# IALA

# IALA MODEL COURSE

## C0103-1
## VTS OPERATOR TRAINING

## Edition 3.0

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# DOCUMENT REVISION

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

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# PART A    MODEL COURSE OVERVIEW

## 1.  INTRODUCTION

IALA model courses have been developed to provide guidance on the level of training and knowledge needed to reach levels of competence defined by IALA. They provide IALA national members and other appropriate authorities with guidance on the training of VTS Personnel.

IALA's contribution to the development of internationally harmonized guidance for vessel traffic services is recognized in IMO Resolution *A.1158(32) Guidelines on Vessel Traffic Services* and the Annex to the resolution states:

- *Contracting Governments are encouraged to take into account IALA standards and associated recommendations, guidelines and model courses.* (Section 9.2)

- *VTS personnel should only be considered competent when appropriately trained and qualified for their VTS duties. This includes, inter alia:*

  - *satisfactorily completing generic VTS training approved by a competent authority;*

  - *satisfactorily completing on-the-job training at the VTS where the personnel are employed;*

  - *undergoing periodic assessments and revalidation training to ensure competence is maintained; and*

  - *being in possession of appropriate certification.*

IALA recommendations, guidelines and model courses specifically related to the establishment and operation of VTS include:

- *Recommendation R0103 Training and certification of VTS personnel* specifies the practices associated with the training and certification of VTS personnel to assist authorities when recruiting, training and assessing VTS personnel to ensure the harmonized delivery of vessel traffic services world-wide.

- *Guideline G1156 Recruitment, training and certification of VTS personnel* states that *"Model courses provided by accredited training organizations should be approved by the competent authority."*

- *Guideline G1014 Accreditation of VTS training organizations and approval to deliver IALA model courses* sets out the process by which a training organization can be accredited to deliver approved VTS training courses.

IALA model courses include:

- Model Course C0103-1 VTS Operator Training

- Model Course C0103-2 VTS Supervisor Training

- Model Course C0103-3 VTS On-the-Job Training

- Model Course C0103-4 VTS On-the-Job Training Instructor

- Model Course C0103-5 VTS Revalidation Process for VTS Qualification and Certification

## 2.  PURPOSE OF THE MODEL COURSE

The purpose of the model course is to assist training organizations and their teaching staff in the preparation and provision of new training courses for VTS Operators, or in enhancing, updating, or supplementing existing training material. It provides guidance on the level of training and knowledge needed to reach levels of competence defined by IALA to obtaining a C0103-1 certificate.

It is not the intention of the model course to present instructors with a rigid 'teaching package'. Rather, this model course provides the curriculum content for the training for VTS Operators. It intended to be used by accredited training organizations in preparing their C0103-1 training programs.

## 3.  COURSE OBJECTIVE

To successfully complete this course the student will demonstrate the requisite knowledge, skills and attitude to undertake the duties associated with the provision of a VTS Operator. This includes:

• provide timely and relevant information on factors that may influence the transit of a ship and assist on-board decision making;

• monitor and manage traffic to ensure the safety and efficiency of ship movements; and

• respond to developing unsafe situations to assist the decision-making process on board.

## 4.  COURSE CURRICULUM OUTLINE

The model course comprises seven modules, each of which deals with a specific subject representing a requirement or function of a VTS Operator. Each module contains a subject framework stating its scope and aims, a subject outline, learning objectives, teaching points and recommended hours.

The recommended hours are indicative and based on the assumption that the students have no or little previous knowledge of the subject. Instructors should revise as required to address the requirements of the students to ensure the learning outcomes are achieved based on the competence levels detailed in each module (Table 1 refers). Time for assessments is in addition to the range of duration included in the model course.

Training activities, simulated exercises and assessments undertaken during the course are intended to represent the role of the VTS Operator and reflect events or incidents that may be experienced at a VTS.

No timetable is included in this model course. Working within the normal practices of the training establishment, instructors should allow time during the course for revision of course content and develop their own timetable depending on the:

• level of skills of students;

• number of persons to be trained;

• number of instructors; and

• simulator facilities and equipment available.

*Table 1     Summary of C0103-1 Training*

| Module Title | Recommended Duration in Hours | | Overview |
|---|---|---|---|
| | Presentations / Lectures | Exercises / Simulation | |
| 1. Communication Coordination and Interaction | 17-29 | 37-52 | This module covers the communications principles used in VTS operations and assumes the minimum level of English has been obtained as identified in IALA Guideline 1156 and has appropriate national qualifications to operate the VHF marine radiotelephony equipment. |
| 2. Legal Framework | 7-14 | 6-11 | This module covers the regulatory and legislative framework of VTS, including the liabilities and the responsibilities of allied services and participating ships in the VTS. |
| 3. Provision of VTS | 19-29 | 39-49 | This module covers the theory and practice associated with the purpose of VTS, including the provision of information, and the issue of advice, warnings, instructions, and traffic clearances. |
| 4. Nautical Knowledge | 23-44 | 16-31 | This module covers nautical knowledge elements required to perform the function of a VTS Operator. |
| 5. Equipment | 8-15 | 3-6 | This module covers the requirement for VTS Operators to be able to understand the operational limitations and benefits of equipment used in VTS. |
| 6. Human Factors | 5-10 | 3-6 | This module addresses the requirement for VTS Operators to perform their duties under all conditions, including emergencies and stressful situations. It is recommended that the contents of this module be presented to the students in the early stages of the course. |
| 7. Emergency Situations | 7-12 | 8-13 | This module covers the response to emergency situations while maintaining safety of the waterway in the VTS area |
| Total time range | 86-153 | 112-168 | *Note: Hours are based on the assumption that the students have no or little previous knowledge of the subject.* |

## 5. ENTRY REQUIREMENTS

Every student attending a C0103-1 model course should have achieved the International English Language Testing System (IELTS) level 5, or its equivalent.

The training organization may determine, and document, any additional course entry requirements for example, due to national requirements or tailoring the course for the student intake.

## 6. RECOGNITION OF PRIOR LEARNING

It is recognized that some students may have experience, knowledge, skills, attitudes, and competencies acquired through formal or informal learning in some modules or subject elements associated with the VTS model course. In such cases, consideration should also be given to the recognition of prior learning (RPL), which may reduce the time requirement to meet the level required for certification.

IALA Guideline *G1017 Assessment for recognition of prior learning in VTS training* provides further guidance assessing and recognizing the prior learning of students.

