



ICAO

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

**Eighth Eastern Caribbean Network Technical Group
(E/CAR/NTG/8)
and Sixth Eastern Caribbean Radar Data Sharing
Ad hoc Group (E/CAR/RD/6)
Meetings**

Final Report

Saint George's, Grenada, 3 - 5 September 2018

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HISTORICAL

ii.1 Place and Date of the Meetings

The Eighth Eastern Caribbean Network Technical Group (E/CAR/NTG/8) and Sixth Eastern Caribbean Radar Data Sharing Ad hoc Group (E/CAR/RD/6) Meetings were held at the Radisson Grenada Beach Resort, Grand Anse, in Saint George's, Grenada, from 3 to 5 September 2018.

ii.2 Opening Ceremony

On behalf of Grenada, Mr. Earl Charles, Senior Civil Aviation Officer and Secretary Air Transport Licensing Board and Mrs. Wendy Francette-Williams, CEO, Grenada Airports Authority provided opening remarks.

Mrs. Wendy Francette-Williams indicated that aviation is an important sector in the Caribbean Region. She talked about Grenada's vision and future plans for the development of a new training centre (academy project), and that they would build a new airport that could be a regional aviation hub for the Caribbean States. Mrs. Williams recalled the need to work together to improve regional projects like the Radar Data Sharing Phase II, since it is an important project for Grenada.

Mrs. Mayda Ávila, Regional Officer, Communications, Navigation and Surveillance, on behalf of the North American, Central American and Caribbean (NACC) Regional Office of the International Civil Aviation Organization (ICAO), expressed her gratitude to Grenada for hosting these important meetings and indicated the importance for all Eastern Caribbean States to work together with the objective of improving aviation, as aviation improves social development in every State due to the direct and indirect jobs that this activity generates.

Situational awareness is based on decision-making based on real information. Mrs. Ávila indicated that this meeting was an opportunity to analyse what decision the States need to make for their current operations and for the near future to ensure that the Eastern Caribbean States will offer safety and proper services to all people that use their facilities. Mr. Earl Charles officially opened the Meetings.

ii.3 Officers of the Meetings

The E/CAR/NTG/8 and E/CAR/RD/6 Meetings were chaired by Ms. Veronica Ramdath, the E/CAR/NTG Rapporteur, and Mrs. Mayda Ávila acted as Secretary.

ii.4 Working Languages

The working language of the Meetings was English and working papers, information papers and draft report of the meeting 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 the Agenda and Work Schedule

Agenda Item 2: Review of Valid Conclusions from E/CAR/NTG/06-RDS/04, E/CAR/CATG/02 and ECAR/DCA/26 Meetings related to the Work of the NTG and RDS

- 2.1 Follow-up on previous E/CAR/NTG-RD Conclusions and Decisions
- 2.2 Follow-up on E/CAR/CATG/02, ECAR/DCA/26, and NACC/DCA/6 Meetings
- 2.3 Follow-up to the Air Navigation Implementation Working Group (ANI/WG) Conclusions

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

- 3.1 Network performance and general aspects
- 3.2 Update on E/CAR AFS Network Interconnection to the MEVA Network

Agenda Item 4: Surveillance Sharing Activities

- 4.1 Review of Surveillance Sharing Letter of Agreements (LoAs)/Memoranda of Understanding (MoUs): Trinidad and Tobago, French Civil Aviation, and Barbados
- 4.2 Surveillance sharing update: Antigua and Barbuda, Guyana, Sint Maarten, Trinidad, and Tobago, United States (San Juan), Venezuela
- 4.3 Automatic Dependent Surveillance – Contract (ADS-C) and Automatic Dependent Surveillance - Broadcast (ADS-B)/MLAT developments
- 4.4 Review of Performance and User's Comment on Radar Display Phase 1

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

- 5.1 Definition of Technical Requirements and Proposal
- 5.2 Definition 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, and representatives of 3 Industry members, totalling 30 delegates as indicated in the list of participants.

ii.8 Draft Conclusions and Decisions

The Meeting recorded its activities as Draft Conclusions and Decisions as follows:

DRAFT

CONCLUSIONS: Activities requiring endorsement by the Directors of the Eastern Caribbean.

DECISIONS: Internal activities of the E/CAR/NTG and E/CAR/RD

An executive summary of these conclusions is presented in **Appendix A** to this report.

CONCLUSIONS		
Number	Title	Page
8-6/1	UPDATE SURVEILLANCE INFRASTRUCTURE OF EASTERN CARIBBEAN	4-2
8-6/2	SUPPORT EASTERN CARIBBEAN STATES IN THE DEVELOPMENT OF THEIR IMPLEMENTATION PLANS	4-4
8-6/3	RADAR DATA DISPLAY PROJECT PHASE II	5-1

ii.9 List of Working and Information Papers and Presentations

Refer to the Meeting web page:

<https://www.icao.int/NACC/Pages/meetings-2018-ntg8rd6.aspx>

WORKING PAPERS

Number	Agenda Item	Title	Date	Prepared and Presented by
WP/01	1	Provisional Agenda and Schedule	17/07/18	E/CAR/NTG Rapporteur
WP/02	2.1	Follow-up on previous E/CAR/NTG-RDS Conclusions and Decisions	17/08/18	E/CAR/NTG Rapporteur
WP/03	2	Review of Valid Conclusions from E/CAR/NTG/7, E/CAR/RD/5, and NACC/WG/5 Meetings Related to the Work of the NTG and RD	27/08/18	Secretariat
WP/04	4.2	Surveillance Data Sharing Recommendations	25/08/18	Secretariat
WP/05	3	Network Performance and General Aspects	28/08/18	ECCAA
WP/06	3	General Feedback of the FWI	28/08/18	France

WORKING PAPERS

Number	Agenda Item	Title	Date	Prepared and Presented by
WP/07		Cancelled		
WP/08	4.2	Recommendations for ADS-B Implementation	31/08/18	Secretariat
WP/09	4.1	Review of Surveillance Sharing Letters of Agreement (LOAS)/Memorandum of Understanding (MOUs): Barbados, France, Sint Maarten and Trinidad And Tobago	17/08/18	E/CAR/NTG Rapporteur
WP/10	7.3	AIDC Implementation	02/09/18	Secretariat
WP/11	4.2	Modernization of The FWI ATM System	17/08/18	SNA AG-France
WP/12	4.2	Surveillance Sharing Update: Antigua and Barbuda, Barbados, Sint Maarten and Trinidad and Tobago	17/08/18	Trinidad and Tobago
WP/13	4.3	Surveillance/ADS-B/MLAT Developments/Updates	28/08/18	Barbados
WP/14	6	E/CAR/NTG Future Meeting and Update to its Terms of Reference and RD Ad hoc Group's Tasks	30/08/18	E/CAR/NTG Rapporteur
WP/15	7	Performance Based Communications and Surveillance (PBCS)	30/08/18	Secretariat
WP/16	5.1	Definition of Technical Requirements and Proposal	17/08/18	E/CAR/NTG Rapporteur
WP/17	7	Additional communication requirements for the AIM/SWIM		
WP/18	3	Update on E/CAR AFS Network Interconnection to the Meva Network	23/08/28	United States
WP/19	4.2	Surveillance /ADS B Update: Antigua	03/09/18	Antigua and Barbuda
WP720	7	AIDC/ASIA PAC and NAM/ICD Implementation (Flight Plan errors)	04/09/18	Secretariat

