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| IALA Model Course |

C2000

AIDS TO NAVIGATION - Technician Training

overview of model courses

Edition 3.1

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 |
| December 2013 | 13-21/PART 2 | Completed detailed training syllabus for all Level 2 Technician model courses |
| June 2016 | Pages 3, 10, 12 & 19 | Minor modifications to ensure compatibility with Recommendation E-141 |
| June 2021 | Entire document | Review of content and changes to model course numbering |
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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.

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

Mindful of the desire to ensure conformance with 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 covering elements of training for AtoN personnel having Level 2 technician responsibilities. It is intended that such courses shall be delivered by an Accredited Training Organisation.

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

The Dean

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1. - COURSE OVERVIEW

# INTRODUCTION

## Purpose of ‘Level 2’ Technician Model Courses

The purpose of this suite of model courses for Level 2 Aids to Navigation (AtoN) technicians is to assist training organisations and their teaching staff in organizing and introducing new training courses, or in enhancing, updating, or supplementing existing training material where the quality and effectiveness of the training courses may thereby be improved.

This overview document expands on the recommended syllabus for Level 2 AtoN technicians set out in Appendix 1 to IALA Recommendation R0141. Each subject module is sub-divided into elements and sub-elements. Individual model courses covering specific elements and/or sub-elements will be issued periodically by the IALA World-Wide Academy (the Academy).

It is not the intention of these model courses to present instructors with a rigid teaching package that they are expected to follow blindly. For teaching purposes, the subjects may be grouped and re-arranged where that is considered an advantage. The knowledge, skills and dedication of the instructor are key components in the transfer of knowledge and skills to those being trained through this model course.

## Purpose of the Model Course

Successful completion of some or all of the Level 2 model courses for AtoN technicians preferably should be considered as the minimum competency level for personnel tasked with conducting the installation, servicing, maintenance or replacement of AtoN and their components. Subsequent career development training is encouraged so that it forms part of the process towards the management of AtoN for candidates with the necessary potential and drive.

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. Example levels of competence are listed in Table 1 below.

The level of competence required from an AtoN technician is shown for each element and sub-element of each Module as required. These are graded from level 1 (basic understanding) to level 3 (good understanding).

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 |
| 2 | The conduct of routine tasks unsupervised and some more complex tasks under guidance | A **satisfactory** understanding of theoretical concepts and principles so that they can be applied in practice | Correctly acquired responses have become habitual. Actions can be performed confidently and efficiently |
| 3 | The skilful conduct of many complex and non-routine tasks | A **good** understanding of the subject matter and its interaction with others leading to an analytical distinction between facts and inferences | Complex actions are inherently co-ordinated and performed smoothly, accurately and skilfully |

## Use of the Suite of Model Courses

The complete suite of model courses comprises 11 modules each covering a specific subject or area of knowledge in which AtoN technicians tasked with the application of such knowledge are required to have competence. The full syllabus is set out in part 2. Not all technicians will need to be competent in all subject areas. It will be for the competent authority or AtoN service provider to determine which technicians require to take which modules. A certificate of competence will be issued to candidates on the successful completion of each module or element[[1]](#footnote-2).

Each module is sub-divided into a number of subject elements. These elements are intended to cover the appropriate degree of knowledge and practical competence required for a technician to properly install; service; maintain or replace specific components of AtoN used on both fixed and floating aids. Each specific model course begins by stating its scope and aims, and then provides a detailed teaching syllabus based on that shown in part 2. The syllabus takes account of appropriate IALA recommendations and guidelines, which are listed as references in each model course.

## Presentation and Lesson Plans

The majority of these model courses are practical and job-centred. They are designed to provide participants with a realistic, hands-on educational experience. The modular presentation enables the instructor to adjust the course content to suit the trainee intake and provide any revisions to the learning objectives as required. Where no adjustment has been found necessary in the learning objectives, the lesson plans may simply consist of the syllabus with keywords or other reminders added to assist the instructor in making his or her presentation of the material.