## 7. COURSE INTAKE - LIMITATIONS

The training organization should determine the number of students enrolled on the course and provide information on the student to staff ratio. The class/group size should allow the instructor(s) to give adequate individual attention to students as required to meet the learning objective(s).

In general, it is recommended that 8 - 10 students is the maximum that a single instructor can be expected to train satisfactorily to the level of competence involved. Larger numbers may be admitted depending on the method of delivery.

During practical sessions such as simulations, there may be additional restraints on class/group size. Where the use of a simulator or similar teaching aid is involved, it is recommended that no more than two students be trained simultaneously on any individual piece of equipment.

## 8. TRAINING STAFF REQUIREMENTS

All instructors and assessors should be appropriately qualified for the training being provided and the assessment required for the model course.

As well as instructors and assessors, additional staff may be required for the maintenance of equipment, for the preparation of materials and training areas as well as support for simulation and other practical activities.

IALA Guideline *G1156 - Recruitment, training, and assessment of VTS Personnel* provides further guidance on the qualifications for instructors.

## 9. FACILITIES AND EQUIPMENT

The teaching aids, facilities and equipment students will utilise during the course should be fit for purpose and of a sufficient standard to reflect the training methodologies used in the course delivery. Examples of training methodologies may include:

- Classroom sessions, presentations and facilitated discussion
- Group based learning activities
- Case studies and recordings

- Remote learning (e.g., e-learning, online, distance, hybrid, blended)
- Simulation training

Training should be managed in a manner consistent with IALA Guideline G1027 in order to provide sufficient behavioural realism to allow students to acquire the knowledge and skills appropriate to the training objectives.

The training organization should provide for safe learning environment consistent with any national health and safety requirements.

## 10. DELIVERY OF THE MODEL COURSE

To make effective use of the model course, training staff should review the course outline, including the competence tables for each module, and prepare a detailed teaching syllabus.

The instructor should take into consideration existing knowledge, skills, and attitudes of students to support the assessment and recognition of prior learning. A gap analysis should be carried out to identify any differences between the level of skills and competencies of the student and those identified within the curriculum tables, and teaching strategies to address these gaps should be implemented.

All VTS training should be:

1    Structured in accordance with written programmes, including such methods and means of delivery, procedures and course material as are necessary to achieve the prescribed standard of competence; and

2    Conducted, monitored, assessed, and supported by qualified persons.

Teaching programmes should ensure that all listed elements are addressed in some manner, and that this is clearly documented.

If students are required to meet additional requirements, then the module objectives, scope and content for each subject may be adjusted to ensure the additional elements are covered. All changes to the training should be clearly documented.

The presentation of concepts and methodologies may be repeated as necessary in various ways until the instructor is satisfied that the student has attained the required competence in each subject.

Thorough preparation is key to successful implementation of the course.

## 10.1.  Developing course content

The modular presentation enables the instructor to adjust the course content to suit the student intake and provide any revisions of the subject objectives as required. The instructor should develop lesson plans and detailed learning objectives based on the competence tables, references, and materials as suggested (see Part B).

It is not intended that the modules be presented in the order provided in this model course. It is expected that, to address effective training and learning methodologies, the content of modules will be grouped as appropriate for the learning environment. Presentation of the material should be tailored to reflect specific training objectives and include practical exercises, assessments, etc. When developing lesson plans, the instructor should use a teaching method or combination of methods that will ensure students can achieve the required learning objectives.

Depending on the student intake, the recommended hours may need to be adjusted as necessary. For example, it is normal for different students to require different lengths of time to cover the same content, and minor adjustments may be needed to the course timetable.

## 10.2. Competence levels

To assist in the development of lesson plans, five levels of competence are used in the model courses for VTS personnel. Levels 1 to 4 are used in the model course for the training of VTS Operators. High level learning objectives are provided within the model course. Verb taxonomies have been provided to assist with the creation of detailed learning objectives (Table 2 refers).

IALA Guideline *G1103 – Train the trainer* assists instructors with the preparation and development of training courses and is aimed at courses delivered an accredited training organization.

## 10.3. Competence tables, teaching aids and references

Detailed competence tables are provided, including competence levels and proposed teaching aids and references. The training materials prepared (e.g., course notes, course presentations and reference documents etc) should be consistent with IALA standards and up-to-date taking into account recent changes and industry developments. These training materials should be available to the student for their reference.

Where remote learning delivery is proposed, training organizations should consider the necessary adjustments that may be required.

IALA Guideline *G1014 – Accreditation of VTS training organizations and approval* to deliver IALA model courses provides further detail on remote learning.

## 10.4. Training course references

Course development and delivery should take into consideration the following references. Where required, additional references are identified in specific modules:

- United Nations Convention on the Law of the Sea (UNCLOS)
- International Regulations for Preventing Collisions at Sea, 1972 (COLREGS)
- International Conventions for the Safety of Life at Sea (SOLAS):
    - SOLAS Chapter V, Regulation 12 - Vessel traffic services
    - SOLAS, Chapter V, Regulation 7 - Search and Rescue Services
    - SOLAS Chapter V, Regulation 11 – Aids to Navigation
- IMO/ICAO Publication - International Aeronautical and Maritime Search and Rescue (IAMSAR) manual, three volumes:
    - Vol 1 – Organization and management (IMO 960)
    - Vol 2 – Mission co-ordination (IMO 961)
    - Vol 3 – Mobile facilities (IMO 962)
- IMO GMDSS Manual
- IMO Resolution A.1158(32), Guidelines for Vessel Traffic Services
- IALA Vessel Traffic Services Manual
- IALA S1040 Vessel Traffic Services
- IALA S1050 Training and Certification
- IALA R0103 (V-103) Training and Certification of VTS Personnel
- IALA G1132 VTS Voice Communications and Phraseology
- IALA G1141 Operational Procedures for Delivering VTS

- IALA G1156 Recruitment, Training and Certification of VTS Personnel
- IALA Model Courses on VTS:
    - C0103-3 (VTS On-the-job Training (OJT))
    - C0103-2 (VTS Supervisor Training)
    - C0103-4 (VTS OJT Instructor Training)
    - C0103-5 (VTS Recurrent, Refresher and Adaptation Training)
- IALA International Dictionary of Marine Aids to Navigation
- National, regional, and local legislation and regulations on VTS, ports, harbours, pilotage and
- Allied services
- National Notices to Mariners pertaining to VTS
- National procedures and standards for operation of VTS

