

## LPV Implementation at Air France: A Step Closer Towards Full PBN Operations

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Credits: Air France

Air France is one of the largest airlines in Europe, with an ever-increasing number of annual flights and city pairs possibilities. Over the years, the Operator has expanded its fleet to almost 200 aircraft, including new-generation units such as the A220 and A350. ESSP talked with Laurent Puzenat, CNS Project Manager (Flight Operations) at Air France, to discuss the LPV implementation status on their fleet, the future intended modifications and other specific topics of interest for aviation stakeholders.

In total, more than 200 aircraft comprise the current Air France fleet. These include 19 LPV-capable units: 6 A220s and 13 A350s, and they expect to receive 21 more by the end of the year. Although A220s come with LPV capability as a standard function, the operator is to specifically choose the A350s' LPV capability as an option. When pilots started flying the first LPV procedures, they confirmed that EGNOS approaches were highly stable, reliable and easy to operate, to the extent that this is the preferred type of approach, if available. Only minor modifications to the training syllabus to pilots were required to obtain the Operational Approval (OA) to fly LPV procedures, as these are designed to be similar to ILS approaches. All in all, pilots are taught the basics of SBAS, LPV, charts and how to read the indicators on the Primary Flight Display (PFD).

From an Airline perspective, getting the OA for the A350s and A220s was extremely easy, as the solution came fully integrated into the cockpit. Therefore, no particular effort had to be made towards documentation or certification. However, they foresee that this could change if a retrofit solution is implemented, as it may require further changes.

For the rest of the fleet: they are looking forward to implementing LPV on those aircraft that have or will have a solution available in the market. In this regard, they are eagerly awaiting a Supplemental Type Certificate (STC) or a Service Bulletin (SB) for the B777, the B787.

Regarding LPV capability in future aircraft, Air France has a clear policy: every new unit must have SBAS implemented so that LPV procedures can be performed. This motto came about after analysing the benefits of its implementation and understanding the specific constraints that affect Airlines. In fact, one of the major arguments that lead Air France to request LPV on every new aircraft order is the publication of the PBN IR regulation, as it lays out that Operators will use PBN as a standard means of navigation by 2030.

SBAS LPV installation allows better minima, provides safety benefits compared to LNAV/ VNAV barometric approaches and will benefit from SBAS future deployments, such as Africa. Air France believes SBAS LPV will be installed as a primary function on every new aircraft and not as an option.

Moreover, aircraft flying to the US must comply with the US mandate on ADS-B Out, which can be easily met if SBAS is implemented onboard. It is noteworthy that implementing an SBAS receiver enables the "SBAS NAV" capability, ensuring the transponder will broadcast a more accurate position solution. However, to perform LPV approaches, the Multi-Mode Receiver (MMR) would also have to be properly connected to a suitable Flight Management Computer (FMC) and have a Navigation Database (ND) to allow performing LPV approaches. Although these capabilities can be acquired in separated steps – first "SBAS NAV" and then "LPV" – it is more cost-efficient to implement both at once.

The future of Air France concerning EGNOS is promising. They are working towards a full-fleet implementation on their aircraft, and almost 40% of their destinations already have some EGNOS-based procedure published, allowing for reduced fuel and CO2 emissions. We will be following up on their implementation process!