The detailed teaching syllabus for each individual module or element is laid out in a learning-objective format in which the objective for each sub-element describes what each participant must achieve to demonstrate that the necessary level of knowledge has been acquired. The learning-objective format assumes that the objective for each sub-element or lesson in each specific model course is preceded by the phrase:

*The expected learning outcome is that the participant [trainee] has acquired the recommended level of competence in ……………………………*

IALA publications, including other model courses issued by the Academy, are written in English as the standard international language. However, it is recognised that many technicians will work in their native language. It is anticipated that accredited training organisations and institutes will adopt the most appropriate language for the instruction of participants.

## Assessment of Participant Progress

‘*The award of AtoN qualifications should be based on the principle that satisfactory results are obtained during the basic training course’*[[2]](#footnote-3). Participants should be assessed on their understanding of the material and their ability to carry out the tasks associated with each sub-element or lesson of each model course. Additional guidance is provided in part 1section 5.

## Implementation

Thorough preparation is the key to successful implementation of the courses. For the courses to run smoothly and effectively, considerable attention must be paid to the availability and use of:

* qualified instructors;[[3]](#footnote-4)
* support staff;
* rooms and other spaces;
* training equipment;
* practical training sites ashore;
* buoy tenders or other AtoN service craft;
* safety equipment;
* reference material.

## Validation

The information contained in this document has been validated on behalf of the Academy by a group of subject matter experts drawn from the IALA membership. Validation in the context of this document means that the group has found no grounds to object to its contents.

# COURSE FRAMEWORK

## Scope

This suite of courses is intended to provide technicians with the practical training necessary to become efficient and competent in specific aspects of installation; servicing; maintenance or replacement of AtoN and their associated components.

## Objective

Upon successful completion of each of these courses, participants will have acquired sufficient knowledge and skill to install; service; maintain or replace specific AtoN components on the job within their organizations.

## Entry Standard

The competent authority may prescribe minimum standards for education or work experience for prospective participants to enter these courses. In preparing each of these courses, it has been assumed that participants would have the minimum physical ability and educational background necessary to carry out successfully the function of installing; servicing; maintaining or replacing AtoN and their components.

It is anticipated that the minimum entry standard will include a basic technical education and a basic health and safety at work pre-qualification.

## Requirements for Certification

Every candidate for certification should:

* be not less than 18 years of age;
* satisfy the competent authority that they possess the theoretical and practical knowledge necessary to carry out the responsibility of installing; servicing; maintaining or replacing AtoN and their components.

## Course Intake Limitations

Class sizes may be limited at the discretion of the competent authority in order to allow the instructor to give adequate attention to individual trainees. In general, it is recommended that a maximum of 10 participants be the upper limit that a single instructor can be expected to train satisfactorily to the level of competence required.

## Training Staff Requirements

All instructors, supervisors and assessors should be appropriately qualified in the subject matter covered by these courses. It is expected that some training staff may hold an IALA AtoN Level 1 Managers Certificate. In addition to technical expertise in the subject matter, approved training programmes should ensure that all members of the teaching staff have appropriate training in instructional techniques and assessment methods. As well as instructors, supervisors, and assessors, additional staff may be required for the maintenance of equipment and the preparation of materials, supplies, and work areas.

## Teaching Facilities and Equipment

This suite of courses involves both classroom instruction and practical visits to work areas at sea or on land. Theoretical courses conducted in classrooms should be supported with appropriate teaching aids to enable presentation of the subject matter. An alternative to classroom instruction would be to provide the lecture material to students at a distance via the Internet or other electronic means (i.e. ‘e-learning’). In that case, students would need access to computers and related equipment, and should be provided with a means of interacting with instructors for discussion and to answer questions.

Practical instruction in the field will require the identification of suitable shore-based training sites, such as an operational lighthouse or beacon. Sea experience for practical instruction in buoy work will require the use of a suitable buoy tender or other AtoN service craft. Pre-booking of these facilities will be required to avoid conflict with planned operations.

## Teaching Aids and References

Participants should have access to the types of equipment that they will be expected to work with on the job. Each model course will specify which teaching aids might be most appropriate to the course of instruction.

In addition to any specific reference required by the competent authority, each model course will list those IALA recommendations, guidelines or NAVGUIDE references relevant to that course.