INFORMATION PAPERS

Number	Agenda Item	Title	Date	Prepared and Presented by
IP/01	---	List of Working, Information Papers and Presentations	31/08/18	Secretariat
IP/02	4	Automatic Dependent Surveillance – Broadcast (ADS-B) out: Equipage Data for States in the Region	02/09/18	United States
IP/03	4	Automatic Dependent Surveillance – Broadcast (ADS-B) out: Ensuring Preparedness for the 2020 Equipage Mandate	02/09/18	United States

INFORMATION PAPERS

Number	Agenda Item	Title	Date	Prepared and Presented by
IP/04	7	Effects of Hurricane Maria on San Juan, PR MEVA	02/09/18	United States

PRESENTATIONS

Number	Agenda Item	Title	Presented by
1	3.1	Network Performance analysis and general aspects	Trinidad and Tobago
2	5.2	Radar Data Display Project - Air Situational Awareness,	Thales
3	5.2	Frequentis	Frequentis
4	7.1	Emergency Thales support to SXM	Thales
5	7.3	AIDC Implementation,	Secretariat
6	5.2	Overview	Leonardo S.p.A
7	5.2	Overview (cont.)	Leonardo S.p.A

LIST OF PARTICIPANTS

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iv – 2

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E/CAR/NTG/8 and E/CAR/RD/6
List of Participants – Contact Information

iv – 3

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Agenda Item 1 Approval of the Agenda and Work Schedule

1.1 The E/CAR/NTG Rapporteur presented WP/01, inviting the Meetings to approve the provisional agenda and schedule and referred to IP/01 with the list of associated documentation. The Meetings approved the agenda as presented in the historical section of this report and did not make changes to the schedule.

**Agenda Item 2 Review of Valid Conclusions from E/CAR/NTG/06-RDS/04, E/CAR/CATG/02
and ECAR/DCA/26 Meetings related to the Work of the NTG and RDS**

2.1 Under WP/02, the actions taken regarding the valid conclusions from previous E/CAR/NTG meetings, as well as the conclusions and decisions formulated by the E/CAR/NTG/7 and E/CAR/RD/5 meetings were examined.

2.2 The status and follow-up comments for each conclusion/decision are based on information and discussion at the meeting. The status for each conclusion/decision is designated as valid, completed or superseded. The follow-up to the E/CAR/NTG and E/CAR/RD valid conclusions/decisions is presented in **Appendix B** to the report.

- WP/03 (Secretariat)

2.3 Under WP/03, a summary of the conclusions and recommendations provided by different ICAO NACC meetings and Task Forces was presented in order to achieve regional and global implementations to support regional harmonization and standardization.

2.4 ICAO provided information on the activities that the different Task Forces are developing in the NAM/CAR Regions and invited the Meeting to adopt the recommendations provided in the different meetings regarding Automatic Dependent Surveillance - Broadcast (ADS-B), Air Traffic Services Inter-facility Data Communication (AIDC), MEVA communication improvement and others to support them to adopt regional agreements.

2.5 ICAO indicated that the ICAO NACC Regional Office was coordinating with the States and the industry to promote the necessary discussion spaces so that the States can make decisions, work together and promote the percentage of regional implementation in all the facilities.

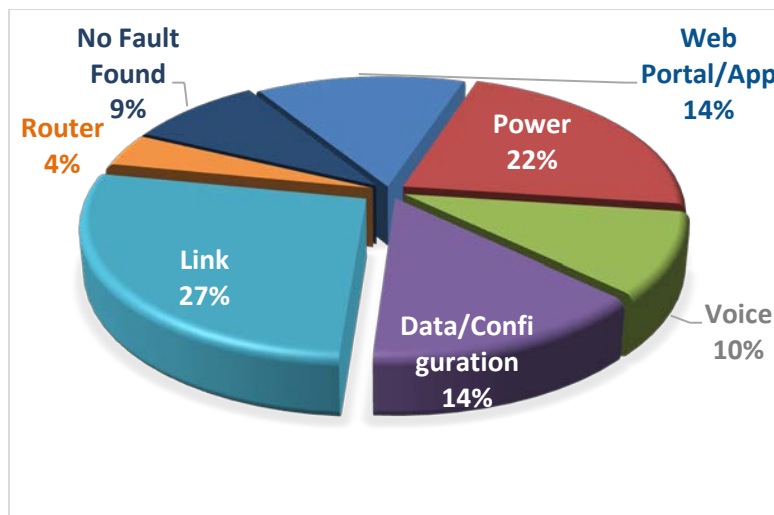
2.6 ICAO invited all States to participate in the following events that will be held in the Region:

- Automatic Dependent Surveillance – Broadcast (ADS-B) Implementation and Regulation Meeting for the NAM/CAR/SAM Regions (ADS-B/LEG) (Mexico City, Mexico, 26-30 November 2018)
- FPL errors workshop in 2019 (TBD)
- AIDC database maintenance (TBD)
- Incorporate their communication needs through Trinidad and Tobago in the new MEVA IV telecommunications project.

Agenda Item 3 E/CAR Aeronautical Fixed Services (AFS) Network Performance and Operation Network Performance and General Aspects

3.1 Under P/01, the E/CAR Aeronautical Fixed Service (AFS) network service provider, TSTT, examined E/CAR network features, managed service capabilities, network performance analysis and upgrade and recommendations. Regional Multi-Protocol Label Switching (MPLS) circuits with Cisco WAN edge routers, converged voice and data and redundant paths and stand-by devices aspects of the network were discussed, in particular fault management, availability and performance monitoring, fault analysis, remediation and configuration changes as well as upgrades.

