ECA Position Paper

On the Exclusive Use of Performance-Based Navigation from 2030 (Regulation [EU] 2018/1048)

BACKGROUND

As the EU is moving towards mandatory exclusive use of PBN from 2030[1], significant safety issues as well as technical, operational, and regulatory challenges have emerged. ECA is strongly concerned that the aviation industry will not be prepared to make a safe and smooth transition to PBN as per the current PBN Implementing Regulation (PBN IR). ECA's position is that the PBN IR must be revised, and several measures must be taken to ensure flight safety, efficiency, and regularity.

WHAT ARE THE MAIN CHALLENGES?

- PBN IR Articles 5(1) and 7(2)(a) require exclusive use of PBN from 6 June 2030.[2] Normal use of conventional navigation procedures will be restricted from this date, in particular ILS CAT I (CAT II/III and contingencies exempted).

- GNSS and Space-Based Augmentation System (SBAS)[3] are key enablers for PBN. In Europe, SBAS services are provided by the European Geostationary Navigation Overlay Service (EGNOS).[4] ILS CAT I can only be conditionally substituted by RNP approach using Localiser Performance with Vertical Guidance (LPV)[5] CAT I or LPV-200[6], and less so by Approach Procedure with Vertical Guidance (APV) using LPV (APV-I)[7]. LPV provides geometric vertical guidance similar to an ILS glideslope. For this purpose, GNSS and SBAS / EGNOS must be available, aircraft must be certified for LPV, and LPV procedural design criteria must be fulfilled at all applicable runways.

    - European LPV fleet equipage is currently low and is highly unlikely to be sufficiently increased by 2030 for several reasons, and no LPV equipage mandate is planned.[8]

---

[1] PBN IR geographical scope
[2] Commission Implementing Regulation (EU) 2018/1048 – PBN IR
[3] SBAS Worldwide: Quick Facts
[4] EGNOS Safety-of-Life Service Definition Document (SoL SDD) / EGNOS Aviation Portal
[5] EUROCONTROL Factsheet RNP Approaches
[6] Currently not compliant with ICAO Annex 10 Vol. 1, ref. EGNOS SoL SDD
[7] APV-I system minimum is 250 ft. (Type A approach), ref. EGNOS SoL SDD
[8] EASA - Comment-Response Document (CRD) 2023-04 (A) - PBN specifications for oceanic operations

  - Some aerodromes will likely remain outside of SBAS / EGNOS coverage, and LPV design criteria are not achievable at all targeted runways.[9]
  - SBAS / EGNOS is vulnerable to regional or wide-area service degradation or outage due to space weather[10], especially around solar maximum. EGNOS NOTAM services appear inadequate at present.
  - Prospective EGNOS improvements (i.e., EGNOS v3.2 / Dual Frequency Multi-Constellation) and associated benefits must be treated as uncertain until further.[11]
  - Because of these issues and the PBN IR restriction, overall access to approach procedures with geometric vertical guidance down to CAT I minima will most likely be severely limited from 2030, causing a significant negative impact on flight safety and runway accessibility.

- APV using Baro-VNAV (barometric vertical navigation) is widely used today but cannot safely substitute approach procedures with geometric vertical navigation (ILS, LPV), as Baro-VNAV involves significant safety hazards. [12] [13] [14]
- Over-reliance on GNSS and escalation of disruptive GNSS Radio Frequency Interference (RFI) events in multiple European FIRs.[15]
  - Long-term regional GNSS disruptions due to jamming and spoofing must be expected, with potential for further escalation. This is a significant concern with regards to flight safety, efficiency, and regularity.[16] [17]
  - GNSS disruptions due to space weather.[18]
  - Decommissioning of conventional navigation aids (generally limited by PBN IR Article 6). Future developments in each Member State are presently uncertain.
  - Overall increased risk of GNSS becoming a single point of failure affecting multiple critical systems, negatively impacting flight safety, efficiency, and regularity.
  - Contingency measures are not sufficiently addressed by PBN IR Article 6 or applicable supporting materials.[19]

---

[9] EASA views on the implementation of EGNOS-based operations
[10] UN Office for Outer Space Affairs (UNOOSA) - IFALPA presentation – GNSS: Aviation Users' Views
[11] European Radio Navigation Plan 2023
[12] EASA SIB 2023-03 - Incorrect Barometric Altimeter Setting
[13] ICAO AN-Conf/14-WP/59 - Vulnerabilities of Baro-VNAV Approaches to Altimeter Setting Errors
[14] BEA Safety Investigation Report – 9H-EMU
[15] EASA SIB 2022-02R3 - GNSS Outage and Alterations Leading to CNS Degradation
[16] Joint industry position: IFALPA Position 25POS07 – Disruption of Satellite-Based Signals
[17] OPSGROUP: GPS Spoofing – Final Report
[18] EASA SIB 2012-09R1 - Effects of Space Weather on Aviation
[19] Acceptable Means of Compliance and Guidance Material to PBN IR

As of 2025, it is highly unlikely that most European operators and Air Navigation Service Providers will be sufficiently prepared to make a safe and smooth transition to exclusive use of PBN from 2030.

