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| IALA Guideline |

Gnnnn

Buoy Tender Activities

Edition 1.0

Date (of approval by Council)

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

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# Introduction

# Buoy tender activities are important to the management of AtoN, whose safety risk is higher than other activities. Due to this particularity, there are obvious differences between buoy tender activities and other marine vessel activities. This guideline puts forward suggestions on some factors that should be considered for buoy tender activities.

## Responsibilities of the Competent Authority

## As a key participant in front line management or maintenance of AtoN, determining, creating and delivering the necessary guidelines for the crew or workers of the buoy tender is the responsibility of the competent authority. This objective is also in line with the IALA mission.

## Overview

## The operations undertaken by buoy tenders are unique from those of other vessels. They are complex in nature and often with increased safety risk. Buoy tender crews not only conduct general sailing maneuvers and other activities associated with safe navigation and seamanship, they also carry out high risk buoy operations.

## Background

## This guideline focuses on the nature of buoy tenders highlighting safety guidance and operational considerations. At present there are no recommendations or guidance contained within IALA technical documentation, nor existing World Wide Academy (WWA) training courses focused on buoy tending operations.

# BUOY TENDER OPERATIONS

# Buoy tenders frequently carry out activities such as retrieving and deploying AtoN equipment at the edges of waterways, shallow points, or near reefs. These activities are difficult and have high safety risks requiring operators to have special skills and strictly adhere to risk prevention protocols. Making buoy tender activities efficient and safe has always been an important aspect of the work of the competent authorities.

# Aims and Objectives

Provide guidance to the competent authority to manage tender activities, provide safe operation guidelines for tender operations, and assist the personnel responsible for tender activities by identifying safety risks.

## Scope of the GuidEline

Provide operating parameters for buoy tender activities including the retrieval, deployment, positioning, maintenance and other special operations contained in table 1.

## Essential Components of the Guideline

# The guideline contains safety and operational guidance for buoy tenders. It contains information on safety procedures, risk management, environmental considerations and buoy tender operations.

Table 1

|  |  |  |
| --- | --- | --- |
| Item | Content | Description |
| 1 | Safety procedure | Preparation before operation. Making work plan, preparation of machinery, collection and analysis of weather/sea/traffic information, pre-departure check. |
| Personal protection equipment as identified by member state |
| 2 | Risk Management | Complete risk assessment checklist. |
| Ensure correct vessel and/or equipment for operation |
| 3 | Environmental Considerations | Marine Protected Areas, Endangered Species, Seasonal Restrictions, Pollution Contamination, Noise, Guano, Poisonous Plants, Dangerous Animals |
| 4 | Buoy Deck Machinery and Equipment | Introductions to buoy deck machinery and equipment, to include, crane, winches, rigging equipment, mooring tools, and rigging inspections |
| 5 | Task responsibility | Introductions to basic task information and responsibility of bridge, deck, and engine department. |
| 6 | Buoy technical characteristics | Introductions to basic buoy characteristics relating to buoy tender operation. |
| Introductions to buoy mooring system |
| 7 | General buoy operation procedure | Loading and unloading procedure. |
| Buoy retrieval procedure. |
| Inspection of mooring system. |
| Positioning methods and procedures. |
| Buoy deployment procedure. |
| 8 | Specialist Operations | Large buoy (light ship) operation. |
| Sunken Buoy Recovery |
| Drifting Buoy Recovery |
| Beached Buoy Recovery |
| Obstructions and Hazards to Navigation |
| Diving Operations |
| Drones |
| Hydrographic and AtoN Surveys |
| Piling Operations, Construction of AtoN Structures |
| Operating in Strong Currents and Heavy Seas |
| Towing Operations |
| Ice Breaking |
| Alongside operation (fix mark/off-shore structure) |

## 3.3 Other consideration of the guideline

# In recent years, with the development of technology, the number of marine economic activities has been increasing. The rise of economic activities such as offshore wind farms and aquaculture have brought new challenges to the activities of buoy tenders. These activities are not limited to traditional buoy maintenance operations. Vessel traffic density and volume has increased resulting in more operational risk, more AtoNs to service, more commercial aids requiring additional supervision and inspection, with these tasks being assigned to the buoy tender by the authority.

# Common requirements

## Safety Procedure

Decide what Personal Protective Equipment (PPE) the buoy tender personnel are required to use according to national regulations and environmental conditions.

Determine the best procedures according to national regulations and good marine practices.

Personnel competency and skills must be certified to and follow national standards. These standards may incorporate training as detailed by WWA.

Provide task-oriented training (on the job) in accordance with standard operating procedures.

Conduct safety briefings as required.

## Risk Assessment

Identify common risks related to the task

Identify risks associated with particular objective or operations

Create risk assessment matrix

## ENVIRONMENTAL CONSIDERATIONS

Ensure that you identify risks specific to certain environmental conditions

## BUOY DECK MACHINERY AND EQUIPMENT

Make sure that all buoy deck machinery and equipment are maintained and inspected according to national regulations and those of the competent authority.

