



Aids to Navigation (AtoN) Maintenance Guide

(Supplement to IALA Level 2
Technician Training)



Pacific
Community
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PAKIFIC SAFETY
OF NAVIGATION
PROJECT



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AtoN Maintenance Buoy Components and what to check?

Focal Plane Height

Freeboard

Centre of Buoyancy

Ballast

Centre of Gravity

Tail Tube (or "Skirt")

Topmark

Marin Lantern

Superstructure or Tower

Float; hull or buoyancy chamber

Waterline

- Shape colour and dimensions

- Range, light characteristic
- Intensity, current, voltage
- Solar panel, battery and sun switch
- Bird spikes and guano

- Corrosion
- Rails and ladder wear
- Anodes
- Verticality and metal thickness
- Dissimilar materials

- Paint thickness and colour
- Guano
- Damages to hull
- Marine fouling
- Buoyancy
- Anodes
- Lifting eye configuration
- Corrosion, marine fouling

Buoy Components Check List

Performance measurement by CA or AtoN managers for Availability, Reliability, Continuity, Redundancy and Integrity

AtoN Maintenance, Daymarks

It should not be forgotten that most traffic occurs during the day, which means that the daymarks should be readily identified by mariners at a distance without possibility of confusion

Detection

The observer is aware of an object. The navigator sees an object, but will usually not be able to deduce its shape or colour and will not know that it is an AtoN

Recognition

The observer is aware that the object is an AtoN

Identification

The observer is aware which AtoN the object is. At this distance, the navigator can perfectly discern the type of mark it is

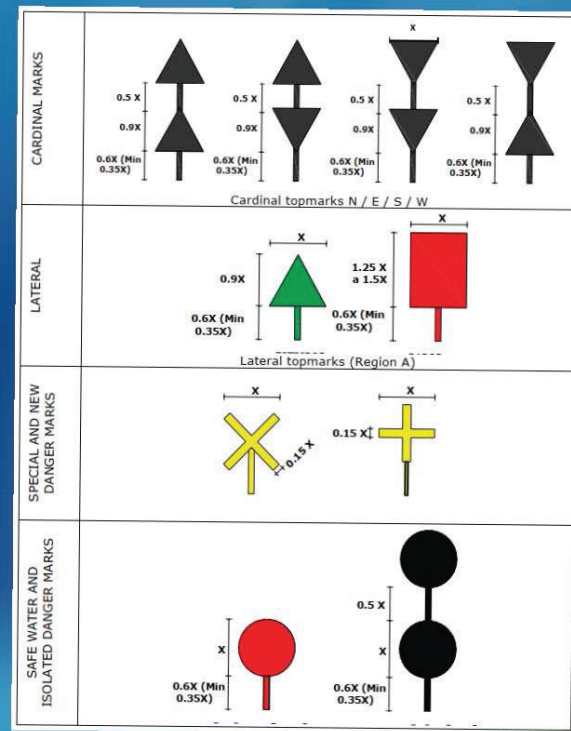
For AtoN Daymarks the following constructions are in use:

Flat daymark
Solid daymark
Crossed plates
Lattice construction



For fixed Aids there is more freedom in the design of daymarks. For Example:

A fixed daymark may be much larger and higher providing a long daymark range;
A specific colour scheme may be used to identify a particular fixed aid;
It may be flat;
It may be designed for a specific background;
It may have a background panel to show more contrast;
The design of the daymark should take into consideration environmental conditions such as wave action;
The supporting structure of a daymark may become part of the daymark or be used to enhance the conspicuity



AtoN Maintenance Lantern and Lamp Components and what to check ?

- Ensure solar modules are not covered and are in clear view of the sun with no shadows
- Visually inspect lantern lens and base for cracks, grazing, holes
- Inspect bird deterrent spike
- Battery check- inspection performed routinely to ensure the charger, battery and ancillary electronics are functioning correctly
- Use voltage meter to check the battery voltage in both on-load and off-load conditions and ensure all terminals are clear of foreign matter
- Inspect battery boxes for damaged flanges, covers, gaskets, vent valves, and securing hardware
- Check for degradation of sector colours, and replace or adjust to the correct charted position if necessary
- Solar panels – tilt angle, framework and mounting hardware, corrosion and tension, broken glass, water intrusion around the edges. Inspect wiring for cuts, abrasion and UV degradation. Where plugs and sockets are used, check for water ingress or corrosion. Test power output including the solar regulator.
- A review of spares holding

