RNAV 1 AND RNAV 2 JOB AID

APPLICATION TO CONDUCT RNAV 1 AND RNAV 2 OPERATIONS

1. Introduction

This Job Aid was developed by the Latin American Regional Safety Oversight Cooperation System (SRVSOP) to provide States, operators, and inspectors with guidance on the process to be followed by an operator in order to obtain an RNAV 1 and RNAV 2 authorization.

2. Purpose of the Job Aid

2.1 To give operators and inspectors information on the main RNAV 1 and RNAV 2 reference documents.
2.2 To provide tables showing the contents of the application, the associated reference paragraphs, the place in the application of the operator where RNAV 1 and RNAV 2 elements are mentioned and columns for inspector comments and follow-up on the status of various RNAV 1 and RNAV 2 elements.

3. Actions Recommended for the Inspector and Operator

Some recommendations for use of the Job Aid follow:

3.1 At the pre-application meeting with the operator, the inspector reviews the “basic events of the RNAV 1 and RNAV 2 approval process ”described in Part 1 of this Job Aid, in order to provide an overview of the approval process events.
3.2 The inspector reviews this Job Aid with the operator in order to establish the form and content of the RNAV 1 and RNAV 2 approval application.
3.3 The operator uses this Job Aid as a guide to collect the documents/annexes of the RNAV 1 and RNAV 2 application.
3.4 The operator inserts in the Job Aid references showing in what part of its documents are the RNAV 1 and RNAV 2 programme elements located.
3.5 The operator submits the Job Aid and the application to the inspector (documents/annexes).
3.6 The inspector indicates in the Job Aid whether an item is in compliance or needs corrective action.
3.7 The inspector informs the operator as soon as possible when a corrective action by the operator is required.
3.8 The operator provides the inspector with the revised material when so requested.
3.9 The CAA provides the operator with the operational specifications (OpSpecs) or a letter of authorisation (LOA), as applicable, once the tasks and documents have been completed.

4. Structure of the Job Aid

5. Main sources of documents, information, and contacts

To access the RNAV 1 and RNAV 2 Job Aid, enter to the Web page of the ICAO/SAM Regional Office (www.lima.icao.int) under the SRVSOP link.

6. Main reference documents

Reference document	Title
Annex 6	Operation of aircraft
ICAO Doc 9613	Performance-based navigation (PBN) manual
FAA AC 90-100A	U.S. Terminal and en route area navigation (RNAV) operations
TGL 10	Airworthiness and operational approval for precision RNAV operations in designated European airspace
Spain DGAC CO 03/01	*Aprobaciones de aeronavegabilidad y operacionales para operaciones RNAV de precisión (P-RNAV) en el espacio aéreo Europeo designado*
AMC 20-5	Acceptable means of compliance for airworthiness approval and operational criteria for the use of the NAVSTAR Global positioning system (GPS)
AC 20-130()	Airworthiness approval of multi-sensor navigational system for use in the U.S. National Airspace System
AC 20-138A	Airworthiness approval of Global navigation satellite system (GNSS) equipment
AC 25-4	Inertial navigation system (INS)
AC 25-15	Approval of FMS in transport category airplanes
AC 90-45A	Approval of areas navigation systems for use in the U.S. National Airspace System

PART 1: GENERAL INFORMATION

Basic events in the RNAV 1 and RNAV 2 approval process

	Action by the operator	Action by the CAA
1	Establishes the need to obtain RNAV 1 and RNAV 2 authorization.	
2	Reviews the AFM, AFM supplement or Type Certificate Data Sheet (TCDS), or other appropriate documents (*e.g.,* service bulletins (SB), service letters (SL), etc.) to determine the eligibility of the aircraft for RNAV 1 and RNAV 2 operations. The operator contacts the aircraft or avionics manufacturer, if necessary, to confirm RNAV 1 and RNAV 2 or higher eligibility of the aircraft.	
3	Contacts the CAA to schedule a pre-application meeting to discuss the operational approval requirements.	
4		During the pre-application meeting, establishes: • the form and contents of the application; • the documents that support RNAV 1 and RNAV 2 approval • the date in which the application will be submitted for evaluation • if necessary, conducts a validation flight observed by the CAA
5	Submits the application at least 60 days before the start-up of RNAV 1 and RNAV 2 operations.	
6		Reviews the request of the operator.
7	Once the amendments to manuals, programmes, and documents have been approved, provides training to flight crews, flight dispatchers, and maintenance personnel, and conducts a validation flight, if required by the CAA.	Only if required, participates in the validation flight.
8		Once the operational and airworthiness requirements have been met, issues the operational approval in the form of OpSpecs for LAR 121 or 135 or equivalent operators, or an LOA for LAR 91 or equivalent operators, as appropriate.