*Table 2      Competence Level Taxonomy for VTS Training*

| Level | Knowledge and/or Attitude | Skill | Verbs (examples) |
|---|---|---|---|
| Level 1<br><br>Work of a routine and predictable nature generally requiring supervision | Comprehension<br><br>Understands facts and principles; interprets verbal/written material; interprets charts, graphs and illustrations; estimates future consequences implied in data; justifies methods and procedures | Guided response<br><br>The early stages in learning a complex skill and includes imitation by repeating a demonstrated action using a multi-response approach (trial and error method) to identify an appropriate response | Arrange, define, list, locate, label, identify, select |
| Level 2<br><br>More demanding range of work involving greater individual responsibility. Some complex/non-routine activities | Application<br><br>Applies concepts and principles to new situations; applies laws and theories to practical situations; demonstrates correct usage of methods or procedures | Autonomous response<br><br>The learned responses have become habitual, and the movement is performed with confidence and proficiency | Comply (with), describe, display, give examples, recognise, operate, perform (an action), participate in |
| Level 3<br><br>Skilled work involving a broad range of work activities. Mostly complex and non-routine | Analysis<br><br>Recognises un-stated assumptions; recognises logical inconsistencies in reasoning; distinguishes between facts and inferences; evaluates the relevancy of data; analyses the organizational structure of work | Complex observable response<br><br>The skilful performance of acts that involve complex movement patterns. Proficiency is demonstrated by quick, smooth, accurate performance. The accomplishment of acts at this level includes a highly co-ordinated automatic performance | Analyse, apply, categorise, classify, compare, differentiate, explain, justify, operate, solve |
| Level 4<br><br>Work that is often complex, technical and professional with a substantial degree of personal responsibility and autonomy | Synthesis<br><br>Integrates learning from different areas into a plan for solving a problem; formulates a new scheme for classifying objects or events | Adaptation<br><br>Skills are so well developed that individuals can adapt rapidly to special requirements or problem situations | Adapt, construct (build), demonstrate, devise, evaluate, interpret, organize, plan, predict, resolve, respond to |
| Level 5<br><br>Complex techniques across wide and often unpredicted variety of contexts. Professional/senior managerial work | Evaluation<br><br>Judges the adequacy with which conclusions are supported by data; judges the value of a work by use of internal criteria; judges the value of a work by use of external standards of excellence | Creation<br><br>The creation of new practices or procedures to fit a particular situation or specific problem and emphasizes creativity based upon highly developed skills | construct, compose, coordinate, create, criticise, draw conclusion, evaluate, formulate, improve, judge, modify, synthesize |

## 10.5. Course review and updating

The course content should be reviewed on a regular basis to ensure it reflects the current IALA standards, recommendations, guidelines and consider recent changes and industry developments.

On conclusion of the course, a review should be undertaken based on course feedback and observations during course delivery to identify ongoing improvements and training materials that may need updating.

## 11. ASSESSMENT

Student progress should be continually monitored and assessed, and regular reviews undertaken. Any problems that may arise should be addressed so that the student can attain the required levels of competence and has the opportunity to meet the course objectives.

Assessments should reflect the level of competence required, as provided in the competence tables for each module.

The training organization should determine the assessment methods to be used to ensure competence levels have been attained for each subject of the module course. In addition, the training organization should have procedures in place to address instances where the student is unable to attain the required competence.

Assessment results should be recorded and retained in accordance with national and/or organizational requirements as evidence to indicate the competence levels that have been attained for each subject of the model course.

## 12. COURSE CERTIFICATES

A course certificate should be issued by the training organization where a student:

- demonstrates they have the theoretical and practical knowledge; and

- has passed the appropriate assessments to ensure the student has met the required competency as outlined in this model course.

## 13. ABBREVIATIONS

| | |
|---|---|
| AIS | Automatic Identification System(s) |
| ALRS | Admiralty List of Radio Signals |
| ARPA | Automatic Radar Plotting Aid |
| AtoN | Marine Aid to Navigation |
| CCTV | Close circuit television |
| COLREGS | International Regulations for Preventing Collisions at Sea |
| COMSAR | Sub-Committee on Communications and Search and Rescue (IMO – now part of NCSR) |
| DF | Direction Finding (VHF-DF) |
| DGNSS | Differential Global Navigation Satellite System(s) |
| DSC | Digital Selective Calling |
| DST | Decision Support Tool |
| ECDIS | Electronic Chart Display and Information System(s) |
| ECS | Electronic Chart System(s) |
| ETA | Estimated Time of Arrival |

| | |
|---|---|
| FAL | Convention on the Facilitation of International Maritime Traffic (IMO) |
| GMDSS | Global Maritime Distress and Safety System |
| GNSS | Global Navigation Satellite System(s) |
| GOC | General Operator Certificate (GMDSS) |
| IAMSAR | International Aeronautical and Maritime Search and Rescue (IMO/ICAO) |
| ICAO | International Civil Aviation Organization |
| IEC | International Electrotechnical Commission |
| IELTS | International English Language Test System |
| IMDG | International Maritime Dangerous Goods (IMO) |
| ISPS | International Ship and Port Facility Security (Code) |
| ITU | International Telecommunication Union |
| LLTV | Low light television |
| LOP | Line(s) of position |
| MARPOL | International Convention for the Prevention of Pollutions from Ships (IMO) |
| MASS | Maritime Autonomous Surface Ships |
| MAtoN | Mobile AtoN |
| MSC | Maritime Safety Committee |
| MSI | Maritime Safety Information |
| OJT | On-the-Job Training |
| PIANC | World Association for Waterborne Transport Infrastructure |
| Racon | Radar beacon(s) |
| ROC | Restricted Operator's Certificate (GMDSS) |
| Ro-ro | Roll on – roll off |
| RPL | Recognition of Prior Learning |
| RR | Radio Regulations |
| SAR | Search and Rescue |
| SMCP | Standard Marine Communication Phrases (IMO) |
| SOLAS | Convention on the Safety of Life at Sea (IMO) |
| STCW | Standards of Training, Certification and Watchkeeping of Seafarers, 1978, as amended |
| UN | United Nations |
| UNCLOS | UN Convention on the Law of the Sea |
| VHF | Very High Frequency (30 MHz to 300 MHz) |
| VDES | VHF Data Exchange System |
| VTS | Vessel Traffic Services |
| WMO | World Meteorological Organization |

# PART B    MODULES

# MODULE 1    COMMUNICATION COORDINATION AND INTERACTION

English is the accepted language of international business, trade, and diplomacy. This has led to the establishment of reliable tests to demonstrate that students have attained a sufficient level of the English language. This module assumes the minimum level of English has been obtained as identified in IALA Guideline 1156[1] and has appropriate national qualifications to operate the VHF marine radiotelephony equipment.

