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GPS and ADS-B Intentional Interference

Issue Overview

Intentional GPS and ADS-B interference in the National Airspace System (NAS) is increasing in terms of number of events and unique locations impacted. These exercises, primarily conducted by the Department of Defense (DoD), have a significant impact on General Aviation given the large size of the impacted area and the vagueness of the published description. In most cases, pilots are unclear on these interference events and their impact. The lack of detailed information can hinder adequate preflight planning and result in the unnecessary cancellation of flights. These incidents are receiving greater attention and raising questions as to how the NAS can transition to primarily satellite-based technology if this technology will be routinely disrupted.

The issues impacting General Aviation include:

- GPS and ADS-B interference NOTAMs describe geographic areas that are the size of multiple states and do not indicate likelihood of impact;
- GPS interference flight advisories, which have the benefit of a graphic, are not provided with the applicable NOTAM or on a normal preflight website that a pilot would visit;
- The flight advisory does not explain how the impact was calculated which can lead to pilots unnecessarily cancelling flights and a resulting negative economic impact;
- The mitigations for interference events, such as “stop buzzer,” minimum weather requirements, etc., are not published for pilots to be aware of.

The impact of purposeful degradation or denial of satellite signals must be better understood from the air traffic and pilot perspective so that effective mitigations can be put in place.

General Aviation Pilot Concerns

General Aviation pilots have expressed concern for the impact GPS interference events have on their ability to operate. AOPA collaborated with Thales, the Experimental Aircraft Association, and the National Air Traffic Controllers Association to conduct a survey of Oshkosh 2016 attendees (138 survey participants) regarding their concerns for GPS interference. Of those pilots surveyed:

- 35% indicated they had experienced a GPS outage or unavailability in flight;
- 64% said they were concerned about the impact of intentional interference of GPS;
- 76% expressed concern for the decommissioning of VORs as part of the MON.

In 2015, AOPA partnered with the Canadian Owners and Pilots Association (COPA) to survey members regarding the impact of GPS interference. COPA and AOPA pilots (425 survey participants) responded indicating:

- 22% had experienced a complete loss or partial loss of RNAV capability while utilizing an IFR-certified GPS;
- 37% of those pilots impacted reported increased workload because of the loss of capability and 21% said it was a safety concern;
- 62% of surveyed pilots stated they check GPS NOTAMs before flight;
- 49% thought the NOTAMs were ineffective at alerting them to an outage. Per the USAF: “anecdotal evidence exists that pilots/controllers don’t trust the NOTAMs because many aircraft within footprint do not experience interference.”

As the FAA implements the VOR Minimum Operating Network (MON) and begins decommissioning over 300 VORs, there will be increasing reliance on satellite-based systems as the sole method for efficient navigation and accessing airports. The VOR MON considers areas prone to GPS outages to be primarily the Western US; however, there are frequently large-scale interference events on the East Coast and in the Southern US. The VOR MON is to be primarily unnecessary for continuity of operations, but the increasing likelihood of interference events could impact the ability for aviation to effectively operate otherwise. Greater information is needed for pilots to be able to flight plan through or around GPS interference areas effectively.

Recommendations

The DoD’s GPS testing is critical to meeting national security requirements; however, improvements to the process are needed to accommodate civil aircraft operations safely and efficiently. The FAA’s timeline for realization of ADS-B and GPS benefits could be threatened if a comprehensive approach to this issue is not taken, particularly when it comes to the issues of real-time awareness and full understanding of impact. AOPA recommends the following actions be taken:

- Conduct a comprehensive evaluation of interference events that have impact on the NAS;
- Establish effective tracking and metrics for the evaluation of interference events that have impact on air traffic;
- Evaluate air traffic control procedures established for alerting pilots of interference events;
- Establish a standard minimum weather requirement for GPS-only airfields within interference areas and advertise that criteria so pilots can effectively flight plan;
- Assess the effectiveness of the notification process for pilots;
- Publish guidance materials to increase pilots’ understanding and awareness of mitigations such as “stop buzzer” and weather criteria;
- Define the flight advisory impact contours based on likelihood of interference that industry helps determine is appropriate.

The FAA should formally task RTCA’s Tactical Operations Committee to develop recommendations related to the issues detailed above so that a unified solution can be implemented.