Notes related to the approval process

1. **Responsible authority**

   a. **Commercial air transport (LAR 121 and/or 135 or equivalent regulations).-** The **State of Registry** determines that the aircraft meets the airworthiness requirements. The **State of the Operator** issues the RNAV 1 and RNAV 2 approval (*e.g.,* OpSpecs).

   b. **General Aviation (LAR 91 or equivalent regulations).-** The **State of Registry** determines that the aircraft meets the airworthiness requirements and issues the operational approval (*e.g.,* an LOA).

2. The CAA does not need to issue an LOA or an equivalent document for each individual area of operation in the case of LAR 91 operators.

3. LAR 121 and/or 135 operators with RNAV 1 and RNAV 2 approval must list this approval in the OpSpecs.

4. Related sections of the Latin American Aeronautical Regulations (LAR) or equivalent regulations

   a. LAR 91 Sections 91.1015 and 91.1640 or equivalents

   b. LAR 121 Section 121.995 (b) or equivalent

   c. LAR 135 Section 135.565 (c) or equivalent

5. Related ICAO Documents

   a. Annex 6 to the Convention on International Civil Aviation – Operation of Aircraft

   b. Annex 10 to the Convention on International Civil Aviation – Aeronautical Telecommunications

   c. Annex 15 to the Convention on International Civil Aviation – Aeronautical Information Services

   d. ICAO Doc 9613 – Manual on performance-based navigation (PBN)

   e. ICAO Doc 7030 – Regional supplementary procedures

PART 2: INFORMATION ON THE IDENTIFICATION OF AIRCRAFT AND OPERATORS

NAME OF THE OPERATOR: _____

Aircraft manufacturer, model, and series	Registration numbers	Serial numbers	Area navigation systems (RNAV) Number, manufacturer, and model	RNAV specification

DATE OF PRE-APPLICATION MEETING _____

DATE ON WHICH THE APPLICATION WAS RECEIVED _____

DATE ON WHICH THE OPERATOR INTENDS TO BEGIN RNAV 1 and RNAV 2 OPERATIONS _____

IS THE CAA NOTIFICATION DATE APPROPRIATE? YES _____ NO _____

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PART 3 – OPERATOR APPLICATION (ANNEXES AND DOCUMENTS)

Annex	Title of Annex/document	Indication of inclusion by the operator	Comments by the Inspector
A	**Operator letter requesting RNAV 1 and RNAV 2 authorization**		
B	**Airworthiness documents showing aircraft eligibility for RNAV 1 and RNAV 2** AFM, AFM revision, AFM supplement, or Type certificate data sheet (TCDS) showing that RNAV systems are eligible for RNAV 1 and RNAV 2 or RNP 1 or above. Statement by the manufacturer.- Aircraft that have a statement by the manufacturer documenting compliance with the criteria of SRVSOP CA 91-003 or equivalent meet the performance and functional requirements of said document.		
C	**Aircraft modified to meet RNAV 1 and RNAV 2 standards. Documentation on aircraft inspection and/or modification, if applicable.** Maintenance records documenting the installation or modification of aircraft systems (*e.g.,* FAA Form 337 – major repairs and alterations).		
D	**Maintenance programme** • For aircraft with established RNAV 1 and RNAV 2 system maintenance practices, the list of references of the document or programme. • For recently installed RNAV 1 and RNAV 2 systems, the maintenance practices for their review.		
E	**Minimum equipment list (MEL) (only for operators conducting operations based on a MEL):** MEL showing provisions for RNAV 1 and RNAV 2.		
F	**Training** **1. LAR 91 operators or equivalent: Training method:** Training at home, LAR		