## 1.1    SUBJECT FRAMEWORK

### 1.1.1 Scope

This module covers the communications principles used in VTS operations, focusing on the use of standard phraseology when communicating with vessels and allied services to:

- Facilitate clear, concise, and unambiguous communications in routine and emergency situations as referenced in IMO Resolution A.1158(32).

- Minimise misunderstanding of the intent of messages and reducing the time required for effective communication.

*Note: In some instances, training may include the use of an agreed, alternative language. This is not included in the C0103-1 course. The training in this alternative language could be as agreed between the Training Organization and Competent Authority, and consistent with IALA G1132[2].*

### 1.1.2 Objective of Module 1

On completion of the module the student will communicate using consistent, clear and concise maritime English that reflects standard message structure, including:

- standard phrases for communicating with vessels and allied services using IMO Standard Marine Communication Phrases and IALA G1132 on VTS voice communications and phraseology;

- concepts of message construction in terms of compiling, delivering and interpret messages;

- effective communication skills;

- managing the collection, evaluation, and dissemination of VTS information; and

- handover procedures.

### 1.1.3 Additional references relevant to this module

The following references are relevant to the planning and delivery of this module:

- IMO Resolution A.918(22), Standard Marine Communication Phrases

- IMO Resolution A.954(23), Proper use of VHF channels at sea

- ITU Radio Regulations, including Appendices

- ITU-R Recommendation M.493, DSC for use in the maritime mobile services

- IALA R1012 VTS Communications

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1 IALA G1156 states 'Every student attending a C0103-1 model course should have achieved the International English Language Testing System (IELTS) level 5, or its equivalent'

2 IALA G1132 states 'English language should be used for all VTS communications with ships and allied services unless use of an alternative language has been agreed. If an alternative language be used, VTS personnel should be mindful that not all participants may understand what is being communicated.

## 1.2 SUBJECT OUTLINE OF MODULE 1

*Table 3 Subject outline – Communication Coordination and Interaction*

| Element | Recommended Competence Level | Recommended Hours | |
|---|---|---|---|
| | | Presentations and Lectures | Exercises and Simulations |
| **General communication skills** | | **6 to 9 hrs** | **12 to 18 hrs** |
| Clear, concise and consistent communications | Level 3 | | |
| Procedures to enhance effective communication | Level 3 | | |
| Verbal and non-verbal communications | Level 3 | | |
| Options to overcome barriers to communication | Level 3 | | |
| Questioning techniques | Level 3 | | |
| Eliminate ambiguity | Level 3 | | |
| **VTS Communication Phrases** | | **4 to 7 hrs** | **8 to 12hrs** |
| Importance of standard phraseology | Level 4 | | |
| Construct VTS phrases | Level 4 | | |
| **Information Management** | | **1 to 3 hrs** | **1 to 2 hrs** |
| Collection, evaluation and dissemination of data | Level 3 | | |
| Log keeping and record keeping | Level 2 | | |
| **Handovers** | | **2 to 4 hrs** | **6 to 8 hrs** |
| Handovers in VTS | Level 4 | | |
| **Use of VHF radio communication in VTS** | | **4 to 6 hrs** | **10 to 12 hrs** |
| Demonstrate use of VHF in VTS Communications | Level 4 | | |
| | *Total time range* | *17 to 29 hrs* | *37 to 52 hrs* |

## 1.2.1 DETAILED Competence table FOR MODULE 1 – Communication Coordination and interaction

*Table 4    Competence Table – Communication Coordination and Interaction*

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---------|-------------------|-------------|------------------|---------------------|
| 1.1 | General Communication Skills | | | |
| 1.1.1 | Demonstrate clear, concise, and consistent general communication skills. | 1.1.1.1 | Active listening skills | 4 |
| | | 1.1.1.2 | Interpersonal skills | 4 |
| | | 1.1.1.3 | Effective team communications | 4 |
| | | 1.1.1.4 | Empathy in communication | 4 |
| 1.1.2 | Demonstrate procedures to enhance effective communication | 1.1.2.1 | Reading-back received message | 4 |
| | | 1.1.2.2 | Breaking message into smaller components | 4 |
| | | 1.1.2.3 | word grouping and pauses | 4 |
| | | 1.1.2.4 | Rephrasing message | 4 |
| 1.1.3 | Demonstrate verbal and nonverbal communications | 1.1.3.1 | Voice and digital communications | 4 |
| | | 1.1.3.2 | Voice inflection, tone and volume | 4 |
| | | 1.1.3.3 | Speech rate, keyword emphasis, word grouping and pauses | 4 |
| | | 1.1.3.4 | Non-verbal communication | 3 |
| 1.1.4 | Explain options to overcome barriers to communication | 1.1.4.1 | Language differences | 3 |
| | | 1.1.4.2 | Empathy, fatigue, and emotional aspects | 3 |
| | | 1.1.4.3 | Cultural aspects | 3 |
| 1.1.5 | Demonstrate effective questioning techniques | 1.1.5.1 | Direct questioning using message markers | 4 |
| | | 1.1.5.2 | Voice inflection in questioning | 4 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| | | 1.1.5.3 | Specific question types (closed, open, funnel) | 4 |
| 1.1.6 | Describe the techniques to eliminate ambiguity | 1.1.6.1 | 'Conditional' words and their elimination in VTS messages | 2 |
| | | 1.1.6.2 | Consequences of misuse of 'conditional' words | 2 |
| 1.2 | VTS Communication Phrases | | | |
| 1.2.1 | Explain the importance of using standard phraseology | 1.2.1.1 | Introduction to IALA G1132 on VTS voice communications and phraseology | 3 |
| | | 1.2.1.2 | Introduction to SMCP - Its overall construction and origins | 3 |
| 1.2.2 | Construct VTS messages using standard phraseology. | 1.2.2.1 | Message structure | 4 |
| | | 1.2.2.2 | Use of message markers | 4 |
| | | 1.2.2.3 | Use of standard VTS phraseology consistent with G1132 | 4 |
| | | 1.2.2.4 | Use of the SMCP (focus on Part 3, section 6 of the SMCP). | 4 |
| | | 1.2.2.5 | Use of standard phrases to elicit predictable actions | 4 |
| | | 1.2.2.6 | Identifying options for alternative wording to clarify understanding | 4 |
| 1.3 | Information Management | | | |
| 1.3.1 | Explain collection, evaluation and dissemination of data (information) management in VTS. | 1.3.1.1 | Collect data | 3 |
| | | 1.3.1.2 | Evaluate data – verify, validate | 3 |
| | | 1.3.1.3 | Evaluate data - prioritise | 3 |
| | | 1.3.1.4 | Disseminate data – methods | 3 |
| | | 1.3.1.5 | Disseminate data – phrasing, timing and content | 3 |
| 1.3.2 | Describe log keeping and record keeping (recording) in VTS. | 1.3.2.1 | Objectives of log keeping and recording | 2 |
| | | 1.3.2.2 | Principles of log keeping / retention | 2 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| | | 1.3.2.4 | Methods of log keeping | 2 |
| | | 1.3.2.5 | Statement and report writing | 2 |
| 1.4 | Handovers | | | |
| 1.4.1 | Demonstrate handovers in VTS | 1.4.1.1 | Handing over the shift | 4 |
| | | 1.4.1.2 | Vessel handovers | 4 |
| 1.5 | Use VHF Communication | | | |
| 1.5.1 | Demonstrate the use of proper VHF Communications in VTS | 1.5.1.1 | VHF radio procedures | 4 |
| | | 1.5.1.2 | VHF use in routine VTS operations | 4 |
| | | 1.5.2.1 | Distress, Urgency and Safety VHF radio procedures | 4 |

