



# IALA MODEL COURSE

L2.1.10

AIDS TO NAVIGATION – TECHNICIAN  
TRAINING  
MODULE 1 ELEMENT 10  
LEVEL 2 - MAINTENANCE OF PLASTIC BUOYS

**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	Entire document	Minor textual changes



# CONTENTS

---

<b>PART 1 - COURSE OVERVIEW .....</b>	<b>6</b>
<b>1. SCOPE .....</b>	<b>6</b>
<b>2. OBJECTIVE .....</b>	<b>6</b>
<b>3. COURSE OUTLINE.....</b>	<b>6</b>
<b>4. TEACHING MODULES .....</b>	<b>6</b>
<b>5. SPECIFIC COURSE RELATED TEACHING AIDS .....</b>	<b>6</b>
<b>6. ACRONYMS .....</b>	<b>7</b>
<b>7. DEFINITIONS.....</b>	<b>7</b>
<b>8. REFERENCES .....</b>	<b>7</b>
<b>PART 2 – TEACHING MODULES .....</b>	<b>8</b>
<b>1. MODULE 1 – HEALTH AND SAFETY.....</b>	<b>8</b>
1.1. Scope.....	8
1.2. Learning Objective .....	8
1.3. Syllabus .....	8
1.3.1. Lesson 1 - Health and Safety.....	8
<b>2. MODULE 2 – TYPES OF PLASTIC BUOYS.....</b>	<b>8</b>
2.1. Scope.....	8
2.2. Learning Objective .....	8
2.3. Syllabus .....	8
2.3.1. Lesson 1 - Types of Plastic Buoys.....	8
<b>3. MODULE 3 – AFLOAT MAINTENANCE .....</b>	<b>8</b>
3.1. Scope.....	8
3.2. Learning Objective .....	9
3.3. Syllabus .....	9
3.3.1. Lesson 1 - Inspection .....	9
3.3.2. Lesson 2 – Maintenance .....	9
<b>4. MODULE 4 – ASHORE MAINTENANCE – DISMANTLING AND REBUILD.....</b>	<b>9</b>
4.1. Scope.....	9
4.2. Learning Objective .....	9
4.3. Syllabus .....	9
4.3.1. Lesson 1 - Dismantling .....	9
4.3.2. Lesson 2 - Steel protection .....	9
4.3.3. Lesson 3 - Reassembly .....	9
4.3.4. Lesson 4 - Inspection .....	10
4.3.5. Lesson 5 - End of Life Disposal.....	10
<b>5. MODULE 5 – STANDARDS.....</b>	<b>10</b>
5.1. Scope.....	10



# CONTENTS

---

5.2.	Learning Objective .....	10
5.3.	Syllabus .....	10
5.3.1.	Lesson 1 - Standards .....	10
<b>6.</b>	<b>MODULE 6 – SITE VISIT.....</b>	<b>10</b>
6.1.	Scope.....	10
6.2.	Learning Objective .....	10
6.3.	Syllabus .....	10

## List of Tables

<i>Table 1</i>	<i>Table of Teaching Modules.....</i>	<i>6</i>
----------------	---------------------------------------	----------

## 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 the maintenance of plastic buoys 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 maintenance of plastic buoys. 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](mailto:academy@iala-aism.org)  
Internet: [www.iala-aism.org](http://www.iala-aism.org)

## PART 1 - COURSE OVERVIEW

### 1. SCOPE

This course is intended to provide technicians with the practical and theoretical training necessary to have a satisfactory understanding of the maintenance of plastic buoys.

This introductory course is intended to be supported by further training modules on theoretical and practical aspects of floating aids to navigation. 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 maintain plastic buoys whilst on the job within their organisations.

### 3. COURSE OUTLINE

This practical course is intended to cover the knowledge required for a technician to maintain plastic buoys under supervision. The complete course comprises 5 classroom modules, each of which deals with a specific subject covering aspects of plastic buoy maintenance. Module 6 comprises a site visit designed to consolidate theoretical and practical 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
Health and Safety	1	This module identifies the health and safety issues associated with plastic buoy maintenance
Types of plastic Buoys	0.5	This module describes the types of plastic buoys in common use
Afloat Maintenance	1	This module describes maintenance that can be carried out whilst buoy is on station
Ashore Maintenance – Dismantling/Rebuild	2	This module describes the dismantling and rebuild of the buoy in the shore facility
Standards	0.5	This module describes the international and local standards pertinent to plastic buoys
Site visit	4	To visit a buoy refurbishment facility to consolidate knowledge learned
<b>Total Hours:</b>	<b>9</b>	2 day course

### 5. SPECIFIC COURSE RELATED TEACHING AIDS

This course involves both classroom instruction and a visit to a buoy refurbishment facility. Classrooms should be equipped with blackboards, whiteboards, and overhead projectors to enable presentation of the subject matter.

