



Agenda Item 2: Follow-up to the implementation status of the performance based navigation systems plans for the CAR and SAM Regions and to the latest amendments to the ATM- and CNS-related SARPS

PROGRESS OF THE PERFORMANCE BASED AIR NAVIGATION IMPLEMENTATION PLAN FOR THE NAM/CAR REGIONS

(Presented by the Secretariat)

SUMMARY	
This Working Paper presents the progress of the Performance Based Air Navigation Implementation Plan for the NAM/CAR Regions (NAM/CAR RPBANIP) approved by the NACC/DCA/3 Meeting. Suggested action for the meeting is presented in paragraph 3.	
<i>ICAO Strategic Objectives:</i>	A: Safety - Enhance global civil aviation safety D: Efficiency - Enhance the efficiency of aviation operations
<i>References:</i>	<ul style="list-style-type: none">• Doc 9854 - <i>Global Air Traffic Management Operational Concept</i>• Doc 9883 - <i>Manual on Global Performance of the Air Navigation System</i>• Doc 9750 - <i>Global Air Navigation Plan</i>• Report of the GREPECAS/15 Meeting (Río de Janeiro, Brazil, October 2008)• Report of the Third Meeting of North American, Central American and Caribbean Directors of Civil Aviation (NACC/DCA/3) Punta Cana, Dominican Republic, 8-12 September 2008

1. Introduction

1.1 Based on the recommendations of the Eleventh Air Navigation Conference (AN-Conf/11) for the implementation of air navigation systems, ICAO has developed guidance material including: a) *Global Air Traffic Management Operational Concept* (Doc 9854); b) *Manual on Air Traffic Management System Requirements* (Doc 9882); c) *Manual on Global Performance of the Air Navigation System* (Doc 9883); d) *Global air navigation Plan* (Doc 9750) and e) *Safety Management Manual (SMM)* (Doc 9859).

1.2 Doc 9750 distinguishes different Global Plan Initiatives (GPIs) to facilitate the implementation of systems such as RNAV, RNP, FUA, civil-military coordination, situational awareness, etc. Due to different development levels of air navigation systems worldwide, it is acknowledged that implementation should be in line with the Regions and States own needs, based on the main flows, traffic density and their growth perspective.

1.3 GPIs support the operational improvement initiatives, developed as Regional Performance Objectives (RPOs), where the short and medium-term strategies to achieve evolutionary progress in the ATM system implementation are reflected. The long term initiatives, which are necessary to provide guidance to the evolution towards a global ATM system, will be added to the Global Plan as they are developed and approved.

1.4 Based on these guidelines, the NACC/DCA/3 Meeting approved the Performance Based Air Navigation Implementation Plan for the NAM/CAR Regions (NAM/CAR RPBANIP) so that all the Working Groups of the NAM/CAR Regions could harmonize their work programmes.

2 Analysis

2.1 The RPBANIP, available at the ICAO NACC Regional Office web page (www.mexico.icao.int), was developed with RPOs wherein the tasks, implementation dates, responsible entity and status of compliance of each task are indicated. The plan was developed with project management techniques and has a finalizing horizon of each strategy from 2010 to 2016.

2.2 After several meetings, action plans have been integrated in the CAR Region for all the air navigation fields.

2.3 In line with Doc 9750 GPIs, RVSM initiatives, the “A” classification of airspace above FL195 and the harmonization of flight levels have now been completed. **Appendix A** to this WP presents a comparative table of Doc 9750 GPIs with RPBANIP performance objectives.

2.4 Action plans serve as guidance material to harmonize all States work and implementation plans. The regional implementation work plan is coordinated by the ICAO NACC Regional Office with the sub-regional Implementation Groups and technical co-operation experts supporting the development of tasks in line with agreed planning. Implementation activities monitoring allows the identification of priorities as well as and the material and economical resources required by States/Territories/International Organizations to ensure tasks compliance.

2.5 From the implementation works carried out in the last years, several operational performance measures have been identified in the safety and efficiency areas related with the air navigation system, included in **Appendix B** to this WP.

2.6 States/Territories/International Organizations will continue providing information on the progress of their implementation plans, identifying other initiatives that may be adapted to their own needs and ensuring integration and harmonization of air navigation systems and infrastructure.

