



SAM/IG/5  
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**International Civil Aviation Organization  
South American Regional Office**

**FIFTH WORKSHOP/MEETING OF THE SAM IMPLEMENTATION GROUP (SAM/IG/5)  
REGIONAL PROJECT RLA/06/901**

**Lima, Peru, 10 - 14 May 2010**

**Agenda Item 4: Standards and procedures for the approval of performance-based navigation operations**

**Proposed revision to AC 91-002 – Aircraft and Operators Approval for RNAV 5 Operations**

(Presented by the DGCA of Chile)

**Summary**

This working paper contains a proposed revision to AC 91-002 – Aircraft and operators approval for RNAV 5 operations, regarding the navigation database requirement.

**References:**

- AC 91-002
- Report of the SAM/IG/4 meeting
- First course on aircraft and operators approval for RNAV operations

**1 Background**

- 1.1 The Fourth Workshop/Meeting of the SAM Implementation Group (SAM/IG/4) (Lima, Peru, 19 - 23 October 2009) took note of the content of AC 91-002 concerning the approval of aircraft and operators for RNAV 5 operations.
- 1.2 The ICAO PBN Manual, Doc 9613, Volume II, Part B, Chapter 2, item 2.3.6 states that if the aircraft is equipped with, and uses, a navigation database, it must contain updated data appropriate for the region in which the foreseen operation is to be carried out, and must include the navigation aids and the regulatory waypoints for the route foreseen.

- 1.3 Advisory Circular 91-002 “Aircraft and operators approval for RNAV 5 operations”, in its item 6.4 f), states that a navigation database is not part of the required RNAV 5 functions and that, in absence of such database, manual WPT entry will be required, thus significantly increasing the potential of error in WPTs.

## **2. Discussion**

- 2.1 According to item 1.3 above, a navigation database is not part of the functions required for RNAV 5 operation.
- 2.2 If an RNAV system does not have an appropriate navigation database, the flight crew will be forced to enter the waypoints (Wets) established for the RNAV route manually, and if the route has more than 4 WPTs, these shall be entered during the flight.
- 2.3 If the RNAV system requires WPTs to be established in geographic coordinates, in addition to their identification, 7 characters for longitude and 7 characters for latitude must be entered for each of them.
- 2.4 If each WPT needs to be identified in the Rho/Theta mode as normally required by traditional RNAV equipment used in general aviation, in addition to their identification, the frequency of the VOR/DME station, the 3-digit VOR radial, and the 3-dit DME distance must be entered for each of them.
- 2.5 Accordingly, the absence of an adequate navigation database will require the manual entry of WPTs, thus significantly increasing flight crew workload and generating a potential source of error in the WPTs to be flown. This was confirmed at the first RNAV course conducted by the Regional Safety Oversight Cooperation System in March 2010.

## **3 Suggested action**

In view of the above, the Meeting is invited to consider that:

- 3.1 Navigation based on an appropriate navigation database will significantly reduce flight crew workload.
- 3.2 Use of an appropriate navigation database will minimise a potential source of error in the definition of the flight path, significantly reducing path definition error (PDE) and, consequently, total system error (TSE).
- 3.3 The fleet operating in airspace or regional routes designated as RNAV 5 will estimate its position based on a flight manager or a GNSS, both of which should be capable of using a navigation database. Thus, its inclusion as a requirement for operational authorisation will not have a major impact on the aircraft and operators approval process.

- 3.4 In view of the above, it is suggested that the requirement of having an updated database appropriate to the area to be flown be established for operations on routes or airspaces designated as RNAV 5.
- 3.5 Likewise, the Meeting is invited to extend the aforementioned analysis to RNAV10 (RNP10) operations.

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