Lanterns and Lamps checklist

- | | |
|--|---------------------------------------------------------------|
| | • Light Intensity, range |
| | • Battery voltage, resistance, current and electrolyte levels |
| | • Cracks or signs of water ingress |
| | • Earthing and power output |
| | • Colour degradation |
| | • Sun switch glazing and lantern glazing |
| | • Bird spikes, Guano and dirt |
| | • Obstruction around lights, solar modules etc |
| | • Level and focus |
| | • Flash character |
| | • Signal output |
| | • Solar Panels |

Performance measurement by CA or AtoN managers for Availability, Reliability, Continuity, Redundancy and Integrity



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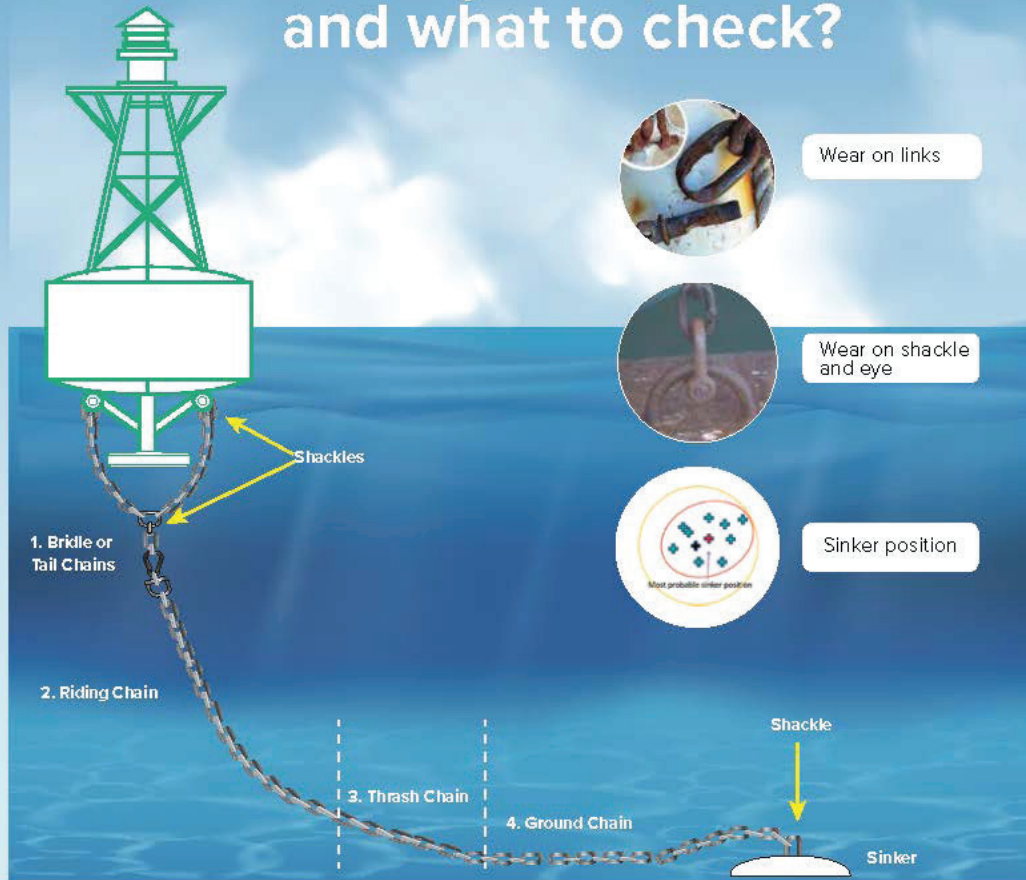
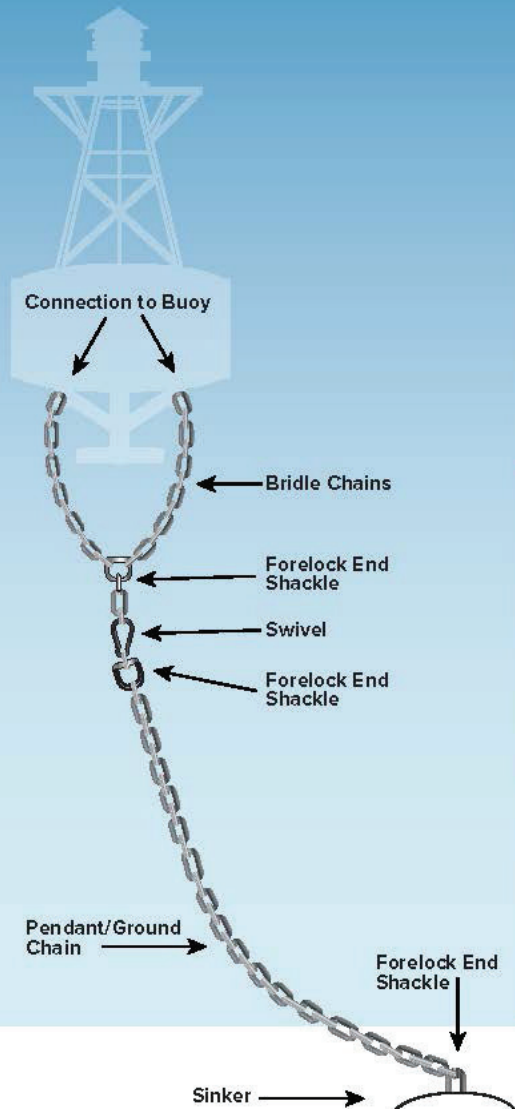