KEY MESSAGES AND PRINCIPLES

- The transition to PBN must not harm flight safety, efficiency, or regularity.
- An equivalent or higher level of flight safety compared to current standards can only be achieved with the best possible use of geometric vertical guidance such as ILS or RNP APCH to LPV minima.
- APV Baro-VNAV cannot safely substitute approach procedures with geometric vertical guidance. It must be recognised that Baro-VNAV introduces significant and frequently avoidable safety hazards.
- Robust and resilient Positioning, Navigation and Timing (PNT) is essential. GNSS must not become a single point of failure as a primary PNT source. A robust conventional Communications, Navigation and Surveillance (CNS) Minimum Operational Network (MON) must be retained and improved, as per PBN IR Article 6.

CONCRETELY, THE PILOTS' COMMUNITY REQUESTS THAT:

- a transition to exclusive use of PBN is not made until the industry is fully ready for a safe and smooth transition, with no negative impact on safety or operational efficiency. Until such time,
    - normal use of ILS CAT I must be permitted (permanently if required). Existing ILS CAT I installations must not be decommissioned until substitute PBN procedures are proven to be at least equivalent to ILS CAT I in terms of safety and system performance.
    - SBAS / EGNOS performance must be improved to comply with ICAO Annex 10 Vol. 1 standards and to provide compliant LPV CAT I or LPV-200 service at all applicable runways.
    - operators must achieve sufficient LPV capability (an LPV mandate for operators should be considered).
- safety hazards introduced by Baro-VNAV are assessed and mitigated. With regards to barometric altimeter setting errors, standardised and reliable onboard safety systems and procedures, and ATM systems such as Approach Path Monitoring and Barometric Pressure Setting Advisory Tools, should be considered.
- PBN training remains mandatory, recurrent, and includes contingency scenarios.
- mandatory national PBN transition plans are actively overseen by EASA and harmonised to the largest possible extent, with EUROCONTROL support, to avoid large discrepancies. CNS MON and contingency plans should be included.
- all applicable regulatory conflicts are resolved, in particular between the PBN IR and Air OPS[20] concerning flight planning and alternate selection.

[20] (EU) 965/2012

- each Member State retains and improves a robust CNS MON able to support traffic in a non-GNSS environment, as per PBN IR Article 6.
    - Member States must exercise due diligence in shaping a future CNS MON, including decommissioning of conventional navigation aids. Stakeholders must be consulted to ensure a complete and shared understanding of current and future needs. Deployment of additional navigation aids, such as ILS and DME/DME, should be considered where appropriate. Sufficient availability of aerodromes with conventional procedures must be assured, considering all potential consequences for flight planning and execution if, e.g., conventionally equipped alternate aerodromes are situated far away from GNSS-only destinations (potential impact includes more fuel and weight, reduced aircraft performance, fewer options during emergencies that require landing ASAP, increased emissions, reduced payload).
    - all safety-critical ground-based systems normally using GNSS time must be protected with alternative time provision to function in a non-GNSS environment.
    - PBN IR Article 6, AMC/GM, and other applicable regulations/materials should be improved to provide more specific requirements and guidance for the development of CNS MON, coordinated contingency frameworks, etc.
- aircraft systems such as GNSS receivers are made more resilient to RFI. This also applies to all onboard systems using GNSS data, such as Terrain Awareness and Warning System (TAWS) and Controller-Pilot Data Link Communications (CPDLC) and could include provisions for alternative PNT.
- SBAS / EGNOS and GNSS are made more resilient to space weather effects, the EGNOS NOTAM service is improved, and the distribution of space weather advisory NOTAM is improved.

* * *

02/10/2025

European Cockpit Association AISBL
Rue d'Arlon, 1000 Brussels, Belgium I **T** +32 2 705 32 93 I eca@eurocockpit.eu I www.eurocockpit.eu

RESOURCES

Regulations

Commission Implementing Regulation (EU) 2018/1048 - PBN IR

PBN IR geographical scope

Acceptable Means of Compliance and Guidance Material to PBN IR

Commission Implementing Regulation (EU) 965/2012 – Air OPS

SBAS

SBAS Worldwide: Quick Facts

EGNOS Safety-of-Life Service Definition Document

EGNOS Aviation Portal

EASA - Comment-Response Document (CRD) 2023-04 (A) - PBN specifications for oceanic operations

EASA views on the implementation of EGNOS-based operations

European Radio Navigation Plan 2023

Space weather

UN Office for Outer Space Affairs (UNOOSA) - IFALPA presentation – GNSS: Aviation Users' Views

EASA SIB 2012-09R1 - Effects of Space Weather on Aviation

Baro-VNAVEASA SIB 2023-03 - Incorrect Barometric Altimeter Setting

ICAO Working Paper - 14th Air Navigation Conference - Vulnerabilities of Baro-VNAV Approaches to Altimeter Setting Errors

EUROCONTROL: Safety of Vertical Navigation on Final Approach Workshop - ECA presentation

BEA Safety Investigation Report – 9H-EMU

GNSS RFI

EASA SIB 2022-02R3 - GNSS Outage and Alterations Leading to Communications / Navigation / Surveillance Degradation

IFALPA Position 25POS07 - Disruption of Satellite-Based Signals

IFALPA Briefing Leaflet 23ADOBL01 - Effects of Manipulated GNSS Signals on Aircraft and Mitigation Measures

OPSGROUP: GPS Spoofing – Final Report

PBN/GNSS contingencies/reversion

European GNSS Contingency/Reversion Handbook for PBN Operations

ICAO AN-Conf/14-WP/61 - Planning for GNSS Contingencies

Refer to national PBN Transition Plans for details on decommissioning of conventional navigation aids and frameworks for CNS MON / contingencies in respective Member States.

General

ICAO - PBN concept and implementation overview

EUROCONTROL: RNP Approaches Factsheet