CIVIL AVIATION AUTHORITY
OF NEW ZEALAND
Te Mana Rererangi Tūmatanui o Aotearoa

Notice of Requirement NTC 91.263

RNAV 5 Navigation Specification

Revision 1
5 April 2025

Preliminary

The Director of Civil Aviation issues the following requirements ("the requirements"), conditions and restrictions relating to the use of the RNAV 5 navigation specification under section 64(5) of the Civil Aviation Act 2023 and Civil Aviation Rule 91.263(a).

Purpose

The purpose of this notice is to specify the requirements for using a RNAV 5 navigational procedure or route (RNAV 5 operations), determined by the Director under rule 91.263, in relation to the following:

i. the application of the RNAV 5 operations;

ii. the navigation functionalities the aircraft systems must have;

iii. requirements for system redundancy, including requirements for conventional navigation equipment;

iv. continuing airworthiness requirements;

v. operator procedures;

vi. the operational and training requirements for flight crew members; and

vii. approval by the Director for RNAV 5 operations.

Rule 91.263(b) requires compliance with the requirements in this notice to ensure the safe operation of aircraft using RNAV 5 procedures.

General

Civil Aviation Authority (CAA) notices contain approvals and requirements including the detail about the approvals, standards, conditions, procedures and technical specifications that have been approved or determined by the Director under the Civil Aviation Rules. These details must be complied with by parties to whom it applies. They apply in particular circumstances to particular aviation document holders as specified in the notice.

CAA notices are issued under Civil Aviation Rules in accordance with section 64(5) of the Civil Aviation Act 2023. This section permits the Minister of Transport or the Governor-General to specify any terms and conditions within the rules:

- To require or provide for a matter to be determined, undertaken or approved by the CAA, the Director, or another person; or
- to empower the CAA, Director, or any another person to impose requirements or conditions as to the performance of any activity, including (but not limited to) any procedures to be followed.

Notices support a performance-based approach to regulation, and improve the flexibility and responsiveness of the Civil Aviation Rules. They may be used where performance-based regulation is the appropriate way to achieve the desired regulatory outcome, for example, in circumstances where new technological changes or challenges require more flexibility than prescribing requirements in the rules (and rulemaking may get quickly out-dated), or where there is a need to respond to safety issues which the rules do not adequately deal with.

The requirements stated in this notice are mandatory and must be complied with.

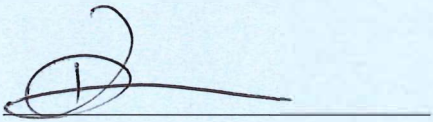
Related Rules

Civil Aviation Rules 91.261, 91.263, 91.263B and 91.263C.

Effective Dates

This notice comes into effect on 5 April 2025.

Issue of CAA Notice



13.1.25

Signed by
Director of Civil Aviation

Date

Revision History

Version	Amendment	Effective Date
Revision 1	Original version	5 April 2025

1. Application

These requirements apply to:

(1) every operator of an aircraft operating under instrument flight rules using a RNAV 5 navigational procedure or route (RNAV 5 operations); and

(2) every operation that requires a lateral navigation accuracy full term of TSE (TSE) of 5 nautical miles, to be achieved at least 95 % of the flight time by the population of aircraft operating within the airspace, route or procedure.

2. Operational Approval Requirements

(a) Description of aircraft equipment:

(1) The operator must ensure that relevant documentation acceptable to the Director is available to establish that the aircraft is equipped with an RNAV system with a demonstrated RNAV 5 capability.

(2) The operator must have a configuration list and, if necessary, an MEL detailing the required aircraft equipment for RNAV 5 operations.

(b) Training documentation:

(1) An air operator certificated under Part 119 must have a training programme addressing the operational practices, procedures and training phases related to RNAV 5 operations.

(2) A private operator under Part 91 must be familiar with the practices and procedures referred to in clause 5 of this notice.