# MODULE 2   LEGAL FRAMEWORK

## 2.1   SUBJECT FRAMEWORK

### 2.1.1 Scope

This module covers the regulatory and legislative framework of VTS, including the liabilities and the responsibilities of allied services and participating ships in the VTS.

### 2.1.2 Objective of Module 2

On completion of the module the student will explain the role of legal and regulatory framework in VTS, including:

- national and international regulations;
- legal liabilities and their implications to VTS;
- the roles, responsibilities of and relationships between ship masters, marine pilots, VTS and allied services; and
- importance of record and log keeping.

### 2.1.3 Additional references relevant to this module

The following references are relevant to the planning and delivery of this module:

- Regional / national / local legislations and regulations relevant to VTS, ports, harbours, pilotage, and allied services

## 2.2 SUBJECT OUTLINE OF MODULE 2

*Table 5 Subject outline – Legal Framework*

| Subject Area | Recommended Competence Level | Minimum Recommended Hours | |
|---|---|---|---|
| | | Presentations and Lectures | Exercises and Simulations |
| **Regulatory requirements** | | **2 to 4 hrs** | **1 to 2 hrs** |
| Maritime organizations | Level 2 | | |
| Legislative requirements related to VTS | Level 3 | | |
| Regulatory and legal framework | Level 3 | | |
| Legislative requirements related to the marine environment | Level 1 | | |
| Promulgation of maritime information | Level 1 | | |
| **Legal liabilities** | | **2 to 4 hrs** | **1 to 2 hrs** |
| Related to VTS functions | Level 3 | | |
| **Roles and responsibilities** | | **2 to 4 hrs** | **2 to 3 hrs** |
| Ship masters, marine pilots, VTS and allied services | Level 1 | | |
| Responsibilities of VTS personnel | Level 3 | | |
| **Log keeping and record keeping** | | **1 to 2 hrs** | **2 to 4 hrs** |
| Objectives and Requirements of log keeping and record keeping | Level 1 | | |
| | *Total time range* | *7 to 14 hrs* | *6 to 11 hrs* |

## 2.2.1 DETAILED COMPETENCE TABLE OF MODULE 2 – Legal Framework

*Table 6  Competence Table – Legal Framework*

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| 2.1 | Regulatory Framework | | | |
| 2.1.1 | List the maritime organizations related to VTS, maritime operations and protection of the environment. | 2.1.1.1 | UN Organizations (IMO, ITU) | 1 |
| | | 2.1.1.2 | Intergovernmental Organizations (IGOs), Non-Governmental Organizations (NGOs) including IALA, IHO, ISO and IEC | 1 |
| | | 2.1.1.3 | IALA Standards, recommendations, and guidelines | 1 |
| 2.1.2 | Explain the legislative requirements relating to VTS. | 2.1.2.1 | IMO Conventions, Resolutions and Circulars related to VTS (including SOLAS Chapter V, Reg. 12, IMO Res A1158(32)) | 3 |
| | | 2.1.2.2 | IALA Standards, recommendations and guidelines | 3 |
| 2.1.3 | Explain the regulatory and legal framework relating to operations in the VTS area. | 2.1.3.1 | National regulations related to VTS | 3 |
| | | 2.1.3.2 | Local regulations and byelaws related to VTS | 3 |
| 2.1.4 | Identify legislative requirements relating to maritime operations and protection of the environment. | 2.1.4.1 | United Nations / UNCLOS (innocent passage, areas and zones) | 1 |
| | | 2.1.4.2 | IMO Conventions, Resolutions and Circulars (other – including SOLAS V-10, 11, 13; MARPOL, SAR, FAL, IMDG) | 1 |
| | | 2.1.4.3 | Recommendations and standards (ITU, IEC) | 1 |
| 2.1.5 | Identify how maritime information may be promulgated. | 2.1.5.1 | Notices to mariners, Admiralty List of Radio Signals (ALRS) | 1 |
| | | 2.1.5.2 | Other means (websites, etc.) | 1 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---------|-------------------|-------------|------------------|---------------------|
| 2.2 | Legal Liabilities | | | |
| 2.2.1 | Explain the legal liabilities related to VTS functions. | 2.2.1.1 | Extent of authority and responsibility for Competent Authority, VTS Provider | 3 |
| | | 2.2.1.2 | Extent of authority and responsibility for VTS Personnel:<br>• Routine operations<br>• Incidents / emergency response<br>• Accuracy of information promulgated<br>• Requirements and limitations of authority | 3 |
| | | 2.2.1.2 | Concept of civil, administrative, and criminal aspects. | 2 |
| 2.3 | Roles and Responsibilities | | | |
| 2.3.1 | Identify the roles, responsibilities of and relationships between ship masters, marine pilots, VTS and allied services. | 2.3.1.1 | Roles and responsibilities of VTS, master and pilot | 1 |
| | | 2.3.1.2 | Relationship between VTS, master and pilot | 1 |
| | | 2.3.1.3 | Interactions with Allied services | 1 |
| 2.3.2 | Explain the responsibilities of VTS personnel | 2.3.2.1 | Role and responsibility of VTS personnel in the provision of VTS | 3 |
| | | 2.3.2.2 | Monitoring compliance and enforcement of regulatory provisions for which they are empowered | 3 |
| 2.4 | Log Keeping and Record Keeping | | | |
| 2.4.1 | Identify the objectives and requirements for log keeping and recording in VTS | 2.4.1.1 | Methods and principles of log keeping; retention of logs | 1 |
| | | 2.4.1.2 | Reporting of incidents, casualty and near miss including:<br>• the role of VTS:<br>• collection of data,<br>• statement and report writing. | 1 |

