

Automatic Identification System (AIS) - A Ship Tracking Device

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SUMMARY

In recent years, maritime safety and efficiency has become very important across the world. The Automatic Identification System (AIS) is a Very High Frequency (VHF) radio broadcasting system that transfers packets of data over the VHF data link (VDL) and enables AIS-equipped vessels and shore-based stations to send and receive identification information that can be displayed on a chart plotter. Especially when used with appropriate graphical displays, this information can help in situational awareness and provide a means to assist in collision avoidance. There are different types and classes of AIS. The AIS has been very useful to the fishermen since it renders various advantages like collision avoidance, helps in navigation, search and rescue of lost crafts etc. These applications are possible since AIS transmits different data like static data, dynamic data and voyage data related to the ship. This article discusses about the advantages of setting AIS in ships and its classifications.

INTRODUCTION

The automatic identification system (AIS) is an automatic tracking system that uses transponders on ships. AIS integrate a standardized VHF transceiver with a positioning system such as a GPS receiver, with other electronic navigation sensors, such as a gyrocompass. Vessels fitted with AIS transceivers can be tracked by AIS base stations located along coast lines, when out of range of terrestrial networks, they are connected through a growing number of satellites that are fitted with special AIS receivers. AIS is included in the Safety of Life at Sea (SOLAS) Convention, and large ships began fitting AIS in July 2002. AIS transmits, automatically and at set intervals, dynamic information relating to the ship's course, speed and heading; static information related to the ship's name, length, breadth; and voyage-related details such as cargo information and navigational status.

Description of the system

Each AIS station consists of one VHF transmitter, two VHF receivers (AIS 1 and AIS 2), one VHF DSC receiver, a standard marine electronic communications link and sensor systems.

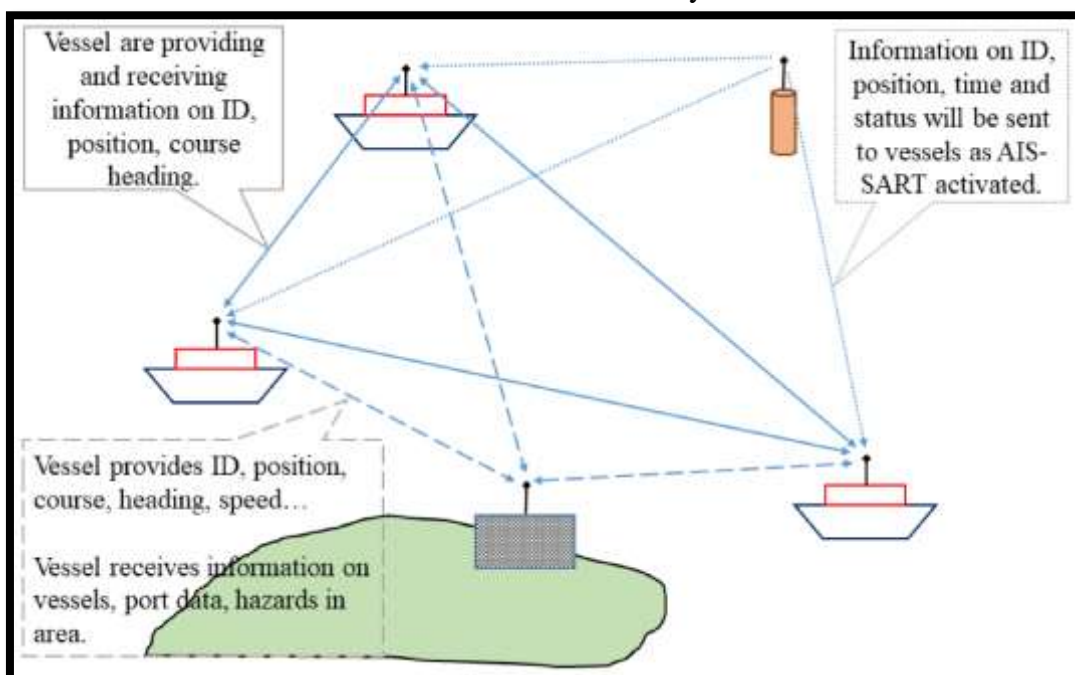


Figure: AIS systems overview (<https://ars.els-cdn.com/content/image/1-s2.0-S0957417424008546-gr2.jpg>)

Requirement of SOLAS for setting AIS in ships

The International Maritime Organization (IMO) Convention for the Safety Of Life At Sea (SOLAS) Regulation requires all vessels of 300 GT and above engaged on international voyages and all passenger ships, irrespective of size, to carry AIS onboard.

Types of AIS

There are two classes of shipborne AIS

(1) **Class A:** Mandated for all vessels 300 GT and above engaged on international voyages as well as all passenger ships

(2) **Class B:** Provides limited functionality and is intended for non-SOLAS vessels. Primarily used for vessels such as pleasure crafts.

Different types of data transmitted by AIS

The AIS transmits various data like static information, dynamic information and information related to voyage. For every 6 minutes on request the static information like MMSI number, IMO number, Length and Beam, Type of ship, Location of position fixing antenna etc are provided. It also provides data related to the dynamic of ships. It includes data on the ships position with accuracy indication. Further data on ships draught, type of cargo carried, destination of the ship, route followed by the ship are also transmitted. It also produces Short safety-related messages. This content could be such as buoy missing, iceberg sighting etc

Applications of AIS:

The original purpose of AIS was solely collision avoidance but many other applications have since developed and continue to be developed. AIS is currently used for:

- Collision avoidance of ships
- Fishing fleet monitoring and control
- Helps in navigation of ships
- Investigations to accidents happened at sea
- Search and rescue of the lost ships
- Ocean currents estimates by accessing AIS data
- Fleet and cargo tracking
- Infrastructure Protection of the sea ecosystem

Limitations of AIS

As with all navigational equipment, the AIS has limitations:

- The accuracy of AIS information received is only as good as the accuracy of the AIS information transmitted
- Over-reliance on the AIS can cause complications since error may occur
- Users must be aware that the AIS might transmit erroneous information from another ship
- Not all ships are fitted with AIS

CONCLUSIONS

The AIS station, with its ability to exchange large blocks of information at high data rates, offers a new tool to enhance the safety of navigation and efficiency of shipping traffic management. In the ship-to- ship mode AIS is being used to assist in situational awareness and as another tool to aid in collision avoidance. Coastal ship reporting systems, VTS and ports are significant beneficiaries of this wealth of near real time ship data, with many countries implementing AIS base station coverage in an integrated manner for vessel tracking. The AIS data transfer also provides the means for a wide range of maritime regulatory, traffic monitoring, administrative and logistical management activities that can be exploited to advantage by the maritime industry. Thus, the member states of International Maritime Organization (IMO) have been leading in and enforcing the use of automatic identification systems (AIS) in the analysis of ship-to-ship collisions, vessel monitoring, and maritime traffic management offshore. Hence AIS can be useful to the merchants and fishing sailors and awareness has to be created by spreading the advantages of installing the AIS system in ships.

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