ASO Alerta de Segurança Operacional

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The ASO contains important information on safety and may contain recommendations for actions to be taken by operators. However, even if a recommendation is published in an ASO, an alternative action may be as or more efficient for the specific case of each operator and its particularities. The content of this document is for guidance purposes only, has no legal force and effect, and is not intended to bind the public.

GNSS Signal Interference and Spoofing

This ASO provides warning information to the civil aviation community about interference and spoofing of the Global Navigation Satellite System (GNSS) signal.

History

A concerning increase in the number of cases of interference and spoofing (jamming and spoofing) directed at the global navigation satellite system (GNSS) has recently been observed in various regions of the world. GNSS is one of the main enablers of Performance-Based Navigation (PBN) and provides navigation guidance in various phases of flight, such as in cruise flight and precision approach. By providing accurate position and time information, GNSS enables several systems critical to flight safety.

Since 2003, the International Civil Aviation Organization (ICAO) has been actively developing recommendations and guidance regarding radio frequency interference to GNSS. To foster discussions on managing GNSS vulnerabilities and possible mitigation measures against interference, ICAO held the ICAO EUR/MID Radion Navigation Symposium from February 6 to 8, 2024, in Antalya, Turkey. This symposium resulted in some recommendations, described in this document.

Recommendations made by ANAC

- **Aircraft Operators:**
  - Develop procedures to guide crews to notify air traffic control whenever they become aware of GNSS interference events, as well as procedures to inform the respective aircraft and avionic equipment manufacturers (OEMs);
  - Develop procedures to notify ANAC, through the Single Notification Portal (*Portal Único de Notificações*), of any anomaly in the GNSS signal. This notification must contain, at a minimum, the following information:
    - Date
    - Aircraft Model
    - Phase of Flight
    - Location where the anomaly occurred
    - Transient or permanent anomaly

  - Develop procedures and training based on guidance received from aircraft and avionic equipment manufacturers, the Civil Aviation Authority of the aircraft's State of Design, and ANAC.
  - Give additional emphasis for crews to closely monitor the performance of aircraft equipment, promptly informing air traffic control of any apparent GNSS degradation, and to be prepared to operate without GNSS navigation systems.
- **Manufacturers (OEMs):**
  - Improve their equipment and provide additional guidance and information on the effects and mitigation measures of GNSS anomalies (including interference, jamming, and spoofing), from the perspective of the aircraft's equipment.
  - Ensure that aircraft equipment recovers quickly and resumes GNSS navigation once the anomaly has ceased.

It is also recommended to carefully read the following documents:

- Special Airworthiness Bulletin (BEA) 2024-02 issued by ANAC, dated May 24, 2024 (in portuguese):
  https://www.gov.br/anac/pt-br/assuntos/regulados/aeronaves/arquivos/BEA202402GNSS.pdf

- FAA Safety Alert for Operators Nº 24002, de 25/jan/2024
  https://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo/all_safos/SAFO24002.pdf

- EASA Safety Information Bulletin Nº 2022-02R3, de 05/jul/2024
  https://ad.easa.europa.eu/ad/2022-02R3

References

- ICAO EUR/MID Radion Navigation Symposium;
- FAA Safety Alert for Operators Nº 24002, de 25/jan/2024;
- EASA Safety Information Bulletin Nº 2022-02R3, de 05/jul/2024.