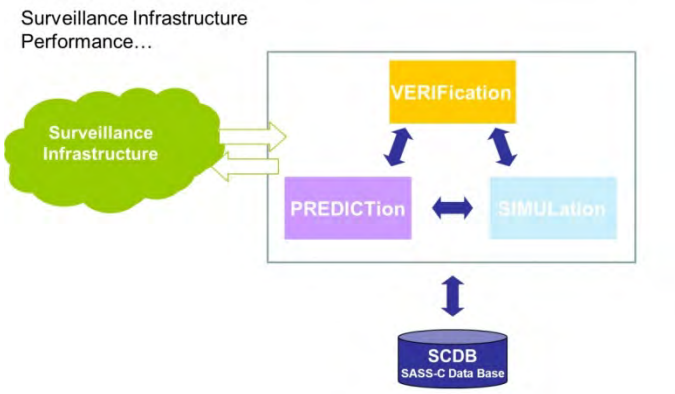
4.3.6 The Meeting provided a user´s feedback on the use of the recently implemented Radar data Displays using the French CPU. Antigua, Barbados, Dominica, Grenada, and Saint Kitts and Nevis indicated the usefulness and good tool for raising situational awareness on Air Traffic Control (ATC). Everyone thanked France for this valuable support and equipment provision.

4.3.7 The Surveillance Data Sharing Implementation Action Plan and the progress on surveillance activities shall be ready for its presentation to the E/CAR/DCA/26 Meeting by the E/CAR/NTG-RD Groups as committed in Decision E/CAR/NTG/5/12 item b).

4.3.8 The Meeting noted the need to ensure radar data quality and the media used for its provision into any ATC Automated System as a safety requirement. In this regard, it was noted that such safety assessment should be conducted by the respective Administration receiving the radar data by means of the ATC Automated assessment capabilities and preferable by independent supporting tools such as the surveillance data assessment applications, listing some examples as:

- RBAT (Radar Beacon Analysis Tool): RBAT is a PC Windows-based application used by, but not limited to, radar analysts, field technicians, and system maintenance personnel throughout the various FAA facilities. RBAT analyses Common Digitized (CD) and ASTERIX data extraction files. The extraction files contain radar and beacon data from radar systems such as ASR-9, ASR-11, TDX 2000, CD2, ARSR-3, and ARSR-4. The real time version of RBAT analyses and monitors a radar system in real time. The RBAT can record and analyse in real time multiples radar systems and Asterix CAT 001/048. The software is available at: http://www.faa.gov/about/office_org/headquarters_offices/ang/offices/tc/about/campus/faa_host/tnes/ATCSurveillance/software/rbat2/

- SASS-C (Surveillance Analysis Support System for ATC-Centre): SASS-C implements a comprehensive set of standardised methods and software systems for analysing the Surveillance Infrastructure performance. SASS-C implements three main functions:



✓ More details: https://eurocontrol.int/services/sass-c-surveillance-analysis-support-system-atc-centre

✓ For its use, an agreement needs to be signed. SASS-C allows the use with radar, ADS-B and MLAT data.

✓ In practice, for joined site acceptance test of surveillance feeds, RBAT analysis may be sufficient and evaluation using SASS-C can be done on the recording of the data.

4.3.9 ICAO also commented that three main tests may be carried on the radar feed on evaluation:

- Surveillance Analysis: coverage, detection probability and code detection
- Beacon false target summary: false targets and multiple false targets
- Nine point accuracy/transponder fixed accuracy: range and azimut precision

4.3.10 In this regard, the Meeting recommended the States/Territories interested in this surveillance data evaluation tools to implement these tools and notify the E/CAR/RD group of their results, adopting the following draft Conclusion:

DRAFT CONCLUSION
E/CAR/NTG/6-RD/4/7 SURVEILLANCE DATA EVALUATION TOOLS

That, in order to ensure radar data quality and for its provision into any ATC Automated System, E/CAR States/Territories:

a) conduct safety assessment by means of the ATC automated assessment capabilities including independent supporting tools;

b) consider the use of surveillance data evaluation tools such as RBAT and SASS-C, and the radar feed recommended tests; and

c) notify to the E/CAR/NTG - RD groups of the use of these tools and the results of the tests by **December 2016**.

4.3.11 Under IP/02, ECCAA commented on the approved guidance for using the radar display donated by France for situation awareness purposes and clarified that the existing training provided by France on the equipment is just for equipment usage and not for control.

4.4 Update of Automatic Dependent Surveillance - Broadcast (ADS-B)/Multilateration implementation in Barbados

4.4.1 Under WP/14, Barbados informed the Meeting of their Multilateration ADS–B project consisting of the following elements.

- Implementation of a Wide Area Multilateration and ADS-B system provided by SELEX using seven sites located primarily along the coastal areas of Barbados utilizing existing Mast and Infrastructure.
- Implementation of Tracking of operational vehicles on the surface of the Airport manoeuvring area.
- Upgrade /replacement of its existing Radar processing equipment with a Flight Data Processing System (FDPS) and Surveillance Data Processing System (SDPS) providing the facility to integrate and display data received from the Radar data server in Trinidad and Tobago.
- Provide Air Traffic Control with Safety Net Features consistent with the requirements of modern Air Traffic Management System.
- Due to the obsolescence of the ATOM system, an IDS System will be provided.

4.4.2 To date, initial software customization issues have been addressed with Barbados Air traffic Control and Selex. The project is currently approaching the Factory training and testing stage scheduled in early August 2015. It is expected that the operator Training phase occur by December 2015.

4.5 ADS-B trials: France and Trinidad and Tobago

4.5.1 Under WP/15, France recapped that the surveillance in French West Indies (FWI) is based on the use of two MSSR located on Guadeloupe and Martinique and on a MRT called Dakota. ADS-B is being tested in French Guiana by SNA/AG. One station could be installed in Martinique in 2016 to be used as a radars back-up. ADS-C is currently in use in French Guiana. Air Traffic Services Inter-facility Data Communication (AIDC) trials are planned for 2017 with Brazil and Dakar. ADS-C is not required in FWI.

4.5.2 In 2014 two studies were performed, one from Guiana ATS and one from Toulouse Civil Aviation Technical Center. The conclusions were that Multilateration (MLAT) was not a cost-effective solution in French Guiana, but a set of five ADS-B stations. The call for tender for the installation of five ADS-B stations is programmed for 2016. In the meantime, French Guiana is installing two Thales ADS-B stations for tests and to develop the concept of operations. Currently, no surveillance guidance nor separation is performed in French Guiana. Once the five stations have been installed, the two ADS-B stations could be used in Martinique and Guadeloupe in case of radars failure. In the meantime, Martinique will purchase one station for trials in 2016.

