***AISM***Association Internationale de Signalisation Maritime ***IALA***

International Association of Marine Aids to Navigation and Lighthouse Authorities

**IALA Model Course E-101/2**

**On**

**Senior Management Training**

**Edition 1**

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Document Revisions

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

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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 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 personnel in charge of AtoN services, IALA has adopted Recommendation E-141 on Standards for Training and Certification of AtoN personnel.

Mindful of the desire to ensure conformance with Recommendation E-141, IALA has developed Guidelines for the Accreditation of AtoN training to be conducted by an Accredited Training Organisation approved by a Competent Authority[[1]](#footnote-1). These include accreditation for a model training course for AtoN personnel having Level 1 managerial functions (Model Course E-101/1) and for personnel responsible for Vessel Traffic Services (Model Courses V-103/1 – 4).

IALA also noted that senior managers responsible for AtoN service provision and their counterparts within the Competent Authority would benefit from more detailed guidance on the implementation of international recommendations and guidelines for the benefit of all mariners and the preservation of the marine environment. Designated Model Course Level 1+ (E-101/2) is intended to provide specific guidance on the training of those senior personnel. Assistance in implementing this and other model courses may be obtained through IALA at the following address:

The Secretary General

IALA Tel: (+) 33 34 51 70 01

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Saint Germain-en-Laye e-mail: [iala-aism@wanadoo.fr](mailto:iala-aism@wanadoo.fr)

France internet: [www.iala-aism.org](http://www.iala-aism.org)

**PART A – COURSE OVERVIEW**

**1 OVERVIEW**

IALA recommends that Training Organisations and other training providers utilise model courses concerned with the provision of AtoN services, including VTS, in accordance with IALA Recommendation E-141 and Guideline #### - Accreditation of AtoN Training [to incorporate Guideline 1014 when published].

1. **PURPOSE OF THE MODEL COURSE**

The purpose of this model course is to provide maritime training organisations and their teaching staff with structured guidance on the delivery of training for senior management concerned with the delivery of AtoN service provision and their counterparts in the Competent Authority who have international responsibility for the provision of such services.

Knowledge, skills and dedication of model course instructors are the key elements enabling those being trained (the **participants**) to acquire the necessary level of **competence**; that is the ability to perform defined tasks or duties effectively. It is not however the intention of this model course programme to restrict instructors in the manner in which they deliver their lectures, particularly as the cultural backgrounds of the participants may vary considerably from country to country.

1. **USE OF THE MODEL COURSE**

The complete course comprises four modules. Each module covers a specific subject or area of knowledge in which senior management responsible for AtoN delivery are required to have competence. In common with Model Course E-101/1, each module is based on a subject framework which states its scope, aims and levels of competency to be acquired. The main subject in each module is sub-divided into subject elements and sub-elements. The sub-elements form the detailed syllabus which takes account of IALA Recommendations and Guidelines and information contained in the NAVGUIDE Manual and other relevant publications.

To use the model course, a Training Organisation is advised to adopt a Training Management System which analyses the detailed syllabus and determines the entry standard for participants undertaking the training[[2]](#footnote-2). It is assumed that senior managers within an AtoN organisation will already hold IALA Level 1 Certificates of Competency and a detailed knowledge of the IALA NAVGUIDE Manual. However some personnel within Competent Authorities may have a less detailed knowledge of some aspects of AtoN service provision. Training Organisations are advised to make provision for such an eventuality by, for example, providing a pre-course recommended reading list and planning additional time for questions and tutorials.

Because the majority of IALA publications are written in English [or French], it is recommended that this model course be taught primarily using the English [or French] language[s]. Explanations and clarifications can be presented in regional languages if required with additional time allocated during lesson planning.

**PART B – DELIVERY OF THE MODEL COURSE**

**1 INTRODUCTION**

The training and assessment of participants seeking accreditation as a senior AtoN manager[[3]](#footnote-3) through the award of an IALA AtoN Level 1+ Certificate by an Accredited Training Organisation should be:

* Structured in accordance with written programmes, including those methods and means of delivery (such as Microsoft PowerPoint®), procedures and course material as are necessary to achieve the prescribed standard of competency; and:
* Conducted, monitored, assessed and supported by persons qualified in accordance with Part C; section 4 of this document – Training Staff requirements.

