

GPS Interference

MEETING 24-01

Christina Clausnitzer, FAA/AFS-410, presented a [briefing](#) on the Global Positioning System/Global Navigation Satellite System (GPS/GNSS) signal interference, otherwise known as “Jamming” or “Spoofing”. Christina explained that these systems are vulnerable because the signals are very weak and easily overpowered. The signal is also not authenticated or encrypted so it is easy to deceive, and most devices blindly trust the signals that are received. There are many systems that are dependent on a valid GPS/GNSS signal. This includes communication, surveillance, safety, automation, and aircraft-specific functions. Also, support equipment and infrastructure are dependent on a valid signal.

Christina then explained jamming and spoofing. Jamming blocks the ability to acquire and track the signals. Spoofing mimics the GPS signal and can give the pilot false information. Pilots are trained to trust their instruments and follow standard operating procedures. Christina then played an audio example of a false alert. Hearing this disruption while flying can affect situational awareness and judgment. A pilot must now use their judgment to determine how to respond to the erroneous alarm. [Slide 8](#) shows how the rate of GNSS jamming and spoofing activity has sharply increased.

[Slide 9](#) demonstrates where and during which phase of flight a GNSS signal loss has occurred. More work is needed to determine how this risk can be mitigated. [Slide 9](#) shows where the hotspots are for these events in the Middle East particularly Beirut. They believe the spoofers and jammers are targeting primarily unmanned aircraft systems. Responses vary due to varying aircraft systems and locations. In the United States, we have had two major incidents. The first was in Denver and it affected trains, planes, and automobiles. The second was a bigger event in October 2022 in the Dallas-Fort Worth area.

[Slide 8](#) lists the short-term actions that the FAA has taken thus far. Christina emphasized three takeaways for the ACM audience: (1) Notice to Air Missions (NOTAM) language will be enriched for when GPS disruptions occur, (2) the FAA will be reviewing GPS resiliency programs, and (3) the FAA will be reviewing everything that says “GPS Required” to ensure GPS is truly required. She emphasized the importance of reporting these events when they happen.

John Collins, Boeing/Foreflight, asked if there are any thoughts on reintroducing Long-Range Navigation (LORAN) as a backup for general aviation. Christina said that has been discussed, however, it looks like distance measuring equipment (DME) navigation is one of the best solutions for a backup. John said that doesn’t work for most general aviation aircraft.

JJ Biel-Goebel, Wisk Aero, asked what the turnaround time is from air traffic control (ATC) being alerted to an issue to a NOTAM being published. Christina said the NOTAM process has not been worked out yet. She said that it would take some time though because the event must first be verified and often by that time, the event is over. That is why they are looking into other means of communicating this information to pilots. JJ then asked if they have considered using Pilot Weather Reports (PIREPS) for reporting these events. Christina said that, for now, alerting ATC is the best way to report an event. JJ then asked how he could stay informed on this topic. Christina explained that the GPS Disruption Action Team is working to get information out to the public via FAA media networks.

Doug Wiley, ALPA ASO, pointed out that some applications have become available to help pilots identify GPS anomalies. He also said there are groups out there researching ways to collaborate and communicate areas of GPS anomalies.