4.5.3 The Secretariat invited France to participate in the CAR ANI/WG ADS-B Task Force (TF) with their ADS-B activities for 2016. France accepted the invitation and will contact the ADS-B TF Rapporteur through ICAO.

4.5.4 ADS-C/CPDLC is in use in French Guiana since May 2011 with FANS1/A equipped airplanes. With these flights, CPDLC is the primary mean for communication. High Frequency (HF) is still in use with others (HF antennas have been renewed in 2010 for 3 M$). Trials should be performed in 2017 to test and activate AIDC with Brazil and Dakar. No ADS-C/CPDLC is planned for FWI.

4.5.5 Under WP/16, Trinidad and Tobago informed of the acquisition of a DO 260A ADS-B receiver with the ATM System upgrade. The receiver and the associated antenna are installed. Initial trials were conducted in October 2013 with the following objectives:

- Verification of the ADS-B static data utilizing both the ICAO flight plan information and radar tracks
- Verification of the ADS-B antenna range via quadrants
- To determine if airline operators are filing their correct equipage

4.5.6 The analysis of the data showed that approximately 55.5% of the aircraft which operates within the coverage of Piarco ADS-B antenna are ADS-B/Mode S equipped. The percentage of aircraft operators which filed incorrect flight plan is approximately 40%. The coverage of the single antenna for overflights ranged from 60 to 200 NM.

4.5.7 An internal ADS-B Task Force was created in Trinidad and Tobago as a result of the attendance to the ICAO/FAA Workshop on ADS-B and Multilateration Implementation (ADS-B/IMP) Mexico City, Mexico, 19 to 22 May 2014 and the Automatic Dependent Surveillance – Broadcast (ADS-B) Implementation Meeting (ADS-B/IMP) Mexico City, Mexico, 27-29 April 2015. The following matters are under consideration in order to move forward with the implementation of ADS-B in the Piarco FIR:

- Regulations and Procedures for Approval
- Service Delivery using ADS-B Out
- ADS-B related Aeronautical Information Publication (AIP)
- Reporting of avionics anomalies
- Operating standards in the FIR (DO 260, DO 260A, DO 260B) and considering that United States (FAA) will adopt DO260B as their standard by 2018
- ATM processing System
- ASTERIX category and version to be used

4.5.8 Discussions have been initiated by Trinidad and Tobago with a vendor for an ADS-B trial with a receiver at one of the Very High Frequency (VHF) (30 to 300 MHz) high sites in addition to the one at Piarco FIR. One of the projects planned for this year is the implementation of a combination of ADS-B/MLAT to provide surveillance in the South sector and ADS-B in the continental airspace of the Piarco FIR. This could leverage the existing infrastructure at the VHF high sites in the Eastern Caribbean and utilize the existing E/CAR Aeronautical Fixed Services Network as the medium of transport to provide better surveillance in the continental airspace. Where terrain poses a hindrance, multiple receivers could be used to offer better low altitude surveillance. High altitude coverage would be less affected by terrain since the reception is expected on line of sight.

4.5.9 The data obtained from this expanded ADS-B/MLAT project could be incorporated into the Piarco MRT for improved surveillance coverage and redundancy. Aircraft equipage for ADS-B is still not at 100 % in all Regions; however, for operations in the FAA NAS and European airspace there is a mandate to be compliant (DO-260B) by 2020. Consequently, these aircrafts would have the required equipment since a significant amount of traffic have US and European origins/destinations ADS-B requirement in the Piarco FIR would be fulfilled.

Agenda Item 5 Radar Data Display Request for Proposal (RFP)

5.1 Definition of Proposal

5.1.1 Under WP/17, the Meeting highlighted that the E/CAR States and Territories recognized that surveillance data sharing provides many operational benefits to aircraft operations, Air Traffic Management (ATM) and safety improvements. Surveillance data sharing will bring to the air traffic environment benefits, such as increased surveillance coverage, which directly impacts airspace capacity and efficiency aiming a reduction in aircraft separation and improved safety. It will provide redundancy within areas where nearby surveillance systems overlap. It will also reduce traffic congestion and improve harmonization in ATC operations with neighbouring States.

5.1.2 Similarly, under the radar data sharing activities, the provision of Surveillance Data Processor (SDP) is to be implemented as end-user equipment within the Eastern Caribbean States as agreed in the Radar Data Sharing Implementation Plan. This initiative is intended to provide Radar-Assisted Situational Awareness (RASA) to controllers in order to enhance the provision of procedural air traffic control service as recognized by the E/CAR/DCA/25 Meeting. The Meeting recalled that the RASA programme involves two phases:

- **Phase 1** - donation of surplus used computer CPUs by France that are already programmed to receive the data per the systems installed in Saint Lucia, which are intended to test the system on a relatively short-term basis.
- **Phase 2** - State acquisition of permanent SDP systems for either medium-term continuation of RASA (as decided by the States), or in the case of Antigua and Barbuda, in conjunction with the intended implementation of its own radar control service.

5.1.3 For Phase 2, a RFI Process was agreed to search market potential radar data display for medium-long term solution. The interested vendors were requested to provide a presentation of their proposal to the E/CAR Radar Data Sharing Ad-Hoc Group Meeting in Guadeloupe, French Antilles in October 2014. Each vendor provided a presentation to the E/CAR/RD/3 Meeting and answered questions from the participants. Having seen the presentations and the questions and answers made with the RFI presentations, the following conclusions were agreed by the RD Group:

a) maintain a scalable solution from single display to more automated functions (tracker, Flight Data Processing (FDP), etc);
b) data Quality of Service (QoS) or Questions and Answers (QA) to be incorporated; and
c) each State/Territory needs to clearly define the way forward regarding automation.

5.1.4 Based on the information obtained from the RFI responses, the draft technical specifications for the Request for Proposal were presented in Appendix of WP/17. The Meeting reviewed the draft and accepted the version 0 as attached in **Appendix B** to this report. In this regard, the following decision was adopted:

DECISION
E/CAR/NTG/6-RD/4/8 E/CAR RADAR DATA DISPLAY RFP DOCUMENT

That, in order to continue the review and complete the end user requirements and the RFP process to be adopted by the E/CAR area, the E/CAR States/Territories involved in the Radar Data Display RFP process use as reference the version 0 of the E/CAR Radar Data Display RFP document (Appendix B to the E/CAR/NTG/6 Report).

5.2 Definition and Revision of RFP Process

5.2.1 Following the E/CAR/DCA mandate for Radar Data Sharing and improvement to situational awareness, the E/CAR/RD/3 Meeting agreed that the following milestones would be included in the update to the Radar Data Implementation Plan concerning the E/CAR radar display acquisition:

- E/CAR Radar Display Tender- preparation of RFP: June-October 2015
- E/CAR RD Tender- process: January-March 2016
- E/CAR RD Selection: April 2016
- E/CAR RD Implementation: July-December 2016

5.2.2 From the analysis of the E/CAR Radar Data Display Proposals received in the RFI Process, each State/Territory was urged to clearly define the way forward regarding automation and that for the RFP process, a scalable solution from single display to more automated functions (tracker, FDP, etc.) should be included.