	142 training centres, or other training courses, course completion records. **2. LAR 121 and/or 135 operators or equivalent:** Training programmes (training curriculums) for flight crews, flight dispatchers, and maintenance personnel.		
G	**Operating policies and procedures** **1. LAR 91 operators or equivalent:** Operations manual (OM) or sections to be attached to the application, corresponding to RNAV 1 and RNAV 2 operating procedures and policies. **2. LAR 121 and/or 135 operators or equivalent:** Operations manual and checklists.		
H	**Navigation database** Details of the navigation data validation programme.		
I	**Withdrawal of RNAV 1 and RNAV 2 approval** Indication of the need to follow up on navigation error reports submitted and the possibility of withdrawal of RNAV 1 and RNAV 2 approval.		
J	**Validation flight plan:** Only if required by the CAA**.**		

CONTENTS OF THE APPLICATION TO BE SUBMITTED BY THE OPERATOR

____ **DOCUMENTATION SHOWING RNAV 1 AND RNAV 2 COMPLIANCE BY AIRCRAFT/NAVIGATION SYSTEMS**

____ **OPERATING PROCEDURES AND POLICIES**

____ **SECTIONS OF THE MAINTENANCE MANUAL RELATED TO RNAV SYSTEMS (if not previously reviewed)**

Note 1: Documents may be grouped in a single folder or may be sent as individual documents.

PART 4: CONTENTS OF OPERATOR APPLICATION FOR RNAV 1 AND RNAV 2

#	Contents of the RNAV 1 and RNAV 2 application by the operator	Reference paragraphs CA 91-003	In what Annexes/Documents of the operator can the application contents be located Note: The operator must update this column to reflect the contents of the application	Comments and/or recommendations by the inspector	Follow-up by the inspector: Item status and date
1	**Operator request letter** Statement of intent to obtain RNAV 1 and RNAV 2 authorization.	Paragraph 9.1.1 b) 1) Appendix 5, Paragraph e)	Annex A		
2	**Aircraft equipment description**	Paragraph 9.1.1 b) 2)			
3	**RNAV 1 and RNAV 2 systems eligibility** Airworthiness documents establishing the eligibility of RNAV navigation systems, their approval status, and a list of the aircraft for which the approval is being requested.	Paragraph 9.1.1 b) 3) Paragraph 8.3	Annex B Annex C		
4	**Training programmes** **1. LAR 121 or 135 operators or equivalent: Training programmes:** Operators will develop an initial and recurrent training programme for flight crews, flight dispatchers, if applicable, and	Paragraph 9.1.1 b) 4) (a) Paragraph 11 For maintenance Paragraph 9.1.1 b) 8)	Annex F		

#	Contents of the RNAV 1 and RNAV 2 application by the operator	Reference paragraphs CA 91-003	In what Annexes/Documents of the operator can the application contents be located Note: The operator must update this column to reflect the contents of the application	Comments and/or recommendations by the inspector	Follow-up by the inspector: Item status and date
	maintenance personnel. **2. LAR 91 operators or equivalent: Training methods:** The following methods are acceptable for these operators: Training at home, LAR 142 training centres, or other training courses.	Paragraph 9.1.1 b) 4) (b) Paragraph 11			
5	**Operating procedures** **1. LAR 121 and/or 135 operators or equivalent:** Operations manual and checklists. **2. LAR 91 operators or equivalent:** Operations manual or section of the operator application documenting RNAV 1 and RNAV 2 policies and procedures.	Paragraph 9.1.1 b) 5) (a) Paragraph 10 Paragraph 9.1.1 b) 5) (b) Paragraph 10	Annex G		
6	**Maintenance practices** • For aircraft with established RNAV 1 and RNAV 2 maintenance practices, the operator will provide references of the documents.	Paragraph 8.5 b) Paragraph 9.1.1 b) 7)	Annex D		

