

## **PBN – Performance Based Navigation – and the ATC Flight Plan**

**RNP AR approaches often provide more fuel-efficient approaches than ILS. An airline that holds the required RNP AR APCH approvals will get better use of these procedures if the ATC is aware of the navigation capability of each specific flight. The Air Traffic Controller gets information about the navigation capability of a flight via the ATC Flight Plan. If a Flight Plan contains T1 it means that ATC might offer an RNP AR APCH if the traffic situation allows, or the pilot can ask for an RNP AR APCH. The text below describes how correct flight planning for RNP AR APCH capable aircraft is done and how a pilot can request an RNP AR APCH procedure.**

Air Traffic Control receives information about an aircraft's PBN capabilities through the filed Flight Plan. It is therefore important that airspace users have filled out the flight plan correctly and according to the capability of the specific flight. A flight plan is not approved until it has officially been accepted by Eurocontrol's flight planning function, IFPS.

Below is a list with abbreviations from the PBN Manual (ICAO Doc 9613). Code T1 (RNP AR APCH with RF (special Authorization required)) is of particular interest for non-straight in and curved approaches. This capability is needed for all RNP AR APCH operation, published in the Swedish AIP.

A1	RNAV 10 (RNP 10)
B1	RNAV 5 all permitted sensors
B2	RNAV 5 GNSS
B3	RNAV 5 DME/DME
B4	RNAV 5 VOR/DME
B5	RNAV 5 INS or IRS
B6	RNAV 5 LORANC
C1	RNAV 2 all permitted sensors
C2	RNAV 2 GNSS
C3	RNAV 2 DME/DME
C4	RNAV 2 DME/DME/IRU
D1	RNAV 1 all permitted sensors
D2	RNAV 1 GNSS

- D3 RNAV 1 DME/DME
- D4 RNAV 1 DME/DME/IRU

#### RNP SPECIFICATIONS:

- L1 RNP 4
- O1 Basic RNP 1 all permitted sensors
- O2 Basic RNP 1 GNSS
- O3 Basic RNP 1 DME/DME
- O4 Basic RNP 1 DME/DME/IRU
- S1 RNP APCH
- S2 RNP APCH with BARO-VNAV
- T1 RNP AR APCH with RF (special Authorization Required)
- T2 RNP AR APCH without RF (special Authorization Required)

#### **T1**

The RNP AR APCH procedures published for Arlanda's RWY 01R and RWY 26 require that the current flight fulfils all requirements to perform an RNP AR APCH with RF (special authorization required) which is stated as T1 in field 18 of the ATC Flight Plan. This means that the aircraft can navigate with high accuracy using GPS and inertial systems during the final approach. "Special Authorization Required" means that a permit is required to fly this approach. It is sufficient that a general permit is issued by a Competent Authority (State of Operator/State of Registry) in order for a flight to be able to fly any RNP AR APCH in Sweden.

The following is stated in ICAO Doc 9613 Vol II. Part C, Ch. 6 mom 6.3.2.7.4:

*"Once approval is received from the State of Registry, operators should also be able to perform RNP AR APCH operations in other States."*

The following is stated in EASA SUBPART B: PERFORMANCE-BASED NAVIGATION (PBN) OPERATIONS:

"SPA.PBN.100 PBN operations

Regulation (EU) 2016/1199

(a) An approval is required for each of the following PBN specifications:

- (1) RNP AR APCH; and
  - (2) RNP 0.3 for helicopter operation.
- (b) An approval for RNP AR APCH operations shall allow operations on public instrument approach procedures which meet the applicable ICAO procedure design criteria.
- (c) A procedure-specific approval for RNP AR APCH or RNP 0.3 shall be required for private instrument approach procedures or any public instrument approach procedure that does not meet the applicable ICAO procedure design criteria, or where required by the Aeronautical Information Publication (AIP) or the competent authority.”

To fly RNP AR each airline **previously** had to apply for a separate permit from the Swedish Transport Agency for each individual approach procedure, proving that the airline in all parts meet the requirements required to fly the procedure in question. However, from 9<sup>th</sup> November 2017, airlines that operate under EASA regulations and that has a general RNP AR APCH approval from the national aviation authority in the State of Operator or in the State of Registry are allowed to fly all RNP AR APCH procedures published in the Swedish AIP.

Air Traffic Control needs to know if a flight has been approved to fly an RNP AR APCH to be able to give the correct instructions to the pilot.

### **Pilot requests to perform an RNP AR approach**

If a pilot requests a different approach procedure than ILS, such as an RNP AR APCH, that request is conveyed via radio to the current ATCO. Before the pilot receives a clearance, the current ATCO coordinates with “downstream” ATCOs such as the TMC (Terminal Control) and TWR (control tower) for acceptance with regard to the current and expected traffic situation.

### **ATC initiation to perform an RNP AR approach**

An initiation can also be made by air traffic control to the pilot if he or she is interested in performing an RNP AR APCH.

This happens after the responsible ATCO identifies a flight that is able to perform such an approach (via T1 in the aircraft’s Flight Plan). ATC then contacts the pilot to see if he or she is able and wants to perform an RNP AR APCH.

It is important to be aware that a flight commencing an RNP AR APCH is one among sometimes many other flights in the TMA at a given time and has no priority over these other flights. It can happen that ATC needs to cancel the intended RNP AR APCH to be flown to ensure that an overall safe and efficient flow of traffic in the TMA is maintained.