



Agenda Item 3: Air Navigation Matters

**3.2 Follow-up on the implementation of the NAM/CAR Regional
Performance Based Air Navigation Plan (RPBANIP) in Eastern Caribbean**

Performance Based Navigation Plan Schedule

(Presented by Barbados)

SUMMARY This information Paper sets out the Performance Based Air Navigation Implementation schedule for Barbados regarding navigation (PBN) and its infrastructure.	
References: Barbados PBN Implementation Plan (2011-2015)	
Strategic Objectives	<i>This working paper is related to Strategic Objectives A and C.</i>

1. Introduction

1.1 RVSM was implemented in the CAR/SAM Region on 20 January 2005. This implementation established the optimization of the airspace structure that would be best achieved through the employment of Performance-Based Navigation which created the conditions necessary for the utilization of RNAV and RNP capabilities. Indeed Barbados adopted the principles of harmonization within the CAR/SAM Region and embarked upon the implementation of a PBN Roadmap and Action Plan informed by the ICAO PBN Roadmap and Action Plan that is based in ICAO PBN Doc. 9613 and the NAM/CAR Regional Performance Based Air Navigation Implementation Plan (NAM/CAR RPBANIP).

Importantly, the Barbados PBN Roadmap aims to adhere to the documented timelines for implementing various aspects of the PBN Programme contained in the NAM/CAR RPBANIP for TMA's and Control Zones.

2. Current PBN Status

Barbados has implemented RNAV GPS approaches and departures as secondary procedures to the VOR/DME and ILS approaches. RNAV GPS approach and departure procedures based on RAIM were designed and implemented for Runway 09 and Runway 27. The air routes are all designed on the DVOR/DME and are random routes network. Way points have been established on all arrival and departure routes and are provided in WGS 84 Coordinates to facilitate the use of GNSS technology.

The CAR/SAM Regions are currently involved in the ICAO Regional Projects RLA/09/801 and RLA/03/902 and are conducting trials to establish the best system to be implemented for augmentation considering the regional environmental challenges on the satellite signal. SBAS and later GBAS trials have been scheduled and it is expected that States will implement RNAV RNP Cat 1 and Cat II approaches based on the agreed augmentation solution for the regions.

3. Communications/Navigation/Surveillance (CNS)

Barbados employs VHF radios with a coverage of 150 NM radius for air-ground communications supported by an Automatic Terminal Information Service (ATIS) which covers a range of 150 NM, a regional digital network for inter-island controller to controller voice and data communication and inter-unit communications system for controller to controller communications supported by an Air Traffic Service Operations Management (ATOM) System. The VHF radios support radar control services within the airspace. Also employed in the airspace for the control of aircraft are: DVOR/DME and ILS, which serve as the basis for instrument arrival and departure procedures. The modern fleet of aircraft equipped with advanced avionics that operate within Barbados' airspace demand the employment of GNSS instrument approach procedures.

Barbados' airspace is covered with radar surveillance provided by a TMA/En-route MSSR with a radial range of 250 NM. Barbados plans to augment its surveillance coverage in 2012 through the introduction of a Multilateration (MLAT) system that will cater to advanced avionics and the traditional avionics of the aging fleet of aircraft that operate in the airspace.

4. Performance Objectives

The Barbados' airspace will be modelled on the ICAO airspace concept and based on strategic objectives of Efficiency, Safety, Environment and Capacity. These objectives will achieve the following benefits:

- Enhanced route structures
- Reduced spacing and flying times of aircraft
- Facilitates the operation of aircraft with advance avionics and common PBN approvals
- Reduced operational cost of aircraft
- Reduced infrastructure and maintenance cost
- Reduced aircraft noise and emissions
- Significant increased capacity and cost savings to airlines and revenue to States

5. PBN Implementation Schedule

COMPONENT		TASK DESCRIPTION	START- END	RESPONSIBLE	STATUS
(a)	Communications	Continued use of VHF Voice Communications (Park Air)	2011-2015	GAIA Inc.	Completed
(b)		Continued use of Sola Comm. Communication Switch	2011-2015	GAIA Inc	Completed
(c)		E/CAR Digital Network Upgrade with the Agreement to Change to a VSAT Solution	2011-2015	TTCAA	Valid
(d)		Air Traffic Operations Management - (ATOM) System. (AMHS) Upgrade or System replacement due in 2011	2011-2012	GAIA Inc	Valid
(e)		Automatic Terminal Information Service (ATIS) System replacement due in 2011	2011-2012	GAIA Inc	Valid
(f)		Aeronautical Fixed Telecommunication Network (AFTN) Upgrade to facilitate the New E/CAR Network & New Flight Plan format	2011-2012	TTCAA	Valid

COMPONENT	TASK DESCRIPTION		START- END	RESPONSIBLE	STATUS
Navigation	(a)	Continued use of VOR/DME	2011-2015	GAIA Inc.	Completed
	(b)	Continued use of GNSS Navigation	2011-2015	Barbados Civil Aviation Department	Completed
	(c)	Continued use of ILS	E/CAR Decision	GAIA Inc.	Completed
Surveillance	(a)	Mandatory Carriage of Transponders	2011-2015	Barbados Civil Aviation Department	Completed
	(b)	Continued use of MSSR	2011-2015	GAIA Inc.	Completed
	(c)	Multilateration Decision on ADS-B Implementation by E/CAR Region Outstanding	2011-2015	GAIA Inc.	Valid
ATM	(a)	Minimum Safe Altitude Warning to be installed	2011-2015	GAIA Inc.	Valid
	(b)	Conflict Prevention to be installed	2012-2015	GAIA Inc.	Valid
	(c)	Conflict Alert to be installed	2012-2015	GAIA Inc.	Valid
	(d)	Implementation of ADS Procedures	2011-2015	Barbados Civil Aviation Department	Valid
	(e)	Determine the Airspace Capacity	2011-2015	Barbados Civil Aviation Department	Valid
	(f)	Continued review and Maintenance of ISO 9001 Certification	2011-2015	Barbados Civil Aviation Department	Valid
	(g)	Continued Initial, Developmental, Refresher and Remedial Training	2011-2015	Barbados Civil Aviation Department	Valid

6. Conclusion

The meeting is invited to review the information to this paper.

----- END -----