#	Contents of the RNAV 1 and RNAV 2 application by the operator	Reference paragraphs CA 91-003	In what Annexes/Documents of the operator can the application contents be located Note: The operator must update this column to reflect the contents of the application	Comments and/or recommendations by the inspector	Follow-up by the inspector: Item status and date
	• For newly installed RNAV 1 and RNAV 2 systems, the operator will provide maintenance practices for review.				
7	**Update of the minimum equipment list (MEL)** Applicable to operators conducting operations according to a MEL**.**	Paragraphs 8.5 a) and 9.1.1 b) 6)	Annex E		
8	**Navigation data validation programme**	Paragraph 9.1.1 b) 9)	Annex F		
9	**Withdrawal of RNAV 1 and RNAV 2 approval** Indication of the need for follow-up on the navigation error reports and the possibility of withdrawal of the RNAV 1 and RNAV 2 approval.	Paragraph 13	Annex H		
10	**Validation flight plan, only if required** The validation flight plan will be presented only if required.	Paragraph 9.1.1 d)	Annex I		

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PART 5 – GUIDE TO DETERMINE RNAV 1 AND RNAV 2 AIRCRAFT ELIGIBILITY

#	Topics	Reference paragraphs CA 91-003	Location in the Annexes of the operator	Comments and/or recommendations by the inspector	Follow-up by the inspector: Item status and date
1	**RNAV system requirement** The RNAV system use inputs from the following types of sensors (not listed in a specific order of priority):	Paragraph 8.1.1	Annex B		
1a	GNSS according to TSO-C145 (), TSO-C146 () and TSO-C129()	Paragraph 8.1.1 a) 2) (a)			
1b	DME/DME	Paragraph 8.1.1 a) 2) (b)			
1c	DME/DME/IRU	Paragraph 8.1.1 a) 2) (c)			
2	**Performance, monitoring and alerting requirements**	Paragraph 8.1.2	Annex B		
3	**Aircraft eligibility** 1. Aircraft that have a statement of compliance with SRVSOP CA 91-003 criteria. 2. Aircraft approved under TGL-10 and AC 90-100A. 3. Aircraft that meet TGL-10. 4. Aircraft that comply with AC 90-100A.	Paragraph 8.2 Paragraph 8.2.1 Paragraph 8.2.2 Paragraph 8.2.3	Annex B		

#	Topics	Reference paragraphs CA 91-003	Location in the Annexes of the operator	Comments and/or recommendations by the inspector	Follow-up by the inspector: Item status and date
	5. Aircraft with a statement by the manufacturer. 6. Information to be included in the AFM, POH or avionics operating manual	Paragraph 8.2.4 Paragraph 8.2.5 Paragraph 8.2.6			
4	**Criteria for RNAV 1 and RNAV 2 systems**	Paragraph 8.3	Annex B		
4a	GNSS RNAV system	Paragraph 8.3.1	Annex B		
4b	DME/DME RNAV system	Paragraph 8.3.2 Appendix 1 Paragraph 2	Annex B		
4c	Confirmation of the performance of RNAV systems that use DME	Paragraph 8.3.3 Appendix 1 Paragraph 3	Annex B		
4d	DME/DME/IRU RNAV system	Paragraph 8.3.4 Appendix 2 Paragraph 2	Annex B		
5	**Functional requirements and their explanation**	Paragraph 8.4 Appendix 3	Annex B		
6	**Maintenance requirements**	Paragraph 8.5	Annex B		
7	**Navigation database** Details of the navigation data validation programme.	Paragraph 12 Appendix 4	Annex B		

PART 6 - BASIC PILOT PROCEDURES FOR RNAV 1 AND RNAV 2 OPERATIONS

	Topics	Reference paragraphs CA 91-003	Location in the Annexes of the operator	Comments and/or recommendations by the CAA	Follow-up by the Inspector: Item status and date
	Operating procedures	Paragraph 10	Annex G		
1	**Pre-flight planning**	Paragraph 10.1 a)			
	Operators and pilots intending to conduct RNAV 1 and RNAV 2 operations must fill in the appropriate boxes of the ICAO flight plan.	Paragraph 10.1 a) 1)			
	On-board navigation data must be current and be appropriate for the intended operating region, and will include NAVAIDS, WPTs, and the relevant ATS route codes for departures, arrivals and alternate aerodromes. RNAV STAR procedures may be designated using multiple runway transitions. Operators that do not have this function will provide an alternate means of compliance (for example, a navigation database adjusted to these operations). If there is no alternate means of compliance to fly an RNAV procedure containing multiple runway transitions, the operators will not submit or accept an approval for these procedures.	Paragraph 10.1 a) 2)			
	Using all the information available, the availability of the required navigation infrastructure for the projected routes, including any non-RNAV contingency, must be confirmed for the foreseen period of operation. Since Annex 10 Volume I requires GNSS (RAIM or SBAS) integrity, it must be determined that the availability of these devices	Paragraph 10.1 a) 3)			