3.2 An analysis of the faults for the period July 2017 - July 2018 showed that there were 118 reported faults. Figure 1 below shows the statistics by type of fault:



3.3 The number of faults by State is shown in Table 2 below:

State/Territory	2015	2016	2017
Anguilla	14	11	2
Antigua and Barbuda	4	8	9
Barbados	3	3	3
Dominica – Canefield	3	10	2
Dominica – Douglas Charles	2	0	7
Grenada	11	0	1
Guadeloupe	6	17	12
Martinique	2	14	13
Montserrat	1	7	1
Nevis	4	3	4
Saint Lucia – George Charles	3	4	0
Saint Lucia - Hewanorra	1	8	3
Saint Kitts	0	8	3

State/Territory	2015	2016	2017
Saint Vincent and the Grenadines	0	3	1
Antigua Hub/Sint Maarten	0	3	0
Tobago	6	3	0
Trinidad	9	7	26
San Juan	15	7	24

3.4 Availability statistics are shown as follows:

State/Territory	Availability 2017/2018
Antigua and Barbuda	98.9%
Barbados	100%
Dominica – Canefield	5%
Dominica – Douglas Charles	69.8%
Grenada	100%
Guadeloupe	99.5%
Martinique	99.8%
Nevis	99.1%
Saint Lucia	99.9%
Saint Kitts	99.2%
Trinidad and Tobago	100%

3.5 An upgrade of the network was discussed with the following key features:

- Automatic Services Failover
- Enhanced Monitoring and Management
- Firewall and Security
- Power Management

3.6 Under WP/05, ECCAA informed the meeting that C.J. Lloyd Airport, Anguilla and Canefield Airport, Dominica, suffered loss of terminal equipment during the passages of Hurricanes Irma and Maria in September 2017. Apart from the affected airports noted above, the network on a whole performed well, and the few outages which were reported did not significantly affect the operations of the Air Traffic Service(s) (ATS) units.

3.7 Under WP/06, France presented information on the situation in FWI and identified possible improvements. The E/CAR AFS network is globally compliant with operational requirements, but some improvements may be needed, both, in technical and procedural aspects. The FWI E/CAR/AFS network connection is achieved through dual access: Guadeloupe (Antigua, Martinique) and Martinique (Trinidad and Tobago, Guadeloupe). A new technical architecture to improve the quality and reliability of the service was proposed by the vendor Southern Caribbean Fiber and accepted by the Trinidad and Tobago Civil Aviation Authority (TTCAA). The improvement provides protection mechanism on the wet portion based on ring protection switching within System Component Failure (SCF) network, but also using third party networks and protection mechanism on the backhaul (local loop) portion based on HSRP between DSL connection and fiber optic connection in Martinique and Guadeloupe. In that perspective, SCF partnered with Digicel Business Solutions in order to provide the local loop for the access links in Guadeloupe and Martinique. Both access links in Guadeloupe and Martinique use copper lines. It is already scheduled to migrate on the copper access line of Martinique to fiber technology. The optical fiber is delivered but yet to be connected.

3.8 France reported some difficulties with phone communications. By resetting the router, the problem is resolved. TSTT informed that during the last maintenance activity in July this year the IP Service Level Agreement (SLA) feature of the router was set to 10 seconds which would authorize automatic switchover to the alternate track route (path) in the event of an issue lasting more than 10 seconds. The performance is being monitored to confirm resolution. France and Trinidad and Tobago agreed to amend the procedure with a Letter of Agreement (LoA) to request authorization and approval to reset the router.

3.9 France informed the Meetings of its plans to replace their CAGOU AFTN and switch to MANGO, a COMSOFT system (AIDA, CADAS-ATS), compliant with Aeronautical Message Handling System (AMHS). The new system will be in operation beginning 2020. The Meetings were also informed about the measures to increase cyber security and safety. All outgoing or incoming data will go through a new system, called NARCISSE, which will become operational in the beginning of 2020.

3.10 Under WP/18, United States provided information on the combined activities in the Central and Eastern Caribbean and updates on AMHS implementation. These activities are carried out in order to improve the telecommunications in the area.

3.11 The Federal Aviation Administration (FAA) identified some needs in the Caribbean and addressed five projects to improve safety. These projects were delayed because of the hurricane season. The five projects are:

- San Juan CERAP to British Virgin Islands – Incomplete
- San Juan CERAP to Curaçao – Incomplete
- San Juan CERAP to Piarco – Incomplete
- San Juan to Maiquetia, Venezuela – Complete
- Houston ARTCC to Habana – Complete

3.10 United States provided information about the Automatic Dependent Surveillance - Broadcast (ADS-B) and AMHS activities in the region and their current status.

Agenda Item 4 Surveillance Sharing Activities

4.1 Under WP/04, information on surveillance data sharing and benefits of sharing and integrating surveillance data in different ATC systems was presented.

4.2 ICAO recalled the importance of having common situational awareness information; in the last years ICAO has assisted those States which make decisions based on realistic information to allow safety improvements. Sharing surveillance data is an essential requirement to support and improve situational awareness and it is a basic requirement before the Air Traffic Services Inter-facility Data Communication (AIDC) implementation.

4.3 ICAO recommended that Eastern Caribbean States incorporate the following issues in the NTG and RD activities:

- 1) update technical infrastructure of their surveillance systems (radar systems, multilateration (MLAT), ADS-B) indicating manufacturer, model, protocols, etc.
- 2) update technical infrastructure of their ATC Systems, indicating the manufacturer, model and surveillance protocols that can be managed for them.
- 3) perform an analysis of the current infrastructure and create the necessary recommendations of minimum requirements that surveillance systems and air ATC systems must meet to ensure their integration.
- 4) not only ensure local integration and standardization, but integrate regional requirements with the other States of the Caribbean and South America with whom Eastern Caribbean States make coordination.

4.4 In this regard, the following Draft Conclusion was formulated:

DRAFT CONCLUSION	
E/CAR/NTG/8 – E/CAR/RD/6/01 UPDATE SURVEILLANCE INFRASTRUCTURE OF EASTERN CARIBBEAN	
<p>What:</p> <p>That, bearing in mind that it is necessary for States to provide information on the technical characteristics of their surveillance infrastructure, the E/CAR States:</p> <p>a) Integrate all the technical information and capacity of their surveillance systems (provider, model, protocols, etc.), according to table A of Appendix C to this report;</p> <p>b) promote with this information the activities of radar data sharing among the States which technical capacity allows it; and</p> <p>c) integrate into development plans the necessary requirements for new projects and capabilities by 30 December 2018.</p>	<p>Expected impact:</p> <p><input type="checkbox"/> Political / Global</p> <p><input type="checkbox"/> Inter-regional</p> <p><input type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Operational/Technical</p>
<p>Why:</p> <p>It is necessary to improve safety in the region and surveillance data sharing.</p>	
<p>When: By 30 December 2018</p>	<p>Status: <input checked="" type="checkbox"/> Valid / <input type="checkbox"/> Superseded / <input type="checkbox"/> Completed</p>
<p>Who: <input checked="" type="checkbox"/> States <input type="checkbox"/> ICAO <input type="checkbox"/> Other:</p>	<p>All States</p>

4.5 Under WP/09, updated information on the LoAs between Barbados and Trinidad and Tobago and the “*Service de la Navigation Aerienne Antilles Guyane*” and Sint Maarten were presented. The LoA between the “*Service de la Navigation Aerienne Antilles Guyane*” and the Trinidad and Tobago Civil Aviation Authority was revised earlier this year to allow the TTCAA to distribute the Multi-Radar Tracking (MRT) enriched with French radar data to the FAA for the sole use of the Air Traffic Flow Management (ATFM) initiative. The revised LoA includes the provision of radar data from the ATS Units of Martinique *Aimé Césaire* and Guadeloupe, for the benefit of member States of the E/CAR AFS Network. These States are Antigua and Barbuda, Barbados, Dominica, Grenada, Kingdom of the Netherlands (Sint Maarten), Saint Lucia, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Trinidad and Tobago and United Kingdom (Anguilla and Montserrat).

