

Advisory Circular

OPERATIONAL APPROVAL FOR AREA NAVIGATION RNAV-10

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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-10 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-22.

EFFECTIVE DATE

This AC is effective from 1 October 2018.

Other References

- ICAO Doc 9613 Performance-based Navigation (PBN) Manual
- FAA Order 8400.12C Required Navigation Performance 10 (RNP 10) Operational Authorization

1 INTRODUCTION

RNP 10 was first implemented in the North Pacific (NOPAC) and Central East Pacific (CEPAC) routes in 1998. Since 2005 it was designated RNP 10 50/50 (50 nm lateral and longitudinal). Accepted under 'grandfather's rights' by ICAO as RNP 10, by PBN definition, it is an RNAV 10 navigation specification.

2 OPERATIONAL REQUIREMENTS

- 2.1 An aircraft operating in RNP10 airspace must be equipped with at least two independent and serviceable (LRNS) long range navigation systems. The LRNS may comprise an INS, an IRS FMS or a GNSS with integrity such that the navigation system does not provide unacceptable probability of misleading information.
- 2.2 The aircraft must be maintained to meet track-keeping accuracy at equal to or better than ± 10 nm over 95% of flight time in both lateral and longitudinal positions.
- 2.3 Any GNE (gross navigation error) of 25 nm or more must be investigated and reported to CAAS.

3 AIRCRAFT ELIGIBILITY

- 3.1 To be granted RNP-10 operational approval, aircraft should meet the following requirements:
 - (a) AFM documentation of RNP compliance;
 - (b) Dual INS or IRU approved for RNAV operations (Operating time limit with no radio updating is 6.2 hour starting from engagement in navigation mode.);
 - (c) Dual GNSS with FAA AC 20-138C certification for primary means of navigation in oceanic and remote areas subject to approved dispatch FDE prediction. (Maximum FDE outage time is 34 mins);
 - (d) Multi-sensor systems with FAA AC 20-130D certification; or
 - (e) A combination of a single INS or IRU approved to 14 CFR Part 121 Appendix G standards, and a single GNSS approved in accordance with TSO - C129a.

4 OPERATING PROCEDURES

- 4.1 The operating procedures should include and ensure the following:
 - (a) The aircraft is serviceable for RNAV 10 operation;
 - (b) Notation of RNAV 10 capability in the ATS flight Plan;
 - (c) En-route flight time against aircraft RNAV 10 operating time limitation;
 - (d) Identification and report of loss of RNAV 10 capability; and
 - (e) Contingency procedures for loss of capability.
- 4.2 GNSS based operations must be rescheduled to avoid any FDE outage time window that exceed 34 minutes using the approved dispatch FDE prediction programme.

5 FLIGHT CREW KNOWLEDGE AND TRAINING

- 5.1 The operator must have programme to ensure the flight crew have the necessary knowledge in RNAV 10 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 10 training using ground-based instructional method.

6 WITHDRAWAL OF OPERATIONAL APPROVAL

- 6.1 The operational approval is conditional upon compliance with RNAV 10 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.