	Topics	Reference paragraphs CA 91-003	Location in the Annexes of the operator	Comments and/or recommendations by the CAA	Follow-up by the Inspector: Item status and date
	is also appropriate.				
	Aircraft not equipped with GNSS.- Aircraft not equipped with GNSS must be capable of updating the DME/DME and DME/DME/IRU position for RNAV 1 and RNAV 2 routes, as well as for SIDs and STARs.	Paragraph 10.1 a) 4)			
	If only the TSO-C129 equipment is used to meet RNAV 1 and RNAV 2 requirements, RAIM availability for the intended route of flight (route and time) must be confirmed using current GNSS satellite information.	Paragraph 10.1 a) 5)			
	If TSO-C145/C146 equipment is used to meet the RNAV requirement, the pilot/operator does not need to do the prediction if it is confirmed that the coverage of the wide area augmentation system (WAAS) will be available throughout the flight route.	Paragraph 10.1 a) 6)			
	Availability of RAIM (ABAS)	Paragraph 10.1 a) 7)			
	Availability of DME	Paragraph 10.1 a) 8)			
2	**General operating procedures**	Paragraph 10.1 b)			
	Operators and pilots shall not request, or present in the flight plan, RNAV 1 and RNAV 2 routes, SIDs or STARs, unless they meet all the CA 91-003 criteria. If an aircraft that does not meet these criteria receives an authorisation from the	Paragraph 10.1 b) 1)			

	Topics	Reference paragraphs CA 91-003	Location in the Annexes of the operator	Comments and/or recommendations by the CAA	Follow-up by the Inspector: Item status and date
	ATC to conduct an RNAV procedure, the pilot will notify the ATC that it cannot accept the authorisation and will request alternate instructions;				
	The pilot shall follow any instruction or procedure identified by the manufacturer, as necessary, to meet the performance requirements of this section;	Paragraph 10.1 b) 2)			
	At system initialization, pilots must: (a) confirm the validity of the navigation database; (b) verify the current position of the aircraft; (c) verify the proper entry of the assigned ATC route once the initial clearance is received, and of any subsequent route changes; and (d) ensure that the WPT sequence displayed on the navigation system coincides with the route shown in the appropriate charts and with the assigned route.	Paragraph 10.1 b) 3)			
	Pilots shall not fly an RNAV 1 or RNAV 2 SID or STAR unless it can be retrieved from the on-board navigation database using the procedure name and is consistent with the procedure in the chart. However, the route can be modified afterwards by inserting or deleting specific WPTs based on an ATC clearance. Manual entry or the creation of new WPTs by manually entering latitude and longitude or rho/theta values is not allowed.	Paragraph 10.1 b) 4)			

	Topics	Reference paragraphs CA 91-003	Location in the Annexes of the operator	Comments and/or recommendations by the CAA	Follow-up by the Inspector: Item status and date
	Furthermore, pilots must not change an RNAV SID or STAR WPT from a fly-by WPT to a flyover WPT or *vice versa*.				
	Whenever possible, RNAV 1 or RNAV 2 routes must be obtained from the database as a whole, instead of loading route WPTs individually from the database to the flight plan. However, designated WPTs and fixes can be individually selected and inserted from the navigation database provided all the fixes along the published route to be flown are inserted. Furthermore, the route can be modified afterwards by inserting or deleting specific WPTs based on ATC clearances. Manual entry or the creation of new WPTs by manually entering latitude and longitude or rho/theta values is not allowed.	Paragraph 10.1 b) 5)			
	Flight crews must verify the cleared flight plan by comparing the charts or other applicable resources to the navigation system text displays and aircraft chart displays, as applicable. If required, the exclusion of specific NAVAIDs must be confirmed. A procedure must not be used if there is any doubt about the validity of the procedure in the navigation database.	Paragraph 10.1 b) 6)			
	During the flight, when feasible, the flight crew must use the information available from ground NAVAIDs to confirm that navigation is reasonable.	Paragraph 10.1 b) 7)			
	For RNAV 2 routes, pilots must use a lateral deviation indicator, an FD or an AP in lateral navigation mode. Pilots may use a navigation chart	Paragraph 10.1 b) 8)			

