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MODEL COURSE

C2001-6

MARINE AIDS TO NAVIGATION– TECHNICIAN TRAINING INTRODUCTION TO BUOY POSITIONS

Edition 2.0

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International Organization for Marine Aids to Navigation
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DOCUMENT REVISION

Revisions to this model course are to be noted in the table prior to the issue of a revised document. The latest edition of the model course is the only version in force unless the model course is explicitly revoked by the Council.

Date	Revision details	Approval
June 2016	Edition 1.0	
June 2026	Edition 2.0 Entire document, minor textual changes and time in hours Changes	Council 04

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FOREWORD

The International Organization for Marine Aids to Navigation (IALA) recognizes that training in all aspects of Marine 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.

Under the SOLAS Convention, Chapter 5, Regulation 13, contracting governments should undertake to take into account existing international recommendations and guidelines when establishing aids to navigation. A footnote is included referencing inter alias recommendations and guidelines of IALA.

IALA has adopted the normative Recommendation R0141 on Training and Certification of AtoN Personnel. In order to help Members of the Organization, AtoN authorities and other stakeholders worldwide to confirm with the provisions of the Recommendation a series of model courses covering elements of training for AtoN personnel have been developed by the Committees and the World-Wide Academy of the Organization (WWA).

It is intended that such courses shall be conducted by a training institute or an organization accredited by a competent authority in a Member State of the Organization or Non-member State. This model course is intended to provide Members, AtoN authorities and other appropriate stakeholders with specific guidance on the training of AtoN technicians in shore marks.

PART 1 – COURSE OVERVIEW

1. 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.

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 model course C2000Level 2 - Technician Training Model Course.

2. 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 authorities, organizations or other stakeholders.

3. 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 2 classroom modules, each of which deals with a specific subject covering aspects of buoy positions.

4. TEACHING MODULES

Table 1 Table of Teaching Modules

Module Title	Time in hours	Overview
An introduction to buoy positions at sea	1,5	This module describes how the positions of buoys are determined and reported
Factors affecting the position of a buoy	1.0	This module describes why the position of a buoy may vary
Evaluation	0.5	Written test
Total Hours:	**3,0**	0,5 day course

5. SPECIFIC COURSE RELATED TEACHING AIDS

This course will be classroom-based. Classrooms should be equipped with blackboards, whiteboards, and overhead projectors to enable presentation of the subject matter.

A regional medium and large-scale chart should be provided.

A model of a buoy in a water tank should be considered as a valuable teaching aid.

6. ACRONYMS

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

AtoN	Marine Aids to Navigation
GPS	Global Positioning System

IALA	International Organization for Marine Aids to Navigation
L	Level
MBS	IALA Maritime Buoyage System
SOLAS	International Convention for the Safety of Life at Sea, 1974 (as amended)
WWA	World-Wide Academy

7. DEFINITIONS

The definition of terms used in this Guideline can be found in the International Dictionary of Marine Aids to Navigation.

8. REFERENCES

In addition to any specific references required by the Competent Authority, the following material is relevant to this course:

1 IALA NAVGUIDE

2 IALA Recommendation R1001 The IALA Maritime Buoyage System

3 IALA Recommendation R0107 on Moorings for Floating Marine Aids to Navigation

4 IALA Recommendation R0118 for the Recording of Marine Aids to Navigation Positions

5 IALA Recommendation R0104 on 'Off Station' signals for Major Marine Floating Aids

6 IALA Guideline 1066 on the Design of Floating Marine Aid to Navigation Moorings

PART 2 – TEACHING MODULES

1. MODULE 1 - AN INTRODUCTION TO BUOY POSITIONS AT SEA

1.1. SCOPE

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

1.2. LEARNING OBJECTIVE

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

1.3. SYLLABUS

1.3.1. 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

1.3.2. 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 Use of transits from a vessel

4 Use of remote monitoring

2. MODULE 2 – FACTORS AFFECTING THE POSITION OF A BUOY

2.1. SCOPE

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

2.2. LEARNING OBJECTIVE

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

2.3. SYLLABUS

2.3.1. 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 the mooring chain length (swing radius)

3 The concept of a position ellipse

4 The concept of 'out of position'.

2.3.2. 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