



# ICAO

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

INFORMATION PAPER

E/CAR/NTG/12 & E/CAR/RD/10 — IP/02  
19/07/23

**Twelfth Eastern Caribbean Network Technical Group (E/CAR/NTG/12) and Tenth Eastern Caribbean Radar Data Sharing Ad hoc Group (E/CAR/RD/10) Meetings**  
Miami, United States, 24-25 July 2023

**Agenda Item 4: Surveillance Sharing Activities**  
**4.1 Surveillance/Automatic Dependent Surveillance – Broadcast (ADS B)/Multilateration (MLAT) Developments/Updates**

**ADS-B IMPLEMENTATION PROJECT IN FRENCH WEST INDIES**

(Presented by France)

**EXECUTIVE SUMMARY**

SNA-AG is considering the implementation of ground-based ADS-B stations for FWI.

<i>Strategic Objectives:</i>	<ul style="list-style-type: none"><li>• Safety</li><li>• Air Navigation Capacity and Efficiency</li></ul>
<i>References:</i>	<ul style="list-style-type: none"><li>• Automatic Dependent Surveillance – Broadcast OUT Implementation Meeting for the NAM/CAR Regions (ADS-B/OUT/M), Ottawa, Canada on 21-23 August 2019</li><li>• First NAM/CAR/SAM Meeting/Workshop on Planning the Implementation of Automatic Dependent Surveillance - Broadcasting (ADS-B) (ADS-B ANP/1) - (Teleconferences, 02 to 04 March 2022)</li><li>• THE AUTOMATIC DEPENDENT SURVEILLANCE – BROADCAST ADS-B CONCEPT OF OPERATIONS (CONOPS) Development by Surveillance ICAO Task Force for NAM/CAR Region Supported by SAM States (Revised on March 2022)</li><li>• Letter of Agreement between the Trinidad and Tobago Civil Aviation Authority and the Service de la Navigation Aerienne Antilles Guyane regarding remoting and use of radar data from Martinique and Guadeloupe ATS units to Piarco ATS</li></ul>

**1. Introduction**

1.1 FWI is currently assessing the opportunity to implement ground-based ADS-B (Drafting of a business case in progress).

1.2 The operational benefit would be an improvement of the surveillance coverage, a better situational awareness, and an enhancement of the radar-based surveillance image.

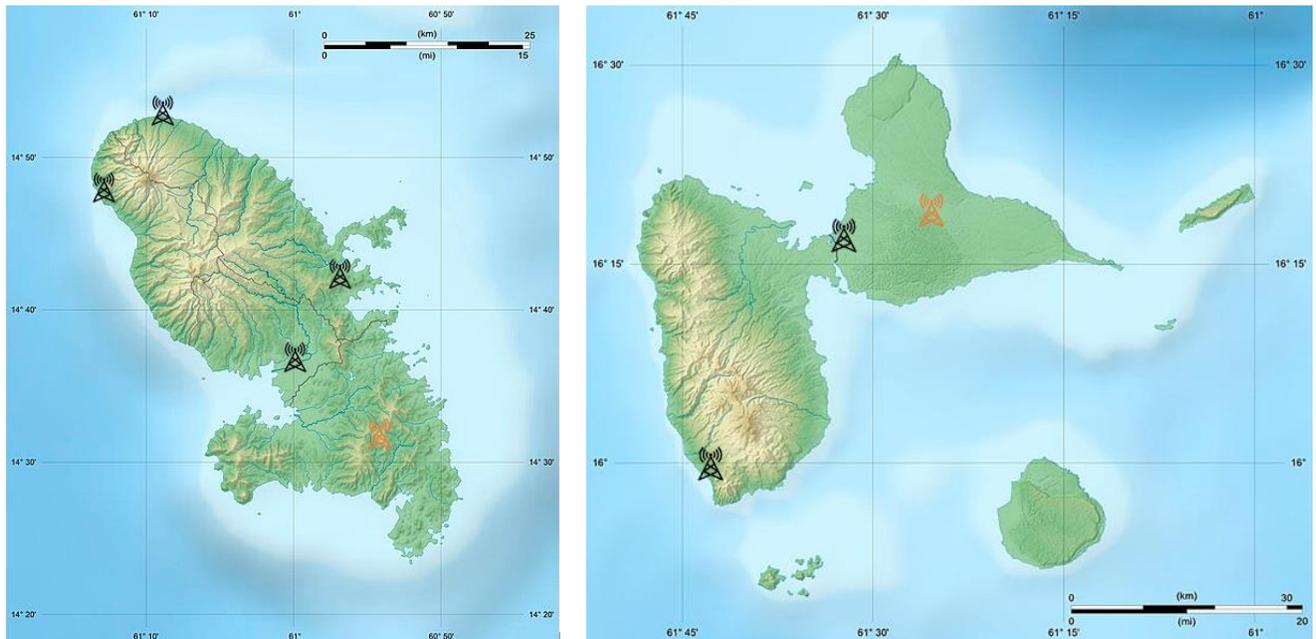
1.3 Data collection for analysis is in progress and a simulation with 2 to 4 antennas per island is underway to assess the optimal coverage.

