

OPS workshop # 2 SPA.PBN OPS approval DGAC perspective

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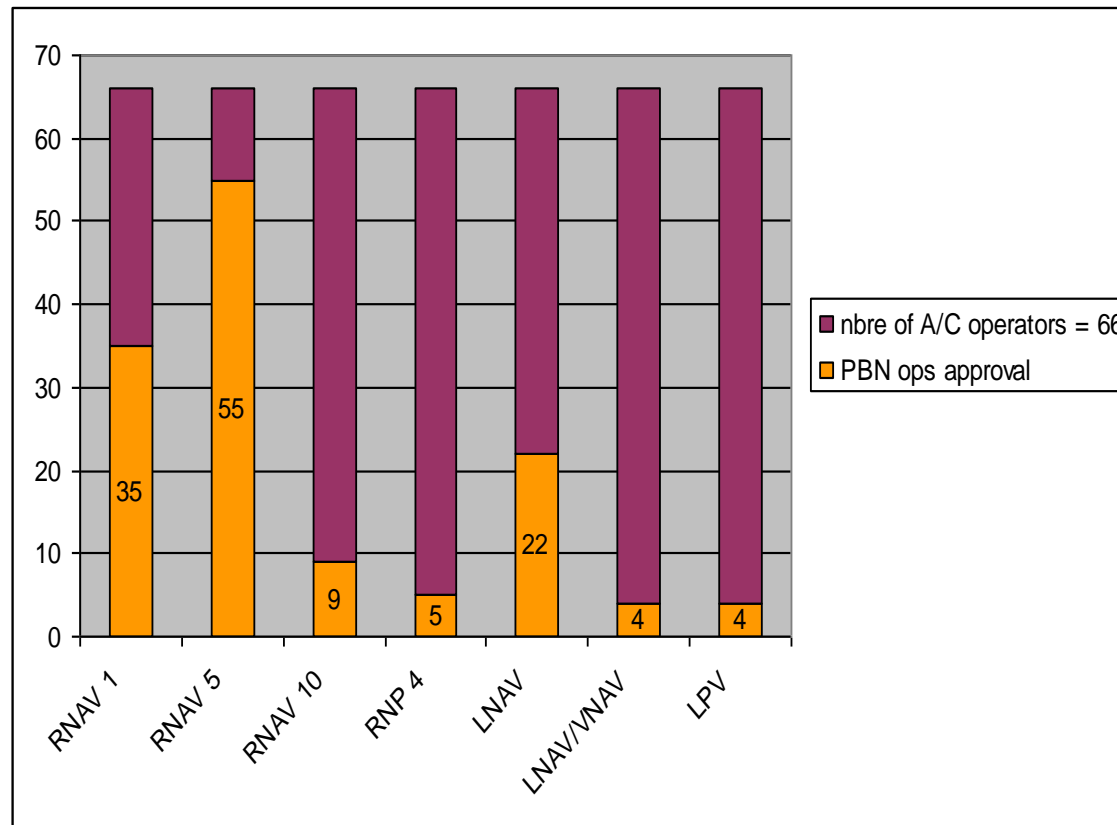


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Présent
pour
l'avenir

State of the art

PBN and french approved operators



State of the art

PBN and OPS approval

- Air France has just been approved to fly RNP 1 arrival and departure with or without RF, with GNSS or DME/DME/IRS (if the procedure has been protected in accordance with DME/DME/IRS)
- Sesar project « Rise » : 2015 - Air France/Airbus SA - RNP AR APCH in Nice, Ajaccio.





EU OPS and PBN.SPA

- PBN is better covered in AIR OPS than in EU OPS
- EU OPS 1.243 (operations in defined areas or along specific routes where navigation performance has been prescribed or specified)
- PBN was not explicitly mentioned and the GNSS approaches not clearly covered
- AIR OPS => Part SPA.PBN
- Clear reference to PBN AMC (AMC 20-4, 20-12, 20-27, 20-28) in GM1 SPA.PBN.100
- RNAV 5 : approval no longer required. It makes sense

Experience 1 - Aircraft eligibility

- Determined through the AFM or the POH or any document referenced in the AFM.
 - Identify the navigation specification or standard with which the aircraft was certified
 - Most of the aircraft certified before the new terminology defined in PBN manual or before the new standards
- RNAV 1 vs PRNAV (AC 90-100A vs TGL-10)
- RNP 4 : use of FAA Order and PBN manual
- RNP APCH - LNAV/VNAV (AC 20-129 vs AMC 20-27)



Experience 1 - A/C eligibility

RNP APCH LNAV/VNAV

RNP APCH LNAV / VNAV

- No harmonization between EASA and FAA
- Performance requirements for the vertical TSE more stringent than those in AC 20-129 and PBN manual.
- Some aircraft are still not certified in accordance with AMC 20-27.
- DGAC considered the following chapter from AMC 20-27:

An acceptable means of complying with the above accuracy requirements is to have the VNAV system approved for RNAV approaches in accordance with FAA AC 20-129 and to provide evidence that the FTE, or VTSE, or operation procedures to bound the FTE are within the required limits.

