



Agenda Item 2: Air Navigation Matters
2.3 Other Specific Air Navigation Developments
2.3.3 Air Traffic Management (ATM)

**FOLLOW-UP TO ASSEMBLY RESOLUTION A36/23 ON THE IMPLEMENTATION OF PBN
APV (BARO/VNAV) PROCEDURES**

(Presented by the Secretariat)

SUMMARY	
This working paper requests the Meeting to update information on PBN implementation.	
References:	
• Doc 9902 - <i>Assembly Resolutions in Force (as of 28 September 2007)</i> • Report of the Fifteen Meeting of the CAR/SAM Regional Planning and Implementation Group (GREPECAS/15) Rio de Janeiro, Brasil, 13 – 17 October 2008	
Strategic Objectives	<i>This working paper is related to Strategic Objectives A and D.</i>

1. Introduction

1.1 The ICAO Assembly approved Resolution A36/23 transcribed herewith for ease of reference:

A36-23: Performance based navigation global goals

Whereas a primary objective of ICAO is that of ensuring the safe and efficient performance of the global Air Navigation System;

Whereas the improvement of the performance of the Air Navigation System on a harmonized, worldwide basis requires the active collaboration of all stakeholders;

Whereas the Eleventh Air Navigation Conference recommended that ICAO, as a matter of urgency, address and progress the issues associated with the introduction of area navigation (RNAV) and required navigation performance (RNP);

Whereas the Eleventh Air Navigation Conference recommended that ICAO develop RNAV procedures supported by global navigation satellite system (GNSS) for fixed wing aircraft, providing high track and velocity-keeping accuracy to maintain separation through curves and enable flexible approach line-ups;

Whereas the Eleventh Air Navigation Conference recommended that ICAO develop RNAV procedures supported by GNSS for both fixed and rotary wing aircraft, enabling lower operating minima in obstacle rich or otherwise constrained environments;

Whereas Resolution A33-16 requested the Council to develop a programme to encourage States to implement approach procedures with vertical guidance (APV) utilizing such inputs as GNSS or distance measuring equipment (DME)/DME, in accordance with ICAO provisions;

Recognizing that implementation of approach with vertical guidance (APV) is still not widespread;

Recognizing that the Global Aviation Safety Plan has identified Global Safety Initiatives (GSIs) to concentrate on developing a safety strategy for the future that includes the effective use of technology to enhance safety, consistent adoption of industry best practices, alignment of global industry safety strategies and consistent regulatory oversight;

Recognizing that the Global Air Navigation Plan has identified Global Plan Initiatives (GPIs) to concentrate on the incorporation of advanced aircraft navigation capabilities into the air navigation system infrastructure, the optimization of the terminal control area through improved design and management techniques, the optimization of the terminal control area through implementation of RNP and RNAV SIDs and STARs and the optimization of terminal control area to provide for more fuel efficient aircraft operations through FMS-based arrival procedures; and

Recognizing that the continuing development of diverging navigation specifications would result in safety and efficiency impacts and penalties to States and industry;

The Assembly:

1. Urges all States to implement RNAV and RNP air traffic services (ATS) routes and approach procedures in accordance with the ICAO PBN concept laid down in the Performance Based Navigation Manual (Doc 9613);

2. Resolves that:

- a) States and planning and implementation regional groups (PIRGs) complete a PBN implementation plan by 2009 to achieve:*
 - i) implementation of RNAV and RNP operations (where required) for en route and terminal areas according to established timelines and intermediate milestones; and*

- ii) *implementation of approach procedures with vertical guidance (APV) (Baro-VNAV and/or augmented GNSS) for all instrument runway ends, either as the primary approach or as a back-up for precision approaches by 2016 with intermediate milestones as follows: 30 per cent by 2010, 70 per cent by 2014; and*
- b) *ICAO develop a coordinated action plan to assist States in the implementation of PBN and to ensure development and/or maintenance of globally harmonized SARPs, Procedures for Air Navigation Services (PANS) and guidance material including a global harmonized safety assessment methodology to keep pace with operational demands;*

3. *Urges that States include in their PBN implementation plan provisions for implementation of approach procedures with vertical guidance (APV) to all runway ends serving aircraft with a maximum certificated take-off mass of 5700 kg or more, according to established timelines and intermediate milestones.*

4. *Instructs the Council to provide a progress report on PBN implementation to the next ordinary session of the Assembly; and*

5. *Requests the Planning and Implementation Regional Groups (PIRG) to include in their work programme the review of status of implementation of PBN by States according to the defined implementation plans and report to ICAO any deficiencies that may occur.*

1.2 As a follow-up to this Assembly resolution, GREPECAS formulated the following conclusion:

CONCLUSION 15/38 NATIONAL PBN IMPLEMENTATION PLANS

That in order to initiate PBN implementation and in accordance with Resolution 36/23, CAR/SAM States/Territories:

- a) *develop their PBN national implementation plans by December 2009, and present them to the corresponding Regional Offices;*
- b) *consider using the PBN action plans models presented in **Appendix G** to this part of the Report as guidance material; and*
- c) *designate a Point-of-Contact who will coordinate PBN implementation activities in each State/Territory.*

2. Discussion

2.1 Some CAR States have provided information on their action and implementation plans concerning their procedures at international airports. Information on international airports that have implemented RNAV/RNP procedures is shown in the **Appendix** to this working paper. It is required that all States inform the ICAO NACC Regional Office on PBN implementation by 15 December 2010 so that information gathered be sent to the ICAO Council.