Training staff are recommended to review initially the course outline and detailed syllabus for each main subject heading. A training needs analysis process should then be conducted for each participant based on academic qualifications; skills and competencies acquired prior to the model course and other relevant experience. This should lead to the identification of where additional foundation training (including language training) may be required. Potential participants without an appropriate level of previous experience might be recommended to attend one or more modules of the Level 1 Model Course before being reconsidered for the Level 1+ Course.

Successful completion of this intensive model course leading to the award of an IALA AtoN Level 1+ Certificate preferably should be considered as the minimum competency level for personnel with senior management responsibilities for AtoN service provision or supervision of such a service.

**2 COURSE MODULES**

A modular system enables the Training Organisation to tailor each course to match the results of the training needs analysis. Having determined what needs to be taught to whom, instructors would produce lesson plans which match the detailed syllabus for each module. Sub-elements for which competency has already been demonstrated through, for example, documented Accredited Prior Learning (APL), can be deleted in exceptional circumstances. However lesson plans shown in Part E of this document assume that all participants will receive instruction in all sub-elements of the complete syllabus. IALA reference publications that the instructor may wish to use are listed under each modular subject element. National Training Organisations can add local publications and training aids as appropriate.

The level of competence required from a senior AtoN manager is shown for each element or sub-element as required. These are graded from level 3 (good understanding) to level 5 (comprehensive understanding). Details are at Table 1 below[[4]](#footnote-4).

**3 SUBJECT OUTLINE**

A subject outline for each module is shown in tabular form in Part E of this document. This lists the minimum recommended level of competence for each subject element or sub-element. Sub-elements have been grouped so that training covering them might reasonably be delivered in a 40 minute lecture, assuming a standard entry level based on training needs analysis and a common standard of language comprehension for all participants.

A standard 40 minute lecture has been selected so that a 20 minute interval can be allocated between lectures. This should permit instructors (having reviewed the training objectives of each element and the particular needs of participants) to adjust timing to match local circumstances.

**Table 1 – Levels of Competence for Level 1+ Senior Managers**

|  |  |  |  |
| --- | --- | --- | --- |
| **Level** | **Learning Outcome** | **Instructional Objectives** | **Required skills** |
| 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 |
| 4 | The professional conduct of unsupervised technical and managerial tasks | A **detailed** understanding of facts, theories and practical applications which enables problem solving and prioritisation | Acquired skills are developed to the extent that rapid reaction and adaptation to unforeseen situations is second nature |
| 5 | The confident application of complex techniques across a wide and often unpredictable variety of contexts | A **comprehensive** understanding of both national and international legislation, recommendations and guidelines appertaining to the delivery of AtoN services | Recognised external standards of excellence are applied faultlessly in a developing legislative and technical environment |

1. **DETAILED TEACHING SYLLABUS**

The detailed teaching syllabus for each module 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 is preceded by the phrase:

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

1. **PRESENTATION**

The manner and frequency of the presentation of facts, concepts and methodologies will be determined by individual instructors who will use what they see as the most appropriate teaching method to ensure that each participant has acquired the required level of competency in each sub-element of the syllabus.

1. **EVALUATION OR ASSESSMENT OF THE COURSE PARTICIPANTS**

IALA Recommendation E-141 Article 4.1 states that theaward of AtoN qualifications should be based on the achievement of satisfactory results obtained during training courses.The Level 1+ Model Course for senior AtoN Managers is principally theoretical supported by some practical tasks. It is recommended therefore that the competency of each participant is evaluated or assessed by a formal written test taken by participants at the end of the course. Further recommendations are at Part D paragraph 3.

1. **IMPLEMENTATION**

It is self-evident that planning and preparation are essential to the successful implementation of this model course. In order to ensure that participants receive high quality instruction, Training Organisations will ensure that the following minimum assets are available before the course commences:

* Qualified Instructors[[5]](#footnote-5)
* Support staff and facilities
* Instruction and rest rooms
* Training aids and equipment[[6]](#footnote-6)
* Reference books; publications or extracts and other reference material[[7]](#footnote-7)
* Navigational charts and nautical publications

1. **VALIDATION**

The information contained in this document has been based on Recommendation E-141 – Standards for Training and Certification of AtoN Personnel amplified by information provided by the Dean of the IALA World Wide Academy. It has been prepared by a Consultant kindly sponsored by the International Foundation for Aids to Navigation (IFAN) and validated by the appropriate IALA Working Group on behalf of the Secretary General.