5.2.3 For the RFP Process, several options can be performed based on the States' needs and formal requirements. One option is to have the acquisition and performance of the RFP Process as a regional Project to ensure that all requirements are accomplished as defined in the RFP document and under a neutral environment for the evaluation and selection process, the installation and with support from ICAO. A briefing of the ICAO procurement process with the four phases was presented in Appendix to WP/18.

5.2.4 The Meeting requested to push back the dates previously agreed for the E/CAR radar display acquisition by three months after reviewing the progress on the RFP process preparation and considering that:

- most of the end user requirements are still to be reviewed
- lack of knowledge on required radar display requirements exists. Need for more time to use French donated CPUs to become familiar with the equipment
- OECS involved States/Territories in the need to confirm with their Administration the necessary budgets and timelines for this implementation, as well as on their national planning considerations
- the need to have a specific person from each involved Administration to facilitate the necessary information to complete the RFP document

5.2.5 The Meeting highlighted that States/Territories planned for the Radar Display RFP are the OECS currently implementing the French CPUs. Antigua and Barbuda informed that their Administration have plans for reactivating the radar system. Saint Lucia informed that they are interested to continue their current collaboration with France.

5.2.6 The following Points of Contact (PoCs) were defined for updating the RFP and include the end user requirements:

State/Territory	Point of Contact for RFP update/user requirements
RFP participants	
Dominica	Jean Williams
Grenada	Roselyn Charles
Nevis	Daron Sutton
Saint Kitts	Daron Sutton
Saint Lucia	Remy Lambert
Saint Vincent and the Grenadines	Corsel Robertson
Anguilla	TBD
Montserrat	TBD
Supporting entities for RFP	
Antigua and Barbuda	Shenneth Phillips
Barbados	Suzanne Griffith
France	Jean-Jacques Deschamps
Trinidad and Tobago	Veronica Ramdath
United States	Raul Chong
ECCAA	Rudyard Ashe
ICAO	Julio Siu

5.2.7 ECCAA informed that they will work with their OECS to confirm by **30 October 2015** their formal commitment for the RFP process, the best RFP process to use and to determine and advise if this can be done as one project or as individual projects. Trinidad and Tobago and ICAO offered support to explain the RFP requirements and process to States' Administrations, in order to provide States more experience with surveillance (IRMA CPU) and to allow Antigua and Barbuda to confirm the timelines of their radar procurement.

5.2.8 TTCAA will hold one to one videoconferences with Dominica, Grenada, Saint Kitts and Nevis, Saint Vincent and the Grenadines to share operational experiences to assist in the compilation of operational user requirements. Subject matter experts, Antigua, Barbados, France, Trinidad and Tobago and United States, will provide support in this sharing activity. Teleconferences will start in August and run through December 2015. In this regard the following draft conclusion was adopted:

DRAFT CONCLUSION
E/CAR/NTG/6-RD/4/9 NEW E/CAR RADAR DATA DISPLAY ACQUISITION RFP MILESTONES

That, in order to allow the E/CAR States/Territories involved in the Radar Data Display RFP process to include their end-user requirements and express their formal commitment:

a) ECCAA coordinate with their OECS States/Territories for a formal commitment and process chosen for conducting the RFP process and inform the E/CAR/RD and ICAO by **30 October 2015** of this commitment;

b) Trinidad and Tobago conduct teleconferences with each involved OECS State/Territory for explaining the radar data display and the end user requirements to be defined starting 1 August 2015; and

c) E/CAR States/Territories involved in the Radar Data Display RFP process to conduct the RFP process with the following new milestones:

- E/CAR Radar Display Tender- preparation of RFP: October 2015-January 2016
- E/CAR RD Tender- process: March - June 2016
- E/CAR RD Selection: July 2016
- E/CAR RD Implementation: October 2016-March 2017

5.2.9 To fulfil these new milestones, it was agreed that:

- a RDS Evaluation commission be formed to support the RFP Process
- a 3 day-meeting at the ICAO NACC Regional Office will be held for the evaluation and recommendation of the best proposal
- the RDS Evaluation commission creation and the expected meeting shall be defined through a teleconference before the E/CAR/DCA/26 Meeting, once ECCAA informs on the OECS States/Territories formal commitment
- Results of the RDS Evaluation Commission will be presented in E/CAR/NTG/7 and E/CAR/RD/5 Meetings

Agenda Item 6 Update of E/CAR/NTG and RDS Terms of Reference and Work Programme

6.1 Under WP/19, the Meeting recalled that the annual E/CAR/NTG meetings have proven to be very productive and effective, rapidly solving problems like the original E/CAR AFS Network issues; implementation of the MPLS Network; implementation of failure reporting features; coordination on new services implementation; establishing awareness on Network health, changes and expansion. Similarly, the joint execution of these meetings with the Radar Data Sharing Ad hoc Group activities has also demonstrated to be an efficient and cost-effective implementation tool.

6.2 During the last E/CAR/NTG Meeting, the E/CAR States/Territories recognized that the E/CAR AFS communication network and RDS tasks will be key components for the Aviation System Block Upgrades (ASBU) implementation, and so, Decision E/CAR/NTG/5/15 - *Update the E/CAR/NTG And RDS Work Programme and Terms Of Reference aligning them to the RPBANIP and ASBU Methodology* was adopted. In this regard, an updated work programme and Terms of Reference (ToRs) for the E/CAR/NTG were agreed as presented in **Appendix C** to this part of the report. The following Draft Conclusion was adopted:

DRAFT CONCLUSION
E/CAR/NTG/6-RD/4/10 APPROVAL OF E/CAR/NTG TERMS OF REFERENCE AND WORK PROGRAMME

That, E/CAR/NTG Terms of reference and Work programme as shown in Appendix C are considered approved.

6.3 The CNS Committee of the Eastern Caribbean Civil Aviation Technical Group (E/CAR/CATG) shall amend the tasks assigned to the radar data sharing Ad Hoc Group now relating them as Surveillance data activities in line with the NAM/CAR Regional Performance-Based Air Navigation Implementation Plan (RPBANIP) and ASBU methodology.

6.4 In accordance with the rotational scheme. Saint Kitts and Nevis confirmed hosting the next E/CAR/NTG/7, E/CAR/RD/5 and E/CAR/CATG/3 meetings in 2016, tentatively for July/October 2016. E/CAR/NTG and the E/CAR/CATG meetings will be held consecutively.

