



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**

**FOLLOW-UP ON THE IMPLEMENTATION OF THE NAM/CAR REGIONAL
PERFORMANCE BASED AIR NAVIGATION PLAN (NAM/CAR RPBANIP)**

(Presented by the Secretariat)

SUMMARY	
This Working Paper presents the progress and update of the Regional Performance Based Air Navigation Implementation Plan for the NAM/CAR Regions (NAM/CAR RPBANIP) submitted to the NACC/DCA/04 Meeting, as well as the coordination carried-out by ICAO to follow-up on the implementation actions of the RPBANIP.	
References: • Report of the Fourth Meeting of North American, Central American and Caribbean Directors of Civil Aviation (NACC/DCA/4), San Pedro Sula, Honduras, 20 to 24 June 2011 • Report of the Third North American, Central American and Caribbean Working Group Meeting, NACC/WG/3 Guatemala City, Guatemala, 9 to 13 May 2011 • NAM/CAR Regional Performance Based Air Navigation Plan (NAM/CAR RPBANIP) http://www.mexico.icao.int/RegionalGroups/NAMCARRPBANIPV02May2011en.pdf	
Strategic Objectives	<i>This working paper is related to Strategic Objectives A and C.</i>

1. Introduction

1.1 The NACC/DCA/4 Meeting was informed on the results of the NACC/WG/3 Meeting and the meetings of the sub-regional working groups (C/CAR/WG, CA/ANE/WG and E/CAR/WG). Also, the progress achieved in implementing the NAM/CAR RPBANIP, the benefits obtained from the Plan, and an update of the respective Terms of Reference (ToRs) and work programmes was provided.

1.2 Likewise, The Meeting reviewed the Executive Summary of the NACC/WG/3 Meeting report (Appendix A to NACC/DCA/4 - WP/05) including the draft conclusions and modified Draft Conclusion 3/4 items a) and b).

1.3 When reviewing the implementation of the NAM/CAR RPBANIP, the Meeting noted the work achieved, the areas which need work by the NAM/CAR Regions States/Territories and COCESNA; and the work improvements identified for the NACC/WG and its sub-regional working groups, highlighting the need for more active participation by State experts from each air navigation field within each working group and the use of more technological means (email, phone, ICAO webpage, virtual meetings, etc.) to carry out the tasks by the various groups.

2. Follow-up to Implementation Activities of the RPBANIP

2.1 The updated version of the NAM/CAR RPBANIP (V-2.0) is available at the following web page: <http://www.mexico.icao.int/RegionalGroups/NAMCARRPBANIPV02May2011en.pdf>.

2.2 Through ICAO State Letter Ref.: NE57-2 — EMX0583 dated 9 June 2011, concerning the final report of the NACC/WG/3, Subregional Working Groups were encouraged to send updates of their action plans by 31 December 2011.

2.3 The progress reported to the NACC/DCA/4 by each Working Group is included in **Appendix A** to this paper.

2.4 Since August 2011 to date, several teleconferences have been held with the Chairpersons of each one of the Working Groups in order to support and provide guidance in the follow-up of the activities of the RPBANIP, as well as to highlight achievements and operational benefits obtained through these implementations.

2.5 From the analysis of established times, the envisaged activities and the corresponding action plans in the Regional Performance Objectives (RPOs), the following was concluded:

- a) many of the due dates and person responsible for RPOs activities requires to be validated, in view that in several cases the dates have expired or no compliance report has been notified. AGA and SAR Rapporteurs need to be designated;
- b) there are no detailed action plans for the RPO 12 associated with MET; and
- c) ICAO has not been informed of any updates to the action plans based on the NAM/CAR RPBANIP (V-2.0).

3. Benefits Reported from the Implementation of the RPBANIP

3.1 The operational benefits reported to the NACC/DCA/4 meetings by each Working Group are presented in **Appendix B** to this paper.

3.2 As part of the measurement process, ICAO will introduce a Global Air Navigation Report (Global AN Report) for air navigation systems, starting in 2013, through which States may establish a mechanism for data collection, processing and storage and to provide the information to the ICAO NACC Regional Office for the identified regional performance-based metrics.