**PART C – COURSE FRAMEWORK**

**1 INTRODUCTION**

The syllabus for this model course is based on selected key subject elements at Appendix 1 to IALA Recommendation E-141. Having demonstrated the required level of competence by passing the modular examinations set by the Accredited Training Organisation, participants will be awarded an IALA AtoN Level 1+ Certificate. This will permit them to operate as a senior manager with an AtoN service provider approved by the Competent Authority or as a senior director within such an Authority.

**2 ENTRY LEVEL REQUIREMENTS FOR A LEVEL 1+ SENIOR MANAGER**

This model course is designed principally for managers with experience in AtoN service provision or the Competent Authority that has responsibility for providing such a service. The Accredited Training Organisation (which is in turn responsible to the Competent Authority) must determine minimum entry requirements for AtoN Level 1+ senior manager training. The following list provides guidance on criteria for selection of participants:

* Demonstrable competence in English or other approved main language of instruction
* Be in possession of an IALA AtoN Level 1 Certificate and at least 3 years’ management experience following the award of such a certificate
* Hold a middle or senior management appointment in a recognised AtoN service provider with at least six years’ experience in such an organisation[[8]](#footnote-8)
* Hold a senior director-level appointment in the maritime affairs department of the Competent Authority[[9]](#footnote-9)

**3 COURSE INTAKE – LIMITATIONS**

The Accredited Training Organisation will determine the maximum number of participants that can reasonably acquire the necessary competence during a specific course of instruction. It is expected that one lead instructor should be able to transfer a satisfactory level of understanding to a maximum of 8 participants during a series of 40 minute lectures.

1. **TRAINING STAFF REQUIREMENTS**

Accredited Training Organisations will be accountable to the Competent Authority for ensuring that the instructors and course supervisors tasked with the conduct of this model course, and any supporting staff, are appropriately qualified and subject to review by approved Quality Management System procedures. The key factor is that both instructors and supervisors should have an appropriate balance of professional and teaching competencies. The following list provides guidance on criteria for approved training staff:

* 1. **Course Instructors**
* Fluency in English or other approved main language of instruction
* Be in possession of an IALA AtoN Level 1+ Senior Manager’s Certificate and at least 6 years’ management experience in AtoN service provision
* At least 5 years’ work experience with a recognised AtoN service provider or other maritime safety organisation in a senior management or consultancy capacity
* An accredited IMO auditor with at least 5 years’ experience
* Proven professional or technical expertise in a specialist field related to syllabus elements or sub-elements (for example Law of the Sea or Traffic Monitoring)
  1. **Course Supervisors**
* At least 3 years’ experience as an approved IALA AtoN Level 1 trainer
* Be in possession of an IALA AtoN Level 1+ Senior Manager Certificate
* Chair of an IALA Technical Committee
* Persons approved by the Dean of the IALA World Wide Academy[[10]](#footnote-10)

1. **TEACHING FACILITIES AND EQUIPMENT**

It is assumed that standard lecturing equipment such as white boards and computer-assisted projectors will be provided. Additional teaching aids and equipment which might be appropriate to specific lectures are listed in the detailed teaching syllabus for each module.

References to specific paragraphs or sections in the IALA NAVGUIDE or other Manuals, Recommendations, Guidelines or Conventions are shown in the detailed teaching syllabus.

**Part D – GUIDELINES FOR INSTRUCTORS**

1. **INTRODUCTION**

Senior managers in AtoN service providers and directors in Competent Authorities are responsible for providing an appropriate quantity and quality of aids to navigation services which meet or exceed the obligations set out in the SOLAS Convention, Chapter 5, Regulation 13 and other mandatory instruments issued by the International Maritime Organisation.