	Topics	Reference paragraphs CA 91-003	Location in the Annexes of the operator	Comments and/or recommendations by the CAA	Follow-up by the Inspector: Item status and date
	display with a functionality equivalent to a lateral deviation indicator without an FD or AP.				
	For RNAV 1 routes, pilots must use a lateral deviation indicator, an FE or an AP in the lateral navigation mode.	Paragraph 10.1 b) 9)			
	Pilots of aircraft with lateral deviation display must make sure that the lateral deviation scale is appropriate for the navigation precision associated to the route/procedure (*e.g.*, full-scale deflection: ± 1 NM for RNAV 1, ± 2 NM for RNAV 2 o ± 5 NM for TSO-C129() equipment in RNAV 2 routes.	Paragraph 10.1 b) 10)			
	All pilots are expected to maintain the route centrelines represented on the on-board lateral deviation indicators and/or flight guide during all RNAV 1 and RNAV 2 operations, unless cleared by the ATC to deviate or in response to an emergency. For normal operations, the cross-track error/deviation (the difference between the path calculated by the RNAV system and the position of the aircraft relative to the path) shall not exceed ± ½ the navigation precision associated to the route or flight procedure (*e.g.*, 0.5 NM for RNAV 1 and 1.0 NM for RNAV 2). Small lateral deviations from this requirement are allowed (*e.g.,* overshooting or undershooting the path) during or immediately after an en-route turn/procedure, up to a maximum of 1 times the navigation precision (1xRNP) (*e.g.,* 1 NM for RNAV 1 and 2 NM for RNAV 2).	Paragraph 10.1 b) 11)			
	If the ATC assigns a course that places the aircraft	Paragraph 10.1 b)			

	Topics	Reference paragraphs CA 91-003	Location in the Annexes of the operator	Comments and/or recommendations by the CAA	Follow-up by the Inspector: Item status and date
	outside the route, the pilot shall not modify the flight plan in the RNAV system, until a new clearance is received that allows the aircraft to resume the route or the controller confirms a new route clearance. When the aircraft if not in the published route, the specified precision requirements do not apply.	12)			
	Manual selection of functions that limit the bank angle of the aircraft may reduce the ability of the aircraft to maintain its desired track and is not recommended. Pilots should recognise that manual selection of functions that limit the bank angle of the aircraft could reduce its ability to meet ATC path expectations.	Paragraph 10.1 b) 13)			
	Pilots operating aircraft with RNP approval according to the CA 91-003 provisions do not need to modify the pre-determined RNP values of the manufacturer, as established in the FMC.	Paragraph 10.1 b) 14)			
3	**Specific RNAV SID requirements**	Paragraph 10.1 c)			
	Prior to commencing take-off, the pilot must verify that the RNAV system of the aircraft is available, is operating properly, and that the appropriate aerodrome and runway data have been loaded. Before the flight, pilots must verify that the navigation system of the aircraft is operating properly and that the appropriate departure procedure (including any applicable en-route transition) has been entered and is duly displayed. Pilots assigned to an RNAV departure procedure and subsequently receive a change of runway,	Paragraph 10.1 c) 1)			