(c) Operations manuals and checklists:

(1) An air operator certificated under Part 119 ensure that its operations manuals and checklists address information/guidance on operational procedures referred to in clauses 5 and 6 of this notice.

(2) The operator must ensure that appropriate manuals contain navigation operating instructions and contingency procedures where specified.

(3) The operator must submit to the Director their manuals and checklists for review as part of the application process.

(d) Minimum Equipment List (MEL) considerations:

(1) Any MEL revisions necessary to address RNAV 5 operations must be approved by the Director.

(2) Operators must adjust the MEL or equivalent, to allow for operations using RNAV 5 and specify the required dispatch conditions.

(e) Continuing airworthiness:

The operator must submit to the Director –

(1) the continuing airworthiness instructions applicable to the aircraft's configuration and the aircraft's qualification for RNAV 5 operations; and

(2) their maintenance programme, including a reliability programme for monitoring the equipment.

(f) Aircraft Requirements:

The operator must ensure that RNAV 5 operations are based on the use of RNAV equipment which automatically determines the aircraft position using input from one or a combination of the following types of position sensors, together with the means to establish and follow a desired path:

(1) VOR/DME;

(2) DME/DME;

(3) INS or IRS; and

(4) GNSS.

3. On-board Performance Monitoring and Alerting

(a) The operator must ensure that the following requirements regarding accuracy are met:

(1) During operations in airspace or on routes designated as RNAV 5, the lateral TSE must be within ±5 NM for at least 95% of the total flight time.

(2) The along-track error must be within ±5 NM for at least 95% of the total flight time.

(b) Integrity:

The operator must ensure that aircraft navigation equipment are designed and installed in a manner that the probability of a malfunction of the equipment which is classified as a major failure condition occurring is less than 1×10^{-5} per hour.

(c) Continuity:

Loss of function is classified as a minor failure condition if the operator can revert to a different navigation system and proceed to a suitable airport.

(d) Signal-In-Space:

If using GNSS, the operator must ensure that the aircraft navigation equipment provides an alert if the probability of Signal-In-Space (SIS) errors causing a lateral position error greater than 10 NM exceeds 10^{-7} per hour.

(e) The operator must ensure that the following requirements for specific navigation source are met:

(1) INS/IRS:

(i) Inertial systems may be used either as a stand-alone INS or an IRS acting as part of a multi-sensor RNAV system, where inertial sensors provide augmentation to the basic position sensors, as well as a reversionary position data source when out of cover of radio navigation sources.

(ii) INS without automatic radio updating of aircraft position, but approved in accordance with FAA AC 25-4 or an equivalent standard acceptable to the Director, and when complying with the functional criteria of this specification, may be used only for a maximum of 2 hours from the last alignment or position update performed on the ground.

(iii) Specific INS configurations may be considered if either equipment or the aircraft manufacturer's data justify extended use from the last position update.

(iv) INS with automatic radio updating of aircraft position, including those systems where manual selection of radio channels is performed in accordance with flight crew members' procedures, must be approved in accordance with FAA, AC 90-45A, AC 20-130A or an equivalent standard acceptable to the Director.

(2) VHF VOR:

(i) VOR accuracy can meet the accuracy requirements for RNAV 5 up to 60 NM, or 75 NM for Doppler VOR, from the NAVAID.

(ii) Specific regions within the VOR coverage may experience larger errors due to propagation effects such as multipath.

(iii) Errors referred to in paragraph (ii) may be resolved by specifying areas where the affected VOR may not be used, or by taking account of lower VOR performance in the setting up of the proposed RNAV routes, such as increasing additional route spacing.

(iv) Account must be taken of the availability of other NAVAIDs that can provide coverage in the affected area and that not all aircraft may be using the VOR concerned and may therefore not exhibit the same track-keeping performance.

(3) DME:

(i) DME signals meet the requirements of RNAV 5 whenever the signals are received and there is no closer DME on the same channel, regardless of the published coverage volume.

