• Operator Name			
• Inspector Name			
• Airplane Type(s)			
• AOC Applicant/Holder Focal Point	**Name**	**Phone No.**	**E-mail**

No	R NAV 1&2 Operational Approval Application Attachments	ICAO Doc 9613	OMD	YES	NO	NA	Remarks
A	**Operations Manual Part D - Training Program**						
1	**Training Program.**						
a	**Training program**. Commercial operators must have a training program addressing the operational practices, procedures and training items related to RNAV 1 and/or RNAV 2 operations (e.g. initial, upgrade or recurrent training for pilots, dispatchers or maintenance personnel).	3.3.2.3.2.1					
2	**Flight Crew Training Program.** The following items should be addressed in the pilot training program (e.g. simulator, training device, or aircraft) for the aircraft's RNAV system:						
a	The meaning and proper use of aircraft equipment/navigation suffixes;	3.3.5					
b	Procedure characteristics as determined from chart depiction and textual description;	3.3.5					
c	Depiction of waypoint types (fly-over and fly-by) and path terminators (provided in 3.3.3.3, ARINC 424 path terminators) and any other types used by the operator, as well as associated aircraft flight paths;	3.3.5					
d	Required navigation equipment for operation on RNAV routes/SIDs/STARs, e.g. DME/DME, DME/DME/IRU, and GNSS;	3.3.5					
e	**RNAV system-specific information:**	**3.3.5**					
(1)	Levels of automation, mode annunciations, changes, alerts, interactions, reversions, and Degradation;	3.3.5					
(2)	Functional integration with other aircraft systems;	3.3.5					
(3)	The meaning and appropriateness of route discontinuities as well as related flight crew procedures;	3.3.5					
(4)	Pilot procedures consistent with the operation;	3.3.5					

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(5)	Types of navigation sensors (e.g. DME, IRU, GNSS) utilized by the RNAV system and associated system prioritization/weighting/logic;	3.3.5					
(6)	Turn anticipation with consideration to speed and altitude effects;	3.3.5					
(7)	Interpretation of electronic displays and symbols;	3.3.5					
(8)	Understanding of the aircraft configuration and operational conditions required to support RNAV operations, i.e. appropriate selection of CDI scaling (lateral deviation display scaling);	3.3.5					
f	**RNAV equipment operating procedures, as applicable, including how to perform the following actions:**	3.3.5					
(1)	Verify currency and integrity of the aircraft navigation data;	3.3.5					
(2)	Verify the successful completion of RNAV system self-tests;	3.3.5					
(3)	Initialize navigation system position;	3.3.5					
(4)	Retrieve and fly a SID or a STAR with appropriate transition;	3.3.5					
(5)	Adhere to speed and/or altitude constraints associated with a SID or STAR;	3.3.5					
(6)	Select the appropriate STAR or SID for the active runway in use and be familiar with procedures to deal with a runway change;	3.3.5					
(7)	Perform a manual or automatic update (with take-off point shift, if applicable);	3.3.5					
(8)	Verify waypoints and flight plan programming;	3.3.5					
(9)	Fly direct to a waypoint;	3.3.5					
(10)	Fly a course/track to a waypoint;	3.3.5					
(11)	Intercept a course/track;	3.3.5					
(12)	Following vectors and rejoining an RNAV route from "heading" mode;	3.3.5					
(13)	Determine cross-track error/deviation. More specifically, the maximum deviations allowed to support RNAV must be understood and respected	3.3.5					
(14)	Resolve route discontinuities;	3.3.5					
(15)	Remove and reselect navigation sensor input;	3.3.5					
(16)	When required, confirm exclusion of a specific NAVAID or NAVAID type	3.3.5					
(17)	When required by the authority, perform gross navigation error checks using conventional NAVAIDs;	3.3.5					
(18)	Change arrival airport and alternate airport;	3.3.5					
(19)	Perform parallel offset functions if capability exists. Pilots should know how offsets are applied, the functionality of their particular RNAV system and the need to advise ATC if this functionality is not available;	3.3.5					
(20)	perform RNAV holding functions;	3.3.5					