4.6 Following the destruction of Air Navigation Services (ANS) infrastructure on Sint Maarten including the Sunhillo RICI box in the wake of Hurricane IRMA in September 2017, the LoA between Sint Maarten and Trinidad and Tobago was put on hold until Sint Maarten’s infrastructure including the MEVA node and the radar services are restored.

4.7 The review of the LoA with Barbados to include ADS-B and MLAT data to Trinidad and Tobago and the authorization to redistribute this data as part of the Piarco MRT data is in progress.

4.8 Under WP/12, Trinidad and Tobago presented information on developments in the areas of ADS-B/ MLAT in the Piarco Flight Information Region (FIR). Surveillance within the continental airspace of the Piarco FIR is presently achieved with the Piarco radar and radar data from Guadeloupe and Martinique through radar sharing. ADS-B would be an economical and relatively easy solution to implement to enhance the surveillance in the continental airspace.

4.9 In accordance with the surveillance concept for the Piarco FIR at least two sources of surveillance within the same coverage area are recommended. If one source fails or has to be removed from service for maintenance, two sources should still be available. This is not the case in the continental Piarco FIR. The coverage of the Piarco radar is not the same as that of Martinique and Guadeloupe, which results in only one source in some areas. If this source fails or is removed from service for maintenance then no surveillance is available in that area. The introduction of ADS-B would provide a second source.

4.10 Analysis of data obtained from trials conducted in November 2017 showed that with one ADS-B receiver located at Piarco, over sixty percent (60%) of aircraft transiting the continental airspace was equipped for ADS-B.

4.11 In August 2018, the TTCAA engaged ICAO's Technical Cooperation Bureau (TCB) for the ADS-B/ Wide Area Multilateration (WAM) project for the continental airspace of the Piarco FIR. It is envisaged that the project will be completed in 2019. The E/CAR AFS Network shall be the means of transport from the airports to Piarco. The Piarco ACC shall be repository for all the ADS-B/WAM data processing where the data would be integrated into the Piarco Air Traffic Management (ATM) System and the MRT. The combined data from all available surveillance sources would be available over the E/CAR AFS Network for distribution to the E/CAR States.

4.12 Under WP/19, Antigua and Barbuda provided an overview of their intention to acquire surveillance for the Antigua Terminal Control Area (TMA). As the region progresses towards the implementation of ADS-B within the Piarco FIR, Antigua will work towards meeting the targets of the ICAO Regional Performance Based Air Navigation Implementation Plan (RPBANIP). In this regard, meetings have been held with the appropriate government agency to discuss the need of achieving this goal. Taking into consideration the wide range of types of aircraft which operate within the airspace and their capabilities, the realistic goal must incorporate the needs of all users. Therefore, some Secondary Surveillance Radar (SSR) capabilities are necessary. To this end, a Request for Information (RFI) to acquire ADS-B with SSR capabilities has been disseminated.

4.13 Antigua and Barbuda discussed some of the challenges in receiving the relevant approvals for the fulfilment of the RPBANIP targets and appealed to the Meetings for assistance from ICAO and Trinidad and Tobago to sensitize their government on the importance of the objectives. In this regard, the following Draft Conclusion was formulated:

DRAFT CONCLUSION	
E/CAR/NTG/8 – E/CAR/RD/6/2	SUPPORT EASTERN CARIBBEAN STATES IN THE DEVELOPMENT OF THEIR IMPLEMENTATION PLANS
<p>What:</p> <p>That, in view that:</p> <p>Eastern Caribbean States require support for the development of aviation projects that support air traffic control activities, and the development of the second phase of the radar presentation project is a need, since it will promote the operational safety of the region and improve situational awareness,</p> <p>a) ICAO support the Second phase of the radar data implementation project;</p> <p>b) Trinidad and Tobago support this project in all possible ways, since it promotes safety in the PIARCO FIR; and</p> <p>c) ICAO provide an approach among the different Eastern Caribbean States by March 2019.</p>	<p>Expected impact:</p> <p><input checked="" type="checkbox"/> Political / Global</p> <p><input type="checkbox"/> Inter-regional</p> <p><input checked="" type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Operational/Technical</p>
<p>Why:</p> <p>To improve safety in the region.</p>	
<p>When: March 2019</p>	<p>Status: <input checked="" type="checkbox"/> Valid / <input type="checkbox"/> Superseded / <input type="checkbox"/> Completed</p>
<p>Who: <input checked="" type="checkbox"/> States <input checked="" type="checkbox"/> ICAO <input type="checkbox"/> Other:</p>	

4.14 Under WP/11, France explained that the FWI ATM system is based on the use of two systems: IRMA (Radar Display) and SIGMA (Flight Plan system). The surveillance is based on the use of two monopulse secondary radars (Thales RSM970 MSSR in Guadeloupe and Martinique) and on one MRT (called DACOTA based on Martinique).

4.15 France noted the SNA AG plans to modernize the overseas ATM systems. These heterogeneous systems (IRMA and SIGMA), would be replaced by a single system by the Canadian company ADACEL. It is expected that Guadeloupe would be in operation in 2020, and Martinique in 2021. New features would include Electronic flight strips and automatic coordination between Martinique and Guadeloupe, as well as the opportunity to hold AIDC with other Air Navigation Service Providers (ANSPs). The radar and MRT DACOTA would use UDP/IP format. A second MRT DACOTA to be operational in 2020 would be installed in Guadeloupe.

4.16 In 2021, due to format changes and obsolescence, IRMA displays would not be usable any more (in French West Indies, in Saint Lucia, and in the Caribbean Islands where IRMA was installed for familiarization).