(ii) When the RNAV 5 system does not take account of published "Designated Operational Coverage" of the DME, the RNAV system must execute data integrity checks to confirm that the correct DME signal is being received.

(4) GNSS:

(i) The use of GNSS to perform RNAV 5 operations is limited to equipment approved to ETSO-C129(), ETSOC145(), ETSO-C146(), FAA TSO-C145(), TSO-C146(), and TSO-C129() or an equivalent standard acceptable to the Director, and include the minimum system functions specified in clause 5(b) of this notice.

(ii) Integrity must be provided by SBAS GNSS or RAIM or an equivalent means within a multi-sensor navigation system.

(iii) GPS stand-alone equipment is to include the following functions:

(A) pseudo-range step detection; and

(B) health word checking.

(iv) Where approval for RNAV 5 operations requires the use of traditional navigation equipment as a back-up in the event of loss of GNSS, the required NAVAID capability, as defined in the approval regarding VOR, DME, and/or ADF, must be installed and operable.

(v) Positioning data from other types of navigation sensors may be integrated with the GNSS data

provided other positioning data do not cause position errors exceeding the track-keeping accuracy requirements.

4. Functional Requirements for on-board navigation system

(a) Required functions for on-board navigation system:

The operator must ensure that the on-board navigation system has the following functionalities:

(1) continuous indication of aircraft position relative to track to be displayed to the pilot flying the aircraft, on a navigation display situated in his/her primary field of view;

(2) where the minimum flight crew member is 2 pilots, indication of the aircraft position relative to track to be displayed to the pilot not flying the aircraft, on a navigation display situated in his/her primary field of view;

(3) display of distance and bearing to the active (to) waypoint;

(4) display of ground-speed or time to the active (to) waypoint;

(5) storage of waypoints; minimum of 4; and

(6) appropriate failure indication of the RNAV system, including the sensors.

(b) The operator must ensure that the required navigation display has the following functionalities:

(1) Navigation data must be available for display either on a display forming part of the RNAV equipment or on a lateral deviation display such as CDI, EHSI, or a navigation map display.

(2) Navigation data must be used as primary flight instruments for the navigation of the aircraft, for manoeuvre anticipation and for failure/status/integrity indication.

(3) The display of navigation data must meet the following requirements:

(i) be visible to the pilot when looking forward along the flight path;

(ii) for lateral deviation display, scaling must be compatible with any alerting and annunciation limits, if implemented, and have full-scale deflection appropriate for the RNAV 5 operation.

5. Operating Procedures:

(a) Requirements for pre-flight planning:

(1) Operators must use the appropriate ICAO flight plan designation specified for the RNAV 5 route.

(2) The operator must confirm the availability of the NAVAID infrastructure, required for the intended routes, including any non-RNAV contingencies, for the period of intended operations using all available information.

(3) Where GNSS is used, since GNSS integrity (RAIM or SBAS signal) is required by Annex 10, Volume I, the availability of these should also be determined as appropriate. For aircraft navigating with SBAS receivers (all TSO-C145/C146), operators must check appropriate GPS RAIM availability in areas where SBAS signal is unavailable.

(4) Where a navigation database is used, it must be current and appropriate for the region of intended operation and must include the NAVAIDs and waypoints required for the route.

(b) Availability of GNSS:

Operators relying on GNSS must have the means to predict the availability of GNSS fault detection such as ABAS RAIM, to support operations along the RNAV 5 route.

(c) General operating procedures:

(1) The pilot must comply with any instructions or procedures identified by the manufacturer as necessary to comply with

the performance requirements in this navigation specification.

(2) Operators and pilots must not request or file RNAV 5 procedures unless they satisfy the requirements of this notice.

(3) If an aircraft that does not meet the requirements of this notice receives a clearance from ATC to conduct an RNAV 5 procedure, the pilot-in-command must advise ATC that they are unable to accept the clearance and must request alternate instructions.

