



IALA MODEL COURSE

L2.1.3 & L2.1.4

AIDS TO NAVIGATION - TECHNICIAN
TRAINING

MODULE 1 ELEMENTS 3 & 4

LEVEL 2 - INTRODUCTION TO AIDS TO
NAVIGATION - BUOYAGE

Edition 2.0

June 2016



DOCUMENT REVISION

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

| Date | Page / Section Revised | Requirement for Revision |
|-----------|------------------------|--|
| June 2016 | Pages 3 & 6 | Minor text amendments and update of Teaching Modules |
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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 5, Regulation 13, paragraph 2; Contracting Governments, mindful of their obligations published by the International Maritime Organisation, undertake to consider the international recommendations and guidelines when establishing aids to navigation, including recommendations on training and qualification of AtoN technicians, IALA has adopted Recommendation E-141 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 E-141 Level 2 technician functions. This model course on AtoN Service Craft and Buoy Tenders should be read in conjunction with the Training Overview Document IALA WWA.L2.0 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 service craft and buoy tenders. Assistance in implementing this and other model courses may be obtained from the IALA World Wide Academy at the following address:

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78100 Saint Germain-en-Laye
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Tel: (+) 33 1 34 51 70 01
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PART 1- COURSE OVERVIEW

1. SCOPE

This course is intended to provide technicians with the theoretical training necessary to have a satisfactory understanding of the types and function of floating marks (buoys) and the lights and other aids to navigation that can be fitted to them.

This introductory course is intended to be supported by further training modules on 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 L2.0.

2. OBJECTIVE

Upon successful completion of this course, participants will have acquired sufficient knowledge and skill to recognise the types and functions of floating marks and the lights and other aids to navigation fitted to them whilst on the job within their organizations.

3. COURSE OUTLINE

This mainly theoretical course is intended to cover the knowledge required for a technician to recognise and understand the suite of aids to navigation that can be fitted to floating marks. The complete course comprises 2 classroom modules, dealing with floating marks. Module 3 comprises a site visit designed to consolidate theoretical knowledge. Each module begins by stating its scope and aims, and then provides a teaching syllabus.

4. TEACHING MODULES

Table 1 Table of Teaching Modules

| Module Title | Time in hours | Overview |
|--|---------------|--|
| Introduction to buoys and the light sources fitted to them | 2.0 | This module describes the concept of a buoy as a floating platform for aids to navigation and the types of marine lanterns that can be fitted to them with an introduction to the concept of range |
| Introduction to other AtoN fitted to buoys | 1.0 | This module describes the types and functions of both active and passive additional aids to navigation that can be fitted to floating marks |
| Site visit | 4.0 | To visit an appropriate coastal location to see and recognise various types of floating marks and describe their function and the lights and other AtoN fitted to them |
| Evaluation | 1 | Written test |
| Total Hours | 8 | 2 day course |

5. SPECIFIC COURSE RELATED TEACHING AIDS

- 1 This course involves both classroom instruction and a visit to a coastal area. Classrooms should be equipped with blackboards, whiteboards, and overhead projectors to enable presentation of the subject matter.
- 2 Copies of a large scale nautical chart of the coastal area selected for the site visit for the pre-visit brief.
- 3 Trainees should have access to binoculars for the site visit. If the site visit includes a sea trip, all appropriate safety clothing and life-saving equipment should be made available.

6. ACRONYMS

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

| | |
|-------|---|
| AIS | Automatic Identification System |
| AtoN | Aid(s) to Navigation |
| IALA | International Association of Marine Aids to Navigation and Lighthouse Authorities |
| L | Level |
| MBS | IALA Maritime Buoyage System |
| RACON | Radio Beacon |
| 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 (IALA Dictionary) at <http://www.iala-aism.org/wiki/dictionary>

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 Maritime Buoyage System (MBS).
- 3 IALA Recommendations E-141 on Standards for Training and Certification of AtoN Personnel
- 4 IALA Guideline 1035 on the Availability and Reliability of Aids to Navigation.
- 5 Technical documentation from equipment manufacturers.

PART 2 – TEACHING MODULES

1. MODULE 1 – INTRODUCTION TO BUOYS AND LIGHT SOURCES FITTED TO THEM

1.1. SCOPE

This module describes the concept of a buoy as a floating platform for aids to navigation and the types of marine lanterns that can be fitted to them with an introduction to the concept of range.

1.2. LEARNING OBJECTIVE

To gain a **basic** understanding of the function and types of buoys and the marine lanterns that can be fitted to them.

1.3. SYLLABUS

1.3.1. LESSON 1 – INTRODUCTION TO BUOYS

1. The floating platform for aids to navigation.
2. The concepts of buoyancy, stability and moorings.
3. Sizes of buoys and their applications.
4. Superstructure, shape and topmarks.

1.3.2. LESSON 2 – MARINE LANTERNS (GENERAL)

- 1 Types of marine lanterns.
- 2 Colours of light sources and their uses.

1.3.3. LESSON 3 – LIGHT CHARACTERS AND RANGES

- 1 The concept of light characters.
- 2 Introduction to the nominal and geographic range of marine lanterns.

2. MODULE 2 – INTRODUCTION TO OTHER AtoN FITTED TO BUOYS

2.1. SCOPE

This module describes the types and functions of both active and passive additional aids to navigation that can be fitted to floating marks.

2.2. LEARNING OBJECTIVE

To gain a **basic** understanding of the types and functions of additional aids to navigation that can be fitted to floating marks.

2.3. SYLLABUS

2.3.1. LESSON 1 – INTRODUCTION TO RADIONAVIGATION AtoN ON BUOYS

- 1 Function of a Racon.
- 2 Morse Code characters used by Racons.
- 3 Passive radar reflectors.
- 4 Radar Target Enhancers.
- 5 Basic functions of AIS on buoys.

2.3.2. LESSON 2 - MECHANICAL AND ELECTRICAL SOUND SIGNALS

- 1 Functions of sound signals
- 2 Bells, whistles and gongs
- 3 Electrical sound signals

3. MODULE 3 - SITE VISIT

3.1. SCOPE

To visit an appropriate coastal location to identify and recognise various types of floating marks and then to describe their function and the lights and other AtoN fitted to them.

3.2. LEARNING OBJECTIVE

To consolidate theoretical classroom study through a practical visit to coastal floating marks.

3.3. SYLLABUS

Half day visit to an appropriate coastal area to study different types of floating marks and the AtoN fitted to them.