4.17 Under WP/13, Barbados updated the Meetings on the work done in the areas of ADS-B and MLAT. Since 2014, Barbados embarked on a project to replace its aging MSSR system and provide greater safety and efficiency in its airspace through the use of more modern technologies that would facilitate automation in the management of air traffic. Specific objectives include the following:

- Replacement of the aging MSSR
- Improving low level coverage provided by the exiting MSSR
- Providing the ability to monitor for runway incursions by identifying all vehicles and their location in the airfield
- Providing the ability to fully cover in Barbados airspace using multilateration
- Provide coverage of approximately 250 NM using ADS-B
- Provide the facility to receive and share Surveillance data keeping in line with regional civil aviation and ICAO's objectives and subject to the appropriate agreements
- Provide enhancements including a more modern flight data processor system
- Introduce safety features such as safety nets (short, and medium term conflict alerts and trajectory prediction)
- Provide greater automation with the introduction of electronic flight strip processing

4.18 Notwithstanding, several challenges have resulted in delays to the project, the current status is as follows:

- **Surface movement system:** Installed and active.
- **Wide Area Multilateration and ADS-B:** four out of seven planned sites installed and active. A provisional mast has been put in place to facilitate activation of the remaining sites

4.19 The vendor is expected to recommence installation and software customization and additional training activities in mid-September. The system is expected to be fully installed with Site acceptance testing it is currently scheduled to be completed by the end of **October 2018**.

4.20 Under WP/08, a summary of the benefits identified by the NAM/CAR and SAM Regions to implement ADS-B was presented.

4.21 Under IP/02, United States provided information on the status of ADS-B equipment implementation in the region, also the level of aircraft capacity before July 2018. United States made an analysis to obtain this information and it was observed that some aircraft equipped with Link Version 2 and with ICAO codes in the blocks belonging to Canada and Mexico were using the UAT link, either by itself or in combination with a 1090ES ADS-B Out system. Therefore, the results for Canada and Mexico were broken out by Link technology, as well as Link Version 2.3. The results of the analysis are shown in IP/02; in each column, the numbers of ICAO codes per Link Version per country blocks are shown. It is gratifying to see the high percentage of Link Version 2 equipage in this data.

4.22 As a result of the analysis, it was concluded that most aircraft flying in airspace covered by the FAA contracted ADS-B ground stations and having ICAO codes associated with a NACC State (other than United States) are equipped with DO-260B.

4.23 Under IP/03, United States indicated that in 2010, the FAA, published a regulatory requirement for all aircraft operating within certain airspace to be equipped with ADS-B Out technology by **1 January 2020**, according to Title 14 of the U.S. Code of Federal Regulations (14 CFR) sections 91.225 and 91.227. This requirement will affect all flights in the designated airspace. To prepare the aviation community and prevent any operational disruptions, the FAA is promoting the new mandate to the international community so that foreign aircraft intending to operate within the affected airspace will be equipped with the appropriate ADS-B Out system by the compliance date.

Agenda Item 5 Radar Data Display Request for Proposal

5.1 Under WP/16, an update on the agreed actions of Phase II of the radar data project was presented. The Meetings recalled previous agreements on the procurement process for Phase II. During the E/CAR/NTG/7 and E/CAR/RD/5 meetings, there was consensus that a Task Force would be activated comprising ECCAA, France, Trinidad and Tobago and United States, to review the technical specifications, evaluate the tender responses and select a successful vendor. The issuance of the tender would be done through ICAO TCB with responses sent to the ICAO NACC Regional Office. At the last meeting, ICAO highlighted that if the radar data sharing States were interested in implementing Phase II, organized their common requirements and were willing to work together in a common Project, a No Country Left Behind (NCLB) Project may be formulated and proposed for funds raising.

5.2 ICAO was advised that the E/CAR radar data sharing project Phase II does not qualify under a NCLB Project. In light of the time that has elapsed since the last meeting of the Radar Data Group and in consultation with ICAO, it was agreed that an invitation would be issued to industry to present any developments in end user equipment processing of surveillance technology related to Phase II of the project. In this regard, and based on the information presented by industry at the Meeting, a revised Replacement Flight Plan (RFP) would be developed and submitted as previously agreed as an ICAO TCB project. In this regard, the following Draft Conclusion was formulated:

DRAFT CONCLUSION	
E/CAR/NTG/8 – E/CAR/RD/6/3 RADAR DATA DISPLAY PROJECT PHASE II	
What: That, the NTG Rapporteur, in coordination with ECCAA, France, Trinidad and Tobago, United States and the ICAO NACC Regional Office, review the operational requirements of the Radar data sharing Phase II and contact ICAO TCB for an estimate of the project based on the defined user requirements by 31 January 2019 .	Expected impact: <input type="checkbox"/> Political / Global <input checked="" type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Operational/Technical
Why: It is an important regional project that impulse safety	
When: 31 January 2019	Status: <input checked="" type="checkbox"/> Valid / <input type="checkbox"/> Superseded / <input type="checkbox"/> Completed
Who: <input checked="" type="checkbox"/> States <input type="checkbox"/> ICAO <input type="checkbox"/> Other:	

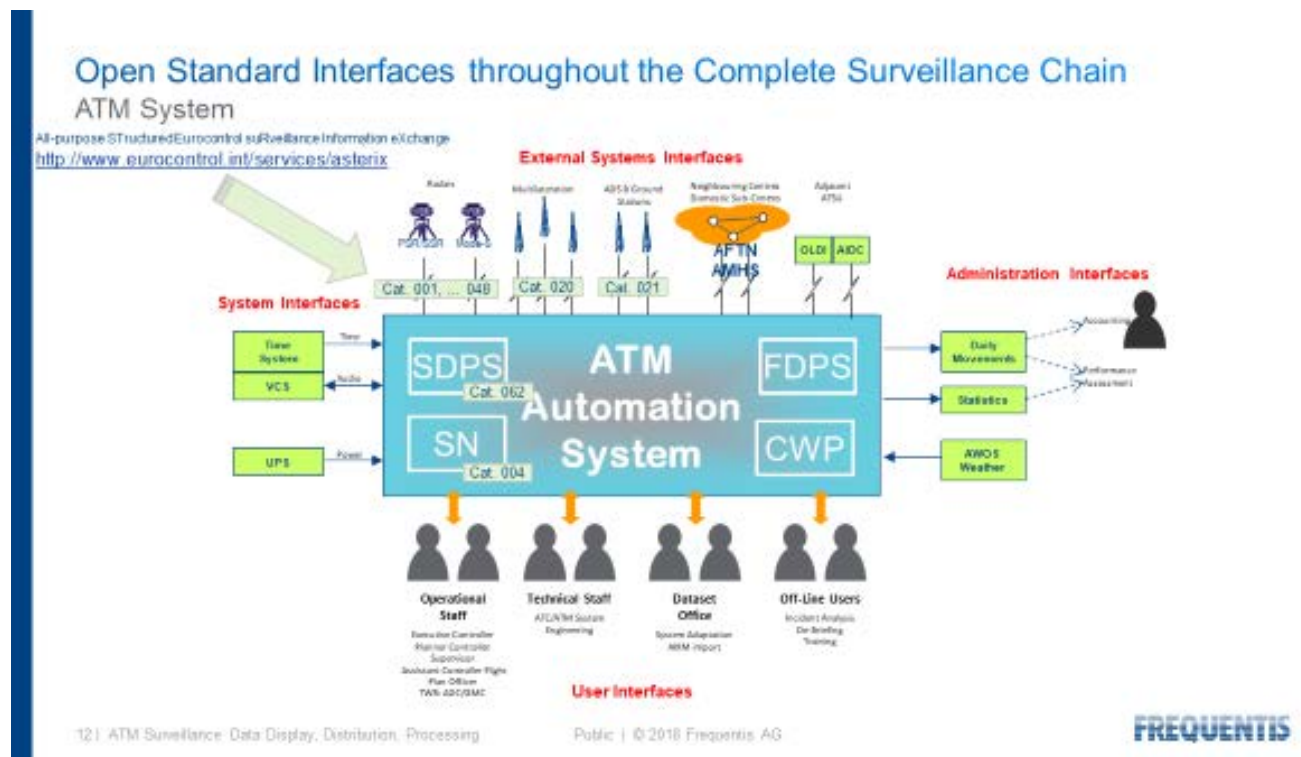
5.3 Under P/02, Thales presented their solution on surveillance, communication, navigation and automation. A solution was proposed for the radar data display project Phase II using either ecosystem architecture with the Thales cloud and E/CAR network or a TopSky-ATC automation based system with air situational awareness and display, monitoring, automatic or manual correlation and additional functional capabilities. The presentation identified main features of human machine interface, technical monitoring and control that could be used as a standalone position for each island. Thales explained two types of cost models for implementation:

