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Agenda Item: B.4.1/C.5.1* **INFORMATION PAPER** WP No: 92 IFATCA'26

Report on IFATCA Activity Regarding GNSS RFI

Presented by TOC and PLC

SUMMARY

During the presentation of the Global Navigation Satellite System (GNSS) Spoofing and Jamming Working Paper at the 2025 Conference in UAE, questions were raised if there were standard, global, working methods and/or phraseologies for a Ground Proximity Warning System (GPWS).

1. INTRODUCTION

1.1. GNSS spoofing, which is also known as radio frequency interference (RFI), refers to disruptions to GNSS signals (like GPS), which can be caused by other radio signals in the same frequency range. These signals can be either unintentional, like from nearby radio devices (like USB 3.0 devices, faulty equipment, or even a cable television plant that accidentally emits on an aircraft emergency frequency) or intentional, like from jammers or spoofers. RFI can significantly degrade or completely block a GNSS receiver's ability to determine position, time, and navigation information. This can be broken down into 2 categories, jamming and spoofing.

1.1.1. Jamming is an intentional RFI with GNSS signals. This prevents receivers from locking onto satellite signals and has the main effect of rendering the GNSS ineffective or degraded for users in the jammed area. (SKYbrary Aviation Safety, 2026)

1.1.2. Spoofing involves broadcasting counterfeit satellite signals to deceive GNSS receivers, causing them to compute incorrect position, navigation, and timing data. (SKYbrary Aviation Safety, 2026)

1.2. These issues are commonly experienced in (but are not limited to), the geographical areas surrounding current conflict zones, e.g. the Black Sea and the Middle East. GNSS RFI is localized and unpredictable, leaving pilot reports as the primary detection method. (GPSwise, 2026)

1.3. Indications of possible GNSS RFI include:

- Onboard system indications (e.g. GNSS degradation messages, gross discrepancies between the aircraft's shown and expected position, suspicious time indications, etc.)
- Trajectory deviations or unexpected turns; either by the crew or on the controller's situation display.
  (WIKIFATCA, 2025)

1.4. Currently, specific phraseology supported by ICAO for reporting GNSS RFI does exist in ICAO Pans 4444 12.3.1.14 & 12.3.1.15. But after discussing GNSS RFI with ATCO's who work this situation and crews that fly through these areas, it seems that it doesn't provide the clarification or precision that the aviation and ATC community desires. There appears to be a gap between the regulatory text and the operational reality of what is happening and understood by both parties. This raises questions such as:

- Is the information readily available and known in ATC/pilot manuals?
- Is the current training adequate for both ATC and the pilot communities?
- Do both sides of the microphone understand the needs of the flying community with clarity?

(ICAO Doc 4444, 2016)

2. DISCUSSION

2.1. IFATCA Technical and Professional Manual (TPM), Automation and ATM Systems (AAS) advises per 1.25 GNSS RFI IFATCA Provisional Policy: **"Globally harmonised phraseology shall be developed to report both GNSS RFI and false EGPWS alerts."** (WIKIFATCA, 2025)

2.2. At the International Civil Aviation Organization (ICAO) 42nd Session in July of 2025, a working paper was presented (A42-WP/34 TE/8). It discussed the following:
a) recognize ongoing technical efforts made to mitigate negative impacts related to GNSS RFI;
b) urge States, international organizations, donors and relevant stakeholders to support ICAO's efforts in addressing GNSS RFI, including providing voluntary contributions toward the validation and deployment of an implementation package (iPack) for the mitigation of GNSS RFI;
c) urge States to report GNSS RFI occurrences which cannot be resolved through routine national or international procedures to their accredited ICAO Regional Office, in addition to following the procedures outlined in the ITU Radio Regulations; and
d) adopt the proposed revision to Assembly Resolution A41-8 which reads: "*Consolidated statement of continuing ICAO policies and practices related to a global air traffic management (ATM) system and communications, navigation, and surveillance/air traffic management (CNS/ATM) systems"*

(ICAO Assembly — 42nd Session Global Navigation Satellite Systems (GNSS) Radio Frequency Interference (RFI), 2025)

2.3. Phillipe Domogala (IFATCA EUR support team) contributed to a WP and Frank Sasse (IFATCA representative, Germany) attended the APDSG (ATM Procedures Development Sub-Group of Eurocontrol) that met in November 2025. The group discussed numerous items including a GNSS RFI Action Plan Task Force that consists of the European Union Aviation Safety Agency (EASA) Eurocontrol, International Air Transport Association (IATA) and ICAO. The goal is to help develop future phraseology for PANS ATM 4444, pertaining to GNSS RFI and eGPWS specifically. Eurocontrol announced that they have developed GRIT (GNSS Radio Frequency Interface Tool) that will be activated in the first quarter of 2026. It detects previous interference, like many other online tools. They are also working on a tool called SHERLOCK, which will be a real time monitoring system. This will hopefully be available in 2027. During this meeting, Spain noted that they had discovered during an eGPWS that the false pull up alerts happen also with jamming, if the aircraft is very close to the source. Previously, it was understood that it only occurred during spoofing.

2.4. Marc Baumgartner (IFATCA EUR support team) has taken the lead on preparing a joint position paper on safety implications of GNSS interferences in Europe. This paper was requested by Single European Sky ATM Research (SESAR), who is seeking information and possible resolutions for GNSS RFI and eGPWS events. Items that are being proposed and discussed are: training for GNSS interference for flight crews, reporting of performance degradation and alerting ATCOs to this situation, recommend new phraseology, the importance of continuing the use of conventional NAVAIDS (ILS, VOR, DME, etc.), along with the need to include recurrent training for ATCOs for scenarios that include GNSS interferences.

2.5. Kimmo Koivula (IFATCA representative to IFALPA Air Traffic Services Committee) and Philippe Domogala (IFATCA EUR support team) met with IFALPA in November 2025, to discuss GNSS interference and the need to ensure that pilots and ATCOs are involved with the evolution of procedures and the technologies that are involved to ensure safety.

2.6. IFATCA continues to work with many groups (such as IFALPA, ICAO, SESAR, EASA, IATA, etc) that are in the midst of discussing concepts, plans and proposals for calendar years 2026 and 2027.

3. CONCLUSION

3.1. Currently, there are many groups that are researching and meeting regularly to discuss how to improve procedures and phraseology, reference GNSS RFI and eGPWS. Since IFATCA has members participating in these different forums and that IFATCA supports a harmonized stance throughout the world, it would be remiss to suggest or make policy at this time. It is the recommendation of this paper to allow the research to continue and to see what develops from the experts, over the next year. Only after an intense research and discussion period will an accurate recommendation have the opportunity to be brought forward.

4. RECOMMENDATIONS

4.1. It is recommended that this working paper is accepted as information material.

5. REFERENCES

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