# OUTLINE OF MODEL COURSES

The complete suite of Level 2 model courses comprises 11 modules, sub-divided into topic elements. These are listed in the syllabus for all courses shown in part 2. The elements of each model course are broken down into teaching modules. These should provide the course outline for a specific topic which specifies a recommended number of minimum of theoretical or practical lessons required for developing that Level 2 course. However, the lesson content can be adapted or expanded to meet the specific requirements of each Competent Authority.

Each model course will propose the recommended duration for lessons and site visits; an assessment of competency and the total time to complete the whole course. An example format for each model course is shown in Table 2 below. The actual content will be decided by each competent authority.

1. Example Course Outline

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Module | Element | Subject | Duration (hours) | Description and Remarks |
| 1 |  | Introduction to AtoN |  | |
|  | 1.1 | IALA and the NAVGUIDE | 5 | Function of AtoN |
| 1.2 | The IALA Maritime Buoyage System | Categories and types |
| 1.3 | Introduction to buoys and the light sources fitted to them | 8 | Types of marine lantern |
| 1.4 | Introduction to other AtoN fitted to buoys | Types of other AtoN |
| 1.5 | Buoy handling and safe working practices | 6 | Includes First Aid |
| 1.6 | Buoy deployment and retrieval | 6 | Methods of recovery |
| 1.7 | Buoy moorings | 7 | Mooring design/servicing |
| 1.8 | Buoy cleaning | 11.5 | Includes practical task |
| 1.9 | Introduction to buoy positioning | 4 | Positions at sea |
| 1.10 | Maintenance of plastic buoys | 9 | Repair and maintenance |
| 1.11 | Maintenance of steel buoys | 11 | Coatings; maintenance |
| 1.12 | Introduction to power sources on buoys | 10.5 | Power components |
|  |  |  |  |
| 1.13 | Introduction to shore marks | 5 | Types of shore AtoN |
|  | Visit to buoy maintenance facility | 2 | View components |
|  | Sea experience in buoy tender | 8 | Practical tasks |
|  | Assessments | 12 | Short written exams |
| **Total Instruction Hours (**Days**)** | | **105** | 15 day course |

# GUIDELINES FOR INSTRUCTORS

## Introduction

The common aim of the suite of Level 2 model courses for AtoN technicians is to enable participants to return to their jobs competent to install, service, maintain or replace marine AtoN and their components. This should be conducted in a safe and efficient manner that protects the individual whilst enhancing navigational safety and preserving the marine environment. Instructors should be thoroughly acquainted with both national and international regulations concerning these issues and emphasise these aspects during instruction whenever they arise. Particular emphasis should therefore be placed on proper safety procedures throughout the training process, reinforced in particular by the instructor's personal example.

Technological advances and threats to safe navigation are generating changes and strategies to existing equipment and practices. It is essential that both instructors and assessors keep abreast of new technologies and regulations and amend or update lesson plans as necessary to reflect changes and to add new sub-elements to the detailed teaching syllabus when appropriate.

## Curriculum

The levels of competence shown in Table 1 explain what a successful participant should be capable of doing in the workplace on the completion of each of the model courses. The objective of each lesson or lecture is to ensure that each participant acquires the required level of understanding in each sub-element so that the required learning outcome can be achieved.

Although the learning objectives are set out in the suite of Level 2 model courses in a certain order, instructors are not obliged to teach them in this order. Instead, instructors should treat them in the order which they consider to be the most effective for their participants and circumstances.

Sub-elements have been grouped into lessons or lectures. The recommended duration in hours for each lecture is intended to be used as an approximate guideline for planning purposes. The hours should be adjusted as necessary to suit local circumstances or based on experience with similar courses. Each training organisation will determine the optimum lecture length; the sub-elements, topics or sub-topics it covers and over what period lectures will be delivered. This will depend on whether participants and instructors are available full time or whether work duties and other conflicting activities require lectures to be delivered in groups over an extended period.

It is also quite usual for different trainees to require different lengths of time to cover the same work. Flexibility should be built into each course to allow for adjustments during its running. It is recommended that no more than five one hour lectures are held in any one working day to allow for this flexibility and private study.

