RNAV GNSS APPROACH

ESESA Aviation Workshop 26th – 27th October 2010

ESESA is a project co-funded by the EU 7th FP and South Africa
Overview

- Before Performance Based Navigation...
- PBN convergence with RNAV GNSS Approach
- RNAV GNSS Approach cross check with RNP APCH
- Airworthiness material
Before PBN...

- Non Precision Approaches (NPA):
  - Use conventional navigation aids such as NDB, VOR and DME to bring the aircraft to a point where the runway is in view and landing can be performed.

- Precision Approaches (PA):
  - Use an instrument landing system (e.g. ILS, GBAS, MLS) which provides both lateral and vertical guidance on a stabilised continuous descent path.

- Approach with Vertical Guidance (APV)
  - VNAV flown with baro altitude (APV Baro VNAV)
  - VNAV flown with SBAS (APV SBAS)

CFIT Risk
Costly ground installation
Takes benefit from aircraft installed systems
NPA ?  APV ?  PA ?  Other ??
PBN and RNAV GNSS Approach

  - Only RNP APCH and RNP AR APCH specifications
  - RNP APCH specification mainly covers lateral navigation
  - No specification for APV (Baro VNAV or SBAS)

Difficulties to consistently implement APV procedures (as recommended by ICAO Assembly Resolution 36 – 23) with PBN applications

Different terminologies used in ICAO Standards, PBN Manual and approach charts lead to confusion

CLARIFICATION URGENTLY NEEDED!
The ICAO State Letter SP 65/4-10/53 (23rd July 2010)

✓ Pre-Lease of PBN update scheduled March 2011
✓ Focus on RNP APCH implementation (not to be confused with RNP AR APCH!)
✓ Clarifications on APV (Baro VNAV and SBAS) and RNP APCH criteria
✓ Help to liaise with airworthiness materials developed by FAA and EASA

Reconciling PBN, Approach charts terminology and aircraft systems

✓ PART A – RNP APCH OPERATIONS DOWN TO LNAV AND LNAV/VNAV MINIMA
  • Addresses APV Baro VNAV (barometric-based vertical navigation requirements given in attachment 1 of the volume)
  • Opens the capability to fly APV Baro VNAV procedures with an SBAS capable GNSS equipment
✓ PART B – RNP APCH OPERATIONS DOWN TO LP AND LPV MINIMA
  • Addresses APV SBAS criteria
  • provisions given are consistent with different sets of LPV minima (down to 200 ft)

CAUTION: requirements on SiS performance in this ICAO State Letter are not consistent with the Annex 10, Table 3.7.2.4-1. This will be soon amended!
### RNAV GNSS App cross check with RNP APCH

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### RNP APCH procedures down to LNAV or LNAV/VNAV minima
- FAA AC 20-138A
- EASA AMC 20-27

Not equivalent – AMC 20-27 under discussion following IATA and AEA letter July 2010

### RNP APCH procedures down to LP or LPV minima
- FAA AC 20-138A
- EASA AMC 20-28 to be issued 2011 (certification already possible by CRI)

### RNP APCH down to LNAV/VNAV conducted with approved SBAS equipment
- Accepted by FAA
- Under scope of EASA