Agenda Item 7 Other Business

7.1 Under WP/20, the Secretariat informed that during the ANI/WG/2 Meeting, States were recalled of their support for the ICAO position for the World Radiocommunication Conference (WRC)-2015, emphasizing the ICAO and the NAM/CAR Regions support to this position, the recent ICAO activities for assisting the States are as follows:

a) ICAO participation in the Interamerican Commission of Telecommunication (CITEL) meetings like the XXIV Meeting of the Permanent Consultative Commission: Radio communications (XXIV PCC.II) (Merida, Mexico) and the XXV Meeting of the Permanent Consultative Commission II: Radio communications (XXV PCC.II) (Medellin, Colombia);

b) keeping State Points of Contact (PoCs) list in support of the ICAO WRC-15 Position for coordination and mutual support;

c) keeping the Regional Frequency Assignment List available for States and general public: ICAO Website: http://www.icao.int/NACC/Pages/frequency.aspx.; and

d) the results from the MEVA/TMG/30 Meeting for the registration of the Very Small Aperture Terminal (VSAT) nodes in the ITU master register

7.2 The Meeting noted that at the most recent CITEL meeting held in Medellin, Colombia (XXV PCC.II), and although some supports to ICAO position were completed, such as: flight tracking initiative and the Agenda Items 1.7 and 1.17; the participation of the Civil Aviation Authorities from the CAR Region was very low. The next CITEL meeting is scheduled for August 2015 in Ottawa (XXVI PCC.II).

7.3 Finally, it was informed that the ICAO position as introduced in 2013 will in all likelihood have some updates in time before the WRC-15. None of the updates will however change the position; they will merely be clarifications in light of studies within ICAO and International Telecommunication Union (ITU-R). In light of this new update, States are urged to coordinate this information with their corresponding Spectrum regulators, following the Conclusion NACC/WG/4/5 - *Active Support from States for ICAO ITU WRC2015 Position*, as well as the following ANI/WG/2/2 conclusion:

CONCLUSION ANI/WG/2/2 COORDINATION FOR UPDATED VERSION OF THE ICAO WRC-2015 POSITION.

That in order to ensure an effective coordination for the support of the ICAO Position for WRC-2015 considering the update of this position by ICAO NAM/CAR States:

a) timely coordinate that this update of the ICAO Position is shared with their national Spectrum regulators; and

b) attend as possible, with their National Spectrum Regulators to attend the last 2015 Regional CITEL (Ottawa, Canada, August 2015) and vote for the Interamerican proposals related with the ICAO position

7.4 The Meeting agreed to support ICAO Position, particularly on the C-band use, considering that the E/CAR area is interconnected with the adjacent FIRs by Very Small Aperture Terminal (SAT) networks (REDDIG, MEVA and AFISNET for Dakar).

APPENDIX A

FOLLOW - UP TO CONCLUSIONS AND DECISIONS - FIFTH EASTERN CARIBBEAN NETWORK TECHNICAL GROUP MEETING (E/CAR/NTG/5) AND THIRD EASTERN CARIBBEAN RADAR DATA SHARING ADHOC GROUP MEETING (E/CAR/RD/3)

Conclusion/Decision	Description	Follow-up	Status
DECISION E/CAR/NTG/5/1 EVALUATION OF CONCLUSIONS AND IDENTIFICATION OF CONTRIBUTIONS FOR E/CAR/CATG AND E/CAR/DCA MEETINGS	That, in order to provide the timely support from the E/CARNTG and the E/CAR/RD on the valid conclusions related to the E/CAR AFS Network formulated by the E/CAR/CATG/01, E/CAR/DCA/25 Meetings, ANI/WG/01 and NACC/WG meetings, that France, United States and the E/CAR/NTG Rapporteur evaluate these conclusions and identify the possible contributions from the E/CARNTG and the E/CAR/RD to be reported to the E/CAR/CATG and E/CAR/DCA 2015 Meetings.		Completed
CONCLUSION E/CAR/NTG/5/2 IMMEDIATE SOLUTION TO ANGUILLA CATASTROPHIC FAILURE	That, in order to implement the immediate actions to solve the catastrophic failure in Anguilla, a) ASSI, ECCAA, TTCAA and Anguilla to conduct technical evaluation visits of the Anguilla's facilities housing the E/CAR AFS equipment for identifying improvements; and b) Anguilla take the necessary actions to restore the E/CAR AFS equipment functionality	(a) Technical visits were conducted by TSTT, ECCAA and TTCAA. Improvement identified and implemented – the equipment rack was relocated to another space in the same equipment room, all doors and windows are sealed. (b) Anguilla has provided the necessary funds based on a proposal from TSTT for the replacement of the routers and the UPS. The equipment has been purchased, configured and sent to Anguilla on June 30, 2015. When cleared from customs TSTT/TTCAA will go to Anguilla to install and test.	Completed
CONCLUSION E/CAR/NTG/5/3 IMMEDIATE RESTORATION OF ECAR AFS NETWORK NODE REDUNDANCY IN ST. KITTS	That, in order to restore the node redundancy for the replacement of the failed equipment in Saint Kitts, a) Trinidad and Tobago to submit end by 30 October a letter to ECCAA on the risk and critical situation due to the lack of the router replacement; b) ICAO to submit a letter to St. Kitts immediately after TTCAA´s letter; and c) St. Kitts to report back by 30 November on the actions taken to conduct this replacement.	(a) A teleconference was held with ECCAA which was followed up with a letter detailing the failure and the implications. (b) The letter by ICAO was submitted. (c) Due to the length of time elapsed since the proposal from TSTT was submitted for the replacement router, a revised proposal was sent to St. Kitts on May 28, 2015. Saint Kitts and Nevis informed the Meeting that the necessary funding is being provided and in conclusion the second router is expected to be provided and installed by TSTT by November 2015.	Completed