The instructor should also make an allowance for external site visits and, if appropriate, sea-time. Using the time estimates, modified as appropriate, a timetable should be drawn up to suit the normal working day and terms of the training institute. At the conclusion of the course, a discussion should be held to determine whether changes should be made to improve future courses.

## Practical Training

As noted throughout this course overview, the intent is for students to have a realistic, hands-on educational experience. Many of the sub-elements, topics and sub-topics in this course lend themselves to practical training exercises in which participants would be expected to work directly with specific equipment and its associated components. Classroom instruction should be backed up, where appropriate, by practical training in the field; either ashore or afloat.

# ASSESSMENT

To evaluate trainee progress, regular assessments must be undertaken. The nature of these assessments and the evaluation criteria used will depend on the needs of the competent authority, the style of training used, and the requirements of the training organisation.

The assessment of competency should generally be evaluated by short but formally conducted short written tests. Questions can either be multiple choice or require short (few-word) answers. The difficulty of each question should be based on the level of competence required from the participant in that subject.

The competent authority will determine the pass mark for each test paper. The guiding principle should be that a participant being considered for the award of an AtoN Level 2 Certificate will be involved actively in AtoN maintenance and servicing and will consolidate his or her basic knowledge though additional on-the-job and career development training. A participant who just fails to meet the pass mark despite active participation in the course may well develop into a satisfactory technician and should be given the opportunity to demonstrate their potential at a formal aural ‘viva’ examination.

The following guidelines are proposed for consideration by competent authorities:

* the standard pass mark in each test is 50% equivalent to a satisfactory (Level 2) degree of understanding;
* participants who fail a competency test by less than 10% will be subject to an aural (‘viva’) examination.
* Participants who fail the competency test by more than 10% or who do not demonstrate a satisfactory competence at a ‘viva’ interview will not be awarded a Level 2 Certificate. Further training may be required and failed participants will be required to re-sit another written competency test at a time to be decided by the Competent Authority

1. – LEVEL 2 TECHNICICAN TEACHING SYLLABII

# MODEL COURSE TEACHING SYLLABUS FOR AtoN LEVEL 2 TECHNICIANS – MODULE 1 – Introduction to AtoN

1. Teaching Syllabus Module 1 – Introduction to Aids to Navigation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Module | Element | Subject | Level of Competence | Model Course | Total Duration (hours) | Total Duration (Days) |
| 1 |  | Introduction to Aids to Navigation |  |  |  |  |
| 1.1 | IALA and the NAVGUIDE | 1 | C2000-1 | 5 | 1 |
| 1.2 | The IALA Maritime Buoyage System | 2 |
| 1.3 | Introduction to buoys and the light sources fitted to them | 1 | C2001-2 | 8 | 2 |
| 1.4 | Introduction to other AtoN fitted to buoys |
| 1.5 | Buoy handling and safe working practices | 3 | C2001-3 | 12 | 2 |
| 1.6 | Buoy deployment and retrieval | 2 |
| 1.7 | Buoy moorings | 2 | C2001-4 | 7 | 1 |
| 1.8 | Buoy cleaning | 3 | C2001-5 | 11.5 | 2 |
| 1.9 | Introduction to buoy positions | 1 | C2001-6 | 4.5 | 1 |
| 1.10 | Maintenance of plastic buoys | 2 | C2001-7 | 9 | 2 |
| 1.11 | Maintenance of steel buoys | 2 | C2001-8 | 11 | 2 |
| 1.12 | Introduction to power sources on buoys | 1 | C2001-9 | 10.5 | 2 |
|  |  |  |  |  |  |
| 1.13 | Introduction to shore marks | 1 | C2001-10 | 6 | 1 |

