



UNITED STATES COAST GUARD
U.S. Department of Homeland Security

MARINE SAFETY ALERT
Inspections and Compliance Directorate

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Safety Alert 01-16

Global Navigation Satellite Systems – Trust, But Verify
Report Disruptions Immediately

Do you know what equipment relies upon the U.S. Global Positioning System (GPS) signal? How would you respond if you lost the signal? This past summer, multiple outbound vessels from a non-U.S. port suddenly lost GPS signal reception. The net effect was various alarms and a loss of GPS input to the ship's surface search radar, gyro units and Electronic Chart Display & Information System (ECDIS), resulting in no GPS data for position fixing, radar over ground speed inputs, gyro speed input and loss of collision avoidance capabilities on the radar display. Fortunately, the vessels were able to safely continue their voyage using radar in heads up display, magnetic compass and terrestrial navigation. Approximately 6nm later, the vessels' GPS units resumed operation. Although the vessels had back-up systems to allow a safe transit, the consequences could have been severe. These types of events highlight the potential detrimental impact to navigation caused by GPS interference or jamming and the importance in understanding how your vessel's or facility's equipment could be impacted by a loss of GPS signal.

Whether walking through the city, driving across town or navigating the world, Global Navigation Satellite Systems (GNSS) have become an integral part of everyday life. However, at times, the positioning signals may be impacted by interference from both natural and human-made sources. The most common types of interference are reception issues, usually due to bad installations, poor antenna positioning or faulty equipment. Jamming devices (<https://transition.fcc.gov/eb/jammerenforcement/fccdhsj.pdf>), while illegal in the U.S. and a threat to safety, have been used for nefarious or deceptive purposes. Interference can also be unintentionally caused when operating GNSS in close proximity to other radiating devices, such as amplified TV antennas (see our Safety Alert 11-02). Therefore, it is important to remember to use all available means for navigation and maintain proficiency so you can still navigate should your primary GPS fail.

Indicators of positioning systems interference include an intermittent signal, no signal, or an incorrect signal. Suspected or suspicious disruptions should be reported immediately. Critical information to take note of during a disruption event includes location, time, and period of outage.

Commercial operators are reminded, should your navigation or other equipment onboard (e.g. AIS) be impaired as a result of a disruption or interference, this should be reported to the nearest U.S. Coast Guard Captain of the Port, District Commander or Vessel Traffic Center as soon as possible; and, await further directions (per 33 CFR 164.53).

All operators should be aware, vigilant, and immediately report GPS disruptions to the U.S. Coast Guard Navigation Center (NAVCEN). The report will be disseminated to the U.S. Air Force GPS Operations Center and the Federal Aviation Administration in an attempt to identify the problem and correlate with any other GPS incidents in the same general geographic location. Depending on the severity of the report, NAVCEN may refer it to law enforcement and/or other federal agencies for further investigation.

Reporting a disruption - or other navigation hazards or aids to navigation outages - is simple, and can be done electronically (<http://www.navcen.uscg.gov> - the preferred method) or phone call to the NAVCEN (703-313-5900), 24 hours a day.

This Safety Alert is provided for informational purposes only and does not relieve any domestic or international safety, operational or material requirement. Questions should be forwarded to the Coast Guard Navigation Center at 703-313-5900 or via email using the NAVCEN website, <http://www.navcen.uscg.gov>.