*The recruitment, selection and training of suitable personnel are pre-requisite to the provision of professionally qualified personnel capable of contributing to safe and efficient AtoN operations….. to ensure that uniform standards of procedures, practices and professional standards are applied world-wide[[11]](#footnote-11)*.

The role of the instructor in this process is vital, particularly as the safety of seafarers and preservation of the marine and coastal environments are at risk if international obligations are not followed; uniform standards are neglected or procedures are not fully understood and applied. All sub-elements of this model course are concerned with safety, navigation risk and preservation of the environment. Instructors should be thoroughly acquainted with both National and International regulations concerning these issues and emphasise these aspects during instruction whenever they arise.

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

1. **CURRICULUM**

The curriculum for this model course is based on the four of the five broad module subject headings and sub-headings listed at Appendix 1 to IALA Recommendation E-141. In Part E of this document, each main module has been broken down into non-prioritised subject elements and sub-elements which show the level of knowledge that the instructor must impart to the course participants in order for them to achieve the specified level of competence.

The levels of competence shown in Table 1 above explain what a successful participant should be capable of doing in the workplace on the completion of the model course. The objective of each 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.

Sub-elements have been grouped into lectures capable of being delivered in 40 minutes under normal circumstances. Each Training Organisation will determine the optimum lecture length; the sub-elements it covers and over what period lectures will be delivered. However given the generally detailed level of understanding required from participants, it is recommended that the whole course be conducted with participants attending full time rather than extending it over a longer period with part-time attendance.

An example of course planning is shown in Table 2 below. This assumes that the syllabus can be covered in three full days comprising 15 forty-minute lectures (each followed by a 20 minute break); a 2 hour workshop and a final examination. Given that participants will be senior managers, the pace of this course is intentionally intensive. Participants will be expected to allocate time for private study of particular IALA publications. Clarification can be provided during tutorials if required. It is therefore recommended that no more than 6 lectures are held in any one working day. Guidance on assessment; examinations and re-sits is at paragraph 3 below.

Table 2 is intended only as a guideline which Training Organisations may use to determine their own training programme based on participant numbers; availability and entry-level standards determined from the training needs analysis.

**Table 2 – Example Course Outline Planning Programme**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Day** | **Module** | **Lectures (see Part E)** | **Instruction hours** | **Other Activity** | **Remarks** |
| 0 | 1 - 4 | 0 | 0 | Training Needs Analysis | Conducted before course commences |
| 1 | 1 | 1 - 6 | 7 | Environmental tutorials | For participants identified during Training Needs Analysis |
| 2 | 2; 3 | 7- 12 | 6 | Tutorials for lectures 1-6  Visit VTS centre | For participants identified on Day 1 |
| 3 | 3; 4 | 13 - 15 | 5 | e-Navigation workshop | Including Industrial Members |
|  | |  | Final examination | In the afternoon following a 1 hour revision period |
| **Three working days** | | **Total hours** | **18** |  |  |

The course supervisor should be involved actively in course planning and its conduct. Participants who encounter difficulties with any elements of the syllabus should be identified during instruction. Additional time should be allocated for tutorials so that every participant who is willing to gain the required competence has every opportunity to do so.

In order to ensure quality management, improvement to the standard of lectures should be obtained through satisfaction feedback from participants based on ISO 9001 principles. Examination results should also be analysed by the course supervisor to determine whether the questions test competency to the required standard. If all participants achieve high scores, the questions may not be sufficiently testing. If all participants fall short of the required standard, the quality of the instruction and content is likely to be below standard too!

1. **EVALUATION AND ASSESSMENT**

The principle method of evaluating whether participants have acquired the required level of competence on this model course is by a formal written examination on Day 3. Each Accredited Training Organisation (ATO) will, in consultation with the Competent Authority, determine the most appropriate form of examination. It should be borne in mind that Level 1+ senior managers will be responsible for the safety of mariners. The final examination should therefore be testing with answers generally provided from memory. The following points provide guidance on the style and content of this examination which ATOs may find helpful in determining the most appropriate in their circumstances:

* The examination which will cover the whole syllabus should be conducted within a maximum time limit of 60 minutes.
* A period to read the question paper before the examination time commences can be allocated, especially if the native language of participants is not the formal language of instruction
* The questions should be short, clear and written in the formal language of instruction
* Questions can either be multiple choice from 4 possible answers; require short written (few-word) answers, or a combination of both
* The difficulty of each question should be based on the level of competence required from the participant in that subject.
* Lectures should end with key learning points and only what has been taught should be examined
* The questions asked of one course of participants should be changed for the next course

Each ATO will determine the pass mark for each examination paper. The guiding principle should be that a participant being considered for the award of an AtoN Level 1+ Certificate is likely to be directly responsible for AtoN service provision or its supervision. A participant who just fails to meet the pass mark despite active participation in the course could exceptionally be given the opportunity to demonstrate his or her potential at a formal aural “viva” examination held at a suitable date after the termination of this model course.

The following guidelines are proposed for consideration by ATOs:

* The standard pass mark in each examination is 70% equivalent to a good (Level 3) degree of understanding
* Participants who fail a competency test by 5% or less will be subject to an aural (“viva”) examination by the Course Supervisor (Assessor) on a convenient date following the written examination. Participants who fail the competency test by more than 5% or who do not demonstrate a satisfactory competence at a “viva” interview will **not** be awarded a Level 1+ Certificate. Further training may be required and failed participants will be required to attend one or more modules of another Level 1+ Model Course and re-sit another written competency test at a time to be decided by the Training Organisation.

**PART E – COURSE MODULES**

This model course comprises four modules covering the key subject headings listed in Recommendation E-141.

Table 2 in Part D above gives an example of how the whole syllabus might be covered in fifteen 40 minute lectures; and exercise and one workshop[[12]](#footnote-12). Table 3 below shows the outline of the model course. This is followed by an introduction and subject framework for each module broken down into a detailed teaching syllabus for each sub-element.

The Training Organisation will determine the most appropriate order of lecture delivery for each course following the training needs analysis of participants and the availability of instructors.

**Table 3 – Model Course Outline**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Module** | **Subject** | **Lectures** | **Exercises** | **Total Instruction Hours** |
| 1 | International Conventions and Authorities | 1 - 6 | Navigation Warning and MSI exercise | 7 |
| 2 | The e-Navigation Initiative | 7 - 12 | none | 6 |
| 3 | Management of AtoN Service Provision | 13 - 15 | none | 3 |
| 4 | e-Navigation workshop |  | Interactive session | 2 |
|  | | | **Total Recommended Instruction Time** | **18 hours** |

**MODULE 1 – INTERNATIONAL CONVENTIONS AND AUTHORITIES**

* 1. **INTRODUCTION**

Module 1 covers International Organisations concerned with AtoN and related safety of navigation matters; detailed examination of SOLAS Chapter 5 and National obligations imposed by it and aspects of the United Nations Convention on the Law of the Sea (UNCLOS) 1982 which relate to AtoN service provision.

Instructors for this module should have proven competency, knowledge and experience in the work of the International Maritime Organisation focussing on obligations imposed on National (Competent) Authorities; the International Association of Marine Aids to Navigation and Lighthouse Authorities; related International Organisations and/or a legal qualification related to a detailed knowledge of UNCLOS 82.

* 1. **SUBJECT FRAMEWORK**
     1. **Scope**

The syllabus for this module requires participants to gain an appropriately high level of competence in understanding the obligations placed on National Authorities by IMO Conventions and the role played by international organisations in improving and monitoring safety at sea and the preservation of the marine environment. By so doing, successful participants can exercise senior managerial functions concerned with the provision of AtoN services or within the regional Competent Authority responsible for providing them.

Participants will also gain an enhanced level of competence in selected aspects of the Law of the Sea which will enable them to understand a Competent Authority’s international maritime legal obligations and restrictions concerning AtoN service provision in their waters.

* + 1. **Aim of Module 1**

On successful completion of module, participants will demonstrate the ability to exercise senior managerial functions concerning their legal obligations connected with efficient and cost effective AtoN service provision.