2.7 ICAO will continue monitoring the implementation progress to assist the States/Territories/International Organizations in their work towards the next AN-Conf 12 scheduled for 2012, where the new air navigation needs will be analysed, which will allow to continue the implementation of ATM system on a worldwide basis. It is expected that during the AN-Conf/12 the global air navigation plan will be updated towards a globally harmonized ATM concept.

3 Suggested Action

3.1 The Meeting is invited to:

- a) take note of the implementation results achieved by NAM/CAR States/Territories/International Organizations, based on the tasks described in the RPBANIP;
- b) update tasks and activities of the work programme of the CNS/ATM/SG as described in this WP; and
- c) recommend other actions as deemed appropriate.

APPENDIX A
ATM PERFORMANCE OBJECTIVES IMPLEMENTATION

As a result of the implementation tasks described in the ATM regional performance objectives (RPOs) of the NAM/CAR RPBANIP, it is observed that from the 23 Global plan initiatives (GPIs) of the Global Air Navigation Plan (Doc 9750), three have been finalized, and several are in the implementation plans as indicated below:

GPI		En-route	Terminal Area	Aerodrome	Supporting Infrastructure	Remarks
GPI-1	Flexible use of airspace	X	X			Adopted in work programme ATM. RPO 1, 2, 3
GPI-2	Reduced vertical separation minima	X				Finalized
GPI-3	Harmonization of level systems	X				Finalized
GPI-4	Alignment of upper airspace classifications	X				Finalized
GPI-5	RNAV and RNP (Performance-based navigation)	X	X	X		Adopted in work programme. RPOs 1, 2, 3
GPI-6	Air traffic flow management	X	X	X		Adopted in work programme. RPO 6
GPI-7	Dynamic and flexible ATS route management	X	X			Adopted in work programme. RPOs 1, 2, 3
GPI-8	Collaborative airspace design and management	X	X			Adopted in work programme. RPOs 1, 2, 3
GPI-9	Situational awareness	X	X	X	X	Adopted in work programme. RPO 7
GPI-10	Terminal area design and management		X			Adopted in work programme. RPOs 1, 2, 3
GPI-11	RNP and RNAV SIDs and STARs		X			Adopted in work programme. RPOs 1, 2, 3
GPI-12	Functional integration of ground systems with airborne systems		X		X	Adopted in work programme. RPO 7
GPI-13	Aerodrome design and management			X		Adopted in work programme. RPO 11
GPI-14	Runway operations			X		Adopted in work programme. RPO 11

GPI		En-route	Terminal Area	Aerodrome	Supporting Infrastructure	Remarks
GPI-15	Match IMC and VMC operating capacity		X	X	X	(All WX operations) Adopted in work programme. RPO 11
GPI-16	Decision support systems and alerting systems	X	X	X	X	Adopted in work programme. RPO 7
GPI-17	Data link applications	X	X	X	X	Adopted in work programme. RPO 7
GPI-18	Aeronautical information	X	X	X	X	Adopted in work programme. RPOs 13 & 14
GPI-19	Meteorological systems	X	X	X	X	Adopted in work programme. RPO 15. Improve MET information availability.
GPI-20	WGS-84	X	X	X	X	Adopted in work programme ATM. RPO 1, 2, 3
GPI-21	Navigation systems	X	X	X	X	Adopted in work programme. RPOs 1, 2 & 3 (GNSS use)
GPI-22	Communication infrastructure	X	X	X	X	Adopted in work programme. RPO 7 (Improvement of aeronautical communications)
GPI-23	Aeronautical radio spectrum	X	X	X	X	Adopted in work programme. RPO 11 (WRC-12)

APPENDIX B
Central Caribbean (C/CAR)

Key Performance Area and Corresponding Metrics	Metrics Reported by FIR						
	Central America	CURACAO (Aruba & Netherlands Antilles)	HAVANA	Port Au Prince	Kingston	Miami, San Juan	Santo Domingo
<p><u>Efficiency</u></p> <ul style="list-style-type: none"> • 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; • 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. 	18 RNAV routes implemented	RNAV route network will be reviewed in 2010	-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 2010	RNAV route network in the Gulf of Mexico will be reviewed in 2010	3 RNAV routes extended from WATRS airspace

Key Performance Area and Corresponding Metrics	Metrics Reported by FIR						
	Central America	CURACAO (Aruba & Netherlands Antilles)	HAVANA	Port Au Prince	Kingston	Miami, San Juan	Santo Domingo
<p>Safety</p> <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> - <u>Aruba</u>: collecting information ongoing - <u>NA</u>: 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 airports and national air space system	Analysis ongoing of operational errors and incident occurrences reported by users

