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Revisions to the IALA Document are to be noted in the table prior to the issue of a revised document.

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Guideline on the Application of AIS on Buoys

# Introduction

This document considers the application of employing AIS on buoys and is designed to offer guidance regarding specification. This document should be considered as complimentary to higher level documents such as ITU document A-126.

# Selection of the AIS unit

## AIS has the capability of transmitting various messages. The comprehensive list of messages available is in the International Telecommunications Union document A-126. The main messages that are of interest to the AIS as an AtoN provider are as follows;

### Message 21 – This is the prime Aids to Navigation message detailing the AtoN position and light status

### Message 8 – This is for the provision of Application Specific Messages such as Meteorological data

### Message 6 – This is for monitoring the status of selected parameter on the buoy such as battery voltage,

There are two types of protocols for sending AtoN AIS messages. They are Fixed Access Time Division Multiple Access (FATDMA) and Random Access Time Division Multiple Access (RATDMA). These two protocols are set to ensure that messages from nearby AIS stations do not conflict.

### Type 1 - FATDMA

This needs to be within transmission range of an AIS base station for slot reservation purposes. The benefits of this type of device are lower power consumption and reduced capital outlay.

### Type 3 - RATDMA

This can be located anywhere and will be received by a receiving station when within range. It will draw more power than the Type 1and will cost more but it is more versatile in it’s location as it does not require any slot reservation by a base station.

### Type 2

The Type 2 device will accept incoming information regarding slot reservation and messaging and will re transmit this from remote stations onto a base station. This enables the range of the AIS units to be extended to form a chain.

# Primary considerations

## Navigational Requirements

## Power consumption.

### The power consumption needs to be balanced to the generation facility as well as the power consumption od other AtoN such as lights etc. to deliver the required autonomy. The power consumption at the agreed configuration is recommended to be measured, rather than rely on the manufacturer’s generic data. The power consumption will vary depending on the transmit frequency and the sleep interval.

## Transmission range.

### A typical transmission range is between 5 to 20 miles though this will increase with a higher aerial on the buoy and a high receiving station. Satellite monitoring of AIS may be available in the future. In areas of very heavy traffic, the volume of AIS transmissions may overload the bases station, which will reduce the range at which the base station will be able to cover. With Type 1 AIS (FATDMA) in an area of heavy traffic, there may not be enough available slots to be allocated to enable transmission from the AIS station.

## Additional services.

### AIS can be used to deliver additional services such as meteorological data and wave data. These can be incorporated into the e-Navigation services infrastructure. Accurate meteorological equipment can be very expensive and will require an analysis of the benefits over the cost of installation. Therefore, it may be a consideration to install the AIS on a Meteorological buoy than the than the other way round. Meteorological data can be difficult to verify and confirmation of the accuracy of this service needs to be assessed with any consequent liability. Most standard navigation buoys are not wave following types and therefore wave data will need to be analysed. An assessment of the number of users who are able to receive and display message 8 with Meteorological data needs to considered otherwise this service will be of little value.

## Integrated unit with lantern.

## Monitoring capability (of battery voltage, light status etc).

## Certification compliance

## Licensing by local licensing authority

# Physical Application

## IP rating.

## Lightning protection.

## Location of antennas and receivers.

## Protection from physical damage.

## Hard wired or plug connections.

## Power supply adequate for current spikes.

## Selection of equipment.

## Security of mounting against shock loading & vibration.

# Commissioning & Testing

*Note – Check GLA commissioning sheets & data*

## Message testing

## Range testing

## Frequency verification.

# MaintenANCE & oPERATION

## Spares.

## Maintenance requirements.

## Training

# rEFERENCES

1. Annex Title

Guidelines should have Annexes. Appendices are attached to Annexes.

ANNEX HEAD1

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