Ensure that buoy deck machinery and equipment is rated to perform the buoy and mooring operation.

Buoy deck cargo, machinery and equipment should be properly secured during transit.

If conducting night operations ensure buoy deck is equipped with sufficient lighting.

## TASK RESPONSIBILITY

Captain responsibilities:

* Captain shall maintain command, control, and organization of the operation through the Bridge, Deck and Engine crews.

Bridge crew responsibilities:

* Safe navigation and maneuvering of the ship.
* Positioning the buoy.
* Internal and external communications
* Route planning
* Give order to execute, pause and secure the specific AtoN operation.
* After launch and fix position of buoy prepare a document signed

Deck crew responsibilities:

* Prepararation buoys, moorings, lanterns prior to loading on the buoy tender.
* Fix cargo (buoys, moorings etc..) on buoy tender deck
* Rigging slinging and lashing
* Preparation of tools and machinery prior to operations so they are in good condition.
* Responsible for following procedure for specific deck machinery
  + Operating crane
  + Operating winch
  + Tools for handling AtoNs
* Internal communication
* Preparation before launching moorings, buoys, lanterns.
* Pre inspection and post inspection of buoy maintenance including moorings and lighting system.
* Take picture of deployed buoy
* Ensure proper identification of the buoy with assigned number.
* Following deck safety procedures
* Work as a group to achieve the operating goal

Engine crew responsibilities:

* Readiness of all machinery relating to the engine including
  + Hydraulics
  + Winches
  + Auxiliary such as electrical power, etc.

## BUOY TECHNICAL CHARACTERISTICS

Typical Characteristics of a buoy are as follows:

* Height
* Diameter
* Weight of Buoy and Mooring
* Material
* Lifting Eye
* Mooring Type

## GENERAL BUOY OPERATING PROCEDURE

Loading and Unloading Procedure

* Follow instructions in cargo securing manual and checklist.

Buoy Retrieval Procedure

* Ensure proper buoy is identified.
* Approach buoy based on environmental conditions (wind, tide, etc..)
* Secure the buoy.
* Lift the buoy on deck.
* Lift the mooring assembly on deck.

Inspection of Mooring System:

* General overview of mooring during lifting procedure
* Secure mooring chain before lifting sinker
* Remove marine growth
* Inspect mooring assembly (chain, shackles, swivels, sinker for wear and thickness)
* Ensure thickness meets organization standard

# References

1. R0118 (O-118) THE RECORDING OF AIDS TO NAVIGATION POSITIONS
2. G1035 AVAILABILITY AND RELIABILITY OF AIDS TO NAVIGATION ‐ THEORY AND EXAMPLES
3. G1041 SECTOR LIGHTS
4. Positioning??

# Section 3 – Heading 1 Style

## Section 3.1 – Heading 2 style

The choice of numbered or bullet point lists depends on the context and content of the text and further guidance is given in the “*IALA Style Guide*”. Bullets are preferred unless it is important that the list is numbered e.g., for future reference or for a sequence.

Three levels of list styles are provided and these styles should be used rather than the default Microsoft Word numbering lists:

1. List 1 style example

**List 1 text** style example

* 1. **List a** style example

**List a text** style example

* + 1. **List i** style example

**List i text** style example

Each list style has a corresponding list text style that can be used for example, if the list requires more than one paragraph and the subsequent text needs to be aligned. If more than one list is used throughout the document it may be necessary to right click and select **Restart at 1** for subsequent lists.

## Section 3.2 – Heading 2 style

There are three levels of bullet point styles available:

* **Bullet 1** style

**Bullet 1 text** style

* **Bullet 2** style

**Bullet 2** **text** style

* **Bullet 3** style

**Bullet 3 text** style

Each bullet style has a corresponding bullet text style that can be used for example, if the bullet requires more than one paragraph and the subsequent text needs to be aligned.

## Section 3.3 – Heading 2 style

### Equations

#### Layout

If equations are included in the main body of the text, they should be explicitly referred to in the running text and centred on the page. Equations should be numbered consecutively with a right justified number in brackets e.g. (1) on the same line as the equation.

Any explanatory terms should be indented immediately below the equation starting with the non-capitalised term “where” and each term punctuated with a semi-colon until the penultimate term which should also include a semi-colon and the non-capitalised word “and”. For example:

The modified impulse response function is expressed by Equation (1):

where

*;*

*;*

*; and*

*.*

#### Numbering

The preferred method for including equations in the template documents is the Microsoft Word Equation Editor found in the **Insert** menu. The preferred layout and number reference described above can be achieved by typing #(x) where x is the number required immediately after the equation.



