

SUMMARY OF DISCUSSIONS AND RECOMMENDATIONS

An analysis of the current PBN implementation in the CAR Region shows lack of harmonization, which does not facilitate efficient coordination and provision of Air Traffic Control (ATC) service, as well as limited use by operators. This diagnosis includes:

- Lack of information of reliable statistics on air operations growth in the States
- Some implemented PBN approach procedures are not being used by operators due to lack of coordination with the users, which results in poor operational benefits
- Lack of update of training programmes for pilots and controllers
- The design of some Terminal Control Areas (TMAs) is not appropriate in view of the new aircraft navigation capabilities
- Published flight tracks are lengthy, exceeding TMAs boundaries, infringing non controlled airspace
- Some waypoints have been established in uncontrolled “G” class airspace, causing confusions to the pilots
- Instrument Flight Rules (IFR) and Visual Flight Rules (VFR) tracks are not segregated to cover ATC operational needs
- Some published tracks have resulted in Air Traffic Service (ATS) hot spots provoking Traffic Alert and Collision Avoidance System (TCAS) report releases
- Not all automated ATS equipment has been updated for appropriate processing of flight plans in accordance with procedures with ICAO Doc 4444
- Not all States have issued suitable regulation for PBN operational certification and approval
- Some ATC units present ATS capacity limitations due to lack of qualified personnel
- Not all States have developed PBN national training plans

Based on the above-mentioned analysis, CAR States should review and develop their own PBN Implementation Projects based on four (4) phases as a high priority matter for the CAR Regions considering gate-to-gate operations and air traffic increase for 2015-2017, based on the Doc 9992 - *Manual on the Use of Performance-based Navigation (PBN) in Airspace Design*, as follows:

- Planning
- Design
- Validation
- Implementation

PBN Projects should meet safety, capacity and efficiency, environment objectives, as well as airspace organization details.

PBN Airspace Redesign Projects should be focused on Area Navigation (RNAV) routes implementation, Required Navigation Performance (RNP) approach procedures, Standard Instrument Departures (SIDs) and Standard Instrument Arrival (STARs) with Continuous Climb Operations (CCO) and Continuous Descend Operations (CDO) criteria, RNAV 10 or RNP 4 for Oceanic airspace, as required.

States should designate and foster the participation of their regulators, controllers, airspace planners, pilots/operators, military authority, general aviation representatives, etc. Guidelines on ICAO PBN operational approval processes and training programmes should be provided to all PBN team members.

PBN Teams should gather data on aircraft PBN capacity including traffic grow in the last 5 years and expected traffic grow for the next 5 years, looking forward to increase aerodrome and ATS capacity in the short term, according to the service demand needed by air operations.

States should develop their national procedures to improve ATS capacity in the short term, in accordance with ICAO Demand and Capacity Balancing (DCB) provisions.

In order to achieve successful PBN implementation, States should coordinate their PBN activities with each other, keeping close coordination with other States and stakeholders of the FIRs involved working together for inter-regional PBN harmonization.

States should complete the following implementation tasks as regional strategy to improve Airspace Organization and Management (AOM) in the CAR Region:

Phase	Operational improvement
<p>Phase I (2015-2016)</p>	<ul style="list-style-type: none"> • Realign, delete and/or implement RNAV routes in the upper airspace based on RNAV 5 navigation specification • Realignment and/or implementation of new RNAV routes in the interface of the upper airspace between the NAM/CAR/SAM, based on three representing traffic flows between North and South America: <ul style="list-style-type: none"> ☑ North America – Central America – South America ☑ North America – Central Caribbean – South America ☑ North America – Eastern Caribbean – South America • Implement random routes and/or RNP 10 navigation specification in the oceanic areas of Central American, Mazatlan oceanic and Piarco FIRs • Implementation of RNAV routes in the lower airspace based on RNAV 1, RNAV 2 and RNP 1 navigation specifications, as required • Implementation of PBN approach procedures (APV, BARO-VNAV) in 100% of the instrument runways, in accordance with Assembly Resolution A37-11
<p>Phase II (2015-2016)</p>	<ul style="list-style-type: none"> • Review of the Terminal Areas (TMAs) configuration, as required • Implementation of CDO and CCO in the international airports, as required • Up-to-date regional supplementary procedures (SUPPs) and Letters of Agreement (LOAs) for dynamic airspace configuration
<p>Phase III (2016-2017)</p>	<ul style="list-style-type: none"> • Review of the upper airspace configuration of CAR Region FIRs • Implementation of Flexible Use of Airspace (FUA) • Implementation of regional procedures for dynamic Air Traffic Management (ATM) between adjacent FIRs

States should conduct a yearly operational improvement assessment based on reduced track miles and CO₂ reduction to obtain benefits to the environment.

States will submit their achievements and new proposals to improve the ATS route network to ICAO NACC Regional Office.

ICAO NACC Regional Office will update the PBN Airspace Concept for CAR Region included in its webpage (<http://www.icao.int/NACC/>).