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SAFETY NOTICE No. 02/2023 Issue 01

GLOBAL NAVIGATION SATELLITE SYSTEM DISTURBANCE

GNSS DISTURBANCES INCREASE

GNSS disturbances were noted in Safety Notice 01/2023. Review of wider sources now shows that there has been a general increase in jamming and or possible spoofing of Global Navigation Satellite Systems (GNSS) since February 2022 and this has intensified in recent months. This issue particularly affects the geographical areas surrounding conflict zones. It is present in other locations, mainly the eastern Mediterranean, Baltic Sea and Arctic area, but is also reported outside of these areas.

The most affected flight information regions (FIR) appear to be:

(a) The Black Sea area:

- FIR Istanbul LTBB, FIR Ankara LTAA
- Eastern part of FIR Bucuresti LRBB, FIR Sofia LBSR
- FIR Tbilisi UGGG, FIR Yerevan UDDD, FIR Baku UBBA

(b) The south-eastern Mediterranean area, Middle East:

- FIR Nicosia LCCC, FIR Beirut OLBB, FIR Damascus OSTT, FIR Tel Aviv LLLL, FIR Amman OJAC,
- North-eastern part of FIR Cairo HECC
- Northern part of FIR Baghdad ORBB, north-western part of FIR Tehran OIIX
- Northern part of FIR Tripoli HLLL

(c) The Baltic Sea area (FIRs surrounding FIR Kaliningrad UMKK):

- Western part of FIR Vilnius EYVL, north-eastern part of FIR Warszawa EPWW, southwestern part of FIR Riga EVRR

(d) Arctic area:

- Northern part of FIR Helsinki EFIN, northern part of FIR Polaris ENOR

THE EFFECTS OF GNSS DISTURBANCES

The effects of GNSS disturbances (which may involve jamming and/or possible spoofing) were observed by crews in various phases of flight, in some cases leading to re-routing or diversions, due to the inability to perform a safe landing. It is not possible to predict GNSS interference or its effects. The extent of the issues generated by these disturbances would depend upon the area concerned, the duration, and the phase of flight. The following list provides some examples of issues that a degradation of GNSS signal could generate:

- Inability to use GNSS for waypoint navigation;
- Loss of area navigation (RNAV) approach capability;
- Inability to conduct or maintain Required Navigation Performance (RNP) operations, including RNP and RNP Authorization Required (RNP AR) approaches;
- Triggering of ground proximity warning system's terrain warnings, possibly with "PULL UP" commands;
- Inconsistent aircraft position on the navigation display;
- Loss of Automatic Dependent Surveillance-Broadcast (ADS-B), wind shear, terrain and surface functionalities;
- Failure or degradation of ATM/ANS/CNS and aircraft systems which use GNSS as a time reference;
- Potential airspace infringements and/or route deviations.

RECOMMENDED ACTIONS

Air operators, including helicopter operators, should:

- Ensure that flight crews promptly report (use special air-report (AIREP)) to air traffic control any observed interruption, degradation or anomalous performance of GNSS equipment or related avionics;
- Assess operational risks and limitations linked to the loss of on-board GNSS capability, including any on-board systems requiring inputs from a reliable GNSS signal;
- 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;
- Ensure that flight crews and relevant flight operation personnel:
  - are aware of possible GNSS disruption including potential jamming and/or possible spoofing;
  - verify the aircraft position by means of conventional navigation aids when flights are operated in proximity to the affected areas;
  - check that the navigation aids critical to the operation for the intended route and approach are available; and

- remain prepared to revert to a conventional arrival procedure where appropriate and inform air traffic controllers in such a case;

- 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).

CONCLUSIONS

In order to allow for the safe and continuous availability of flight services, please remain vigilant and well prepared for possible disruptions until the situation improves. This is best achieved by ensuring that crews are fully informed of the issue and have the opportunity and resources required to prepare for contingency in the case of possible GNSS disturbances.

Best Regards

Eng. Marco Conti

Director General

7th April 2023

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