No	R NAV 1&2 Operational Approval Application Attachments	ICAO Doc 9613	OMD	YES	NO	NA	Remarks
g	Operator-recommended levels of automation for phase of flight and workload, including methods to minimize cross-track error to maintain route centre line;	3.3.5					
h	R/T phraseology for RNAV applications; and	3.3.5					
i	Contingency procedures for RNAV applications	3.3.5					
3	**Flight Dispatcher Training Program.**						
a	Specific equipments	AC NO 13					
b	Flight plan	AC NO 13					
c	MEL requirements	AC NO 13					
d	Normal procedures	AC NO 13					
e	Contingency procedures	AC NO 13					

No	R NAV 1&2 Operational Approval Application Attachments	ICAO Doc 9613	OMA	YES	NO	NA	Remarks
B	**Operations Manuals**						
1	**Operations Manuals Part A**						
a	For commercial operators must address information/guidance on the SOP detailed in 3.3.4. The appropriate manuals should contain navigation operating instructions and contingency procedures, where specified. The operators must submit their manuals and checklists for review as part of the application process.	**3.3.2.3.3.1**					
b	**Preflight planning**						
(1)	Operators and pilots intending to conduct operations on RNAV 1 and RNAV 2 routes should file the appropriate flight plan suffixes.	3.3.4.2.1					
(2)	The on-board navigation data must be current and appropriate for the region of intended operation and must include the NAVAIDs, waypoints, and relevant coded ATS routes for departure, arrival, and alternate airfields.	3.3.4.2.2					
(3)	The availability of the NAVAID infrastructure, required for the intended routes, including any non-RNAV contingencies, must be confirmed for the period of intended operations using all available information. 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 the SBAS receivers (all TSO-C145/C146), operators should check appropriate GPS RAIM availability in areas where the SBAS signal is unavailable.	3.3.4.2.3					
c	**ABAS availability**						
(1)	RAIM levels required for RNAV 1 and RNAV 2 can be verified either through NOTAMs (where available) or through prediction services. The operating authority may provide specific guidance on how to comply with this requirement (e.g. if sufficient satellites are available, a prediction may not be necessary). Operators should be familiar with the prediction information available for the intended route	3.3.4.2.4.1					
(2)	RAIM availability prediction should take into account the latest GPS constellation NOTAMs and avionics model (when available). The service may be provided by the ANSP, avionics manufacturer, other entities or through an airborne receiver RAIM prediction capability	3.3.4.2.4.2					

No	R NAV 1&2 Operational Approval Application Attachments	ICAO Doc 9613	OMA	YES	NO	NA	Remarks
(3)	In the event of a predicted, continuous loss of appropriate level of fault detection of more than five minutes for any part of the RNAV 1 or RNAV 2 operation, the flight plan should be revised (e.g. delaying the departure or planning a different departure procedure).	3.3.4.2.4.3					
(4)	RAIM availability prediction software does not guarantee a service; such tools assess the RNAV system's ability to meet the navigation performance. Because of unplanned failure of some GNSS elements, pilots/ANSP must realize that RAIM or GPS navigation altogether may be lost while airborne which may require reversion to an alternative means of navigation. Therefore, pilots should assess their capability to navigate (potentially to an alternate destination) in case of failure of GPS navigation	3.3.4.2.4.4					
d	**DME availability.** For navigation relying on DME, NOTAMs should be checked to verify the condition of critical DMEs. Pilots should assess their capability to navigate (potentially to an alternate destination) in case of failure of critical DME while airborne	**3.3.4.2.5**					
e	**General operating procedures**						
(1)	The pilot should comply with any instructions or procedures identified by the manufacturer as necessary to comply with the performance requirements in this chapter	3.3.4.3.1					
(2)	Operators and pilots should not request or file RNAV 1 and RNAV 2 routes unless they satisfy all the criteria in the relevant State documents. If an aircraft not meeting these criteria receives a clearance from ATC to conduct an RNAV route, the pilot must advise ATC that he/she is unable to accept the clearance and must request alternate instructions	3.3.4.3.2					
(3)	At system initialization, pilots must confirm the navigation database is current and verify that the aircraft position has been entered correctly. Pilots must verify proper entry of their ATC assigned route upon initial clearance and any subsequent change of route. Pilots must ensure the waypoints sequence, depicted by their navigation system, matches the route depicted on the appropriate chart(s) and their assigned route	3.3.4.3.3					

