

AIS: operator feedback analysed

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Although most mariners seem generally satisfied with the operation of the new automatic identification system (AIS), current users have reported certain anomalies to The Nautical Institute. The Institute's Papers and Technical Committee has now identified some key causes and made recommendations to remedy the problems.

A common symptom was that *ships are transmitting inaccurate information* such as incorrect heading (which may be due to poorly defined offset data) or inaccurate data pertaining to static, dynamic or voyage information (being underway while indicating being stationary). Mariners are therefore advised *not to use AIS information alone for critical decisions* such as collision avoidance, and are reminded to check their own transmission data on a routine basis.

Another common reported fault is that an *MMSI number is constantly displayed in the 'name' field* for target ships. Although mariners perceive this as a design fault of the overall system, it is usually a *symptom of poor reception* due to 'own ship's' equipment. Mariners should be warned that in this case, other vital information might not be received either, and placement of antenna may be the cause.

Reports of anomalies and operational issues have been encouraged by The Nautical Institute over the past nine months in order to provide useful feedback to the industry. Most seafarers have welcomed AIS, stating that it improves positive identification of other vessels and creates better situational awareness. However, as with most new technologies, some teething problems have occurred and The Nautical Institute has been working with other bodies and the industry to identify and alleviate equipment, procedural and training issues. A summary of the findings is as follows:

Equipment

After analysis, it was found that many of the reported anomalies were due to poor installation. Common symptoms of poor installation include:

- MMSI numbers being constantly displayed rather than ships' names, which is an indication of poor signal reception. This symptom also suggests that other important information is being missed. This could be caused by interference and may be associated with the placement of the antenna. This should not, however, be confused with a new target not displaying a ship's name immediately. Since a ship's name, as static data, is broadcast every six minutes and dynamic data, such as speed and heading, are broadcast several times a minute, it is common for newly acquired targets to display MMSI numbers until the name is broadcast: this is quite normal.
- The display of erroneous headings due to the target vessel's having had its heading offset data incorrectly set during installation. This is the most common anomaly and often occurs on vessels with older version heading devices which require a converter to convert the gyro output into a digital format for the AIS to read.
- The abnormal operation of other navigational equipment connected to the AIS. Only a few reports have indicated that when an AIS has been integrated into other bridge equipment, a fault with the AIS has caused operational problems or faults with the associated equipment.

Vessels whose equipment displays any of these symptoms are urged to examine the quality of the installation.

Procedures

As with any piece of equipment, the most effective use results from good procedures being put in place. Reports from mariners indicate that the following issues need to be taken into account:

- When using minimum keyboard and display (MKD) units, thought needs to be given as to the placement of the display for effective use, such as its proximity to radars and VHF's. Many MKDs are installed

in the chartroom behind the bridge: this makes the comparison between an AIS target and an ARPA target tricky, particularly when they are close in range/bearing and where other targets exist.

- Bridge procedures should state that AIS information alone should not be relied upon for critical operations such as collision avoidance, with a special caution that not all vessels or navigational hazards are fitted with AIS. This may be of particular concern in head-on or crossing situations, where CPAs are close.
- Bridge procedures and bridge team management should encompass the possibility of abnormal operation, or failure, of AIS and the impact it might have on navigational safety.
- Procedures should be in place to routinely check the accuracy of own ship's static, dynamic and voyage-related data being transmitted. This may be particularly difficult with some MKD models where 'own ship' data is only accessible in a password protected 'installers' mode. Common errors occur in updating 'navigational status' where indicating 'underway' or 'not underway' is often overlooked. Procedures to align this with the operation of navigation lights might be useful.
- When using MKD graphical display in conjunction with radar, it is important to use similar orientation (heads-up, course-up) to avoid confusion.

Training

AIS is a complex communications/navigation subsystem that is not self-evident in concept or use. Training for the use and operation of AIS needs to be addressed and should not be left to installation engineers or technical manuals. Formal training courses are available and the IMO is due to publish an AIS model course in the near future.

The Nautical Institute is maintaining a website <www.nautinst.org/ais> to collect and monitor mariner feedback on the use of AIS and will continue to work with other organisations and the marine electronics industry to insure that these issues are addressed.