

MODEL COURSE

L2.10.1 & 2

MARINE AIDS TO NAVIGATION - TECHNICIAN
TRAINING

LEVEL 2 MODULE 2 ELEMENTS 10.1 & 10.2

INTRODUCTION TO REMOTE MONITORING OF
AtoN

Edition 2.0

December 2017



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DRAFT



FOREWORD

The International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) recognises 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.

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 R0141 - 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 Level 2 technician functions. This model course on introduction to remote monitoring of AtoN 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 remote monitoring of AtoN. Assistance in implementing this and other model courses may be obtained from the IALA World-Wide Academy at the following address:

The Dean
IALA World-Wide Academy
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 principles of remote monitoring of AtoN. This introductory course is intended to be supported by further training modules on AtoN, their components and Automatic Identification Systems. 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 principles of remote monitoring of AtoN within their organisations.

3. COURSE OUTLINE

This course is intended to cover the knowledge required for a technician to understand the principles of operation of remote monitoring of AtoN. The complete course comprises 4 classroom modules and one practical module, each of which deals with a specific subject covering aspects of Remote Monitoring of AtoN. 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 |
|----------------------------|---------------|---|
| Monitoring overview | 2.0 | This module describes an overview of how AtoN can be monitored remotely |
| Methods of monitoring | 2.0 | This module describes the technologies in common use for monitoring AtoN |
| Problems and fault finding | 1.0 | This module describes typical problems found on monitoring systems |
| Practical | 2.0 | This module describes how to gain practical experience of remote monitoring |
| Evaluation | 1.0 | Written test |
| Total Hours | 8.0 | Two-day course |

5. SPECIFIC COURSE RELATED TEACHING AIDS

This course involves classroom instruction only. Classrooms should be equipped with blackboards, whiteboards, and overhead projectors to enable presentation of the subject matter.

Examples of remote monitoring of equipment and programming units / PCs should be to hand to enable the student to gain practical application and programming skills during the course.



6. ACRONYMS

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

| | |
|--------------|---|
| AtoN | Marine Aid(s) to Navigation |
| IALA | International Association of Marine Aids to Navigation and Lighthouse Authorities |
| L | Level |
| 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 Guideline G1008 on Remote Monitoring and Control of Marine Aids to Navigation.
- 2 IALA NAVGUIDE.



PART 2 – TEACHING MODULES

1. MODULE 1 – MONITORING OVERVIEW

1.1. SCOPE

This module describes an overview of how AtoN can be monitored remotely.

1.2. LEARNING OBJECTIVE

To gain a **satisfactory** understanding of why monitoring is used and what can be monitored.

1.3. SYLLABUS

1.3.1. LESSON 1 – ADVANTAGES OF MONITORING

- 1 Verification of AtoN status.
- 2 Prediction of faults to aid repairs.

1.3.2. LESSON 2 – DISADVANTAGES OF MONITORING

- 1 Added cost of installation.
- 2 Potential running costs.
- 3 System complexity.
- 4 False alarms prompting wasted visits.

1.3.3. LESSON 3 - PARAMETERS THAT CAN BE MONITORED

- 1 Light on/off.
- 2 Racon healthy.
- 3 Position within guard ring.
- 4 Battery voltage.
- 5 AIS operational.
- 6 Operation of other AtoN.
- 7 Other.

1.3.4. LESSON 4- ALARM POINTS - OPTIONAL

- 1 Light off when it should be on.
- 2 Light on when it should be off.
- 3 Low battery voltage.
- 4 AtoN failed.
- 5 Out of position.

2. MODULE 2 – METHODS OF MONITORING

2.1. SCOPE

This module describes the technologies in common use for monitoring AtoN.



2.2. LEARNING OBJECTIVE

To gain a **basic** understanding of the technologies available and in common use for monitoring AtoN.

2.3. SYLLABUS

2.3.1. LESSON 1 – DATA TRANSFER FROM ATO N TO USER INTERFACE

- 1 Direct land telephone line.
- 2 GSM mobile phone signal from modem.
- 3 Satellite data connection.
- 4 VHF link to private shore network.
- 5 VHF link to public shore network.
- 6 VHF point to point.
- 7 AIS message 6 into base station network.
- 8 AtoN supplier's satellite link into web based terminal.
- 9 Other.

2.3.2. LESSON 2 - USER INTERFACE

- 1 Graphical User Interface.
- 2 Presentation of data.
- 3 Data trends and historical logs.
- 4 Web based AtoN supplier's network.

2.3.3. LESSON 3 – REMOTE CONTROL

- 1 Advantages of remote control.
- 2 Disadvantages of remote control.
- 3 What to control.
- 4 Security and access levels.

3. MODULE 3 – PROBLEMS AND FAULT FINDING

3.1. SCOPE

This module describes typical problems encountered with monitoring systems.

3.2. LEARNING OBJECTIVE

To gain a **satisfactory** understanding of the types of problems found with AtoN monitoring systems.

3.3. SYLLABUS

3.3.1. LESSON 1 – PROBLEMS

- 1 Out of range.
- 2 Failed network ashore.
- 3 Failed transmission from AtoN to Modem.
- 4 Component failures:



- a Aerials.
 - b Modems.
 - c Controllers.
- 5 Multiple calling.
 - 6 Incorrect calibration.
 - 7 Security and access levels.

4. MODULE 4 – PRACTICAL

4.1. SCOPE

This module describes how to gain practical experience of remote monitoring.

4.2. LEARNING OBJECTIVE

To gain a **satisfactory** understanding of how to interrogate, control and recognise the monitoring technologies used in the Competent Authority's AtoN.

4.3. SYLLABUS

4.3.1. LESSON 1 – PRACTICAL

- 1 Practical operation of monitoring systems employed.

5. ASSESSMENT

Participants will be assessed on their competency at the end of Module 4.