

Chapter 3 RNAV 5

1. General

In the context of the terminology adopted in the PBN Manual, B-RNAV requirements are termed RNAV 5.

B-RNAV approval meets the requirements of RNAV 5 without additional examination.

RNAV 5 is intended for en-route navigation where there is adequate coverage of ground-based radio navigation aids permitting DME/DME or VOR/DME area navigation operations. Consequently an RNAV 5 route is dependent upon an analysis of the supporting navaid infrastructure. However consideration of navaid coverage is not part of an operational approval as this is the responsibility of the air navigation service provider.

2. Summary

- A single RNAV system only is required.
- A navigation database is not required. Manual entry of waypoint data is permitted, but is subject to human error.
- Storage of a minimum of 4 waypoints is required
- Navigation system alerting is not 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 2.5NM
- An RNAV system failure indication is required.

3. INS or IRS

An INS or IRS system may be used for RNAV 5. If automatic radio updating is not carried out a time limit of 2 hrs applies from the last on ground position update, unless an extended limit has been justified.

4. GNSS

GNSS approved in accordance with ETSO C129 (A), FAA TSO C129 (A) or later meets the requirements of RNAV 5.

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 5 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.

5. Operating procedures

For most operators normal RNAV operating procedures will meet the requirements of RNAV 5.

The essential elements to be evaluated are that the operator's procedures ensure that:

- The aircraft is serviceable for RNAV 5
- RNAV 5 capability is indicated on the flight plan
- En-route loss of capability is identified and reported
- Procedures for alternative navigation are described

If the navigation system does not use a navigation database manual waypoint entry significantly increases the potential for navigation errors. Operating procedures need to be robust to reduce the incidence of human error, including cross-checking of entry, checking of tracks/distances/bearings against published routes and general situational awareness and checking for reasonableness.

Where navigation data is not extracted from a valid database, operations should be limited to not below the minimum obstacle clearance altitude.

As RNAV 5 operations are typically conducted in areas of adequate navaid coverage, contingency procedures will normally involve reversion to conventional ground-based radio navigation.

6. Pilot Knowledge and Training

Unless the operator is inexperienced in the use of RNAV, flight crews should possess the necessary skills to conduct RNAV 5 operations with minimal additional training.

Where GNSS is used, flight crews must be familiar with GNSS principles related to en-route navigation.

Where additional training is required, this can normally be achieved by bulletin, computer based training or classroom briefing. Flight training is not normally required.

7. Operational Approval

The operational approval process for RNAV 5 is generally straightforward, given that most aircraft are equipped with RNAV systems which exceed the minimum requirements for RNAV 5.

In most cases the AFM will document RNAV 5 capability and only occasionally will it be necessary to conduct an evaluation of aircraft capability.