- a) Own and implement automatic system equipment; or
- b) Contract the service and pay for the service and data.

5.4 Upon request from Trinidad and Tobago, Thales has agreed to a demonstration of its proposed solution in Trinidad and Tobago.

5.5 Under P/03, Frequentis shared information about the different activities supported by Frequentis Comsoft, and the experience in the implementation of many projects related to surveillance, and ATM around the world. In this presentation, Frequentis proposed its application for the second phase of radar data sharing of PIARCO FIR and their States.

5.6 The solution made by Frequentis Comsoft relies on open and defined standards wherever possible, such as to ensure smooth integration into any environment, and has a modular design which permits to start small, for instance with a Controller Working Position (CWP), and add Flight Data Processing System (FDPS), Surveillance Data Processing System (SDPS), or Safety Nets (SN) functionality as required later on by a State. Frequentis can further amend Electronic Flight Strips (EFS) and further tower functionality as required.



5.7 The European surveillance data sharing network SURNET (formerly RADNET) runs on Frequentis Comsoft technology and Frequentis Comsoft provides all service for the European surveillance tracker by Eurocontrol, ARTAS. Both of these systems rely on ASTERIX and may be considered as excellent examples of the successful operational implementation of open, defined standards. Frequentis Comsoft RAPS is a versatile, yet comfortable and user-friendly tool to certify ASTERIX compliance and support smooth ATM automation system acceptance and integration.

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

6.1 Under WP/14, an update to the E/CAR/NTG Terms of Reference (ToRs) and work programme and Radar Data Sharing Ad hoc Group Tasks was provided. The Meeting noted that the E/CAR/NTG meetings have proven to be very productive and effective and the joint execution of the meeting with the Radar Data Sharing Ad hoc Group activities has demonstrated an efficient and cost-effective implementation.

6.2 An updated work programme for the E/CAR/NTG is presented in the **Appendix D** to this report, aligning it to the RPBANIP and ASBUs methodology. The membership was revised to reflect the current participation and contributions to the success of the meetings to include Antigua and Barbuda, Dominica, Grenada, Saint Lucia, Saint Kitts and Nevis and Saint Vincent and the Grenadines.

Agenda Item 7 Other Business

7.1 Under WP/10, information on the AIDC and the North American Common Coordination Interface Control Document (NAM/ICD) in the NAM/CAR and SAM Regions was presented.

7.2 The Secretariat indicated that a regional agreement had been adopted for all the NAM/CAR States that integrates basis protocols for their implementations, the NAM ICD (Version E) and AIDC (APAC Version 3), as minimum requirement to conduct connections with their adjacent States. For any new version, the State must ensure that the new protocol is compatible with the aforementioned protocols.

7.3 The NAM/CAR Regions, based on their experience, have identified a series of weaknesses during the AIDC implementation, as well as post-implementation issues and other that were identified by the ATC system provider. In that sense, it is necessary that the Eastern Caribbean States take advantage of the lessons learned and avoid making the same mistake and improving the timing of the AIDC Implementation.

7.4 The Secretariat indicated that it is necessary that technical and operational personnel work together in the development of the automatization protocols; it is necessary also to collaborate with all States to include their requirements in the development and implementation of AIDC.

7.5 States indicated the need to have AIDC training to help them integrate real requirements in their projects and implement the automatized protocols in a better way. The Secretariat also indicated that this could be covered by the Project RLA/09/801 — *Multi-Regional Civil Aviation Assistance Programme (MCAAP)*.

7.5 Under WP/15, a review of the Performance-Based Communication and Surveillance (PBCS) operative objectives, and ICAO Standards and Recommended Practices (SARPs) application and implementation requirements was presented.

7.6 The Secretariat explained the technical requirements needed to provide this service, integrate equipment aboard, ground capacity and validate/certify surveillance and communication equipment.

7.7 The Secretariat indicated that it is necessary that Trinidad and Tobago work closely with the vendor to define the requirements of the Automatic Dependent Surveillance – Contract (ADSC)/Controller-Pilot Data Link Communication (CPDLC) capacity in the update of the Trinidad and Tobago ATM system.

7.8 Under WP/17, information to be taken into account in order to promote communications systems that support future aviation services was presented. The Secretariat indicated that it is necessary that Eastern Caribbean States make an analysis about their current and future communications needs and integrate those needs on a regional approach that allows implementing and integrating a new network within an Internet Protocol (IP)-based Aeronautical Telecommunication Network (ATN), which complies with availability requirements, security, efficiency and low cost.

7.9 Also, to integrate the results of their analysis in the requirement of a new IP communication infrastructure to support the new service.

7.10 Under WP/20, information on flight plans errors was presented, this indicated that flight plan automation and errors management were not only associated to flight plan information errors but also to other factors, such as non-compliance with ICAO standards concerning flight plans (Doc 4444 – *ATM-Air Traffic Management*), database information inconsistencies (including names of procedures, fixes, airways, aircraft information), lack of integrity in the information published in Aeronautical information Publications (AIPs) or weaknesses in the process of the amendment and application of the AIRAC calendar, among others.

