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| IALA Model Course |

C2001-6

AIDS TO NAVIGATION– TECHNICIAN TRAINING

Introduction to Buoy Positions

Edition 2.1

June 2021

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

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| Date | Page / Section Revised | Requirement for Revision |
| June 2016 | Entire document | Minor textual changes |
| June 2021 | Entire document | Review of content |
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FOREWORD

The International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) recognises that training in all aspects of Aids to Navigation (AtoN) service delivery, from inception through installation and maintenance to replacement or removal at the end of a planned life-cycle, is critical to the consistent provision of that AtoN service.

Taking into account that under the SOLAS Convention, Chapter V, Regulation 13, paragraph 2; Contracting Governments, undertake to take into account the international recommendations and guidelines when establishing aids to navigation, including referring to the appropriate recommendations and guidelines of IALA. This includes recommendations on training and qualification of AtoN technicians, and consequently IALA has adopted Recommendation R0141 on Standards for Training and Certification of AtoN personnel.

IALA committees working closely with the IALA World-Wide Academy have developed a series of model courses for AtoN personnel having Level 2 technician responsibilities. This Model Course on an Introduction to buoy positions should be read in conjunction with the Training Overview Document IALA WWA C2000 which contains standard guidance for the conduct of all Level 2 model courses

This Model Course is intended to provide national members and other appropriate authorities charged with the provision of AtoN services with specific guidance on the training of AtoN technicians in an introduction to buoy positions. Assistance in implementing this and other model courses may be obtained from the IALA World-Wide Academy at the following address:

The Dean

IALA World-Wide Academy Tel: (+) 33 1 34 51 70 01

10 rue des Gaudines Fax: (+) 33 1 34 51 82 05

78100 Saint Germain-en-Laye e-mail: [academy@iala-aism.org](mailto:academy@iala-aism.org)

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1. - COURSE OVERVIEW

# SCOPE

This course is intended to provide technicians with the theoretical training necessary to have a basic understanding of the factors affecting the position of floating aids to navigation (AtoN).

This introductory course is intended to be supported by further training modules on floating aids; practical aspects of buoy handling; moorings; deployment and maintenance. Details of these supporting model courses can be found in the Level 2 Technician training overview document IALA WWA C2000.

# OBJECTIVE

Upon successful completion of this course, participants will have acquired sufficient knowledge and skill to understand the factors affecting the position of a floating AtoN within their organizations.

# COURSE OUTLINE

This theoretical course is intended to cover the knowledge required for a technician to determine the factors affecting the position of buoys. The complete course comprises two classroom modules, each of which deals with a specific subject covering aspects buoy positions.

The required standard of competence is considered to be the level of proficiency that should be achieved for the proper performance of the duties carried out by the technician in their organization.

This Model Course is focussed at the basic level of competence.

1. Levels of Competence

| **Competence Level** | **Learning Outcome** | **Instructional Objectives** | **Required skills** |
| --- | --- | --- | --- |
| 1 | The conduct of routine tasks with some supervision | A **basic** understanding of facts and principles | First stage in acquiring competency of a complex skill. Appropriate responses are identified through trial and error |

# TEACHING MODULES

1. Table of Teaching Modules

|  |  |  |
| --- | --- | --- |
| Module Title | Time in hours | Overview |
| An introduction to buoy positions at sea | 2.0 | This module describes how the positions of buoys are determined and reported |
| Factors affecting the position of a buoy | 2.0 | This module describes why the position of a buoy may vary |
| Assessment | 0.5 | Written test |
| **Total Hours:** | **4.5** | 1 day course |

# SPECIFIC COURSE RELATED TEACHING AIDS

1. Classrooms should be equipped with appropriate teaching aids to enable presentation of the subject matter.
2. Copies of a large and medium scale nautical chart of a relevant coastal area.
3. A model of a buoy in a water tank should be considered as a valuable teaching aid.

# ACRONYMS

To assist in the use of this model course, the following acronyms have been used:

AtoN Aid(s) to Navigation

GPS Global Positioning System

IALA International Association of Marine Aids to Navigation and Lighthouse Authorities

MBS IALA Maritime Buoyage System

SOLAS International Convention for the Safety of Life at Sea, 1974 (as amended)

WWA World Wide Academy

# DEFINITIONS

The definition of terms used in this Model Course can be found in the International Dictionary of Marine Aids to Navigation (IALA Dictionary) at <http://www.iala-aism.org/wiki/dictionary>

# REFERENCES

The following material is relevant to this course:

1. IALA NAVGUIDE.
2. IALA Recommendation R1001 on the IALA Maritime Buoyage System (MBS).
3. IALA Recommendation R0107 on Moorings for Floating Aids to Navigation.
4. IALA Recommendation R0118 on the Recording of Aids to Navigation Positions.
5. IALA Guideline 1066 on the Design of Floating Aid to Navigation Moorings.

1. - TEACHING MODULES

# MODULE 1 - AN INTRODUCTION TO BUOY POSITIONS AT SEA

## Scope

This module describes how the positions of buoys are determined and reported.

## Learning Objective

To gain a basic understanding of how the positions of buoys are fixed before their positions are reported using a standard format.

## Syllabus

### Lesson 1 - Geographical Position at Sea

1. Latitude and Longitude.
2. Standard geographical position formats.
3. The determination of the geographical position of a buoy from a chart.

### Lesson 2 - Methods of fixing a buoy Position

1. The use of hand-held GPS.
2. Use of differential GPS receivers to improve accuracy.
3. Limitations of GPS.
4. Use of remote monitoring.

# MODULE 2 – FACTORS AFFECTING THE POSITION OF A BUOY

## Scope

This module describes why the position of a buoy may vary.

## Learning Objective

To gain a basic understanding of the factors affecting the position of a buoy.

## Syllabus

### Lesson 1 - The Movement of a Buoy relative to its Sinker

1. Recording the ‘drop ’position of a sinker (charted position).
2. The theoretical scope of a buoy related to mooring chain length (swing radius).
3. The concept of a position ellipse.
4. The concept of 'out of position'.

### Lesson 2 - Factors affecting the position of a buoy

1. Tidal height and flow.
2. Wind and waves.
3. Ice.
4. Interference by a vessel.
5. Broken moorings.
6. Position errors during buoy laying.