	Topics	Reference paragraphs CA 91-003	Location in the Annexes of the operator	Comments and/or recommendations by the CAA	Follow-up by the Inspector: Item status and date
	procedure or transition, must verify that the appropriate changes have been entered and are available for navigation before take-off. A final check of proper runway entry and correct route depiction, shortly before take-off, is recommended.				
	RNAV equipment engagement altitude.- The pilot must be able to connect the RNAV equipment in order to follow the flight guide in the RNAV lateral navigation mode before reaching 153 m (500 ft) over the aerodrome elevation. The altitude at which the RNAV guide starts in a given route can be higher (*e.g.*, climb to 304 m (1 000 ft) then straight to…)	Paragraph 10.1 c) 2)			
	Pilots must use an authorised method (lateral deviation indicator/navigation map display/FD/AP) to reach an appropriate level of performance for RNAV 1.	Paragraph 10.1 c) 3)			
	DME/DME aircraft.- Pilots of aircraft without GNSS, that use DME/DME sensors without inertial input, cannot use their RNAV systems until the aircraft has entered the appropriate DME coverage. The ANSP will make sure that there is appropriate DME coverage available in each RNAV SID (DME/DME).	Paragraph 10.1 c) 4)			
	DME/DME/IRU aircraft.- Pilots or aircraft without GNSS, that use DME/DME RNAV systems with an IRU (DME/DME/IRU), must make sure that the position of the inertial navigation system (INS) is confirmed within 304 m (1 000 ft/0.17 NM), from a know position, at the starting point of the take-off	Paragraph 10.1 c) 5)			

	Topics	Reference paragraphs CA 91-003	Location in the Annexes of the operator	Comments and/or recommendations by the CAA	Follow-up by the Inspector: Item status and date
	roll. This is usually achieved by using a manual or automatic runway update function. A navigation chart can also be used to confirm the position of the aircraft, if the pilot procedures and display resolution permit compliance with the 304 m (1 000 ft) tolerance requirement.				
	GNSS aircraft.- When a GNSS is used, the signal must be obtained before commencing the take-off roll. For aircraft using TSO-C129/C129a equipment, the take-off aerodrome must be loaded in the flight plan in order to achieve the appropriate navigation system monitoring and sensitivity. For aircraft using TSO-C145a/C146a avionics, if the departure begins at a runway waypoint, then the departure airport does not need to be in the flight plan to obtain appropriate monitoring and sensibility.	Paragraph 10.1 c) 6)			
4	**Specific RNAV STAR requirements**	Paragraph 10.1 d)			
	Before the arrival phase, the flight crew must check that the correct terminal route has been loaded. The active flight plan shall be checked, by comparing the charts to the map display (if applicable) and the MCDU. This includes confirmation of WPT sequence, the reasonableness of track angles and distances, any altitude or speed restriction, and, when feasible, which are fly-by WPTs and which are flyover WPTs. If the route so requires, a check must be done to confirm that the update will exclude a particular NAVAID. A route will not be used if there is any doubt about its validity in the navigation	Paragraph 10.1 d) 1)			

	Topics	Reference paragraphs CA 91-003	Location in the Annexes of the operator	Comments and/or recommendations by the CAA	Follow-up by the Inspector: Item status and date
	database.				
	The creation of new WPTs by the flight crew through manual entry in the RNAV system will invalidate any route and is not allowed.	Paragraph 10.1 d) 2)			
	Where contingency procedures require reversion to a conventional arrival route, the flight crew must complete the necesary preparations before commencing the RNAV route.	Paragraph 10.1 d) 3)			
	Route modifications in the terminal area may take the form of radar headings or “direct to” clearances. In this regard, the flight crew must be capable of reacting in time. This may include entering tactical WPTs from the database. The flight crew is not allowed to enter manually or modify a loaded route using provisional WPTs or fixes not provided in the database.	Paragraph 10.1 d) 4)			
	Pilots must verify that the aircraft navigation system is operating properly and the correct arrival procedure and runway are properly entered and depicted.	Paragraph 10.1 d) 5)			
	Although no particular method is mandated, any publish altitude and speed constraints must be observed.	Paragraph 10.1 d) 6)			
5	**Contingency procedures**	Paragraph 10.1 e)			
	The pilot must notify the ATC of any loss of RNAV capability, and the proposed course of action. If the	Paragraph 10.1 e) 1)			

	Topics	Reference paragraphs CA 91-003	Location in the Annexes of the operator	Comments and/or recommendations by the CAA	Follow-up by the Inspector: Item status and date
	requirements of an RNAV route cannot be met, pilots must notify the ATS as soon as possible. Loss of RNAV capability includes any failure or event that causes the aircraft to be unable to meet the RNAV requirements of the route.				
	In case of a communication failure, the flight crew must continue with the RNAV route, in accordance with the procedure established for lost communications.	Paragraph 10.1 e) 2)			

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Job Aid RNAV 1 and RNAV 2
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