

Tideland Signal Corp.

featuring Aids to Navigation Products

7.2 AIS AtoN

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A. Introduction

The Automatic Identification Systems (AIS) was conceived as a radio communications device that would enhance the safety and efficiency of the maritime industry. [See section 7.1 What is AIS?](#)

Historically, the maritime industry has relied on radio communication for its day-to-day operations as well as the resolution of emergency situations.

The maritime industry, being international, is subject to the problems associated with many languages being used, the wide areas that have to be covered and the need to have reliable contact with safety organisations as well as the vessel owners and commercial interfaces that they deal with daily.

AIS is designed to operate in one of the following modes;

- In a ship to ship mode, for collision avoidance
- As a means for coastal authorities to obtain information about a ship and its cargo
- As a traffic management tool when integrated into a traffic management system

B. AIS and AtoN's

AIS can also make AtoN information available, and there are three ways in which such information can be passed. These are via:

An AIS AtoN – with an AIS terminal on an existing AtoN

An AIS unit can also be fitted to most Aids to Navigation (AtoN). An AIS AtoN broadcasts its position and other identifying data on message 21. In addition an AIS AtoN is also capable of broadcasting sea and weather data on message 6 or 8 as a binary message or as a text message on message 12 or 14.

The Tideland V-03 Informer is easily fitted to new or existing AtoN's and can be powered by a 12V DC solar system with a low power consumption of 0.5Ah per day. In most cases it can be fitted to an existing AtoN without additional solar or battery requirements.

AIS Synthetic AtoN

For this application, the AtoN uses a technology other than AIS to determine its status and to communicate, for example, its position and the status of its equipment to an AIS shore station via low power telemetry or satellite link. This information can then be formatted and broadcast as an AIS message, providing accurate and continuous AtoN reports, and extending the AIS coverage of the AtoN in question.

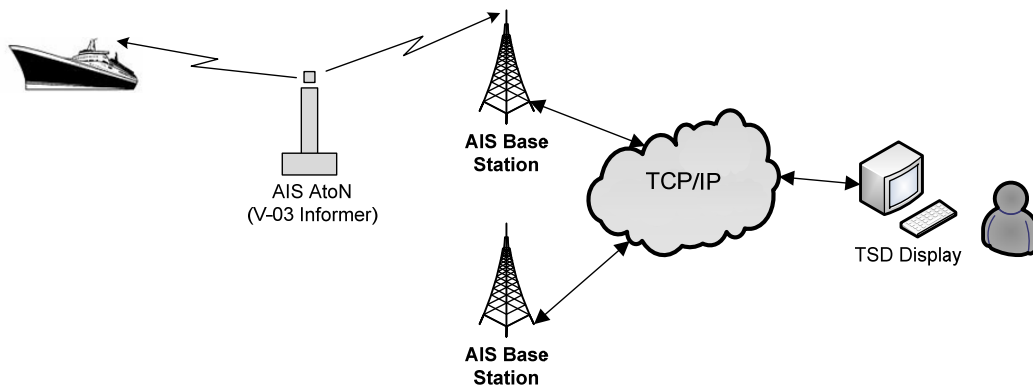
AIS Virtual AtoN

In this application, the required information is entered into the database of an AIS shore station. It is then broadcast at regular intervals to identify, on AIS displays, an area of navigational significance or a danger to navigation, neither of which can be marked by actual AtoN's.

The Tideland Signal V-03 is provided in two designs Type 1 and Type 3. Type 1 is designed to transmit only and Type 3 to receive (for command and control)



Typically AIS AtoN's transmit data to vessels but is also widely used to transmit remote monitoring and weather data back to a land AIS base station.



C. Electronic Zone Marker

When restricted areas such as a military activity area, an environmentally sensitive area, incident management investigations, and temporary dangerous local conditions need to be flagged as “No Go Zones,” the AIS network can be used to broadcast using message 8 to mark an exclusion zone in addition to the normal warning and marking systems already in place.

D. Electronic Traffic Separation Scheme (TSS) Marker

At this time, charts are being used to navigate vessels through TSS schemes. AIS can be utilized to broadcast a set of way-points that define the TSS, so that vessels transmitting and receiving AIS in its vicinity can both monitor their progress through it and be monitored and advised as necessary.

In addition, the separation scheme itself can be sent in a text message or broadcast on a regular basis for all vessel traffic to receive within the broadcast area. In the case of the transmission of an addressed message, a record is kept of each and every vessel that the vessel has received the information. This is ideal since the mariner will not have to regularly reset the alarm that goes off every time an AIS message is received.

E. Meteorological and Hydrological AtoN Information Broadcast

Weather and tidal conditions can present a problem when entering ports and constricted waterways. Port Authorities can transmit the relevant meteorological and hydrological data via AIS, to enable mariners to take account of such data as they approach the port.

A good example for other maritime authorities to consider is the Application Specific messages that the St. Lawrence Seaway has published. In addition to providing most of this critical data, it allows for lock scheduling within the St. Lawrence Seaway.

F. AIS Enhanced Environments

In shipping areas, AtoN's are deployed to minimize risk to the safety of navigation. AIS can contribute to the planning of such deployments by monitoring and recording vessel movements for the purpose of identifying AtoN Needs.

A coastal AIS network can provide valuable safety information to vessels within its coverage. This information could include the electronic marking and status of actual AtoNs, unusual localized conditions and situations, and the emergency marking of wrecks or other objects.

AIS can also be used to enhance or even replace separate telemetry systems, currently in use for the monitoring of AtoN's.