



CAMEROON CIVIL AVIATION AUTHORITY – DIRECTION OF AVIATION SAFETY		
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PERFORMANCE BASED NAVIGATION OPERATIONAL APPROVAL HANDBOOK	ED	01 DU 01/11/2014
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Chapter 4 RNAV 1 and 2

4.1 General

RNAV 1 and 2 navigation specifications constitute harmonization between European Precision RNAV (P-RNAV) and United States RNAV (US-RNAV) criteria.

The RNAV 1 and RNAV 2 navigation specification applies to:

- all ATS routes, including those established in the en-route domain;
- standard instrument departures and arrivals (SID/STAR); and
- instrument approach procedures up to the final approach fix (FAF)/final approach point (FAP).

As RNAV 1 and 2 operations can be based on DME/DME or DME/DME IRU, the navaid infrastructure must be assessed to ensure adequate DME coverage. This is the responsibility of the ANSP and is not part of the operational approval.

There is no difference in the operational approval for RNAV 1 and RNAV 2, and a single RNAV 1 and 2 approval only is issued. An operator with an RNAV 1 and 2 approval is qualified to operate on both RNAV 1 and RNAV 2 routes. RNAV 2 routes may be promulgated in cases where the navaid infrastructure is unable to meet the accuracy requirements for RNAV 1.

4.2 Operational Approval

For operators holding either a P-RNAV approval or a US-RNAV approval or both the operational approval is relatively simple and minimal regulatory effort is required.

However, as there are some small differences between the existing European and US specifications, migration to RNAV 1 and 2 approval is not automatic unless the operator holds both US and European approvals.

Operators holding *both* P-RNAV and US-RNAV approvals qualify for an ICAO RNAV 1 and 2 operational approval without further examination.

For operators holding only a P-RNAV approval, or a US-RNAV approval, it is necessary to ensure that any additional requirements for RNAV 1 and 2 are met. The PBN Manual provides tables identifying these additional requirements. (Part B, Chapter 3 para 3.3.2.7)

Operators not holding a B-RNAV or US-RNAV approval need to be evaluated to determine that they meet the requirements for RNAV 1 and 2.

It should be noted that there is no obligation on an operator to obtain an RNAV 1 and 2 approval or to migrate an existing approval to ICAO RNAV 1 and 2 if their existing approval is applicable to the area of operation. Operators that operate



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only in P-RNAV airspace or only in US-RNAV airspace can continue to do so in accordance with a P-RNAV or US-RNAV approval respectively.

4.3 Summary

For RNAV 1 and 2 operational approval:

- A single RNAV system only is required.
- The RNAV system may be based on:
 - DME/DME
 - DME/DME/IRU
 - GNSS (including GNSS/IRU)
- A navigation database is required.
- Navigation displays in the pilot's forward view must be sufficient to permit track following and manoeuvring.
- The maximum cross-track error deviation permitted is $\frac{1}{2}$ navigation accuracy
 - 0.5NM for RNAV 1
 - 1.0 NM for RNAV 2
- An RNAV system failure indication is required.

4.4 GNSS

GNSS approved in accordance with ETSO C129(A), FAA TSO C129 (A) or later meets the requirements of RNAV 1 and 2.

Stand-alone receivers manufactured to ETSO C129 or FAA TSO C129 are also applicable provided they include pseudo-range step detection and health word checking functions.

GNSS based operations require prediction that a service (with integrity) will be available for the route. Most GNSS availability prediction programs are computed for a specific location (normally the destination airport) and are unable to provide predictions over a route or large area. However for RNAV 1 and 2 the probability of a loss of GNSS integrity is remote and the prediction requirement can normally be met by determining that sufficient satellites are available to provide adequate continuity of service.

The PBN Manual makes reference to the possibility of position errors caused by the integration of GNSS data and other positioning data and the potential need for deselection of other navigation sensors. This method of updating is commonly associated with IRS/GNSS systems and the weighting given to radio updating is