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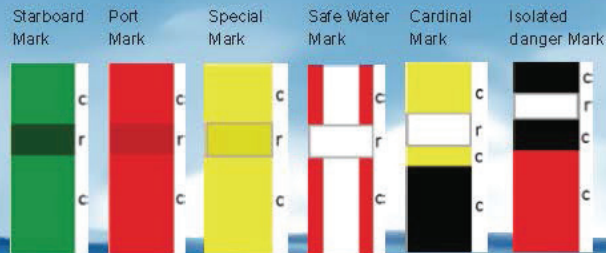
AtoN Maintenance Mooring Components and what to check?



AtoN Maintenance

Paints, Coatings and Retroreflecting materials

Paint provides protection from corrosion and provide the signal colour to be seen by the mariner

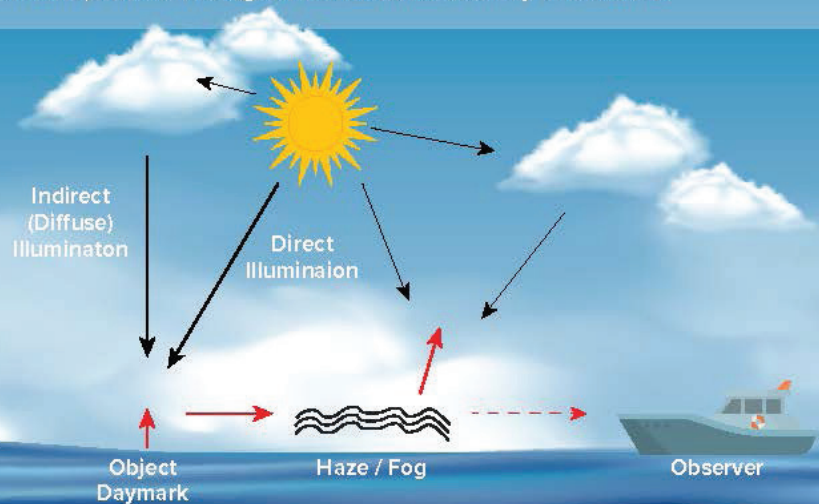


c: Colour of the Mark
r: Retroreflecting Material

AtoNs can be equipped with retroreflective material, so the mariner can detect the position and colour at night by use of a searchlight

In principle, green, red and yellow buoys should carry only one green, red and yellow band respectively

White bands for safe water, cardinal and isolated danger marks



- The IALA MBS uses 5 colours: Red, Yellow, White, Blue and Black
- Coloured surfaces are subject to salt deposits, marine growth, bird fouling, mechanical abrasion UV degradation, etc.
- A surface colour should always be checked, especially at a distance, for its appearance among the surrounding colours
- Deterioration of surface colours in use is a common occurrence, and care must be taken that signal colours always remain in compliance with their specifications
- Effective colour retention will depend on regular maintenance cleaning which will be simplified by utilising paint with a hard and high gloss surface
- A glossy surface produces a saturated colour, thus its recommended to use glossy colours for AtoNs

For more information
www.gem.spc.int