

# Performance Based Navigation Introduction to PBN

Erwin Lassoij  
Performance Based Navigation Programme Manager  
Air Navigation Bureau  
ICAO Headquarters, Montreal

Introduction to PBN Seminar  
PBN Introduction 1




# Presentation Overview

- PBN – Background
- PBN – Status
- PBN – Goals
- Seminar overview




Introduction to PBN Seminar  
PBN Introduction 2



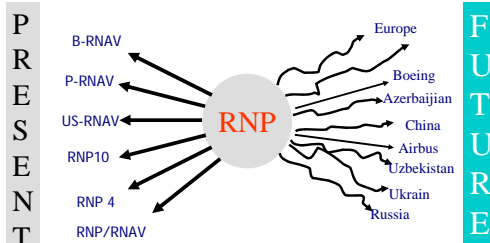
# Aviation challenges

- Growing demand for solutions to airspace congestion
- Growing fuel efficiency requirements
- Growing Environmental requirements
- Growing demand for RNAV approaches (safety, accessibility)
- **Most can be met with current technology, but standardization and operational requirements have to be put into place**

Introduction to PBN Seminar  
PBN Introduction 3




# Are we now going the right way?



Not safe, not efficient, costly, confusing

Introduction to PBN Seminar  
PBN Introduction 4




# Adjustment to the RNP concept required

- Clear distinction between **operations that require performance monitoring and alerting** and **operations that don't require performance monitoring and alerting**
- Introduction of **navigation functional** requirements

**So, what needed to be done?**

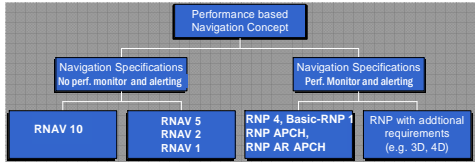
- Harmonization of current RNAV and RNP operations according new concept
- Development of new navigation specifications to meet operational demand
- Need for clear operational approval requirements and implementation guidance

Introduction to PBN Seminar  
PBN Introduction 5




# RNP SORSG

## Performance Based Navigation Concept



**Performance Based Navigation (PBN)**  
Area navigation based on performance requirements for aircraft that are described in navigation specifications

Introduction to PBN Seminar  
PBN Introduction 6




## Current status PBN reference documentation

- Final draft of PBN manual is finalized and posted on ICAO-NET
- State Letter with Navigation Specifications is on ICAO-NET
  - AN 11/45-07/22, 27 April 2007
- PBN terminology changes to Annexes 2, 6, 10, 11 (2008), 4 and 15 (2009) and 3 (2010)
- Flight plan provisions: PANS-ATM (Nov 2012)
- Flight procedure design requirements: PANS-OPS (Nov 2008)
- ICAO RNP AR Procedure Design Manual (Doc 9905), (Final Draft) as of March 2008
- ICAO Quality Assurance Manual for Flight Procedure Design (Doc 9906)

• PBN Web Site: [www.icao.int/pbn](http://www.icao.int/pbn)

7



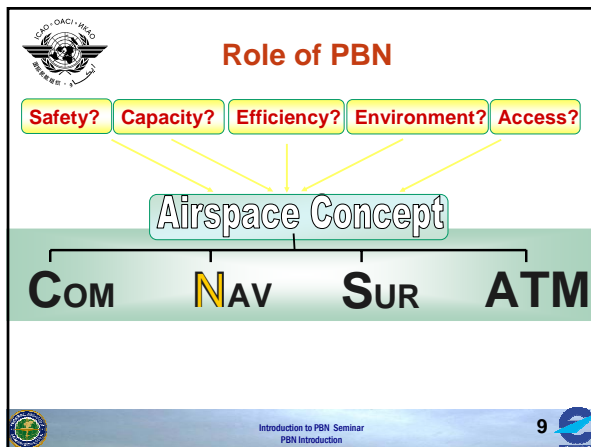

## ICAO implementation goals (as contained in A36-23)

States and/or regions to develop an **implementation plan** by 2009 to achieve the following goals:

- where RNAV operations are required, implementation of enroute (oceanic and continental) and terminal ATS routes to be implemented according to PBN,
- all instrument runway ends to have an approach procedure with vertical guidance (APV), either as the primary approach or as a back-up for precision approaches by **2016**
- States are encouraged to develop APV's for runways that are currently non-instrument runways and operated by aircraft in excess of 5700 kg.

**Shared responsibility of ICAO, Regions, States and stakeholders**

8

## SETTING THE FRAMEWORK

IMPLEMENTATION OF A GLOBAL ATM SYSTEM

- Global ATM Operational Concept
  - Provides the ICAO vision of seamless, global ATM system
  - Endorsed by 11<sup>th</sup> ANCONF
  - Aircraft operate as close as possible to 4D trajectories
- Global Air Navigation Plan
  - 23 Global Plan Initiatives
  - **GPI-5 RNAV and RNP (Performance Based Navigation)**
  - Stems from industry roadmap
  - Supports performance based transition to operational concept
  - Assists in establishment of performance objectives
  - Assists in implementation of ATM operational improvements
  - **PBN Airspace Concept to be incorporated in Global Plan**


10



## ICAO leadership role

- Establishment of ICAO PBN programme
  - Development and maintenance of suitable Standards, procedures and guidance
  - Familiarization, education, training
  - Regional PBN Task Force
    - Development of regional roadmap
    - Assist in implementation of PBN
  - Monitoring, review and take remedial actions

11



## Seminar Schedule

- DAY 1**
  - PBN concepts
  - Implementation processes
  - Case Study
- DAY 2**
  - Introduction to navigation specifications
  - Enroute and terminal navigation specifications
  - Case Study
- DAY 3**
  - Approach navigation specifications
  - Quality assurance (Data, Planning implementation, validation)
  - Case Study
- DAY 4**
  - PBN global implementation
  - Regional implementation

12



## Summary

- PBN concept is established as a step in the evolution of a performance-based global air traffic management (ATM) system
- Familiarization is being conducted now, from here on start the implementation
- ICAO must assume leadership role in implementation but....
- Commitment and active involvement required from States and other stakeholders



## Audience Response System Questions