Conclusion/Decision	Description	Follow-up	Status
DECISION E/CAR/NTG/5/4 PENDING MAINTENANCE ACTIONS BY TSTT	That, in order to carry out the pending maintenance actions related with the E/CAR AFS Equipment, TSTT: a) Provide the Guadeloupe and Antigua backup routers during the maintenance visit scheduled for Nov-Dec 2014; and b) During the maintenance visit resolve the backup routing table to allow automatic backup for Martinique	(a) The Antigua and the Guadeloupe secondary routers were replaced. (b) TSTT to respond.	Completed
CONCLUSION E/CAR/NTG/5/5 E/CAR AFS NETWORK CONTINGENCY PROCEDURES	That, in order to make official and homogeneously apply the E/CAR AFS Network contingency procedures, E/CAR AFS Members implement by the E/CAR/DCA/26 Meeting, the network contingency procedures, incorporating them in their operational procedures.		Superseded
DECISION E/CAR/NTG/5/6 SNMP TOOL FOR LOCAL EQUIPMENT SUPERVISION	That in order to improve local supervision of the equipment, a) France to conduct a feasibility study into the development of the supervision tool; b) Trinidad and Tobago will provide the applicable information (MIBs) as required for the tool development; and c) Report on the progress of the SNMP Tool by next ECAR/NTG Meeting	France explained the SNMP tool and committed to provide the software and manuals for any State/Territory to implement the local solution. These requirements shall be coordinated through PIARCO for the necessary access to the MIBs.	Completed
DECISION E/CAR/NTG/5/7 ECAR AFS NETWORK MAINTENANCE ACTIONS	That, in order to conduct the appropriate maintenance actions of the E/CAR AFS Network: a) Trinidad and Tobago: • Informs at least with a two-weeks' notice of the maintenance dates; • Provide more detailed feedback to all failure reports in the TopDesk application; and b) TSTT to provide: • Breakout of faults regarding power failures • Availability statistics	From the Meeting evaluation on the network performance, improvements have been implemented.	Completed

Conclusion/Decision	Description	Follow-up	Status
DECISION E/CAR/NTG/5/8 COMPLETION OF E/CAR AFS NETWORK STANDARD OPERATIONS PROCEDURES (SOP):	That, in order to complete the SOP and start it application, the E/CAR/NTG Rapporteur to finalize the compilation of the E/CAR AFS network Standard Operations Procedures (SOP): MPLS maintenance procedure and service level of agreement including the inputs from United States, France, ECCAA and TSTT and present this final draft document at the follow up teleconference in February 2015.	Work is on-going on this activity with a draft document to be available for review by October 2015.	Valid
DECISION E/CAR/NTG/5/9 IMPLEMENTATION CONSIDERATIONS FOR RADAR DATA DISPLAYS WITH CPUS PROVIDED BY FRANCE	That, to facilitate the implementation of the Radar Data Displays based on the France provided CPUs that Antigua and Barbuda, Dominica, Barbados, Montserrat and St. Kitts and Nevis ensure the availability of the monitor and comply with the installation considerations proposed by France.	Displays were provided and implementation completed for Antigua, Dominica, Barbados, Grenada, Montserrat, Saint Kitts and Nevis.	Completed
CONCLUSION E/CAR/NTG/5/10 AVAILABILITY OF FRENCH RADAR DATA BY E/CAR STATES/ TERRITORIES	That, to make the French Radar data available to any E/CAR State/Territories through the E/CAR AFS Network, France submits to Trinidad and Tobago, a letter with this allowance by 30 October 2014	Dakota Radar data is available in the network.	Completed
DECISION E/CAR/NTG/5/11 ANTIGUA AND BARBUDA RADAR RESTORATION ACTIVITIES	That Antigua and Barbuda reports no later than 30 November 2014, the activities and planning for the restoration of their radar system.	Antigua reported that this radar restoration is still ongoing and will report any news when Administration´s approval is provided.	Completed
DECISION E/CAR/NTG/5/12 SURVEILLANCE DATA SHARING IMPLEMENTATION ACTION PLAN	That, to show the latest progress and next future action on surveillance matters, France, Trinidad and Tobago, United States, and ECCAA to develop an update for the surveillance data sharing action Plan including the agreed milestones by: a) Drafting this update for the next Radar Data Sharing teleconference of January 2015; and b) Complete this update for its presentation for the E/CAR/DCA/26 Meeting	a) The surveillance data sharing action plan with the agreed milestones remains unchanged after review. A draft Action Plan was presented. b) will be prepared for the E/CAR/DCA/26 Meeting.	a) completed b) Valid

Conclusion/Decision	Description	Follow-up	Status
DECISION E/CAR/NTG/5/13 E/CAR/NTG SUPPORT TO ICAO WRC-2015 POSITION	That, in order to support the ICAO position for WRC-2015, the ECAR/NTG members: a) Contact their National Spectrum Manager Authorities for communicating the ICAO WRC-2015 position including the support on the C-Band protection for aviation; b) Coordinate with corresponding State WRC-2015 PoC, the State support to CITEL proposals in line with ICAO WRC-2015 position; and c) Report your progress on a) and b) in advance to the last 2 CITEL meetings.	Undertaken by Conclusion ANI/WG/2/2	Completed
CONCLUSION E/CAR/NTG/5/14 INCLUSION OF ADS-B IMPLEMENTATION ACTIVITIES AND RENAMING OF RADAR DATA SHARING GROUP	That, in order to support the implementation of ADS-B, the Radar Data Sharing Group: a) Include the necessary tasks in their work programme for assisting the ADS-B implementation (trial conduction, etc.); b) Exchange the State ADS-B plans for regional coordination; c) Update the group name to Surveillance Data Sharing Group; and d) Update the Group´s terms of reference and implementation plan as needed;	(a) The RD group is only interested in the final ADS-B product available from States. The CNS Committee is available to assist any State requiring assistance with trials. (b) States provided their information (c) This rename has been agreed. (d) To be updated at the CNS Action Plan.	Completed
DECISION E/CAR/NTG/5/15 UPDATE THE E/CAR/NTG AND RDS WORK PROGRAMME AND TERMS OF REFERENCE ALIGNING THEM TO THE RPBANIP AND ASBU METHODOLOGY	That, in order to align the E/CAR/NTG and RDS activities with the ICAO ASBU methodology, the ECAR/NTG and RDS updates by the E/CAR/DCA/26 Meeting, the E/CAR/NTG and RDS work programme and terms of reference aligning them to the RPBANIP and ASBU methodology	Done in new proposal to be presented to the E/CAR/DCA/26 Meeting.	Superseded

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APPENDIX B
REQUEST FOR PROPOSAL (RFP)
SURVEILLANCE DATA PROCESSOR AND RELATED RADAR DATA DISPLAYS

1. INTRODUCTION

1.1 Surveillance data sharing provides many operational benefits to aircraft operations, air traffic management and safety improvements. Surveillance data sharing will bring to the air traffic environment benefits such as increased surveillance coverage which directly impacts on airspace utilization and efficiency by permitting a reduction in aircraft separation and improved safety of operations. It will provide redundancy within areas where nearby surveillance systems overlap. It will also reduce traffic congestion and provide improved homogeneity in ATC operations between neighbouring states.

1.2 Within the Eastern Caribbean, the radar data sharing tasks are assigned to be followed-up by the E/CAR CNS Committee in the form of the E/CAR/RD group. In addition to radar, surveillance now embraces Automatic Dependent Surveillance - Broadcast and Contract (ADS-B and ADS-C).