1. Example of how to achieve right justified equation number

For example, typing the formula followed by #(2) (as shown in Figure 3) and then pressing return will result in the following equation centred on the page and number being displayed on the same line to the right:

Note that equations do not automatically renumber using this method. If another equation is inserted between two existing equations the number must be adjusted manually.

Although the Microsoft Word Equation Editor is the preferred way of inserting equations, sometimes it is necessary to insert equations created elsewhere and copy those into the document as pictures. In the example below, the equation is included as a picture, wrapped **In Front of Text**:

“The area of a circle is shown in equation (3):

The picture can be copied directly into the document. To insert the corresponding number manually select **Equation number** paragraph style. The author may need to manually adjust the picture position to ensure it is centred and level with the number, achieving consistency with the automatically generated Microsoft Word Equation Editor layout described above.

# DEFINITIONS

The definitions of terms used in this Guideline can be found in the *International Dictionary of Marine Aids to Navigation* (IALA Dictionary) at <http://www.iala-aism.org/wiki/dictionary> and were checked as correct at the time of going to print. Where conflict arises, the IALA Dictionary should be considered as the authoritative source of definitions used in IALA documents.

# abbreviations

This section should be typed with the **Abbreviations** style. The acronym or initialism is typed and then tab is pressed so that the style inserts the appropriate tabs and paragraph spacings e.g.:

NGO Non-governmental organisation

VTS Vessel Traffic Services

The list should be typed in alphabetical order. The text automatically aligns as an indented paragraph until carriage return is hit and then the next term can be entered.

# references

References are sources directly referred to in the running text and should be given a sequential number, starting at 1. The reference number should be included as close to the referenced text as possible and included as a number within square brackets.

The reference should be listed in the References section in the following syntax using the **Reference** **list** style:

[Author surname,] <space> [initial.] <space> [year] <space> [title.]

For example:

“Hawking also suggests ways that quantum mechanics can be combined with the theory of special relativity [1]. This text builds on his discussion of the instability of black holes described in *A Brief History of Time* [2].”

should be included in the reference list as follows:

1. Hawking, S. (2001) The Universe in a Nutshell.
2. Hawking, S. (1988) A Brief History of Time.

The **Reference list** style will add a number for the reference as soon as you start typing the text and the paragraph will automatically align with the first line of text. Press return to enter a new reference in the list.

# Further reading

Any texts that are recommended to the reader without direct reference in the text should be listed within this section using the same syntax as the reference list. Sources should be listed using the **Further reading** style.

1. Einstein, A. (1905) Relativity: The Special and General Theory of Relativity
2. Idle, E. (1984) The Galaxy Song

# Index

**No index entries found.**

1. Example of appendix Title (Head 1) style

Appendices should be started on a separate page and contain information that is directly relevant to the main body of the text at a certain point, but that would be too large or distracting to include at that particular point. There are four levels of appendix heading styles available in the **Style Gallery.** Care should be taken to select the appropriate heading for the section.

* 1. Example of Appendix Head 2 style

At the end of the **Appendix head 2** style text press carriage return, the following paragraph is **the Heading 1 separation line** style, press carriage return again, and the following line will be in **Body text** style.

* + 1. Example of Appendix head 3 style

The same following formatting applies to the **Appendix Head 3** style i.e., press carriage return, the following paragraph is the **Heading 2 separation line** style, press carriage return again, and you will be back to body text.

* + - 1. Example of Appendix Head 4 style

The Appendix Head 4 style is followed by body text and does not have a separation line. Only the level 1 **Appendix Title** will appear in the TOC.

* + - * 1. Example of Appendix Head 5 style

The **Appendix Head 5 style** is followed by body text and does not have a separation line. Figure and tables should be labelled as a continuation from the main Guideline content.

1. Example of Annex title (Head 1) style

Annexes should include information that can exist in isolation e.g.

* a technical specification for a new piece of equipment;
* the content and structure of a new training module; or
* the detail associated with a new recommendation for an AIS.

Annexes can include appendices if required. There are also four levels of annex heading styles available in the **Style Gallery.** In addition to the **Annex title** (**Head 1)** style there is **Annexe Head 2**, **Annexe Head 3** and **Annexe Head 4**. These follow a similar format to the appendix heading styles. As many annexes can be included as needed and it is advisable to separate them with a page break. Only the level 1 **Annex title** style text will appear in the TOC.

* 1. Example of Annex Head 2 style
     1. Example of Annex Head 3 style
        1. Example of Annex Head 4 style

Annex figures and tables should be labelled with the **Annex Figure Caption** and **Annex Table Caption** styles respectively, rather than the main figure and table caption styles. This ensures the annex can be read logically in isolation and that annex figures and tables are not included in the List of Figures and Tables respectively on the main Guideline contents page.

1. Example of annex table caption
2. Example of annex figure caption
   * + - 1. Example of Annex Head 5 style