7.11 It is necessary that States apply mechanisms to validate and verify the information contained in the databases of their control centres and aeronautical messaging systems, taking into account AIP current data, ICAO SARPs, and changes to information addressing, in order to allow systems to properly manage their security alarms and properly validate flight plans. Lack of training and aeronautical information management are problems identified in the flight plan process.

7.12 The Secretariat informed that ICAO will develop two workshops in 2019, aiming to provide States the necessary information that allows them to properly address the flight plan information.

7.13 ICAO asked about the possibility that one Eastern Caribbean State could be the host of the Second training addressed to all English-speaking States.

7.14 Under IP/04, United States shared information on the destruction of hurricane Maria on the MEVA equipment at the San Juan CERAP, and the aftermath to restore services.

7.15 During the discussion, some States talked about their procedures before the hurricane season, such as: Antigua and Barbuda, France and United States.

7.16 The Meetings agreed that closer collaboration is needed by the stakeholders in each State for the development of contingency plans. These plans must be updated based on their experiences.

7.17 Under P/04, Thales presented an overview of the activities carried out in Sint Marteen after Hurricane Irma damages. Thales explained that surveillance, navigation systems and ATM capabilities suffered damages.

7.18 A temporary FDP system was implemented with the objective to provide flight plan management information and training meanwhile the new ATC system enters in operation.

7.19 Thales provided information on the Fast Track programme to support Sint Marteen in its recovery.

7.20 Thales informed that the new ATC system of Sint Maarten includes 5 topsky remote positions for the Islands around Sint Marteen.

7.21 Thales concluded that following a disaster the restoring of basic CNS/ATM capabilities is not easy, if not anticipated.

7.22 Under P/05, the Secretariat presented information on the factors to be taken into account before the AIDC implementation.

**APPENDIX A
 EXECUTIVE LIST OF CONCLUSIONS**

Number	Conclusion/Decision	Responsible for action	Deadline
1	<p>UPDATE SURVEILLANCE INFRASTRUCTURE OF EASTERN CARIBBEAN</p> <p>That, bearing in mind that it is necessary for States to provide information on the technical characteristics of their surveillance infrastructure, the E/CAR States:</p> <p>a) Integrate all the technical information and capacity of their surveillance systems (provider, model, protocols, etc.), according to table A of Appendix C to this report;</p> <p>b) promote with this information the activities of radar data sharing among the States which technical capacity allows it; and</p> <p>c) integrate into development plans the necessary requirements for new projects and capabilities by 30 December 2018.</p>	States	<i>Note: work to be updated by the E/CAR/CATG Meeting</i>
2	<p>SUPPORT EASTERN CARIBBEAN STATES IN THE DEVELOPMENT OF THEIR IMPLEMENTATION PLANS</p> <p>That, in view that:</p> <p>Eastern Caribbean States require support for the development of aviation projects that support air traffic control activities, and the development of the second phase of the radar presentation project is a need, since it will promote the operational safety of the region and improve situational awareness,</p> <p>a) ICAO support the Second phase of the radar data implementation project;</p> <p>b) Trinidad and Tobago support this project in all possible ways, since it promotes safety in the PIARCO FIR; and</p> <p>c) ICAO provide an approach among the different Eastern Caribbean States by March 2019.</p>	Trinidad and Tobago and ICAO	March 2019

Number	Conclusion/Decision	Responsible for action	Deadline
3	RADAR DATA DISPLAY PROJECT PHASE II That, the NTG Rapporteur, in coordination with ECCAA, France, Trinidad and Tobago, United States and the ICAO NACC Regional Office, review the operational requirements of the Radar data sharing Phase II and contact ICAO TCB for an estimate of the project based on the defined user requirements by 31 January 2019 .	NTG Rapporteur in coordination with ECCAA, France, Trinidad and Tobago, United States and the ICAO NACC Regional Office	31 January 2019

APPENDIX B

FOLLOW UP TO CONCLUSIONS AND DECISIONS - SEVENTH EASTERN CARIBBEAN NETWORK TECHNICAL GROUP MEETING (E/CAR/NTG/7) AND FIFTH EASTERN CARIBBEAN RADAR DATA SHARING ADHOC GROUP MEETING (E/CAR/RD/5)

Conclusion/Decision	Description	Follow-up	Status
DECISION E/CAR/NTG/7-RD/5/1 ROUTER AUTOMATIC CHANGEOVER CAPABILITY	That, in order to increase the reliability of the nodes and the network, TSTT analyze the feasibility and cost-effectiveness of implementing automatic changeover feature in the CISCO Routers by the E/CAR/NTG/8 Meeting.	TSTT has provided a proposal to the TTCAA to implement automatic changeover as part of the upgrade of the E/CAR AFS Network.	Valid
CONCLUSION E/CAR/NTG/07-RD/5/2 REPLACEMENT OF AFS NETWORK NODE REDUNDANCY IN GUADELOUPE	That, in order to restore the node redundancy for the replacement of the failed equipment in Guadeloupe: a) Trinidad and Tobago submit the cost of the replacement by December 15, 2016; and b) France report by 30 January 2017 , on the actions taken to conduct this replacement.	a) The cost of replacement was submitted to Guadeloupe but after discussions with TSTT, the replacement router was covered under the Cisco Smartnet agreement. b) The replacement router was sent in May 2017 and installed by Guadeloupe.	Completed
DECISION E/CAR/NTG/7-RD/5/3 CYBER SECURITY VULNERABILITY ASSESSMENT	That, due to the increased number of cyber-attacks on systems, in order to increase the reliability of the nodes and the network, ECCAA, Barbados, Trinidad and Tobago, United States and France conduct a cyber-security vulnerability assessment on the E/CAR AFS Network by the E/CAR/NTG/8 Meeting.	Barbados, France, ECCAA, Trinidad and Tobago and United States to report.	Valid
CONCLUSION E/CAR/NTG/7-RD/5/4 REVISION OF LETTERS OF AGREEMENT	That, in order to formalize the radar data sharing activities and foster the regional E/CAR ATFM initiative, France and Barbados review their existing LOAs to include the authorization to Trinidad and Tobago to exchange the Multi Radar Tracker (MRT), including any surveillance type feeds with Eastern Caribbean and Caribbean States under the intent of the E/CAR/RD project; and the FAA as part of the ATFM initiative.	The Trinidad and Tobago Civil Aviation Authority and the <i>Service de la Navigation Aerienne Antilles Guyane</i> reviewed and updated the Letter of Agreement regarding remoting and use of radar data from Martinique and Guadeloupe ATS Units to the Piarco ATS Unit for ATFM.	Valid
CONCLUSION E/CAR/NTG/7-RD/5/5 REACTIVATION OF TRINIDAD AND TOBAGO - VENEZUELA RADAR EXCHANGE	That, in order to continue the Trinidad and Tobago - Venezuela Radar Exchange activities, that the ICAO NACC Office in coordination with the SAM Office to contact Venezuela for the reestablishment of the coordination activities with Venezuela for this purposes by 30 December 2016	To be reported in the next meeting.	Valid