4. Suggested Action

4.1 The Meeting is invited to:

- a) note the implementation results achieved in the NACC/WG/3 meeting, presented in Appendix A based on the tasks described in the NAM/CAR RPBANIP;
- b) analyze the information on performance metrics, presented in Appendix B to this working paper;
- c) report the NAM/CAR RPBANIP progress and benefits achieved to date; and
- d) update the corresponding RPOs action plans taking into account the notes provided in paragraph 2.5.

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PROGRESS REPORTED AT THE NACC/WG/3 MEETING BASED ON THE REGIONAL PERFORMANCE OBJECTIVES (RPOs) INCLUDED IN THE NAM/CAR RPBANIP (V2.0)

RPO		Achievements	
		CA/ANE/WG	E/CAR/WG
1. PBN IMPLEMENTATION		Central American States and COCESNA adopted a PBN airspace concept. Implementation Project of a new classification and reorganization of Honduras and Guatemala's airspace. Several RNAV routes were implemented in the Central-America FIR upper airspace.	States and Territories adopted a PBN airspace concept for the Piarco FIR.
	1.1 OPTIMIZATION OF THE ATS ROUTE STRUCTURE IN THE UPPER AIRSPACE	Several RNAV routes were implemented	Several RNAV Routes were implemented Implementation Project RNP 10 at east of parallel 57° W, short term
	1.2 OPTIMIZATION OF THE ATS ROUTE STRUCTURE IN THE TERMINAL AIRSPACE	RNAV routes were implemented, and CDOs for some aerodromes in El Salvador and Honduras.	a) RNAV routes were implemented for some aerodromes b) Implementation of CDOs on short term for the aerodromes to Barbados and Trinidad and Tobago
	1.3 IMPLEMENT APPROACHES RNP	a) RNAV (GNSS) Approaches published for the aerodromes in Honduras. b) The States of El Salvador and Nicaragua don't have implementation projects on RNAV (GNSS) Approaches. c) States are required to comply with Assembly resolution A37-11 IMPLEMENTATION: According to RPO	c) RNAV (GNSS) Approaches published for some aerodromes IMPLEMENTATION: According to RPO
2. IMPLEMENTATION OF FLEXIBLE USE OF AIRSPACE (FUA)		a) There exists agreements ATS with military authority b) Some States established a Civil-Militar Coordination Committee IMPLEMENTATION: According to RPO	Some States established a Civil-Militar Coordination Committee IMPLEMENTATION: According to RPO.
3. TO IMPROVE THE ATM SITUATIONAL AWARENESS		a) New ATC Center at San Pedro Sula, Honduras b) Radar data sharing among Central American States c) Individual automation of ATS System d) CPL implementation agreed between COCESNA and Mexico IMPLEMENTATION: According to RPO	a) Recommendations for resolving missing and duplicated flight plans completed – notified at the E/CAR/DCA/23 Meeting. b) Automation of PIARCO ACC in progress IMPLEMENTATION: According to RPO
4. TO IMPROVE THE BALANCE BETWEEN DEMAND AND CAPACITY (DCB)		a) ATFM Implementation Project between all the Central American States and COCESNA b) COCESNA Periodic Coordination between Mexico and the United States. c) Project to define ATS capacity and AAR for the Central American aerodromes on a short term. IMPLEMENTATION: According to RPO	a) ATFM Implementation Project. b) Periodic Coordination between Trinidad and Tobago and the United States c) ATS and AAR Capacity defined for the Trinidad, Tobago and Guadalupe aerodromes IMPLEMENTATION: According to RPO