1.3 Trinidad and Tobago is host to the radar data server. The PIARCO Air Traffic Management (ATM) system is able to provide a maximum of twenty-four (24) (serial) outputs or multiple outputs via LAN with IP addresses. The data will be provided as System Track (ASTERIX Category 62 standard) data format. For this purpose, a gateway comprised of dual Dell servers is integrated into the system. The surveillance data output will be centered on the same system centre of the PIARCO ATM system. The gateway will provide the output through a serial line, which will be split by means of a passive data distributor.

1.4 To achieve this initiative, Trinidad and Tobago will collect the surveillance data, as and when, it becomes available from States, process the data via multi sensor fusion on the PIARCO ATM system and then disseminate the data to the E/CAR states via the E/CAR Aeronautical Fixed Services (AFS) network.

2. SCOPE AND OBJECTIVE OF THIS DOCUMENT

2.1 The scope and objective of this document is the provision of a Surveillance Data Processor (SDP) per State and its related Radar Data Displays as shown in Table 1. The provision shall include the Design, Supply, Delivery, Installation, Testing and Commissioning to be implemented as end-user equipment within the Eastern Caribbean States. The local site requirements shall be defined based on each site specific environment based on the bidders mandatory site survey.

2.2 The SDP shall be able to process and display the Piarco Multi Radar Tracker (MRT) output with correlated (flight Plan information) and non-correlated radar tracks. The MRT will comprise of a fusion of all the available surveillance sources. **Table 1** below shows the participating States and the number of positions/displays required:

State/Territory	No. of Positions/ Displays	Site
Anguilla	1	Airport Control Tower
Antigua	2	(1) Airport Control Tower (1) Approach Control Room
Dominica	1	Melville Hall: Airport Control Tower
Grenada	2	Maurice Bishop: (1) Airport Control Tower (1) Approach Control Room
Montserrat	1	Airport Control Tower
Nevis	1	Airport Control Tower
Saint Lucia	2	Hewanorra: (1) Airport Control Tower George Charles: (1) Airport Control Tower
Saint Vincent	1	Airport Control Tower

2.3 The interface to the AFS Network at each User State shall be via TCP/IP on an IP port of the AFS Cisco router. Router configurations, if any, shall be under the responsibility of the TTCAA.

2.4 The project will be implemented as a turn-key regional project with on-site installation support provided by the local technicians and management of the project by a committee to be composed of user States.

3. GENERAL REQUIREMENTS

3.1 The solution shall be scalable. It should be presented to allow the end user State to start from the most basic system (a single ATC display of the Piarco MRT data) and expand as desired to a full system with ATM functionalities including modules of billing, flight data processing, ability to add data inputs independent of the Piarco MRT, recording and playback functions.

3.2 The solution should be independent of the Piarco ATM system, that is, it should rely only on the MRT data and not on any other processing of the Piarco ATM System.

3.3 This system shall have an open architecture design and high performance characteristics. Key requirements are its adaptability and scalability to suit any air traffic management environment. The system shall provide a cost effective and low-risk solution for the air traffic management automation needs.

3.4 All designs, materials, manufacturing techniques and workmanship shall be in accordance with the highest accepted international standards for this type of equipment.

3.5 The eventual winning tenderer (hereafter referred to as the Supplier) shall be responsible for the installation and commissioning of all the equipment and elements covered by this specification, including all accessories, cables, cabinets, supports and other necessary installation materials/elements. The Supplier shall also provide the manpower, technical administration, materials, equipment and special tools needed to complete the work.

3.6 The System hardware shall be based on COTS (Commercial Off-The-Shelf) hardware components, available on the market place, and already used for similar critical systems.

4. PROJECT SERVICES

4.1 Project services shall include but not be limited to the following:

a) Project and Quality Management;
b) Factory Acceptance;
c) Delivery of equipment;
d) Site installation, Interoperability and Acceptance Tests;
e) Training;
f) Spares recommendation; and
g) Warranty Services.

5. RISK MANAGEMENT

5.1 The Supplier shall establish as part of the Project Management Plan a risk management process to manage risks throughout the programme and addressing risk identification, risk assessment, risk avoidance and/or mitigation and risk control. Risk assessment shall be monitored during progress Meetings.

6. PROGRESS REVIEWS AND REPORTS

6.1 Progress reviews will be held as defined based on the duration of the project. If needed, customer participation will be requested via phone or videoconference methods. A progress report will be issued after each progress review.

7. CUSTOM CLEARANCE AND PACKAGING

7.1 The equipment shall be delivered according to DAP conditions (Incoterms 2011 -Delivered at Place) to the end user (Seller bears cost, risk and responsibility for cleared goods at named place of destination at buyer’s disposal. Buyer is responsible for unloading. Seller is responsible for import clearance, duties and taxes.)

8. PACKAGING

8.1 The goods to be delivered shall be new, manufacturer’s original and compliant with the specifications and indicated tolerances herein.

8.2 The Supplier shall bear responsibility that the delivered goods shall be packed and sealed and clearly marked with sufficient details for their identification. The packaging shall provide guaranteed protection of the equipment against unfavourable weather conditions and other factors that might affect the quality of the equipment even for prolonged storage periods. Regardless of the form of shipment, all indispensable facilities for the proper handling of the packages shall be provided.

8.3 The packaging to be used for the transport of the equipment and/or materials from the factory to the port of entry into the user States shall follow standard factory practices for long-distance carriage.

8.4 Prior to packing, the goods shall be subjected to the necessary factory acceptance tests to verify the quality and compliance with the technical requirements.

8.5 The spare parts shall be supplied in their original packing, duly protected against humidity with dehydrating or silica elements. Each set of spare parts shall be labelled with the part number and denomination of the item, with an indication of the quantity in each package.

9. SYSTEM INSTALLATION

9.1 The Supplier shall describe briefly the site layout he foresees in his proposal, taking into account the necessary room for access of the hardware maintenance team. Environment conditions required and power consumption of the whole system shall be stated.

9.2 The Supplier shall state clearly which part of the installation he will be responsible for, and which responsibility is expected to be taken by the user State regarding installation matters.

9.3 The Supplier shall clearly state the preparation activities that need to be performed by user State prior to installation.

10. WORK STATEMENT

10.1 Notwithstanding the information supplied in this document, the Supplier shall conduct a site visit, at his own expense, to determine the appropriate locations of all systems involved and shall provide the user States with a site survey report and adequate illustrations and drawings. Not conducting a site visit does not diminish the responsibility of the Supplier from fulfilling all the conditions of this document.

11. MAINTENANCE PROCEDURES AND STANDARDS

11.1 The Supplier shall submit with his proposal, the regular procedures and methodologies for maintenance of the equipment. The procedures shall be in accordance with established standards and shall include administrative procedures and method of spare parts management.