## 6. ACRONYMS

---

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

AtoN	Aid(s) to Navigation
GRP	Glass Reinforced Plastic
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
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 (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 MBS.
- 3 Technical documentation from coating suppliers.
- 4 IALA Guideline 1006 on Plastic Buoys.

## PART 2 – TEACHING MODULES

### 1. MODULE 1 – HEALTH AND SAFETY

---

#### 1.1. SCOPE

---

This module describes the health and safety issues associated with plastic buoy maintenance.

#### 1.2. LEARNING OBJECTIVE

To gain a **satisfactory** understanding of the health and safety issues associated with the maintenance of plastic buoys.

#### 1.3. SYLLABUS

---

##### 1.3.1. LESSON 1 - HEALTH AND SAFETY

- 1 Personal Protective Equipment.
- 2 Use of mobile crane.
- 3 Control of heavy items being moved – buoy tipping and rolling.
- 4 Fork lift trucks.
- 5 High pressure water jet.
- 6 Working at heights.
- 7 General hand tools.

### 2. MODULE 2 – TYPES OF PLASTIC BUOYS

---

#### 2.1. SCOPE

---

This module describes the types of plastic buoys in common use.

#### 2.2. LEARNING OBJECTIVE

---

To gain a **satisfactory** understanding of plastic buoys in common use.

#### 2.3. SYLLABUS

---

##### 2.3.1. LESSON 1 - TYPES OF PLASTIC BUOYS

- 1 Polyethylene buoys.
- 2 Glass Reinforced Plastic (GRP) buoys.
- 3 Polyurethane / elastomer coated foam buoys.
- 4 Composite assemblies.
- 5 Ballast weights.

### 3. MODULE 3 – AFLOAT MAINTENANCE

---

#### 3.1. SCOPE

---

This module describes how plastic buoys can be maintained afloat.



## 3.2. LEARNING OBJECTIVE

---

To gain a **satisfactory** understanding of how plastic buoys can be maintained afloat.

## 3.3. SYLLABUS

---

### 3.3.1. LESSON 1 - INSPECTION

- 1 Review of cleaning – high pressure water/mechanical (scrapers).
- 2 Surface/colour/coating condition.
- 3 Mooring eye wear.
- 4 Damage inspection.

### 3.3.2. LESSON 2 – MAINTENANCE

- 1 Localised painting.
- 2 Review of marine growth and guano removal.
- 3 Mooring eye wear build up or mooring eye replacement.
- 4 Surface colour fading.

## 4. MODULE 4 – ASHORE MAINTENANCE – DISMANTLING AND REBUILD

---

### 4.1. SCOPE

---

This module describes the maintenance of plastic buoys at a maintenance facility ashore.

### 4.2. LEARNING OBJECTIVE

---

To gain a **satisfactory** understanding of the maintenance of plastic buoys at a shore facility.

## 4.3. SYLLABUS

---

### 4.3.1. LESSON 1 - DISMANTLING

- 1 Marine growth removal.
- 2 Tail tube/ballast dismantling.
- 3 Superstructure removal and dismantling.
- 4 Mooring eye – inspection and repair.
- 5 Modular float attachment – inspection.
- 6 Lifting eye testing.

### 4.3.2. LESSON 2 - STEEL PROTECTION

- 1 Galvanising/zinc spray.
- 2 Anode protection.

### 4.3.3. LESSON 3 - REASSEMBLY

- 1 Superstructure assembly.
- 2 Superstructure attachment.
- 3 Modular float attachment.
- 4 Technical equipment attachment.

5 Mooring line attachment.

#### 4.3.4. LESSON 4 - INSPECTION

1 Final inspection prior to deployment:

a Mooring and/or lifting eye testing.

#### 4.3.5. LESSON 5 - END OF LIFE DISPOSAL

1 Disposal plan for end of life.

## 5. MODULE 5 – STANDARDS

---

### 5.1. SCOPE

---

This module describes the standards pertinent to plastic buoys.

### 5.2. LEARNING OBJECTIVE

---

To gain a **satisfactory** understanding of the standards pertinent to the maintenance of plastic buoys.

### 5.3. SYLLABUS

---

#### 5.3.1. LESSON 1 - STANDARDS

1 IALA Recommendation E-108 on Surface Colours used as Visual Signals on Aids to Navigation.

2 IALA Guideline 1006 on Plastic Buoys.

3 Local standards.

4 Local standard operating procedures.

5 Local waste management standards for disposal.

## 6. MODULE 6 – SITE VISIT

---

### 6.1. SCOPE

---

To visit a shore buoy maintenance facility.

### 6.2. LEARNING OBJECTIVE

---

To consolidate knowledge learned from this course.

### 6.3. SYLLABUS

---

Visit to a buoy maintenance facility or buoy tender to view the maintenance of plastic buoys in operation.