(4) At system initialisation, pilots must –

(i) confirm that the aircraft position has been entered correctly;

(ii) verify proper entry of their ATC assigned route upon initial clearance and any subsequent change of route;

(iii) ensure that the waypoint sequence depicted by their navigation system matches the route depicted on the appropriate chart(s) and their assigned route;

(iv) cross-check the cleared flight plan by comparing charts or other applicable resources with the navigation system textual display and the aircraft map display, if applicable;

(v) confirm the exclusion of specific NAVAIDs if necessary.

(5) For RNAV 5 routes, pilots must use a lateral deviation indicator, flight director, or autopilot in lateral navigation mode.

(6) Pilots of aircraft with a lateral deviation display must ensure that lateral deviation scaling is suitable for the navigation accuracy associated with the route or procedure.

(7) Pilots must maintain route centre lines, as depicted by on-board lateral deviation indicators and/or flight guidance, during all RNAV operations, unless authorised to deviate by ATC or if there is an emergency.

(8) For normal operations, cross-track error/deviation is to be limited to ±½ the navigation accuracy associated with the procedure or route which is 2.5 NM.

(9) Brief deviations may be permitted from the standard referred to in paragraph (8) during and immediately after procedure/route turns, up to a maximum of one times the navigation accuracy which is 5 NM.

(10) If ATS issues a heading assignment taking the aircraft off a route, the pilot must not modify the flight plan in the RNAV system until a clearance is received to rejoin the route or the controller confirms a new clearance.

(11) When the aircraft is not on the published route, the specified accuracy requirement does not apply.

(d) Contingency procedures:

(1) The pilot must notify ATC when the RNAV performance ceases to meet the requirements for RNAV 5.

(2) If there is communications failure, the pilot must continue with the flight plan in accordance with the published "lost communications" procedure.

(3) Where stand-alone GNSS equipment is used:

(i) If there is a loss of the RAIM detection function, the GNSS position may continue to be used for navigation.

(ii) The pilot may cross-check the aircraft position, with other sources of position information such as VOR, DME and/or NDB information to confirm an acceptable level of navigation performance.

(iii) If an acceptable level of navigation performance cannot be confirmed, the pilot must revert to an alternative means of navigation and advise ATC.

(iv) If the navigation display is flagged invalid due to a RAIM alert, the pilot must revert to an alternative means of navigation and advise ATC.

6. Pilot knowledge and training

(a) Operators must ensure that pilots are trained and have appropriate knowledge of the topics specific to RNAV 5 operations as contained in AC91-21 and AC61-17 if applicable, including the limits of their RNAV 5 navigation capabilities, the effects of updating, and RNAV 5 contingency procedures where specified.

(b) Pilots must be appropriately licensed, rated and endorsed on the specific equipment to be used for RNAV 5 operations, including knowledge of specific organisational standard operating procedures if applicable.

7. Navigation database

(a) RNAV 5 operations do not require the use of a navigation database; however, where a navigation database is carried and used, it must be current and appropriate for the region of intended operation and must include the NAVAIDs and waypoints required for the route.

(b) If used, the operator must ensure that the navigation database complies with RTCA DO 200A/EUROCAE document ED 76 Standards for Processing Aeronautical Data, or an equivalent standard acceptable to the Director.

(c) The operator must –

(i) report any discrepancies that invalidate the RNAV 5 route to the navigation database supplier;

(ii) inform the pilots of the discrepancies; and

(iii) prohibit the pilots from using the affected route; and

(iv) conduct periodic checks of the operational navigation databases to ensure that the existing quality system requirements are met.

8. Approval for carrying out RNAV 5 operations

(a) An operator must not carry out RNAV 5 operations unless the operator meets all the applicable requirements of this notice.

(b) An operator who was approved by the Director to conduct B-RNAV operations immediately before 21 December 2022 may conduct RNAV 5 operations, if the operator meets all the applicable requirements of this notice.