RPO	Achievements		
	CA/ANE/WG	C/CAR/WG	E/CAR/WG
5. TO IMPLEMENT THE NEW ICAO FLIGHT PLAN FORM	Preparation phase completed: impact identification (matrix) and implicated parts identification IMPLEMENTATION: According to RPO	Preparation phase completed: impact identification (matrix) and implicated parts identification IMPLEMENTATION: According to RPO	Preparation phase completed: identification of impact (matrix) and identification of implicated parts IMPLEMENTATION: According to RPO
6. TO IMPROVE THE SAR SYSTEM	a) COBUSA in charge of SAR implementation activities established in the NAM/CAR RPBANIP. b) Cooperation agreements between civil and military authorities in the provision of a SAR service. SAR agreements are needed with international agencies to improve response capacity on the high seas. States don't have enough SAR resources. c) Reported failures in the activation of the ELT on 406 Mhz. Regulations are hoped to be published for the registry of this beacon code. IMPLEMENTATION: According to RPO	a) The CCAR SAR Committee in charge of de SAR established implementation activities in the NAM/CAR RPBANIP. b) SAR agreements exist between the civil aviation authorities in ECAR. Some States established a Civil-Military Coordination Committee for the provision of a SAR service. c) SAR agreements exist between several CCAR States (RCCs/SRCs: Costa Rica, Cuba, Curazao, United States, Mexico, Dominican Republic). SAR agreements are needed with international agencies to improve response capacity on the high seas IMPLEMENTATION: According to RPO	SAR agreements exist between the civil aviation authorities of the ECAR. Some States established a Civil-Military Coordination Committee for the provision of SAR services. SAR agreements are needed with international agencies to improve response capacity on the high seas. IMPLEMENTATION: According to RPO
7. TO IMPROVE OPERATION CAPACITY AND EFFICIENCY AT AERODROMES	Best practices adopted by States to prevent runway incursions/excursions IMPLEMENTATION: According to RPO	Best practices adopted by States to prevent runway incursions/excursions IMPLEMENTATION: According to RPO	Best practices adopted by States to prevent runway incursions/excursions IMPLEMENTATION: According to RPO
8. PROTECTION AND OPTIMAL USE OF THE RADIOFREQUENCY SPECTRUM	a) Follow-up and regional coordination by States for the protection of the radiofrequency spectrum assigned to aviation in the CMR-12 b) Civil aviation experts have taken part in the delegation of their States in the UIT CMR Meetings. c) ICAO disseminated the policy about the requirements about the radiofrequency spectrum assigned to aeronautic. d) The management of the radiofrequency spectrum has been implemented as well as the regional frequency coordination IMPLEMENTATION: According to RPO. More follow-up from States is required with their Spectrum Management Authorities.	a) Follow-up and regional coordination by States for the protection of the radiofrequency spectrum assigned to aviation in the CMR-12 b) Civil aviation experts have taken part in the delegation of their States in the UIT CMR Meetings. c) ICAO policy about the requirements about the radiofrequency spectrum assigned to aeronautic. d) The management of the radiofrequency spectrum has been implemented as well as the regional frequency coordination IMPLEMENTATION: According to RPO. More follow-up from States is required with their Spectrum Management Authorities.	a) Follow-up and regional coordination by States for the protection of the radiofrequency spectrum assigned to aviation in the CMR-12 b) Civil aviation experts have taken part in the delegation of their States in the UIT CMR Meetings. c) ICAO policy about the requirements about the radiofrequency spectrum assigned to aeronautic. d) The management of the radiofrequency spectrum has been implemented as well as the regional frequency coordination IMPLEMENTATION: According to RPO. More follow-up from States is required with their Spectrum Management Authorities.