# MODEL COURSE TEACHING SYLLABUS FOR AtoN LEVEL 2 TECHNICIANS – MODULE 2 – Power Supplies

1. Teaching Syllabus Module 2 – Power Supplies

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Module | Element | Subject | Level of Competence | Model Course | Total Duration (hours) | Total Duration (Days)[[4]](#footnote-5) |
| 2 |  | Power Supplies |  |  |  |  |
|  | 2.1 | DC power systems | 2 | C2002-1 | 15 | 2.5 |
|  | 2.2 | Primary and secondary battery maintenance | 2 | C2002-2 | 8 | 1.5 |
|  | 2.3 | Photovoltaic (Solar panel) systems and maintenance | 2 | C2002-3 | 7.5 | 1.5 |
|  | 2.4 | Wind generators | 2 | C2002-4 | 7 | 1 |
|  | 2.5 | Mains AC power systems | 1 | C2002-5 | 10 | 2 |
|  | 2.6 | Petrol and diesel generators | 2 |
|  | 2.7 | Lightning protection | 2 | C2002-6 | 14 | 3 |

# MODEL COURSE TEACHING SYLLABUS FOR AtoN LEVEL 2 TECHNICIANS – MODULE 3 – Lights and Marine Lanterns

1. Teaching Syllabus Module 3 – Lights and Marine Lanterns

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Module | Element | Subject | Level of Competence | Model Course | Total Duration (hours) | Total Duration (Days) |
| 3 |  | Lights and Marine Lanterns |  |  |  |  |
|  | 3.1 | Introduction to light and range | 1 | C2003-3 | 11 or 15 | 2 or 3 |
|  | 3.2 | Light sources | 2 |
|  | 3.3 | Colour used in marine lanterns | 1 |
|  | 3.4 | Light flashers and characteristics | 2 | C2003-2 | 12 | 2 |
|  | 3.5 | Lamp changers |
|  | 3.6 | Self-contained (integrated power system) marine lanterns |
|  | 3.7 | Rotating beacons | 2 | C2003-3 | 18 | 3 |
|  | 3.8 | Classical lenses |
|  | 3.9 | Maintenance of mercury rotating optics | 1 | C2003-4 | 18 | 3 |
|  | 3.10 | Range, sector and Precision Direction lights | 1 | C2003-5 | 18 | 3 |

# MODEL COURSE TEACHING SYLLABUS FOR AtoN LEVEL 2 TECHNICIANS – MODULE 4 – Sound Signals

1. Teaching Syllabus Module 4 – Sound Signals

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Module | Element | Subject | Level of Competence | Model Course | Total Duration (hours) | Total Duration (Days) |
| 4 |  | Sound Signals |  |  |  |  |
|  | 4.1 | Sound signals (general) | 1 | C2004-1 | 6 | 1 |
|  | 4.2 | Electrical sound signals and fog detectors | 2 |

# MODEL COURSE TEACHING SYLLABUS FOR AtoN LEVEL 2 TECHNICIANS – MODULE 5 – Painting and Coatings

1. Teaching Syllabus Module 5 – Paintings and Coatings

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Module | Element | Subject | Level of Competence | Model Course | Total Duration (hours) | Total Duration (Days) |
| 5 |  | Painting and Coatings |  |  |  |  |
|  | 5.1 | Introduction to coatings and specifications | 2 | C2005-1 | 11 | 2 |
|  | 5.2 | Surface preparation | 3 |

# MODEL COURSE TEACHING SYLLABUS FOR AtoN LEVEL 2 TECHNICIANS – MODULE 6 – AtoN Service Craft and Tenders

1. Teaching Syllabus Module 6 – AtoN service Craft and Buoy Tenders

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Module | Element | Subject | Level of Competence | Model Course | Total Duration (hours) | Total Duration (Days) |
| 6 |  | AtoN Service Craft and Buoy Tenders |  |  |  |  |
|  | 6.1 | Introduction to service craft | 1 | C2006-1 | 2 | 2 |
|  | 6.2 | Sea experience | 2 | 8 |

# MODEL COURSE TEACHING SYLLABUS FOR AtoN LEVEL 2 TECHNICIANS – MODULE 7 – Radar Beacons

1. Teaching Syllabus Module 7 – Radar Beacon

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Module | Element | Subject | Level of Competence | Model Course | Total Duration (hours) | Total Duration (Days) |
| 7 |  | Radar Beacons (Racons) |  |  |  |  |
|  | 7.1 | Introduction to Racons and their configuration | 2 | C2007-1 | 9.5 | 2 |
|  | 7.2 | Testing and quality control |

