Technical Circular

No.: 012/2026 Date: 09th June 2026

Subject: Guidance on Risks Associated with GNSS Spoofing and GNSS Jamming

1. This Technical Circular is issued to raise awareness regarding the increasing occurrence of interference with Global Navigation Satellite Systems (GNSS) and to provide guidance on measures to mitigate the associated navigational risks.

2. **Background:**
   - The maritime industry is heavily dependent on Global Navigation Satellite Systems (GNSS), such as the Global Positioning System (GPS), GLONASS, NavIC (IRNSS), BeiDou, and Galileo, for position fixing and timing information.

   - Recent geopolitical developments have resulted in an increase in reported incidents involving intentional interference with GNSS signals. Such interference may adversely affect the accuracy and reliability of satellite-based navigation systems and consequently compromise the safety of navigation.

3. **GNSS Interference:**
   GNSS interference generally occurs in the form of spoofing or jamming.

   GNSS Spoofing:
   GNSS Spoofing is the act of deceiving a GNSS receiver into reporting an incorrect position by transmitting counterfeit signals that override legitimate satellite data. As a result, ships relying on satellite navigation may appear at incorrect locations on the ECDIS or on navigational charts when positions are plotted.

   GNSS Jamming:
   GNSS jamming involves the transmission of radio signals on the same frequency bands used by GNSS satellites. These signals overpower legitimate satellite transmissions, preventing receivers from acquiring valid signals and determining an accurate position.

4. **Risks to Safe Navigation**
   The safety of navigation may be significantly compromised by GNSS spoofing or jamming. Such interference may be particularly hazardous when navigating:
   - Coastal waters;
   - Restricted or confined waters;
   - Traffic Separation Schemes (TSS);
   - Approaches to ports and harbours; and
   - Pilotage waters.

Failure to detect GNSS interference may result in navigational incidents including grounding, collision, contact damage, or deviation from the intended route.

5. **Recommended Actions:**
Shipowners, managers, Masters, and bridge teams should ensure that navigational procedures adequately address the possibility of GNSS interference.

The following minimum measures are recommended:

a. Position-Fixing Procedures:

- Ensure company procedures clearly define the methods and frequency of position fixing under various navigational conditions.
- Increase the frequency of position fixing, particularly when navigating in coastal, confined, or pilotage waters.
- Avoid sole reliance on GNSS as the primary means of navigation in areas where positional accuracy is critical.

b. Alternative Means of Position Fixing:

Bridge teams should make effective use of alternative navigation methods, including:

- Visual observations and bearings;
- Radar observations;
- Dead Reckoning (DR);
- Visual bearings combined with radar ranges/distances;
- Parallel indexing techniques; and
- Other available terrestrial navigation aids.

c. Verification of GNSS Information:

- Regularly cross-check GNSS-derived positions using independent navigational methods.
- Compare GNSS information with radar images, visual references, charted features, and other available sources of navigational data.
- Investigate any unexpected discrepancies between the vessel's observed position and GNSS-derived position.

d. Bridge Team Awareness:

Bridge teams should remain vigilant for indications of GNSS interference, including:

- Sudden and unexplained position shifts;

- Inconsistent speed or course information;
- Discrepancies between ECDIS, radar, AIS, and visual observations;
- Loss of GNSS signal or frequent receiver alarms; and
- Abnormal behavior of equipment dependent upon GNSS inputs.

Where GNSS spoofing or jamming is suspected, appropriate corrective actions should be taken immediately, and alternative navigation methods should be employed.

6. Masters and bridge teams should remain alert to the possibility of GNSS spoofing and jamming and exercise prudent seamanship at all times. Particular caution should be exercised in areas where GNSS interference has been reported or where geopolitical situations may increase the likelihood of such activities.

7. Shipowners and managers are encouraged to review their Safety Management System (SMS) procedures and provide appropriate guidance and training to ensure that navigational safety is maintained in the event of GNSS interference

Enclosure: None