* 1. **DETAILED TEACHING SYLLABUS FOR MODULE 1 – INTERNATIONAL ORGANISATIONS AND LAW OF THE SEA**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Module** | **Element** | **Sub-element** | **Subject** | **Level of Competence** | **Recommended training aids and exercises** | **References**  Rec = Recommendation  GL = Guideline | **Lecture No.** |
| **1** |  |  | **INTERNATIONAL CONVENTIONS AND AUTHORITIES** |  |  |  |  |
|  | **1.1** | **IALA; IMO and SOLAS CH V; IHO and Other Authorities** |
|  |  | 1.1.1 | Review of IALA structure and functions | 4 |  | NAVGUIDE Ch.1  www.iala-aism.org | 1 |
|  |  | 1.1.2. | IALA World Wide Academy; certification and competency | 4 |  | NAVGUIDE 8.12.3  IALA Rec E-141 |
|  |  | 1.1.3 | IHO; ITU; IEC; and ILO organisation and responsibilities | 4 |  | www.iho-ohi.net; www.ilo.org; www.iec.ch ; www.itu.int |
|  |  | 1.1.4 | IMO definition of a National (Competent) Authority | 5 |  | IALA Rec E-105 | 2 |
|  |  | 1.1.5 | IMO Mandatory Instruments – SOLAS; MARPOL; STCW; COLREG | 4 |  | www.imo.org/conventions |
|  |  | 1.1.6 | SOLAS Ch. V Regulations applicable to maritime safety (1) | 5 | WWNWS and MSI desk top exercise | SOLAS V Regulations 10; 11; 12 and 13 | 3 |
|  |  | 1.1.7 | SOLAS Ch. V Regulations applicable to maritime safety (2) | 5 | SOLAS V Regulations 4 and 9 |
|  | **1.2** |  | **National (Competent) Authorities** |  |  |  |  |
|  |  | 1.2.1 | Review of obligations placed on a National Authority | 4 |  | NAVGUIDE 8.1 | 4 |
|  |  | 1.2.2 | National legislation to implement international laws and IALA Recs | 4 |  | National Maritime Laws |
|  |  | 1.2.3 | Importance of liaison with regional stakeholders | 5 |  | IALA GL 1079 |
|  |  | 1.2.4 | IMO Audit Scheme | 5 |  | IALA GL 1054 |
|  |  | 1.2.5 | Funding AtoN service provision – State versus user-pays principle | 4 |  | Rec V-102 | 5 |
|  |  | 1.2.6 | Cost efficiency measures including contracting out | 4 |  | IALA GL 1005; 1047; 1052  NAVGUIDE Ch 8 |
|  |  | 1.2.7 | Protection of the marine environment | 4 | Tutorials as required | IALA GL 1036 |  |
|  | **1.3** |  | **UNCLOS 82** |  |  |  |  |
|  |  | 1.3.1 | Convention on Law of the Sea | 3 | Lecture by maritime lawyer | UNCLOS Articles 5; 6-14; 17-26  UNCLOS Part III Art.43 | 6 |
|  |  | 1.3.2 | UNCLOS Articles pertaining to AtoN service provision | 4 |

**Table 4 – Detailed Teaching Syllabus Module 1**

**MODULE 2 – The e-NAVIGATION INITIATIVE**

* 1. **INTRODUCTION**

Module 2 is designed to provide higher levels of competency in the understanding and application of the e-Navigation initiative[[13]](#footnote-13) including increasing demands of the accuracy of navigation and threats to that accuracy.

Instructors for this module should hold a seagoing qualification recognised by the IMO and/or proven competency in e-Navigation development and the technical issues appertaining to it.

* 1. **SUBJECT FRAMEWORK**
     1. **Scope**

The syllabus for Module 2 requires participants to gain an appropriately advanced level of competence in the principles of accurate maritime navigation; the shore and ship based components of e-Navigation including Maritime Operational Services and the fundamental importance of uninterrupted positioning, navigation and timing (PNT) and technological factors that adversely affect or can assist PNT.

* + 1. **Aims**

On successful completion of Module 2, participants will demonstrate a detailed understanding of Navigation principles and components and factors affecting the enhancement of berth to berth navigation and related services for safety and security at sea and protection of the marine environment.