# MODULE 3    PROVISION OF VTS

## 3.1    SUBJECT FRAMEWORK

### 3.1.1 Scope

This module covers the theory and practice associated with the purpose of VTS including the provision of information, and the issue of advice, warnings, instructions, and traffic clearances.

### 3.1.2 Objectives of Module 3

On completion of the course the student will implement the principles of the provision of VTS to maintain a traffic image, provide timely and relevant information, monitor and manage ship traffic and respond to developing unsafe situations. This includes:

- the VTS environment;

- principles of waterway management;

- provision of timely and relevant information;

- monitoring and managing ship traffic; and

- responding to unsafe situations.

### 3.1.3 Additional references relevant to this module

The following references are relevant to the planning and delivery of this module:

- International Ship and Port Facility Security (ISPS) Code

- IALA Recommendation R0125 The Use and Presentation of Symbology at a VTS Centre (V-125) (including AIS)

- IALA Guideline G1089 Provision of a VTS

- IALA Guideline G1070 VTS role in managing Restricted or Limited Access Areas

- IALA Guideline G1166 - VTS in Inland Waters

- IMO COMSAR/Circ.15 - Joint IMO/IHO/WMO Manual on Maritime Safety Information (MSI)

- ITU-R Recommendation M.493, DSC for use in the maritime mobile services

- PIANC Report number 121-2014 – Harbour approach channels design guidelines

- Regional / national / local legislations and regulations relevant to VTS, ports, harbours, pilotage and allied services

## 3.2   SUBJECT OUTLINE OF MODULE 3

*Table 7  Subject outline – Provision of VTS*

| Subject Area | Recommended Competence Level | Recommended Hours | |
|---|---|---|---|
| | | Presentations and Lectures | Exercises and Simulations |
| **VTS environment** | | 6 to 8 hrs | 3 to 5 hrs |
| Characteristics of the VTS area | Level 2 | | |
| Measures to manage traffic in the VTS area | Level 2 | | |
| Developments that affect VTS environment | Level 2 | | |
| Principles of channel design | Level 1 | | |
| Procedures to mitigate risk | Level 3 | | |
| **Principles of waterway and traffic management** | | 4 to 6 hrs | 6 to 8 hrs |
| Factors for the safe movements of ships | Level 4 | | |
| Procedures to maintain a safe and efficient waterway related to planning | Level 4 | | |
| **Provision of Information** | | 3 to 5 hrs | 10 to 12 hrs |
| Timely and relevant information | Level 3 | | |
| Information to influence ship movements and assist with onboard decision making | Level 4 | | |
| **Monitor and Manage Ship Traffic** | | 3 to 5 hrs | 10 to 12 hrs |
| Procedures to plan safe and efficient movement of ship traffic | Level 3 | | |
| Maintain a safe and efficient waterway | Level 2 | | |
| Water space allocation within VTS environment | Level 4 | | |
| **Respond to unsafe situations** | | 3 to 5 hrs | 10 to 12 hrs |
| Considerations for developing unsafe situations | Level 4 | | |
| Respond to developing unsafe situations | Level 4 | | |
| | *Total time range* | *19 to 29 hrs* | *39 to 49 hrs* |