Eastern Caribbean (E/CAR)

Metrics	BENEFITS BY FIR							
	PIARCO					SAN JUAN		
	ECCAA (Antigua* and Barbuda, Dominica, Grenada* Saint Kitts and Nevis, Saint Lucia, Saint Vincent* and the Grenadines)	Barbados*	Trinidad and Tobago	France (Guadeloupe* and Martinique*)	UK (Montserrat)	Netherlands Antilles (Sint Maarten)	UK (Anguilla, British Virgin Islands - BVI)	USA (Puerto Rico and Virgin Islands)
<p><u>Key Performance Area:</u> <u>Efficiency</u></p> <ul style="list-style-type: none"> 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. 	Saint Lucia: NA	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

FIR Central American and Mexico

Métrica de Performance	Belice	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	México	COCESNA
<u>Eficiencia</u> <ul style="list-style-type: none"> • Estimado ahorro de combustible (base año 2000); • Porcentaje de vuelos saliendo a tiempo; • Porcentaje de procedimiento de aproximación por instrumentos en el extremo de la pista con guía vertical (APV), (BARO-VNAV y/o GNSS aumentado) ya sea como aproximación primaria o como respaldo para aproximaciones de precisión; • Rutas PBN implementadas y publicadas en ruta; • Número de aeronaves y pilotos certificados para operaciones PBN para en ruta y TMA; 	40% 2008 a la fecha	0% 2009=191, 227.152 litros		No se cuenta con información. 0%	90%		3,638,931 toneladas	N/A
	80%	No disponible		En proceso de implementación 50%	85%			N/A
	NIL Aproximaciones ILS 90%	0 1 en proceso		No se cuenta con estos procedimientos 0%	95%			N/A
	No	0		6 STAR a) 3 RWY 01 B 3 RWY 19	0%		10 rutas RNAV	Rutas PBN 18
	NIL	No disponible			40%		Aeronaves: 130 Pilotos: 300	N/A

Métrica de Performance	Belice	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	México	COCESNA
<ul style="list-style-type: none"> • Porcentaje de vuelos con duración de vuelo normal; 	90%	No disponible		No se cuenta con información 0%	90%			NIL
<ul style="list-style-type: none"> • Movimientos de tránsito, por ej. # de movimientos; 		160.213 VFR/IFA		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* *al mes de agosto de 2010
<ul style="list-style-type: none"> • Capacidad no utilizada por ej. # de movimientos; 				En proceso 20%	5%			N/A
<ul style="list-style-type: none"> • Número de sistemas automatizados ATC interconectados; 		5		4 AFTN REDILDG HELED (estadísticas) CASS (en proceso)	25%		8: Tijuana, Guadalajara, México, Puerto Vallarta, Cancún, Monterrey, Mérida, Mazatlán	6. Nota: corresponde a la integración de 6 radares de diferentes Estados con los cuales COCESNA tiene convenios de intercambio/compartición de datos radar.
<ul style="list-style-type: none"> • Número de TMAs con SID/STAR implementados. 	0	2		2	0% sólo STAR			N/A
<u>Seguridad operacional</u> <ul style="list-style-type: none"> • Número incursiones en pista al año; 	3	2006=6 2009=0		En proceso. Finalización diciembre 2010	8%		2010= 0 2009= 0	N/A

Métrica de Performance	Belice	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	México	COCESNA
<ul style="list-style-type: none"> Número de errores operacionales al año; 	6	6		En proceso. Finalización diciembre 2010	10%		2010= 11 2009= 11	Se está trabajando en las estadísticas de 2010
<ul style="list-style-type: none"> Número de accidentes por 100,000 salidas; 	8	1		En proceso. Finalización diciembre 2010	4%		2010= 5.242134 2009= 4.735106	N/A
<ul style="list-style-type: none"> Número de muertos por 100,000 salidas; 	8	1		En proceso. Finalización diciembre 2010	4%		2010=3.58 2009=2.27	N/A
<ul style="list-style-type: none"> Número de reportes LHD. 				No aplica	10%		2010=3 2009=3	2008: 29 2009: 22 2010: 12 * *al mes de septiembre de 2010.

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