1.4 There is no ADS-B out equipage mandate in effect in the FWI.

1.5 This new system would complement the 2 radars which will be retrofitted (mode S) in the years to come.

## 2. Environment

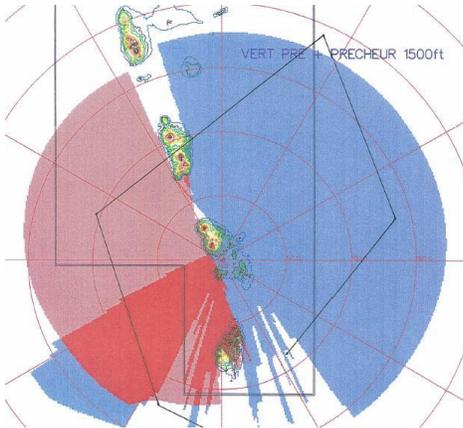
### VHF and Radar sites



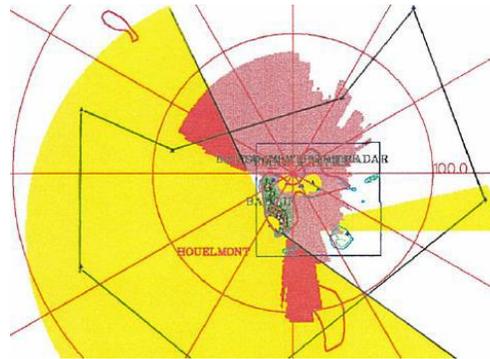
### VHF Coverage

Martinique: Because of the terrain, there are gaps in VHF coverage at low altitudes for VFR, particularly in the north and in the east. This is not a problem for commercial aircraft flying at higher altitudes. The following figure shows the theoretical VHF coverage at 2000ft. A gap is visible in the north of the island. A new antenna will suppress the detection gap to the north (early 2024).

Guadeloupe: Because of the terrain, there are gaps in VHF coverage at low altitudes for VFR, particularly to the west of the island (combined with a radar coverage gap) and to the west of Dominica. There is no problem for commercial aircraft flying at higher altitudes. The following figure shows the theoretical VHF coverage at 1000ft.

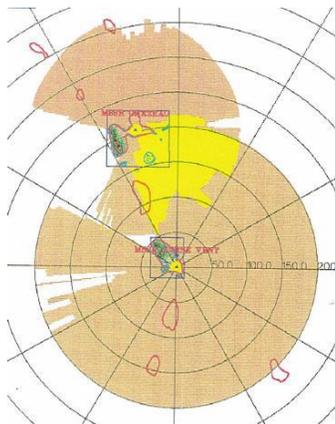


Martinique: Theoretical VHF coverage at 2000ft

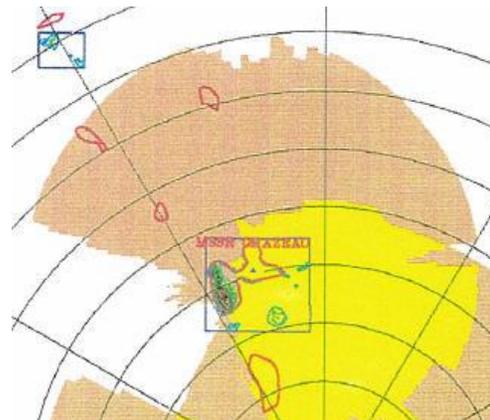


Guadeloupe: Theoretical VHF coverage at 1000ft

### Radar coverage



Martinique: Theoretical VHF coverage at 2000ft



Guadeloupe: Theoretical VHF coverage at 1000ft

2.1 Because of the topography, radar surveillance shows gaps in coverage in nominal mode when both radars are operational.

2.2 In Martinique, for example, there is a coverage gap to the north-west, as illustrated by the map which shows coverage at 2000ft when both radars are operating (nominal case). In this area, there is no need for control services, but the lack of radar coverage affects the provision of flight information and alerting services, as well as SAR services. Although not shown on the map, there are also radar coverage problems for low-altitude VFR to the east of Martinique. This map also illustrates the lack of radar coverage west of Guadeloupe, the problem also exists at 4000ft.

2.3 The situation deteriorates sharply when one of the two radars is not operational (breakdown, maintenance, hurricane, etc.), especially on the island where the radar is located. The provision of control service is impacted, with very high MVAs (Minimum Vectoring Altitude) and even areas with no radar service possible.

2.4 In addition, radar detection around the two Dominica airfields starts between 2000 and 2500ft depending on the area, and there may be detection problems below 3000ft in Saint Lucia.

### **3. Recommendations**

#### Concept Of Operations:

3.1 This paper emphasizes the need to facilitate coordination between the interested parties that will be involved or affected by the implementation of services using ADS-B in the Caribbean region, and to standardize as much as possible the regional ADS-B implementations (NAM CAR SAM CONOPS).

3.2 Individual CAR Region States may develop supplemental implementation documents as needed to reflect their unique operating environments.

3.3 Data sharing Agreement: The Letter of Agreement could be amended to include ADS-B data sharing between both units (Martinique and Guadeloupe ATS units and Piarco ATS) in order to enhance the global surveillance coverage in the PIARCO FIR.

### **4. Conclusion**

4.1 The meeting is invited to note the information contained in this paper; and discuss any relevant matters as appropriate.