## 3.3 DETAILED COMPETENCE TABLE OF MODULE 3 – PROVISION OF VTS

*Table 8  Competence Table – Traffic management*

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---------|-------------------|-------------|------------------|---------------------|
| 3.1 | VTS Environment | | | |
| 3.1.1 | Describe the characteristics of the VTS area. | 3.1.1.1 | Area limits, boundaries, separation zones, shipping lanes and channels | 2 |
| | | 3.1.1.2 | Prohibited or dangerous areas, anchorages and restricted areas | 2 |
| | | 3.1.1.3 | Aids to Navigation | 2 |
| | | 3.1.1.4 | Geographic, hydrographic, and environmental aspects | 2 |
| 3.1.2 | Explain measures to manage traffic in the VTS area. | 3.1.2.1 | Shipping routes and separation criteria (time and spatial separation) | 3 |
| | | 3.1.2.2 | Constraints (geographic, operational requirement, vessel types and characteristics, etc) | 3 |
| 3.1.3 | Describe developments that affect the VTS environment | 3.1.3.1 | Technical | 2 |
| | | 3.1.3.2 | Operational | 2 |
| | | 3.1.3.3 | Environmental | 2 |
| 3.1.4 | Identify principles of channel design | 3.1.4.1 | Principles of channel design under normal and unusual conditions | 1 |
| | | 3.1.4.2 | Limiting factors in channel design | 1 |
| | | 3.1.4.3 | Implications of channel design on ship movements | 1 |
| 3.1.5 | Explain procedures to mitigate risk. | 3.1.5.1 | Introduction to risk management | 1 |
| | | 3.1.5.2 | The IALA Risk Toolbox | 1 |
| | | 3.1.5.3 | Assessing and managing operational risks | 3 |
| | | 3.1.5.3 | Risk mitigation options | 3 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| 3.2 | Principles of waterway management | | | |
| 3.2.1 | Evaluate factors for the safe movements of ships. | 3.2.1.1 | Water reference level (tide gauges, correlation between predicted and actual water levels, allowance for delayed manoeuvres) | 4 |
| | | 3.2.1.2 | Safe under keel clearance<br>- draft measurements,<br>- vertical ship movements,<br>- allowance for squat and swell,<br>- allowance for weather, exposure, bathymetry<br>- safe under keel clearance across channel width | 4 |
| | | 3.2.1.3 | Safe air draft (factors affecting and sources of information for calculating air draft) | 4 |
| | | 3.2.1.4 | Shipping movement authorization (Traffic Clearance)<br>- Consideration<br>- Process when safe criteria has been determined and conditions met) | 4 |
| 3.2.2 | Demonstrate procedures to maintain a safe and efficient waterway related to planning | 3.2.2.1 | Ship routeing (i.e., channel geography, traffic restriction areas, anchorage areas, obstructions) | 4 |
| | | 3.2.2.2 | Types of traffic (i.e., ship characteristics, cargo characteristics) | 4 |
| | | 3.2.2.3 | Waterway Information (i.e., ship traffic, waterway, shipping regattas, fishing, etc) | 4 |
| | | 3.2.2.4 | Environmental aspects (visibility, waterspouts, dust storms, pollution, etc) | 4 |
| 3.3 | Provide Information | | | |
| 3.3.1 | Explain timely and relevant information | 3.3.1.1 | Participating / non-participating traffic | 3 |
| | | 3.3.1.2 | International and national regulations | 3 |
| | | 3.3.1.3 | Local procedures | 1 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| | | 3.3.1.4 | Waterway conditions | 3 |
| | | 3.3.1.5 | Difference between normal and abnormal situations | 3 |
| 3.3.2 | Demonstrate provision of timely and relevant information to influence ship movements and assist with onboard decision making. | 3.3.2.1 | Gather information (types and sources ) | 2 |
| | | 3.3.2.2 | Dissemination of information about navigational situations such as:<br>• Ship traffic information (identity, position, intention (IPI) of other traffic)<br>• Scheduling information<br>• Limitations of ships (restricted manoeuvrability, potential hindrances)<br>• Information concerning the safe navigation of the ship. | 4 |
| | | 3.3.2.3 | Dissemination of maritime safety information such as:<br>• Navigational warnings (diving operations, uncharted obstacles)<br>• Meteorological and hydrographic conditions and warnings<br>• Notices to mariners, status of marine aids to navigation) | 4 |
| | | 3.3.2.4 | Dissemination of other types of information such as:<br>• Port information<br>• Pilotage or Tugs<br>• Cargo information<br>• Health condition<br>• Port State Control (PSC)<br>• International Ship and Port Facility Security (ISPS) | 4 |
| | | 3.3.2.4 | Priority of information to be provided | 4 |
| | | 3.3.2.5 | Anticipating calls using information available / sensors | 4 |
| | | 3.3.2.6 | Delivery of information by voice or digital means:<br>• Broadcast<br>• Individual ships | 3 |
| 3.4 | Monitor and manage ship traffic | | | |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| 3.4.1 | Describe procedures to plan safe and efficient movement of ship traffic | 3.4.1.1 | Forward planning and prioritization of ship movements considering:<br>• Scheduled movements<br>• Assignment of anchorages<br>• Planning regarding lock / bridge passages | 3 |
| | | 3.4.1.2 | Implications of compliance and enforcement policies | 2 |
| 3.4.2 | Organize ships to manage risk and maintain a safe and efficient waterway | 3.4.2.1 | Identify routine (normal) and non-routine (abnormal) traffic patterns (i.e., rogue vessels, sudden change in weather, etc) | 4 |
| | | 3.4.2.2 | Use of voyage (passage) plans | 4 |
| | | 3.4.2.3 | Restrictions to ship routeing (i.e., channel design, geography, bathymetry, traffic restriction areas, anchorage areas, obstructions, point of no return etc) | 4 |
| | | 3.4.2.4 | Interaction of ship traffic in the VTS area ( i.e., ship types and characteristics, cargo, operations, etc.) | 4 |
| | | 3.4.2.5 | Situational information (i.e., waterway congestion, availability of berth, small vessel activity, regattas, fishing activity, marine works in progress etc) | 4 |
| | | 3.4.2.6 | Environmental considerations (i.e., visibility, waterspouts, dust storms, pollution, etc | 4 |
| 3.4.3 | Demonstrate water space allocation within the VTS environment. | 3.4.3.1 | Ship domain | 4 |
| | | 3.4.3.2 | Ship safety Zone / exclusion zones | 4 |
| | | 3.4.3.3 | Traffic Clearances / Permission to Proceed (e.g., entering a VTS area, departing berth/ anchorage, entering fairway, commencing specific manoeuvres or activities):<br>• Factors to consider<br>• Determine when safe criteria and conditions are met/not met<br>• Specify conditions under which movement is authorised | 4 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| | | 3.4.3.4 | Other aspects related to water space allocation:<br>• speed limits<br>• traffic routeing measures,<br>• pilotage requirements,<br>• COLREGS | 4 |
| 3.5.1 | Respond to developing unsafe situations | | | |
| | Explain considerations of developing unsafe situations | 3.5.1.1 | Situational awareness | 3 |
| | | 3.5.1.2 | Potential developing situations that may require intervention, such as:<br>• risk of collision,<br>• unclear intentions,<br>• erratic ship movement<br>• unclear or unsafe passing arrangements / movements between ships<br>• non-routine action,<br>• blind corner<br>• Ship unsure of route or position<br>• Ship deviating from route<br>• Ship requiring guidance to position / anchor<br>• Defects or deficiencies/equipment failure<br>• Severe weather conditions<br>• Emergency response | 3 |
| | | 3.5.1.3 | Conflict assessment (spatial (space, distance) separation / temporal (time) separation) | 3 |
| | | 3.5.1.4 | Considerations for navigational support, such as:<br>• Status of waterway | 3 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| | | | • Equipment capabilities and limitations<br>• Clarity of communications – VTS and ship | |
| | | 3.5.1.5 | Generic circumstances that may require navigational support:<br>• When observed<br>• On request<br>• As identified by procedures | 3 |
| 3.5.2 | Respond to developing unsafe situations to maintain a safe and efficient waterway. | 3.5.2.1 | Request information, such as:<br>• Ship identification and details such as position, course, and speed<br>• Status of ship's equipment/defects or deficiencies | 4 |
| | | 3.5.2.2 | Provide information, such as:<br>• Range and bearing from fixed objects, fairway/channel or waypoints<br>• Proximity to navigational hazards<br>• Information related to navigating into a channel/fairway/lane (i.e., track is parallel/diverging/converging with/from/to reference line)<br>• Guidance to an anchoring position<br>• Meteorological conditions (e.g., low visibility, strong winds)<br>• Ship(s) manoeuvring with difficulty or with unknown intentions<br>• Condition of the waterway that may affect safety of ship traffic | 4 |
| | | 3.5.2.3 | Provide advice, such as:<br>• Advising a ship to alter the course, speed.<br>• Advising a ship to close up/drop back on/from another ship<br>• Advising a ship to keep clear from area/position<br>• Assisting where a key bridge team member is incapacitated | 4 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| | | 3.5.2.4 | Provide warnings such as:<br>• Deviating from the planned or recommended route towards shallow water, dangerous wrecks or other obstacles not otherwise promulgated<br>• Diving operations<br>• Ships not under command. | 4 |
| | | 3.5.2.5 | Implement water space management techniques, such as:<br>• Ship safety zone<br>• Exclusion zone | 4 |
| | | 3.5.2.6 | Providing instructions, such as keep clear of area/position | 4 |
| | | 3.5.2.7 | Liaise with allied services to support a response such as:<br>• Port operations / marine operations<br>• Water police<br>• Rescue Coordination Centre (RCC, JRCC) | 4 |