12. REDUNDANCY, FAULT TOLERANCE AND RECOVERY

12.1 One of the major requirements of the System is to guarantee continuous processing. High availability equipment is required.

12.2 The Supplier shall explain how the hardware fault-tolerant feature is assured and state how redundancy, fault tolerance and recovery will be achieved to protect against service degradation.

12.3 Fault tolerant shall be understood as a group of similar entities equipped with automatic mechanisms that support each other in case of failure and/or when any element of the group is out of service, with the purpose of providing continuity in the operation of services provided. The operation of these mutual support mechanisms should not produce any interruption in the operation or in the services provided.

12.4 Redundant shall be understood as the implementation of the fault tolerance measures employing identical entities.

12.5 Independent entities (for example: equipment, ports, circuits etc.) shall be understood as entities that are physically independent of each other and that do not use a common element.

12.6 Redundant equipment shall be understood to be a physical entity supplied in a common chassis that has redundancy in its common parts and that permits change of common parts without disruption in service.

12.7 Simple equipment shall be understood as a physical entity supplied in a common chassis that do not have redundancy in its common parts.

12.8 In the instance that some components of the Systems are not hardware fault-tolerant the impact on operation of the failure of such components shall be described including the procedures to restore the components to operation.

12.9 In the event that the System includes hardware fault-tolerant units (typically the servers) and unit of active/standby configuration, the requirements stated above shall apply to only the functions supported by the units concerned.

12.10 The Supplier shall propose a design with no **Single Point of Failure** (SPOF) and systems shall have high availability architecture (excluding software).

12.11 The configuration of the system shall permit planned periodical tests of the backup equipment or in the duplicated part of the redundant equipment for the purpose of verifying its operability. These tests shall not adversely affect the service of the System.

13. SYSTEM RELIABILITY, AVAILABILITY AND MAINTAINABILITY

13.1 System Reliability

13.1.1 The System will be considered to have failed when it does not give any support for the execution services, such operational inactive mode being not the result of a deliberate maintenance action.

13.1.2 Itemised reliability figures of the critical hardware components (MTBF and MTTR) shall be provided.

13.1.3 The Supplier shall describe the scenario where the System cannot restart automatically following a System failure, for example: Failure of the power supply; or a software error that prevents the System from restarting, and describe specifically how the System can be restarted.

13.1.4 The User States intend to place a two–year maintenance contract with the Supplier. Therefore, the Supplier shall declare his willingness to support a maintenance contract after the warranty has ended.

13.2 Hardware Maintainability

13.2.1 The Supplier shall describe how the hardware and software maintenance will be conducted during the warranty period. When submitting this plan, the Supplier shall bear in mind that the user States shall carry out first-line hardware maintenance, including Line Replaceable Unit (LRU) swapping. The appropriate training shall be provided.

13.2.2 The Supplier shall propose a list of spare parts he estimates necessary to keep the System at the level of availability stated above.

13.2.3 The Supplier shall state the turn-around time of failed hardware components during the warranty period. It shall be detailed whether the time stated is valid during week-ends and holidays.

13.3 Software Maintainability

13.3.1 The Supplier shall give a detailed description on:

a) The services offered for software maintenance during the warranty period (e.g. how a software problem can be investigated, fixing of bugs, System restart with a new application software release);
b) The availability of those services (office hours, at night, during the week-end); and
c) The split of responsibility between the Supplier and the User States.

13.3.2 The Supplier shall include in his proposal the facility to provide remote maintenance support. This may consist for instance in accessing the System over the Internet to log into the system and perform investigation of software faults as if the supplier was on site.

14. TECHNICAL SPECIFICATIONS

14.1 The SDP shall be supported by a state-of-the-art COTS computer, and a high resolution Traffic Situational Flat Panel colour monitor of raster scan type non-interleaved, for monitoring traffic at and in the vicinity of the airfield, having as a minimum 1024 X 1024 pixels, typically 21 inches, with accompanying keyboard and mouse or track ball.

14.2 The workstation computers, as a minimum, shall consist of a state of the art processor (3GHz), be equipped with an 80GB hard drive, a DVD drive, 2 GB of RAM.

14.3 Latest commercially available equipment with special emphasis on locally acquirable within or close to the E/CAR region

14.4 Interfaces: Serial interface (HDLC), as well as Ethernet (UDP/IP) should be available for data acquisition.

14.5 The equipment shall have a menu to allow the operator to modify the different parameters such as brightness, tones, range, label size, colour, content of the information presented in the zones of general and specific information.

14.6 The equipment shall be capable of the following:

- Multi-layer color map
- Adaptable map projection
- Center, offset, pan and zoom
- Flight position from surveillance or flight plan
- Adaptable flight position symbols that depict flight attributes
- Adaptable multi-page flight data tag (full, limited, basic)
- Automatic tag relocation to avoid overlap
- Predicted track line
- Flight position history
- Range rings
- Lat/Long grid
- Special use airspace dynamic display
- RADAR coverage volume dynamically displayed

14.7 Basic software features:

- Presentation zooming
- Windows management
- Data storage and export options
- Operable with Windows operating system or compatible

14.8 Display information from Secondary Surveillance Radar (SSR) Mode A, Mode C and Mode S

14.9 Display RADAR Map information

14.10 Display Reserved SSR codes including 7500, 7600 and 7700, SPI/operation of IDENT, safety-related alerts and warnings as well as information related to automated coordination etc., in a clear and distinct manner.

14.11 Capability to display ADS-B Asterix Category 21 data.

14.12 The workstation(s) shall be provided with English characters to input the commands included in the operational software.

14.13 The following features (minimum requirements) shall be available on the ATC Display:

- RADAR track identification and display
- RADAR data monitoring
- Aircraft identification, automatic and manual SSR code correlation
- Graphic tools interaction
- Alarms and warnings (STCA, MSAW, DAIW, RVSM, MTCD, etc.)
- Operational data management

14.14 When power is restored after a power failure, the display system shall present the information with the last configuration parameters.

14.15 The appropriate RADAR maps for RADAR display overlays shall be provided. These would have a wide range of user functions including user-configurable range features. When such source data is available, all maps shall apply the accepted world standard, WGS-84 earth-centred coordinate system.

14.16 Maps provided shall at least meet the following minimum requirements:

- The ability to overlay specific maps and routes on a global digitized map.
- Ability to plot new air routes.
- Maps to cover extrapolated flight following and conflict prediction information areas.

14.17 The ATC displays shall indicate MSSR information and extrapolated tracks displayed in different colours to demark the difference between actual RADAR airspace and extrapolated airspace based on flight plan and other input information.

14.18 A redundant Global Positioning System (GPS) based master clock with multiple input system to enable system time coordination and to synchronise all equipment provided in this document.

