

Advisory Circular

OPERATIONAL APPROVAL FOR AREA NAVIGATION RNAV-5

GENERAL	1
PURPOSE	1
APPLICABILITY	1
RELATED REGULATIONS	1
RELATED ADVISORY CIRCULARS	1
CANCELLATION	1
EFFECTIVE DATE	1
OTHER REFERENCES	2
1 RNAV 5 OPERATIONS	3
2 OPERATIONAL REQUIREMENTS	3
3 AIRCRAFT ELIGIBILITY	3
4 OPERATING PROCEDURES	3
5 FLIGHT CREW KNOWLEDGE AND TRAINING	4
6 WITHDRAWAL OF OPERATIONAL APPROVAL	4

GENERAL

Advisory Circulars (ACs) are issued by the Director-General of Civil Aviation (DGCA) from time to time to provide practical guidance or certainty in respect of the statutory requirements for aviation safety. ACs contain information about standards, practices and procedures acceptable to CAAS. An AC may be used, in accordance with section 3C of the Air Navigation Act (Cap. 6) (ANA), to demonstrate compliance with a statutory requirement. The revision number of the AC is indicated in parenthesis in the suffix of the AC number.

PURPOSE

This AC provides guidance to demonstrate compliance with the requirements regarding, and information related to an application for, an approval for specified navigation performance operations in accordance with ANR-98.

APPLICABILITY

This AC is applicable to the operator seeking an approval for RNAV-5 operations.

RELATED REGULATIONS

This AC relates specifically to Division 2 in Part 2 of ANR-98.

RELATED ADVISORY CIRCULARS

- AC 98-1-1 Application for an Approval to Conduct a Special Operation

CANCELLATION

This AC supersedes AC AOC-23.

EFFECTIVE DATE

This AC is effective from 1 October 2018.

OTHER REFERENCES

- ICAO Doc 9613 Performance-based navigation (PBN) Manual
- EASA/JAA AMC 20-4A Airworthiness approval and operational criteria for the use of navigation systems in European airspace designated for Basic RNAV operations
- FAA AC 90-96A Approval of U.S. Operators and Aircraft to operate under Instrument Flight Rules (IFR) in European Airspace Designated for Basic Area Navigation (B-RNAV)/RNAV 5 and Precision Area Navigation (P-RNAV)

1 RNAV 5 OPERATIONS

- 1.1 Basic RNAV (B-RNAV) was mandated as the primary means of navigation in European Civil Aviation Conference (ECAC) airspace in 1998 predicated on DME/DME and VOR/DME ground based navigation aids. In ICAO Doc 9613, B-RNAV is re-classified as RNAV 5.

2 OPERATIONAL REQUIREMENTS

- 2.1 To meet RNAV 5 requirement, the aircraft has to achieve position accuracy of ± 5 nm 95% of the flight time.
- 2.2 Route spacing, flight surveillance and monitoring are the responsibility of the State using applicable ICAO guidance. A summary of RNAV 5 requirements is as follows:
- (a) Only one RNAV system;
 - (b) No navigation database is required; waypoint data may be entered manually;
 - (c) Minimum storage for 4 waypoints;
 - (d) Alerting system is not required;
 - (e) Navigation display in pilot's FOV should be sufficient for track following and manoeuvring;
 - (f) Maximum permitted cross-track error/deviation is 2.5 nm;
 - (g) An indication for RNAV system failure is required.
- 2.3 With no automatic radio updating, the maximum operating time using INS or IRS is 2 hours. The limit time starts at navigation mode engagement.
- 2.4 GNSS certified under ETSO C129(A)/FAA TSO C129(A), or later, meets RNAV 5 requirements. Stand-alone ETSO C129/FAA TSO C129 GNSS receivers are acceptable provided they include pseudo-range step detection and health word checking functions. For GNSS-based operations, GNSS availability prediction is required for the route.

3 AIRCRAFT ELIGIBILITY

- 3.1 Aircraft eligibility is determined through demonstration of compliance with the relevant airworthiness criteria promulgated in AMC 20-4 or FAA AC 90-96.
- 3.2 Aircraft with AFM, STC or manufacturer's documentation, such as service letters, attesting to RNAV 5 airworthiness compliance are acceptable by CAAS.

4 OPERATING PROCEDURES.

- 4.1 The operating procedures shall include and ensure the following:
- (a) The aircraft is serviceable for RNAV 5 operation;
 - (b) Notation of RNAV 5 capability in the ATS flight Plan;
 - (c) En-route loss of capability is identified and reported; and
 - (d) Procedures for alternative navigation are described.

- 4.2 Manual entry of waypoint data in lieu of navigation database would increase potential for navigation error. To mitigate the human error potential, the operating procedures must include and conduct with diligence by the flight crew, systematic cross-check of entry waypoint data, track/distance/bearing against published charts for reasonableness.
- 4.3 As precaution, the operations should be conducted at or above minimum obstacle clearance altitude (MOCA) when validity of the navigation data cannot be assured.

5 FLIGHT CREW KNOWLEDGE AND TRAINING

- 5.1 The operator must have programme to ensure the flight crew have the necessary knowledge in RNAV 5 operations.
- 5.2 Where GNSS is used, the flight crew should be familiar with GNSS principles relating to air navigation.
- 5.3 CAAS may accept RNAV 5 training using ground-based instructional method.

6 WITHDRAWAL OF OPERATIONAL APPROVAL

- 6.1 An operational approval is conditional upon compliance with RNAV 5 operational requirements and promulgations in ICAO Doc 4444, 7030 as well as State AIPs.
- 6.2 Non-compliance, repeated reports of GNE (gross navigation error) or unsatisfactory corrective action may result in CAAS withdrawing the operational approval.