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REPUBLIC OF ARMENIA

GENERAL DEPARTMENT OF CIVIL AVIATION

Implementation of Approach Procedures with Vertical Guidance (APV) by means of Barometric Navigation (Baro-VNAV) in Armenian airspace.

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1. Purpose

1.1 The purpose of this circular is to provide information concerning the introduction of Approach Procedures with Vertical Guidance (APV) by means of Barometric Vertical Navigation (Baro-VNAV) in Armenian airspace.
1.2 It is planned to introduce APV Baro-VNAV procedures at Armenian IFR airports by the end of 2012. This circular is to inform airspace users about the proposed introduction of Approach Procedures with Vertical Guidance by means of Barometrical Navigation (APV Baro-VNAV).

2. Background

2.1 APV provides vertical guidance for pilots to reduce the risk of Controlled Flights Into Terrain (CFITs). Due to the reduced risk of APV operation in comparison with Non-Precision Approaches, the 36th Session of the ICAO Assembly adopted Resolution A36-23 urging all States to implement APV procedures to all runway ends serving aircraft with a maximum take-off mass of 5700 kg or more.
2.2 Barometric Vertical Navigation (Baro-VNAV) is a navigation system which presents computed vertical guidance to the pilot referenced to a specific Vertical Path Angle (VPA). The onboard avionics computer resolves vertical guidance data based on barometric altitude and is ither computed as a geometric path between two waypoints or an angle from a single waypoint. Although the approaches provide vertical guidance they do not meet the more stringent standards of a precision approach.
2.3 The basis for APV Baro-VNAV procedures in Armenia are the existing RNAV (GNSS) procedures where lateral guidance is achieved through Area Navigation (RNAV (GNSS)). The vertical glide path will be generated by the onboard avionic system based on barometric altitude information.
2.4 The APV Baro-VNAV procedures will be designed in accordance with criteria for Area Navigation (RNAV) approach procedures using barometric vertical navigation as stipulated in the ICAO PANS-OPS (Doc 8168) Volume II. Due to the design criteria, it is likely that different Obstacle Clearance Altitude/Height (OCA/H) values are achieved in comparison with the minima on the existing RNAV (GNSS) Non-Precision Approaches.
2.5 Although APV operations use a Decision Altitude/Height (DA/H) instead of a Minimum Descent Altitude/Height (MDA/H), the approach remains a Non-Precision Approach.
2.6 Due to the fact that various Baro-VNAV systems exist and some of them do not have the possibility to correct the altitude for non-standard temperatures, the actual glide path angle is reduced for those systems. The errors are considered in the design of the Approach Obstacle Clearance Surface, thus a minimum temperature will be depicted on the Approach Chart.
2.7 As APV Baro-VNAV procedures are add-ons to RNAV(GNSS) Approach Procedures, the procedures will be depicted on the RNAV(GNSS) Approach Charts with the following additions:

- Depiction of a Minimum Temperature. APV Baro-VNAV procedures are not permitted when the aerodrome temperature is below the promulgated minimum aerodrome temperature for the procedure unless the RNAV system is equipped with approved cold temperature compensation for final approach.
- Depiction of a Vertical Path Angle (VPA).
- Indication that step-down fixes are usable for LNAV only operations.
- OCA(H) for the Non-Precision RNAV (GNSS) procedure will be depicted as LNAV.
- OCA(H) for the APV Baro-VNAV procedure will be depicted as LNAV/VNAV.

3. Conditions for operating APV Baro-VNAV Approach Procedures

3.1 The use of APV Baro-VNAV procedures by aircraft in Armenian airspace is allowed if the aircraft is equipped with at least the following:

a) An LNAV system with a certified along- and across-track performance (TSE) equal to or less than 0.3 NM, 95% probability. The following systems are deemed to meet this requirement:

- Global Navigation Satellite System (GNSS) navigation equipment certified for approach operations; or
- Multi-sensor systems using inertial reference units in conjunction with GNSS certified for approach operations; or
- RNP systems approved for RNP 0.3 approach or less; and

b) A VNAV system certified for approach operations including the ability to have timely changeover to positive course guidance for missed approach; and

c) A navigation database containing the waypoints and associated RNAV and VNAV information, e.g. Reference Datum Height (RDH) and Vertical Path Angle (VPA) for the procedure and missed approach that is automatically loaded into the navigation system flight plan when selected by the crew.

3.2 Detailed information regarding airworthiness approval and operational criteria for APV Baro-VNAV operations are prescribed by GDCA of the Republic of Armenia.

4. Implementation

In line with the above-mentioned ICAO Resolution, the APV Baro-VNAV procedures will be implemented by the end of 2012.

5. Additional information

Further information on planning and implementation issues for APV Baro-VNAV can be obtained from:

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