



ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

A UN SPECIALIZED AGENCY



PBN Manual 5th Edition

Capt. Ian Knowles

Chief, Operational Safety Section

Air Navigation Bureau

ICAO

Page 10

02

03

Future Work

01 Changes to Volume I

Doc 9613

Performance-based Navigation
(PBN) Manual

Fifth Edition, 2023



PBN Manual Volume I

Structural Changes

- **Removal of duplicated material**
 - Part B – Implementation Guidance removed
 - Attachment C - Operational Approval removed



PBN Manual Volume I

Detailed changes

- **Guidance on the use of RF legs**
 - Cost benefit considerations
 - Limitation on the use of RF
 - Other considerations
- **Use of RNAV or RNP independent of surveillance**
- **Holding function**
 - No specifications for RNP holding
 - Use of the RNP/RNAV system to fly conventional hold
- **Terminology for authorizations**

02 Changes to Volume II

Doc 9613

Performance-based Navigation
(PBN) Manual

Fifth Edition, 2023



PBN Manual Volume II

Structural changes

- **Attachment A Barometric VNAV removed**
 - Industry standards and regulatory guidance has moved on
 - Attachment did not address other forms of VNAV or the application of VNAV for credit in the Final Approach Segment verses for Advisory purposes
- **Attachment A now refers to Vertical Navigation (VNAV) in the Final Approach Segment**
- **Attachment B Temperature Compensation added**
 - Taken from RTCA/EUROCAE industry standards
- **Attachment D application of Magnetic Variation added**
 - Taken from RTCA/EUROCAE industry standards
- **Attachment E Document References added**
 - latest industry and regulatory reference material used within Vol II Parts B and C
 - Ease of reference

PBN Manual Volume II

Significant changes

- **Part C, Chapter 4 Implementing Advanced RNP**
 - No scalability, adoption of fixed RNP 0.3 lateral navigation accuracy
 - Missed approach remains at 1 NM
 - Final approach segment is removed
- **Part C, Chapter 6 Implementing RNP with Authorization Required**
 - Development of RNP AR DP nav spec
 - Update of RNP AR APCH based on latest standards and practice

PBN Manual Volume II

Detailed changes

- **On-board performance monitoring and alerting**
 - Text revised and updated for clarity
- **Applicability of nav spec by flight phase**
 - Table IIA-I-I revised
- **Use of Dual Frequency Multi Constellation**
 - Clarification of applicable GNSS elements
- **GNSS monitoring**
- **RNP 0.3 Nav Spec**
 - Identified as helicopter only

03 Future work

Doc 9613

Performance-based Navigation
(PBN) Manual

Fifth Edition, 2023



Proposed future work

GNSS Interference

- Jamming and spoofing
- Identified as a major hazard in AN/Conf-14; Rec. 2.2/2
- Development of mitigations and operational information
- NSP leading this work, FLTOPSP is coordination in operational aspects
 - PBNO SG will review text and include GNSS interference guidance in PBN Manual

Proposed future work

SID STAR Transitions

- Work underway in IFPP
- Development of a global harmonized approach
- May require updates to PBN Manual

Proposed future work

RNP AR APCH with LPV

- Currently RNP AR APCH limited to Baro VNAV
- Limitations and issues related to Baro setting
- Increase in safety and regularity due to reduced minima available with LPV
- Independent vertical profile (FAS Data Block) more robust



Thank You!