Flight Safety Notification
General

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Global Navigation Satellite System (GNSS) interference

Reason for Revision

N/A

Purpose

This Safety Notification is issued for awareness to risks, introduced through Global Navigation Satellite System (GNSS) signal interference, to the civil aviation industry.

References

State Letter E 3/5-24/54
ICAO Doc 9849 Global Navigation Satellite System (GNSS) Manual

Applicability

All aircraft operators, Air Traffic Management/Air Navigation Service Providers (ATM/ANS providers).

Effectivity

This Flight Safety Notification is effective immediately.

Description

Radio Frequency Interference, in context with Global Navigation Satellite System (GNSS), may present in the forms of jamming and/or spoofing.

Important to note, the phenomena is most present in Flight Information Regions (FIR's) associated with conflict zones but is possible in other FIR's not considered conflict zones.

"Jamming is an intentional radio frequency interference (RFI) with GNSS signals" which prevents receivers from locking onto satellites signals, resulting in the GNSS system becoming ineffective or degraded.

Spoofing is the broadcasting of fake satellite signals to deceive GNSS receivers, with the result being inaccurate position, navigation, and timing (PNT) data.

Jamming is typically more noticeable by the flight crew, through the failure of systems to receive GNSS signals. Conversely, spoofing is more difficult to identify by the flight crew, thus posing an increased safety risk.

The following are examples of symptoms that may be experienced with a degradation of GNSS signal:

- Temporary or non-recoverable failure or degradation of PNT information provided by GNSS, possibly resulting in:
  - Loss of or misleading Terrain Avoidance and Warning System (TAWS), example; spurious PULL UP alerts triggered by predictive TAWS during various phases of flight
  - Loss of Airborne Collision Avoidance System (ACAS)
  - Loss of or misleading surveillance function, example; corrupted Automatic Dependent Surveillance-Broadcast (ADS-B)
- Inability to maintain GNSS based Area Navigation (RNAV) and/or Required Navigation Performance (RNP)

Recommendations

All Air Operators in the Kingston FIR should:

a) ensure that flight crews promptly report to air traffic control any observed interruption, degradation or anomalous performance of GPS
b) assess operational risks and limitations linked to the loss of on-board GPS signal. Consideration being given to reinforcement of standard procedures for loss of navigation signal or unreliable navigation signal, development of an alternate navigation procedure or routes to bypass heavily affected areas, provision of specific training or awareness programs for flight crews operating within the affected FIR
c) ensure that operational limitations introduced by the dispatch of aircraft with inoperative radio navigation systems in accordance with the Minimum Equipment List, are considered before operating an aircraft in the affected areas
d) ensure that flight crews and relevant flight operation personnel:
   i. are aware of possible GPS signal interference and/or spoofing

ii. verify the aircraft position by means of conventional navigation aids when flights are operated in proximity to the affected areas
iii. check that the navigation aids critical to the operation for the intended route and approach are available
iv. use alternate navigation systems when flying in or near the affected areas
v. maintain increased situational awareness by cross-referencing of navigation sources and increasing communication with ATC when transiting affected areas

(e) ensure, in the flight planning and execution phase, the availability of alternative conventional arrival and approach procedures (i.e. an aerodrome in the affected area with only GNSS approach procedure should not be considered as destination or alternate)
f) report to the Jamaica Civil Aviation Authority (JCAA), any anomalies or disruptions experienced in their navigation systems while transiting the FIR

Air Navigation Service Providers in the Kingston FIR should:

g) ensure contingency procedures are established between Air Traffic Management/Air Navigation Service Providers (ATM/ANS) and airspace users, for use of existing non-GNSS based navigation infrastructure, particularly Instrument Landing Systems (ILS), Distance Measuring Equipment (DME) stations and Very High Frequency Omnidirectional Range (VOR) stations are made available and kept operational as required
h) ensure issuance of Notice To Airmen (NOTAM), providing a description of the affected areas and related limitations, where multiple reports have been received
i) collect / record information on GNSS degradations and share with / report to the Jamaica Civil Aviation Authority (JCAA) and Spectrum Management Authority (being the national regulatory authority for telecommunications)
j) obtain / provide navigation assistance using radar vectoring as needed
k) ensure that GNSS jamming or spoofing topic is included in the ATCO training, highlighting the identified operational scenarios to recognise and react in a timely manner to different jamming and spoofing cases

The Jamaica Civil Aviation Authority (JCAA) will disseminate additional information as necessary.

Approved by: _____ Date: 25th April 2025

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