No	R NAV 1&2 Operational Approval Application Attachments	ICAO Doc 9613	OMA	YES	NO	NA	Remarks
(4)	Pilots must not fly an RNAV 1 or RNAV 2 SID or STAR unless it is retrievable by route name from the onboard navigation database and conforms to the charted route. However, the route may subsequently be modified through the insertion or deletion of specific waypoints in response to ATC clearances. The manual entry, or creation of new waypoints by manual entry, of latitude and longitude or rho/theta values is not permitted. Additionally, pilots must not change any RNAV SID or STAR database waypoint type from a fly-by to a fly-over or vice versa	3.3.4.3.4					
(5)	Whenever possible, RNAV 1 and RNAV 2 routes in the en-route domain should be extracted from the database in their entirety, rather than loading individual waypoints from the database into the flight plan. However, it is permitted to select and insert individual, named fixes/waypoints from the navigation database, provided all fixes along the published route to be flown are inserted. Moreover, the route may subsequently be modified through the insertion or deletion of specific waypoints in response to ATC clearances. The creation of new waypoints by manual entry of latitude and longitude or rho/theta values is not permitted	3.3.4.3.5					
(6)	Pilots should 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. If required, the exclusion of specific NAVAIDs should be confirmed	3.3.4.3.6					
(7)	During the flight, where feasible, the pilot should use available data from ground-based NAVAIDs to confirm navigational reasonableness	3.3.4.3.7					
(8)	For RNAV 2 routes, pilots should use a lateral deviation indicator, flight director or autopilot in lateral navigation mode. Pilots may use a navigation map display with equivalent functionality as a lateral deviation indicator, as described in 3.3.3.3 a) (1-5), without a flight director or autopilot	3.3.4.3.8					
(9)	For RNAV 1 routes, pilots must use a lateral deviation indicator, flight director, or autopilot in lateral navigation mode	3.3.4.3.9					
(10)	Pilots of aircraft with a lateral deviation display must ensure that lateral deviation scaling is suitable for the navigation accuracy associated with the route/procedure (e.g. full-scale deflection: ±1 NM for RNAV 1, ±2 NM for RNAV 2, or ±5 NM for TSO-C129() equipment on RNAV 2 routes)	3.3.4.3.10					

No	R NAV 1&2 Operational Approval Application Attachments	ICAO Doc 9613	OMA	YES	NO	NA	Remarks
(11)	All pilots are expected to maintain route centre lines, as depicted by on-board lateral deviation indicators and/or flight guidance during all RNAV operations described in this manual, unless authorized to deviate by ATC or under emergency conditions. For normal operations, cross-track error/deviation (the difference between the RNAV system computed path and the aircraft position relative to the path, i.e. FTE) should be limited to ±½ the navigation accuracy associated with the procedure or route (i.e. 0.5 NM for RNAV 1, 1.0 NM for RNAV 2). Brief deviations from this standard (e.g. overshoots or undershoots) during and immediately after procedure/route turns, up to a maximum of one times the navigation accuracy (i.e. 1.0 NM for RNAV 1, 2.0 NM for RNAV), are allowable	3.3.4.3.11					
(12)	If ATC issues a heading assignment taking the aircraft off a route, the pilot should not modify the flight plan in the RNAV system until a clearance is received to rejoin the route or the controller confirms a new route clearance. When the aircraft is not on the published route, the specified accuracy requirement does not apply	3.3.4.3.12					
(13)	Manually selecting aircraft bank limiting functions may reduce the aircraft's ability to maintain its desired track and are not recommended. Pilots should recognize that manually selectable aircraft bank-limiting functions might reduce their ability to satisfy ATC path expectations, especially when executing large angle turns. This should not be construed as a requirement to deviate from airplane flight manual procedures; rather, pilots should be encouraged to limit the selection of such functions within accepted procedures.	3.3.4.3.13					

f	R NAV SID specific requirements						

No		ICAO Doc 9613	OMA	YES	NO	NA	Remarks
(1)	Prior to commencing take-off, the pilot must verify the aircraft's RNAV system is available, operating correctly, and the correct airport and runway data are loaded. Prior to flight, pilots must verify their aircraft navigation system is operating correctly and the correct runway and departure procedure (including any applicable en-route transition) are entered and properly depicted. Pilots who are assigned an RNAV departure procedure and subsequently receive a change of runway, procedure or transition must verify the appropriate changes are entered and available for navigation prior to take-off. A final check of proper runway entry and correct route depiction, shortly before take-off, is recommended.	3.3.4.4.1					