3. Suggested Action

3.1 The Meeting is invited to update the table included in the Appendix on PBN implementation and inform the ICAO NACC Regional Office on international airports that have implemented RNAV/RNP procedures by **15 December 2010**.

RNAV TERMINAL PROCEDURES PUBLISHED IN THE CAR REGION AND BERMUDA (ver. 1.01 - 160410)

STATE/TERRITORY	AERODROME	RWY	SIDs	STARs	APPs (RNP)	TOTAL	AIP issued	JEP issued	REMARKS
EI SALVADOR	MSLP	07/25							NO RNAV PUBLISHED
	MSSS	15/33 - 08/26							NO RNAV PUBLISHED
GRENADA	TGPZ								NO RNAV PUBLISHED
GUADALOUPE, FR	TFFM	09/27							NO RNAV PUBLISHED
	TFFR	11/29			1	1		Apr-09	RNAV (GNSS)
GUATEMALA	MGGT	01/19		6		6	Nov-05	Nov-05	RNAV
	MGTK	10/28							NO RNAV PUBLISHED
HAITI	MTPP	10/28	5		2	7	Apr-05	Jul-05	RNAV (GPS)
	MTCH	05/23	12		2	14	Apr-05	Jul-05	RNAV (GPS)
HONDURAS	MHTG	02/20	5	3	3	11	Jan-09	Dec-09	AIP/SUP 5/09 RNAV
	MHLC	06/24							NO RNAV PUBLISHED
	MHLM	04/22	4	6	1	11	Jan-09	Aug-08	AIP/SUP 5/09 RNAV
	MHRO	06/24	4	5	1	10	Jan-09	May-08	AIP/SUP 5/09 RNAV
JAMAICA	MKJP	12/30	3		2	5	Oct-02	Aug-08	RNAV GNSS
	MKJS	07/25	4		2	6	Oct-02	Jun-06	RNAV GNSS
MARTINIQUE, FR	TFFF	09/27		4	2	6	Jan-09	Jan-09	RNAV GNSS
		05/23- L/R							NO RNAV PUBLISHED
MEXICO	MMMX								NO RNAV PUBLISHED
MONTSERRAT, UK	TRPG								NO RNAV PUBLISHED
NICARAGUA	MNMG	09/27							NO RNAV PUBLISHED
PUERTO RICO, US	TJBQ	08/26			1	1		Oct-09	RNAV (GPS)
	TJIG	09/27			1	1		Apr-08	RNAV (GPS)
	TJMZ	09/27			1	1		Oct-05	GPS
	TJPS	12/30			2	2		Mar-09	RNAV (GPS)
		08/26-							
	TJSJ	10/28	7	10	3	20		May-09	RNAV (GPS)
	TJVQ	09/27	1		1	2		Feb-10	RNAV (GPS)
ST. EUSTATIUS, NL	TNCE	07/25							NO RNAV PUBLISHED
ST. KITTS & NEVIS	TKPK	07/25							NO RNAV PUBLISHED
ST. LUCIA	TLPC	09/27							NO RNAV PUBLISHED
	TLPL	10/28							NO RNAV PUBLISHED
ST. MAARTEN, NL	TNCM	10/28	1	3	1	5	Jun-09	Jun-09	RNAV GNSS
ST. VINCENT & THE									
GRANADINES	TVSV	07/25							NO RNAV PUBLISHED
	TVSC	13/31			2	2	Jan-09	Jan-09	RNAV GNSS
TRINIDAD &									
TOBAGO	TTPP	10/28			2	2	Aug-09	Aug-09	RNAV GNSS
	TTCP	11/29			2	2	Jan-09	Jan-09	RNAV (GPS)
TURKS & CAICOS I.,									
UK	MBAC	07/25	4		2	6	Feb-10	Jan-09	RNAV (GNSS)
	MBGT	11/29			2	2	Feb-10	Feb-10	RNAV (GNSS)
	MBMC	10/28	7		2	9	Dec-08	Dec-08	RNAV (GNSS)
	MBPV	10/28	3		2	5	Feb-10	Feb-10	RNAV (GNSS)
	MBSC	11/29			2	2	Feb-10	Feb-10	RNAV (GNSS)
VIRGIN ISLANDS, US	TIST	10/28			1	1	Nov-06	Nov-06	RNAV (GPS)
			SID	STAR	APP	TOTAL			
	TOTALS		138	95	91	324			