* 1. **DETAILED TEACHING SYLLABUS FOR MODULE 2 – The e-NAVIGATION INITIATIVE**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Module** | **Element** | **Sub-element** | **Subject** | **Level of Competence** | **Recommended training aids and exercises** | **References**  Rec = Recommendation  GL = Guideline | **Lecture No.** |
| **2** |  |  | **e-NAVIGATION** |  |  |  |  |
|  | **2.1** | **Positional Accuracy and Standards** |
|  |  | 2.1.1 | IMO policy on accuracy and standards | 4 | ECDIS display | IMO Resolution A.923(23)  Rec O-118  GL 1072; 1057 | 7 |
|  |  | 2.1.2 | Geodesy and problems with different datums and sources | 3 |
|  |  | 2.1.3 | Developments with ENCs for ECDIS; IHO S-100 standard | 3 |
|  | **2.2** |  | **Electronic Position Systems** |  |  |  |  |
|  |  | 2.2.1 | e-Navigation strategy and development | 4 | Representatives from IALA Industrial Members can be invited as observers to these lectures to improve the quality of Module 4 (see below) | Rec e-NAV 140  NAVGUIDE Chapters. 4; 6 | 8 |
|  |  | 2.2.2 | IMO WW Radio Navigation System and IALA WWRN plan |
|  |  | 2.2.3 | IALA WWRC plan |
|  |  | 2.2.4 | Importance of PNT; GNSS vulnerability and mitigation factors | 5 | NAVGUIDE Chapter 4  Rec R-121 [R-115 (EU)]  Rec R-129; R-135  GL 1016; 1053; 1060 | 9 |
|  |  | 2.2.5 | GNSS-1; GNSS-2; SBAS and GBAS | 5 |
|  |  | 2.2.6 | Terrestrial systems: Differential GPS; Loran-C and e-Loran | 4 |
|  | **2.3** |  | **AIS; Racons and Traffic Monitoring** |  |  |  |
|  |  | 2.3.1 | New Technology Radars and effect of Racons | 4 | NAVGUIDE Chapter 4  Rec A-126; R-101; O-113  GL 1010; 1028; 1029; 1062; 1081 | 10 |
|  |  | 2.3.2 | AIS as a complement or replacement for Racons |
|  |  | 2.3.3 | Regional and global traffic monitoring | 5 | Rec A123; A-124; E-142  GL 1026; 1050; 1056; 1071; 1068; | 11 |
|  |  | 2.3.4 | IALA-Net; satellite AIS and LRIT | 4 |
|  |  | 2.3.5 | VTS; Maritime Operational Services; VTMIS; Traffic Routeing and Maritime Domain Awareness | 4 | Visit to VTS Centre if available | IALA VTS Manual; Recs V-103; V-119; [V-120]; V-127; V-136: GL 1055 | 12 |

**Table 5 – Detailed Teaching Syllabus Module 2**

**MODULE 3 –MANAGEMENT OF ATON SERVICE PROVISION**

* 1. **INTRODUCTION**

Module 3 focuses on the Levels of Service that a Competent Authority and an AtoN service provider should achieve. It includes the availability standards that a mariner can expect from both short-range AtoN and radio AtoN services; remote monitoring of AtoN; navigation risk management; the importance of simulation in AtoN planning and the preservation of national cultural heritage.

Instructors for Module 3 should be fully competent in navigation risk assessment and analysis; in the application of IALA risk management tools and they should hold an appropriate QMS certificate.

**SUBJECT FRAMEWORK**

* + 1. **Scope**

The syllabus for Module 3 requires participants to gain an advanced level of competence in the generation and monitoring of Level of Service statements; short and medium term navigation plans and navigational risk analyses (based where appropriate on IALA risk management tools) and their responsibilities to preserve historic aids to navigation stations where appropriate.

* + 1. **Aims**

On successful completion of Module 3, participants will demonstrate the ability to generate and update Levels of Service statements and plan and oversee internationally acceptable principles of navigation risk analysis for the effective management of AtoN service provision or its supervision.