RPO			Achievements		
			CA/ANE/WG	C/CAR/WG	E/CAR/WG
9. OPTIMIZATION MODERNIZATION COMMUNICATIONS INFRASTRUCTURE	OF	AND THE	a) Several improvements to ATS b) Implementation agreement in the oral circuits Belize APP – Merida ACC c) Improvements to the CAMSAT network d) Completion of the MEVA II REDDIG interconnection e) OLDI CENAMER-San Pedro Sula implementation f) Radar's updated and data sharing COCESNA-Mexico, COCESNA-Cuba, etc. g) ADS-B data recollection h) A review has been completed on the state of performance of the current aeronautical fixed services (AFS) and to identify deficiencies or improvements (AFTN, oral circuits ATS, Communications A/T) i) Coordination and testing for implementation aspects of the applications T-T of the ATN (AMHS and OLDI) j) Technical Revision of the CAMSAT network for the implementation of the ATN. IMPLEMENTATION: According to RPO.	a) Dominican Republic, Haiti and Curaçao met in March of 2011, and have agreed to perform a preliminary study for the implementation of a repeater station, in Barahona, Dominican Republic. b) Mexico will install a VSAT station from MEVA-II system using the equipment in two months and hopes to have it running before the end of 2011. FOLLOW-UP BY MEVA TMG c) Expansion of the MEVA II network: New Node in Atlanta, USA, and AMHS circuits d) Implementation of radar data sharing between the La Havana Centers (San Julian Radar) and CENAMER (Grand Cayman Radar). e) Cuba and Jamaica have signed an agreement for the radar data sharing. f) The review of the state of performance of the current aeronautical fixed services (AFS) and identify deficiencies or improvements (AFTN, oral ATS circuits, communications A/T) g) Coordination and testing for the aspects of the implementation of applications T-T of the ATN (AMHS and AIDC) h) Technical revision of the MEVA network for the implementation of the ATN. i) Recollection of ADS-B data: Cuba, USA and Jamaica IMPLEMENTATION: According to RPO.	a) Phase III completed for New AFS Network (MPLS Network) b) The review of the state of performance of the current aeronautical fixed services (AFS) and identify deficiencies or improvements (AFTN, oral ATS circuits, communications A/T) c) Coordination and testing for the aspects of the implementation of applications T-T of the ATN (AMHS) d) Technical revision of the ECAR network for the implementation of the ATN. IMPLEMENTATION: According to RPO.
10.IMPLEMENTATION OF THE WGS-84 AND e-TOD			Elaboration of geodetic surveys oriented to the determination of obstacles and the terrain and actualization of the primary and secondary data network according to Doc 9674 and Doc 9881 IMPLEMENTATION: According to RPO	Elaboration of WGS84 geodetic surveys oriented to the determination of obstacles and the terrain and actualization of the primary and secondary data network according to Doc 9674 and Doc 9881 IMPLEMENTATION: According to RPO	Elaboration of geodetic surveys oriented to the determination of obstacles and the terrain and actualization of the primary and secondary data network according to Doc 9674 and Doc 9881 IMPLEMENTATION: According to RPO

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MONITORING OF AIR NAVIGATION SYSTEMS PERFORMANCE
TABLE 1. METRICS AND ACHIEVEMENTS: C/CAR SUBREGION - May 2011

Key Performance Area and Corresponding Metrics	FIR							
	Central America	CURACAO (Aruba, Curacao, Bonaire)	HAVANA	Port-au-Prince	Kingston	United States (Houston Miami Nassau)	Santo Domingo	Mexico
Efficiency - Estimated fuel savings (year 2000 as baseline); - Percent of flights departing on-time; - Percentage of instrument runway ends with an approach procedure with vertical guidance (APV), (BARO-VNAV and/or augmented GNSS) either as the primary approach or as a back-up for precision approaches; - PBN Routes implemented and published in en-route; - Number of certified aircrafts and pilots for PBN operations for en-route and TMA; - Percent of flights with normal flight duration; - Percent of flights with normal flight duration; - Traffic movements i.e. # of movements; - Unused capacity i.e. # of movements; - Number of ATC automated systems that are interconnected; - Number of terminal areas with SID/STAR implemented.	Costa Rica: 2009=191, 227.152 litres 18 RNAV implemented Routes.	RNAV route network will be reviewed in 2011	-5 RNAV routes will be implemented – by June 2010. - Analysis of delays for more than 15 minutes due to operational errors in progress	2 RNAV routes extended from WATRS airspace	RNAV route network will be reviewed in 2011	RNAV Routes network in the Gulf of Mexico to be reviewed in April 2012.	16 RNAV routes implemented, 3 extended from the WATRS airspace.	3,638,931 tons. 10 RNAV Routes 8 Automated systems: Tijuana, Guadalajara, Mexico, Puerto Vallarta, Cancun, Monterrey, Merida, Mazatlan.
Safety - Number of runway incursions per year; - Number of operational errors per year; - Number of accidents per 100,000 departures; - Number of fatalities per 100,000 departures; - Number of LHD reports	Based on implemented comprehensive quality system, analysis ongoing of statistics, operational errors and incident occurrences for continuous improvements in air navigation services	-- Aruba: collecting information ongoing - NA: analysis of statistics ongoing regarding LHDs and Runway incursions.	Percentage of 0.02% Incidents per number of air operations	Analysis of LHDs ongoing to mitigate occurrences.	Analysis of LHDs ongoing	Extensive matured evaluation process based on quality assurance principles. Operational improvements based on SMS risk analysis to ensure level of air navigation services in the	Analysis ongoing of operational errors and incident occurrences reported by users	