No	R NAV 1&2 Operational Approval Application Attachments	ICAO Doc 9613	OMA	YES	NO	NA	Remarks
(2)	RNAV engagement altitude. The pilot must be able to use RNAV equipment to follow flight guidance for lateral navigation, e.g. lateral navigation no later than 153 m (500 ft) above the airport elevation. The altitude at which RNAV guidance begins on a given route may be higher (e.g. climb to 304 m (1 000 ft) then direct to …).	3.3.4.4.2					
(3)	Pilots must use an authorized method (lateral deviation indicator/navigation map display/flight director/autopilot) to achieve an appropriate level of performance for RNAV 1.	3.3.4.4.3					
(4)	DME/DME aircraft. Pilots of aircraft without GPS, using DME/DME sensors without IRU input, cannot use their RNAV system until the aircraft has entered adequate DME coverage. The ANSP will ensure adequate DME coverage is available on each RNAV (DME/DME) SID at an acceptable altitude. The initial legs of the SID may be defined based on heading	3.3.4.4.4					
(5)	DME/DME/IRU (D/D/I) aircraft. Pilots of aircraft without GPS, using DME/DME RNAV systems with an IRU (DME/DME/IRU), should ensure the aircraft navigation system position is confirmed, within 304 m (1 000 ft) (0.17 NM) of a known position, at the starting point of the take-off roll. This is usually achieved by the use of an automatic or manual runway update function. A navigation map may also be used to confirm aircraft position, if the pilot procedures and the display resolution allow for compliance with the 304 m (1 000 ft) tolerance requirement	3.3.4.4.5					
(6)	GNSS aircraft. When using GNSS, the signal must be acquired before the take-off roll commences. For aircraft using TSO-C129/C129A equipment, the departure airport must be loaded into 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 sensitivity	3.3.4.4.6					

g	R NAV STAR specific requirements

No	R NAV 1&2 Operational Approval Application Attachments	ICAO Doc 9613	OMA	YES	NO	NA	Remarks
(1)	Prior to the arrival phase, the pilot should verify that the correct terminal route has been loaded. The active flight plan should be checked by comparing the charts with the map display (if applicable) and the MCDU. This includes confirmation of the waypoint sequence, reasonableness of track angles and distances, any altitude or speed constraints, and, where possible, which waypoints are fly-by and which are fly-over. If required by a route, a check will need to be made to confirm that updating will exclude a particular NAVAID. A route must not be used if doubt exists as to the validity of the route in the navigation database	3.3.4.5.1					

No	R NAV 1&2 Operational Approval Application Attachments	ICAO Doc 9613	OMA	YES	NO	NA	Remarks
(2)	The creation of new waypoints by manual entry into the RNAV system by the pilot would invalidate the route and is not permitted	3.3.4.5.2					
(3)	Where the contingency procedure requires reversion to a conventional arrival route, necessary preparations must be completed before commencing the RNAV route	3.3.4.5.3					
(4)	Route modifications in the terminal area may take the form of radar headings or "direct to" clearances and the pilot must be capable of reacting in a timely fashion. This may include the insertion of tactical waypoints loaded from the database. Manual entry or modification by the pilot of the loaded route, using temporary waypoints or fixes not provided in the database, is not permitted	3.3.4.5.4					
(5)	Pilots must verify their aircraft navigation system is operating correctly and the correct arrival procedure and runway (including any applicable transition) are entered and properly depicted	3.3.4.5.5					
(6)	Although a particular method is not mandated, any published altitude and speed constraints must be observed.	3.3.4.5.6					

h	Contingency procedures						
(1)	The pilot must notify ATC of any loss of the RNAV capability, together with the proposed course of action. If unable to comply with the requirements of an RNAV route, pilots must advise ATS as soon as possible. The loss of RNAV capability includes any failure or event causing the aircraft to no longer satisfy the RNAV requirements of the route	3.3.4.6.1					
(2)	In the event of communications failure, the pilot should continue with the RNAV route in accordance with established lost communications procedures	3.3.4.6.2					

No	R NAV 1 & 2 Operational Approval Application Attachments	ICAO Doc 9613	MEL	YES	NO	NA	Remarks
2	Minimum Equipment List (MEL)						
a	MEL revisions necessary to address RNAV 1 and/or RNAV 2 provisions must be approved. Operators must adjust the MEL, or equivalent, and specify the required dispatch conditions	3.3.2.3.4					

- **Assessment Result**

☐ Satisfactory	☐ Unsatisfactory

• Remarks	

Flight Operations Inspector Name	Signature	Date