# MODEL COURSE TEACHING SYLLABUS FOR AtoN LEVEL 2 TECHNICIANS – MODULE 8 – Automatic Identification System

1. Teaching Syllabus Module 8 – Automatic Identification System

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Module | Element | Subject | Level of Competence | Model Course | Total Duration (hours) | Total Duration (Days) |
| 8 |  | Automatic Identification System (AIS) |  |  |  |  |
|  | 8.1 | AIS AtoN Operations | 1 | C2008-1 | 18 | 3 |

# MODEL COURSE TEACHING SYLLABUS FOR AtoN LEVEL 2 TECHNICIANS – MODULE 9 – RADIONAVIGATION/DGNSS

1. Teaching Syllabus Module 9 – Radionavigation and Differential Global Navigation Satellite Systems

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Module | Element | Subject | Level of Competence | Model Course | Total Duration (hours) | Total Duration (Days) |
| 9 |  | Radionavigation and Differential Global Navigation Satellite Systems |  |  |  |  |
|  | 9.1 | Introduction to Radionavigation Systems | 1 | C2009-1 | 8 | 1  or  2 |
|  | 9.2 | Position, Navigation and Timing (PNT) | 1 |
|  | 9.3 | Accuracy, integrity, continuity, availability and vulnerability | 1 |
|  | 9.4 | Applications of GNSS on AtoN | 1 |
|  | 9.5 | Introduction to DGNSS and principles of operation | 1 |
|  | 9.6 | DGNSS receivers; integrity and reference modules | 2 | C2009-1 | 13 | 2 |
|  | 9.7 | DGNSS transmission stations | 2 |
|  | 9.8 | DGNSS operation and maintenance | 2 |
|  | 9.9 | Monitoring of accuracy and signal strength | 2 |

# MODEL COURSE TEACHING SYLLABUS FOR AtoN LEVEL 2 TECHNICIANS – MODULE 10 – Remote Monitoring and Control

1. Teaching Syllabus Module 10 – Remote Monitoring and Control

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Module | Element | Subject | Level of Competence | Model Course | Total Duration (hours) | Total Duration (Days) |
| 10 |  | Remote Monitoring and Control |  |  |  |  |
|  | 10.1 | Principles of remote monitoring | 2 | C2010-1 | 8 | 2 |
|  | 10.2 | Parameters for remote monitoring and alarms | 2 |

# MODEL COURSE TEACHING SYLLABUS FOR AtoN LEVEL 2 TECHNICIANS – MODULE 11 – Structures, Materials and Maintenance

1. Teaching Syllabus Module 11 – Structures, Materials and AtoN Maintenance

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Module | Element | Subject | Level of Competence | Model Course | Total Duration (hours) | Total Duration (Days) |
| 11 |  | Structures, Materials and AtoN Maintenance |  |  |  |  |
|  | 11.1 | Introduction to materials | 2 | C2011-1 | 5.5 | 1 |
|  | 11.2 | Aids to Navigation structures | 1 |
|  | 11.3 | Corrosion of structures | 2 |
|  | 11.4 | Cathodic Protection | 3 |
|  | 11.5 | Weathering of stone and concrete | 1 |
|  | 11.6 | Preservation of structures | 2 | C2011-2 | 16 | 2 or 3 |
|  | 11.7 | Maintenance planning and records | 3 | C2011-3 | 6 | 1 |

1. The recommended format is shown at Appendix 3 to IALA Recommendation R0141 [↑](#footnote-ref-2)
2. IALA Recommendation R0141Article 4.1 [↑](#footnote-ref-3)
3. ‘Competent Authorities should ensure that instructors and assessors are appropriately qualified and experienced for the particular training and assessment of competence for which they are given responsibility. Instructors should hold suitable professional and academic qualifications’. IALA Recommendation R0141 Article 5.1.2 [↑](#footnote-ref-4)
4. Includes time for site visits if appropriate and tests [↑](#footnote-ref-5)