14.19 The facility for the input for artificial RADAR targets shall be provided.

14.20 Aircraft positions on track labels display, either RADAR data, or ADS, or flight plan data shall contain information/data about that aircraft position accordingly, and to be continuously displayed by numerical characters in the predefined formats suitable for air traffic control and management. The movement of track labels position shall assure that:

- Two overlapping labels if any, shall automatically separate when controllers select automatic function (auto rotation); or
- Controllers shall be able directly change track label position by clicking/releasing the mouse-buttons (manual rotation)
- Controller shall be able to change flight plan data by using track labels. In order to perform the data changes easily and quickly, the system shall provide proper options correlating to this function under the "Pop up menu" form and shall allow controllers to run the options by using mouse.

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APPENDIX C
EASTERN CARIBBEAN NETWORK TECHNICAL GROUP (E/CAR/NTG)
TERMS OF REFERENCE

1. Background

1.1 The Eastern Caribbean Network Technical Group (E/CAR/NTG) was established as a standing group in accordance with the Thirty-First Eastern Caribbean Working Group Meeting (E/CAR/WG/31), Conclusion 31/7 - *Replacement of the E/CAR AFS Network*, approved by the Twenty-Second Meeting of Directors of Civil Aviation of the Eastern Caribbean (E/CAR/DCA/22) Port-of-Spain, Trinidad and Tobago, 8 to 11 December 2009. The terms of reference of the E/CAR/NTG were approved by the E/CAR/DCA/22 Meeting, - Decision 22/6 - *E/CAR Network Technical Group (NTG) Terms of Reference and Fist Meeting*. The following main objectives are assigned:

a) analysis and monitoring of the status of the current E/CAR AFS Network;
b) recommend measures to improve reliability of the E/CAR AFS Network for the immediate/near term; and
c) study, analyse and follow-up on the planning, documentation and implementation of the replacement of the existing E/CAR AFS Network.

1.2 By 2013, the E/CAR/NTG had fulfilled these objectives, with an efficient Internet Protocol (IP) Network and well established stable services; however, the continuous monitoring, analysis and follow-up to Network improvements and resolution of failures were considered necessary by the E/CAR AFS Network participants.

2. Terms of Reference

For the activities related to the analysis and monitoring of the status of the current E/CAR AFS Network, the E/CAR/NTG is required to make recommendations on measures to improve the reliability of the E/CAR AFS Network for the immediate/ near term. These activities include:

a) review the current status of the Network (maintenance and reporting procedures, technical personnel involved, spare parts, tools for monitoring the Network status, identify common network points of failure, etc.) and submit recommendations;
b) ensure compliance of the Network services with ICAO SARPs, Regional Air Navigation Plans and user expectations (Aviation System Block Upgrades (ASBU) Block 0 Modules);
c) assist Trinidad and Tobago and the E/CAR States with technical coordination and solutions of problems that occurred with the implementation and operation of the Aeronautical Fixed Service (AFS) including the E/CAR AFS Network, and to consider and make recommendations on measures to improve implementation and operation;
d) study and propose to the E/CAR/DCA intra and inter-regional coordination for the E/CAR AFS Network connectivity with other regional and domestic digital communications networks of the CAR and SAM Regions; and

e) inform and advise the E/CAR AFS Network users, if a major failure or network concern that affects the entire network occurs or may occur or an event that does not allow achieving the Network Service level agreement, recommending solutions for its recovery and actions by the E/CAR AFS Network Service Provider.

3. Work Programme

No.	Activities	Objectives	Responsible	Deliverables
1	To assist the E/CAR AFS Network Members in coordination for the solutions to problems presented in this operation, and in the implementation of services and parts.	Keep E/CAR AFS Network SLA levels	NTG	E/CAR AFS Network assistance
2	To study and implement technical/operational measures that may be agreed to improve the operation and implementation of E/CAR AFS Network services, and that do not impact in a significant cost, investments and objectives of the Network.	Satisfactory operation and service levels	NTG	Implementation of Network improvements
3	Keep E/CAR AFS Network Members aware of the status of the E/CAR AFS Network performance and conditions of operation.	E/CAR AFS Network awareness	NTG	• Reliable E/CAR AFS Network website • Network Performance revision
4	Maintain valid and up-to-date E/CAR AFS Network Contingency Procedures, taking into consideration the contingency plans of each E/CAR AFS Network Member and of the Service Provider and keeping aligned with the CAR Region General Contingency Plan.	Readiness for contingencies	NTG	E/CAR AFS NETWORK Contingency Procedures
5	To assist the E/CAR AFS Network Members in finishing the data and voice circuits implementation, according to the requirements shown in the ANP CAR/SAM (ASBU BO modules and Regional/National Priorities).	Fulfil Air Navigation requirements	Task Forces- Ad hoc Groups	Data and voice circuit implementation
6	To study and propose solutions for AFS connectivity of the E/CAR AFS Network with other regional and domestic CAR/SAM networks.	Fulfil Air Navigation requirements	Task Forces- Ad hoc Groups	Data and voice circuit implementation
7	To review and propose amendments to the terms of the Services Agreement, based on the ICAO requirements for the transitioning towards the ATN for the E/CAR AFS Network.	Network improvements	Taskforces	Effective and efficient E/CAR AFS Network Transition Process
8	Keep and validate with the E/CAR AFS Network Service Provider a procedural handbook on management, operation and maintenance of the E/CAR AFS Network telecommunication circuits.	Ensure proper E/CAR AFS Network maintenance and operation	NTG	Maintenance Procedural Handbook/Manual

4. Working Methods

a) The E/CAR/NTG work programme should present its activities in terms of objectives, responsible and deliverables. Further details can be provided in the form of Work Breakdown Schedule (WBS);

b) E/CAR/NTG will avoid duplication of work within the E/CAR/CATG and maintain close coordination among the existing entities (like the NAM/CAR Air Navigation Implementation Group:ANI/WG) to optimize the use of available resources and experience;

c) E/CAR/NTG may designate, as necessary, Ad hoc groups to work on specific topics and activities; all tasks and activities should be clearly defined by time and deliverables;

d) E/CAR/NTG should co-ordinate and progress its works as follows to maximize efficiency and reduce costs:

- conduct work via electronic written correspondence
- conduct work via phone and teleconference calls
- hold meetings when necessary

e) E/CAR/NTG meetings shall be conducted as possible, jointly with other E/CAR Meetings like the E/CAR/CATG meetings; and

f) E/CAR/NTG will report and coordinate the progress of assigned tasks to the E/CAR/CATG as well as to the E/CAR Directors.

5. Membership

See attached Membership List. ICAO will act as technical adviser to the E/CAR/NTG.

6. Rapporteur

Ms. Veronica Ramdath (Trinidad and Tobago)

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