**1.3 DETAILED TEACHING SYLLABUS FOR MODULE 3 - MANAGEMENT of AtoN Service Provision**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Module** | **Element** | **Sub-element** | **Subject** | **Level of Competence** | **Recommended training aids and exercises** | **References**  Rec = Recommendation  GL = Guideline | **Lecture No.** |
| **3** |  |  | **AtoN PROVISON; DESIGN AND MANAGEMENT** |  | | |  |
|  | **3.1** | **AtoN Provision** |  | | | |
|  |  | 3.1.1 | Levels of Service Statements | 5 |  | NAVGUIDE Chapter 8  Rec O-130; O-132; R-121  GL 1004; 1008; 1033; 1035; 1037; 1050; 1052;1077 | 13 |
|  |  | 3.1.2 | Availability standards for short-range and radio AtoN |
|  |  | 3.1.3 | The role of remote monitoring in LOS for quality statements |
|  |  | 3.1.4 | IALA Risk management tools: PAWSA; IWRAP Mk.2 | 5 |  | Rec O-134; O-138  GL 1018; 1057; 1058 | 14 |
|  |  | 3.1.5 | Use of simulation in navigation risk management |
|  |  | 3.1.6 | Development of a Strategic Plan | 5 |  | GL 1074; 1075  IALA Lighthouse Conservation Manual | 15 |
|  |  | 3.1.7 | Preservation of cultural or historic AtoN stations | 4 |

**Table 6 – Detailed Teaching Syllabus Module 3**

**MODULE 4 – TECHNICAL ISSUES - WORKSHOP**

* 1. **INTRODUCTION**

Module 4 is designed to permit international or regional IALA Industrial Members to present potential solutions to technical issues relevant to Module 2 – e-Navigation.

**SUBJECT FRAMEWORK**

* + 1. **Scope**

There is no formal or detailed syllabus for Module 4. It will for the participants, assisted by the Course Supervisor, to derive short or medium term potential solutions to specific issues relevant to their region generated during Module 2. For example matters concerning the increasing use of New Technology radars, PNT mitigation measures or the remote monitoring of AtoN.

* + 1. **Aim**

On successful completion of Module 4, participants will have gained the necessary competency to develop potential technical solutions to regional issues for incorporation in their Strategic Plans and Levels of Service statements.

1. Definitions; clarifications of terms and common abbreviations used in text of this Model Course are listed at Articles 1.2 and 1.3 of Recommendation E-141 (December 2009) [↑](#footnote-ref-1)
2. Further guidance can be found at Annex A to IALA Recommendation E-141/1 – Level 1 AtoN Model Course [↑](#footnote-ref-2)
3. The term “senior AtoN manager” is taken to mean a person who has held an IALA Level 1 AtoN Certificate for at least four years. [↑](#footnote-ref-3)
4. Levels of Competence 1 (basic) and 2 (satisfactory) apply to junior managers and engineers. See Table 1 on page 9 of Model Course E-141/1 for Level 1 manager training. [↑](#footnote-ref-4)
5. *“Competent Authorities should ensure that instructors and assessors* [or supervisors] *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 E-141 Article 5.1.2 [↑](#footnote-ref-5)
6. Where possible Microsoft PowerPoint® presentations should be capable of being projected onto a suitable white background or screen [↑](#footnote-ref-6)
7. The standard reference publications are SOLAS Chapter V and the IALA NAVGUIDE Manual. References to appropriate IALA Recommendations and Guidelines are given in Part E of this document [↑](#footnote-ref-7)
8. In accordance with the “Grandfather Clause” at Article 4.4 of Recommendation E-141 [↑](#footnote-ref-8)
9. More junior staff working in a maritime affairs department of the Competent Authority might be considered as potential participants in modules of the IALA Level 1 manager course [↑](#footnote-ref-9)
10. It is proposed that a list of accredited supervisors and assessors will be held by the Dean of the World Wide Academy. National Members may choose to nominate appropriate personnel for inclusion on this list so that other National Members or Accredited Training Organisations can avail themselves of their services under individually agreed arrangements or contracts. [↑](#footnote-ref-10)
11. Extract from Article 1.1 of IALA Recommendation E-141 [↑](#footnote-ref-11)
12. Each lecture period has been allocated a time of 60 minutes to allow for breaks between sessions. [↑](#footnote-ref-12)
13. See IALA Recommendation e-NAV140 [↑](#footnote-ref-13)