IALA MODEL COURSE

L2.1.9
AIDS TO NAVIGATION– TECHNICIAN TRAINING
MODULE 1 ELEMENT 9
LEVEL 2 – INTRODUCTION TO BUOY POSITIONS

Edition 2.0
June 2016
Revisions to this IALA Document are to be noted in the table prior to the issue of a revised document.

<table>
<thead>
<tr>
<th>Date</th>
<th>Page / Section Revised</th>
<th>Requirement for Revision</th>
</tr>
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<tbody>
<tr>
<td>June 2016</td>
<td>Entire document</td>
<td>Minor textual changes</td>
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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 an Introduction to buoy positions 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 buoy positions. Assistance in implementing this and other model courses may be obtained from the IALA World-Wide Academy at the following address:

The Secretary-General
IALA
10 rue des Gaudines
78100 Saint Germain-en-Laye
France

Tel: (+33) 1 34 51 70 01
Fax: (+33) 1 34 51 82 05
e-mail: academy@iala-aism.org
Internet: www.iala-aism.org
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 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 understand the factors affecting the position of a floating AtoN within their organizations.

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 buoy positions.

4. TEACHING MODULES

<table>
<thead>
<tr>
<th>Module Title</th>
<th>Time in hours</th>
<th>Overview</th>
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<tbody>
<tr>
<td>An introduction to buoy positions at sea</td>
<td>2.0</td>
<td>This module describes how the positions of buoys are determined and reported</td>
</tr>
<tr>
<td>Factors affecting the position of a buoy</td>
<td>2.0</td>
<td>This module describes why the position of a buoy may vary</td>
</tr>
<tr>
<td>Evaluation</td>
<td>0.5</td>
<td>Written test</td>
</tr>
<tr>
<td><strong>Total Hours:</strong></td>
<td><strong>4.5</strong></td>
<td>1 day course</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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<tbody>
<tr>
<td>AtoN</td>
<td>Aid(s) to Navigation</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Positioning System</td>
</tr>
</tbody>
</table>
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-ism.org/wiki/dictionary

8. REFERENCES

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

- IALA NAVGUIDE.
- IALA MBS.
- IALA Recommendation O-104 on ‘Off Station’ signals for Major Floating Aids.
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 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.