Key Performance Area and Corresponding Metrics	FIR							
	Central America	CURACAO (Aruba, Curacao, Bonaire)	HAVANA	Port-au- Prince	Kingston	United States (Houston Miami Nassau)	Santo Domingo	Mexico
						airports and national air space system		

TABLE 2. METRICS AND ACHIEVEMENTS: E/CAR SUB REGION - May 2011

Key Performance Area and Corresponding Metrics	FIR							
	PIARCO					SAN JUAN		
	OECS **	Barbados	Trinidad and Tobago	France (Guadelupe and Martinique)	UK (Montserrat)	Sint Maarten, St Eustatius and Saba	UK (Anguilla, British Virgin Islands - BVI)	United States (Puerto Rico and Virgin Islands)
- Percentage of instrument runway ends with an approach procedure with vertical guidance (APV), (BARO-VNAV and/or augmented GNSS) either as the primary approach or as a back-up for precision approaches; - PBN Routes implemented and published in en-route; - Number of terminal areas with SID/STAR implemented.	Dominica, Saint Kitts y Nevis, Santa Lucia: RNAV (GNSS) = 6	RNAV: 2 SIDs, 2 APPs (RNP) = 4	RNAV GNSS: 4 APPs (RNP) = 4	RNAV GNSS: 4 STARs, 2 APPs (RNP) = 6		RNAV GNSS: 1 SIDs, 3 STARs, 1 APP (RNP) = 5		RNAV (GPS): 8 SIDs, 10 STARs, 10 APPs (RNP) = 28

** : OECS: Antigua and Barbuda, Dominica, Grenada Saint Kitts y Nevis, Saint Lucia, Saint Vincent and the Grenadines

TABLE 3. METRICS AND ACHIEVEMENTS: Central America SUB REGION and Mexico: May - 2011

Performance Metrics	Belize	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Mexico	COCESNA
Efficiency								
• Estimated fuel savings (year 2000 as baseline);	40% 2008 to date	0% 2009=191, 227.152 litres		Information not available 0%	90%		3,638,931 tons	N/A
• Percent of flights departing on-time;	80%	Not available		In implementation process 50%	85%			N/A
• Percentage of instrument runway ends with an approach procedure with vertical guidance (APV), (BARO-VNAV and/or augmented GNSS) either as the primary approach or as a back-up for precision approaches;	NIL Approaches ILS 90%	0 1 in process	NIL	0%	95%	NIL		N/A
• PBN Routes implemented and published in en-route;	No	0	NIL	6 STAR a) 3 RWY 01, b) 3 RWY 19	0%	NIL	10 RNAV routes	18 PBN routes
• Number of certified aircrafts and pilots for PBN operations for en-route and TMA;	NIL	Not available			40%		Aircrafts: 130 Pilots: 300	N/A
• Percent of flights with normal flight duration;	90%	Not available		Information not available 0%	90%			NIL
• Traffic movements i.e. # of movements;		160.213 VFR/IFR		100%	50%		2010= 950,000 2009= 1,822,465 2008= 2,044,239 2007= 2,136,908 2006= 1,979,273 2005= 1,698,004	2006: 124400 2007: 132132 2008: 139934 2009: 145125 2010 104000* *to August 2010
• Unused capacity i.e. # of movements;				In process 20%	5%			N/A
• Number of ATC automated systems that are interconnected;		5			25%		8: Tijuana, Guadalajara, México, Puerto Vallarta, Cancun, Monterrey, Mérida, Mazatlan	6. Note: corresponds to the integration of 6 radars from different States with whom COCESNA has agreements/radar data exchange.
• Number of terminal areas with SID/STAR implemented;	0	2	1	2	2	NIL		N/A
Safety								
• Number of runway incursions per year;	3	2006=6 2009=0			8%		2010= 0 2009= 0	N/A

Performance Metrics	Belize	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Mexico	COCESNA
• Number of operational errors per year;	6	6			10%		2010= 11 2009= 11	Working in the 2010 statistics
• Number of accidents per 100,000 departures;	8	1			4%		2010= 5.242134 2009= 4.735106	N/A
• Number of fatalities per 100,000 departures;	8	1			4%		2010=3.58 2009=2.27	N/A
• Number of LHD reports.				N/A	10%		2009=3 2010=3	2008: 29 2009: 22 2010: 12 * *to September 2010.

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