Conclusion/Decision	Description	Follow-up	Status
CONCLUSION E/CAR/NTG/7-RD/5/6 TRINIDAD AND TOBAGO - GUYANA RADAR EXCHANGE	That, in order to share surveillance data in benefit of improving the accuracy and precision of the surveillance data, Trinidad and Tobago to: <ul style="list-style-type: none"> a) Coordinate a meeting with Guyana for this purposes by 30 December 2016; and b) Inform the ECAR/NTG/8 Meeting of this progress. 	No progress has been made with the coordination of a meeting.	Valid
CONCLUSION E/CAR/NTG/7-RD/5/7 ANTIGUA RADAR DATA	That, in order to ensure the appropriate planning and coordination for testing and integrating the radar data from the Antigua Radar into the E/CAR MRT data, that ECCAA/ Antigua to provide by 30 December 2016 the details planning (timelines and actions), technical information (radar data format, circuit speed, etc.) from the radar in Antigua.	To be reported in the next meeting.	Valid
DECISION E/CAR/NTG/7-RD/5/8 INTEGRATION OF BARBADOS SURVEILLANCE DATA INTO THE PIARCO MRT AND EXCHANGE OF PIARCO MRT WITH BARBADOS	That, in order to plan and timely coordinate the integration of the Barbados surveillance data into the MRT System, Trinidad and Tobago and Barbados work together to coordinate by 30 December 2016: <ul style="list-style-type: none"> a) the integration of the Piarco MRT at Barbados during the next planned visit of the ATM vendor (Leonardo). b) the integration of the Barbados surveillance (radar/ADS-B/MLAT) into the Piarco MRT. 	To be reported in the next meeting.	Valid
CONCLUSION E/CAR/NTG/7-RD/5/9 ADS-B OUT IMPLEMENTATION IN THE E/CAR REGION	That, in order to prepare the E/CAR Region and take advantage of the operational benefits of ADS-B out: <ul style="list-style-type: none"> a) France, Barbados and Trinidad and Tobago to provide the E/CAR/NTG and ICAO their theoretical surveillance coverages (by flight levels 100, 150, 200 and 250) from their planned ADS-B Stations by 30 December 2016; b) E/CAR States and Territories inform the NTG and ICAO by 30 December 2016 of new plans for ADS-B implementation activities; c) E/CAR/NTG Rapporteur coordinate with the ANI/WG ADS-B TF Rapporteur for aligning the different E/CAR ADS-B activities with the regional ADS-B plan and implementation by February 2017; and d) E/CAR/NTG-RD Rapporteur to update the surveillance plan and inform the E/CAR/NTG/8 Meeting of these progress. 	a) An ADS-B project has been approved for Trinidad and Tobago. The theoretical surveillance coverage information is available. b) Papers to be presented under Agenda Item 4. c) To be discussed at the ANI/WG/4 meeting in August 2018. d) To be presented under Agenda Item 5.	Valid
CONCLUSION E/CAR/NTG/7-RD/5/10 SURVEILLANCE DATA REQUIREMENTS FOR DOMINICA AND ST. VINCENT	That, ECCAA inform the E/CAR/NTG Rapporteur of the surveillance data requirements for Dominica and St. Vincent by November 30, 2016.	ECCAA to report.	Valid

Conclusion/Decision	Description	Follow-up	Status
CONCLUSION E/CAR/NTG/7-RD/5/11 SURVEILLANCE DATA REQUIREMENTS FOR ANGUILLA AND MONTSERRAT	That, a) E/CAR/NTG Rapporteur send a letter to Anguilla and Montserrat requesting information on whether they wish to be part of Phase II and to confirm if their requirement will be situational awareness; and b) ICAO to write to ASSI regarding their commitment to part of Phase II and the agreed procurement process.	a) Email sent to Air Safety Support International (ASSI). b) Letter sent.	Valid
DECISION E/CAR/NTG/7-RD/5/12 DEFINITION OF RADAR DATA DISPLAY PHASE II PROCESS	That, in order to update the activities and agreements for Phase II of the Radar Data Sharing, the E/CAR/NTG Rapporteur, by 30 December 2016, in coordination with the RFP ad-hoc Group inform of the Planning to be implemented for the E/CAR Radar Data Display Phase II Process.	To be reported in the next meeting.	Valid
CONCLUSION E/CAR/NTG/7-RD/5/13 PROJECT PROPOSAL FOR ECAR REGION UNDER ICAO NACC NCLB	That, in order to seek the possible for funds and resources for the Radar Data Sharing Phase II Project or the regional Surveillance improvements with ADS-B States, the E/CAR/NTG Rapporteur work with the NTG Members for formulating a Project Proposal by February 2017.	Superseded by Conclusion E/CAR/NTG/8-RD/6/3	Superseded

APPENDIX C

No.	State	Facility Name	Type (PSR, SSR, MSS-S, MLAT, ADSB)	Provider	Model	ASTERIX Protocol Type that is provided	Location (Geographical Coordinates)	Altitude (Fts in respect to the sea)	Code Interrogator (II) (If assigned)	Observations
1	2	3	4	5	6	7	8	9	10	11

APPENDIX D
E 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 E/CAR/WG Conclusion 31/7, approved by the E/CAR/DCA/22 Meeting (Port of Spain, Trinidad and Tobago, 8-11 December 2009) The terms of reference of the E/CAR/NTG were approved by the E/CAR/DCA Decision 22/6. The following main objectives are assigned:

- a) analyse and monitor 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, analyze 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 has fulfilled these objectives, with an efficient 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

2.1 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 the TTCAA and the E/CAR States with technical coordination and solutions of problems that occurred with the implementation and operation of the AFS including the E/CAR AFS Network and 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

See attached project file.

4. Working Methods

- a) 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 with the E/CAR/CATG and maintain close coordination among the existing entities (like the Air Navigation Implementation Technical 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 shall coordinate and advance its works as follows to maximize efficiency and reduce costs:
 - conduct work via electronic written correspondence
 - conduct work via telephone 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)

**STATE/TERRITORY MEMBERS OF THE E/CAR
NETWORK TECHNICAL GROUP (E/CAR/NTG)**

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E/CAR/NTG 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 upon to improve the operation and implementation of E/CAR AFS Network services, and that do not impact 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 Network awareness	NTG	<ul style="list-style-type: none"> • Reliable E/CAR AFS Network website • Network Performance review
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 in line 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 and B1 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	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