- Vertical deviation has to be clearly shown either on PFD or ND (monitoring on MCDU or CDU of numeric vertical deviation not accepted)

=> A SIB published by EASA handles this issue

Experience 2 - Crew training

- Clear introduction of the PBN in academic training is important
- Lots of acronyms to handle : GNSS vs GPS, NAV Spec / Phases of Flight, RNAV vs RNP (OBPMA), approach vs arrival, BaroVNAV issue, SDF...
- RNAV or RNP : monitoring of the NSE and FTE
- Practical training : Only required for RNP APCH
- French Ops directive (*to introduce RNP APCH practical training : 4 approaches including 2 missed approach*)
- Some Avionics may be “confusing” with regards to PBN terminology
 - LNAV/VNAV can be a guidance mode even for a/c not fitted with GPS => Crew training important



Experience 3 - Database

- All the Database providers and FMS integrators have received a LOA type 1 / type 2
- Feedback to the database providers in case of detected anomalies by the airline
- Gross error Check performed by the crew
- EU OPS 1.873 / IR OPS CAT.IDE.A.355 : Oversight of database providers by operators is quite demanding in particular for small aircraft operators. (cf *The operator shall continuously monitor the integrity of both the process and the products, either directly or by monitoring the compliance of third party providers*)

=> Part DAT – NPA 2014-20



Experience 4 – OPS manual

- Flight preparation

- Raim prediction is not systematic: *In accordance with the aircraft architecture, RAIM prediction may not be required. But the airline has to check the number of available satellites.*

- FDE required for GNSS stand alone systems in oceanic/remote area

- MEL

- RNAV 1 (loss of GNSS => reversion on DME/DME only for arrival and departure procedures protected with DME/DME.

- RNP 4 : 2GNSS required at MEL, but 1 GNSS and 1 IRS is sufficient before entering the airspace.

- RNP APCH : 1 GNSS is required (But it depends on the way the function has been certified and the MMEL is written).

- Other items can be impacted (AP, FD, FMC,...)

Experience 4 - OPS manual (RNP APCH)

- Aerodrome selection
- AMC 20-27 is stringent :
 - En route alternate (*more and more en route alternate destination are only accessible through a RNP APCH procedure*)
 - Destination alternate (*More and more conventional approach procedures are replaced by RNP APCH*)
- Normal procedure
 - Once the airline has been approved for LNAV/VNAV, the normal procedure to fly LNAV/VNAV or LNAV should be the same.
 - The use of the Baro VNAV function should not be different (monitoring of the 75ft should be applied in both cases)
 - The difference is the SDF management. There is no SDF on LNAV/VNAV whereas some LNAV could be published with SDF

Experience 4 - OPS manual (RNP APCH)

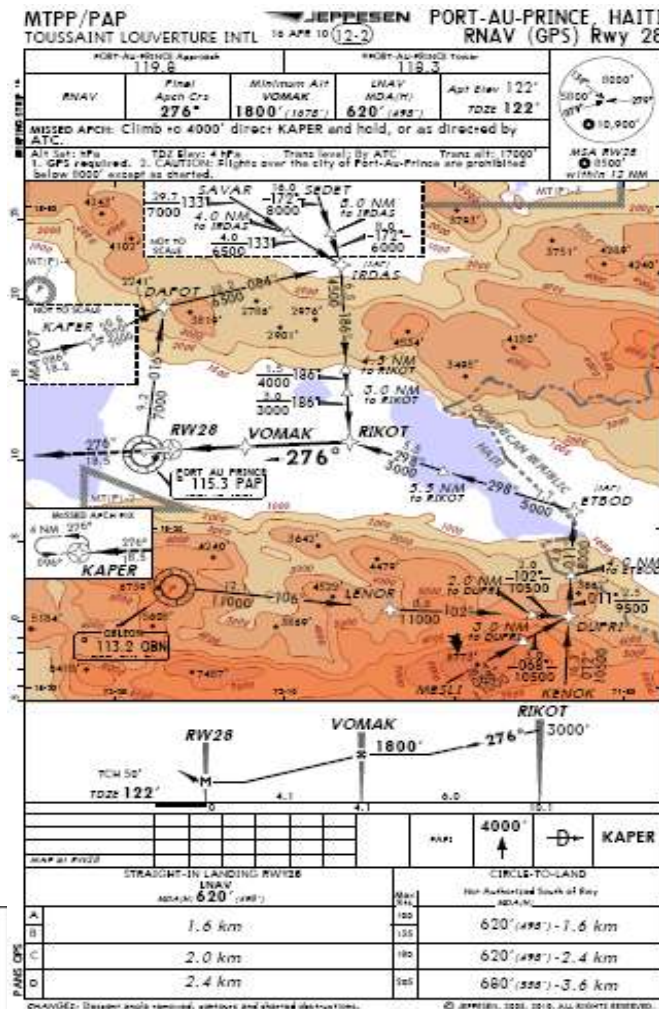
Contingency Procedure

- If the missed approach path is a RNAV procedure a contingency procedure should be defined to cover the loss of RNP APCH capability (note in the AMC 20-27)
- This contingency procedure will consist in following a dead reckoning path, allowing to reach a sufficient altitude.
- This procedure has to be simple and has to be formalized only for special case (montaneous area)



Experience 4 - OPS manual

Example of a « contingency procedure »



Approach RNAV (GNSS) Rwy 28

Missed approach following the loss of RNAV/GNSS function

Extraction procedure :

- climb to 4000 ft, turn to heading 276° .
- Contact ATC for instruction

Experience 5 - OPS specs

- Ops specs – Ramp test
 - RNP 5 vs RNAV 5
 - PRNAV vs RNAV 1
 - RNP 1 vs RNAV 1
- Formalization of French ops specs
 - RNAV 5,
 - RNAV 1 (PRNAV), RNAV 2, RNP 1 with or without RF leg
 - RNP APCH (LNAV and/or LNAV/VNAV and/or LPV)
 - RNP4, RNAV10 (RNP 10)



Questions