# MODULE 4    NAUTICAL KNOWLEDGE

## 4.1    SUBJECT FRAMEWORK

### 4.1.1 Scope

This module covers nautical knowledge elements required to perform the function of a VTS Operator.

### 4.1.2 Objectives of Module 4

On completion of the module, the student will apply nautical knowledge concepts to maintain situational awareness for the provision of VTS, including:

- navigation theory;

- collision regulations;

- voyage (passage planning);

- the effect of tides, tidal streams and currents;

- aids to navigation and the maritime buoyage system;

- knowledge of port operations; and

- shipboard knowledge such as ship handling, navigational equipment and bridge procedures.

### 4.1.3 Additional references relevant to this module

The following references are relevant to the planning and delivery of this module:

- SOLAS' 74 Regulation V/10 – Ships' routeing

- SOLAS '74 Regulation V/11 - Ship reporting systems

- SOLAS '74 Regulation V/27 - Nautical charts and nautical publications

- SOLAS '74 Regulation V/7 – Search and rescue services

- International Maritime Dangerous Goods Code (IMDG Code)

- International Convention on Standards of Training, Certification and Watchkeeping of Seafarers, 1978, as amended in 1995 (STCW Convention)

- IMO Resolution A.917(22), as amended by Resolution A.956(23) on Guidelines for the onboard operational use of shipborne automatic identification systems (AIS)

- IMO Resolution A.954(23), Proper use of VHF channels at sea

- IMO Maritime Safety Committee Resolution MSC.232(82), Revised performance standards for Electronic Chart Display and Information Systems (ECDIS)

- Joint IMO/IHO/WMO Manual on Maritime Safety Information (MSI)

- International Code of Signals

- IHO approved documents of charts and publications

- ITU Radio Regulations, including Appendices

## 4.2   SUBJECT OUTLINE OF MODULE 4

*Table 9 Subject outline – Nautical knowledge*

| Subject Area | Recommended Competence Level | Recommended Hours | |
|---|---|---|---|
| | | Presentations/ Lectures | Exercises/ Simulation |
| **Navigation Theory** | | 2 to 4 hrs | 1 to 3 hrs |
| Terms and acronyms related to charts | Level 1 | | |
| Positioning of ships on charts | Level 1 | | |
| Speed/Distance/Time calculations | Level 3 | | |
| Theory and practice of compass corrections | Level 1 | | |
| **Voyage (Passage) Planning** | | 1 to 2 hrs | 1 to 2 hrs |
| Process of voyage planning (passage planning | Level 1 | | |
| **Tides, tidal Streams and Currents** | | 2 to 4 hrs | 1 to 3 hrs |
| Terms related to tides and tidal streams | Level 1 | | |
| Tide and current tables | Level 2 | | |
| Effect of tides, tidal streams and currents on vessel movements | Level 3 | | |
| **Collision regulations** | | 2 to 4 hrs | 4 to 6 hrs |
| International Regulations for Preventing Collisions at Sea (COLREGS) | Level 1 | | |
| COLREGS within a VTS area | Level 2 | | |
| **Aids to Navigation (AtoN)** | | 3 to 5 hrs | 3 to 5 hrs |
| Role of AtoN in safe navigation | Level 3 | | |
| **Position, Navigation and Timing (PNT)** | | 1 to 2 hrs | - - - |
| Role of PNT in safe, efficient and pollution free transits | Level 1 | | |
| **Navigational Aids (Shipborne)** | | 2 to 4 hrs | 1 to 2 hrs |
| Navigational equipment used onboard ships | Level 2 | | |
| **Shipboard Knowledge** | | 2 to 4 hrs | 1 to 2 hrs |
| Terms related to ships, shipping and cargo | Level 1 | | |
| Types of vessels and cargoes | Level 1 | | |
| Types of propulsion systems for ships | Level 1 | | |
| Considerations for carriage of dangerous goods | Level 1 | | |
| **Ship Handling** | | 4 to 7 hrs | 1 to 2 hrs |
| Factors that influence ship movement and stability | Level 3 | | |
| Factors that affect ship handling | Level 2 | | |

| Subject Area | Recommended Competence Level | Recommended Hours | |
|---|---|---|---|
| | | Presentations/ Lectures | Exercises/ Simulation |
| Effect of meteorology and hydrographic factors on vessels | Level 2 | | |
| **Bridge Procedures** | | 2 to 4 hrs | 1 to 2 hrs |
| Vessel bridge procedures | Level 2 | | |
| **Port Operations and other allied services** | | 2 to 4 hrs | 2 to 4 hrs |
| Description of port operations | Level 2 | | |
| | *Total time range* | *23 to 44 hrs* | *16 to 31 hrs* |

## 4.2.1 DETAILED competence table OF MODULE 4 – Nautical Knowledge

*Table 10* *Competence Table – Nautical Knowledge*

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| **4.1** | **Navigation Theory** | | | |
| 4.1.1 | Define terms and acronyms related to charts. | 4.1.1.1 | Chart projections (including Mercator, polyconic, gnomonic) | 1 |
| | | 4.1.1.2 | Finding positions on the globe – latitude, longitude | 1 |
| | | 4.1.1.3 | Routes and courses – great circle, rhumb line | 1 |
| | | 4.1.1.4 | Chart types (paper, raster, vector) | 1 |
| | | 4.1.1.5 | Electronic Navigation Chart (ENC), Electronic Chart Display and Information Systems (ECDIS) | 1 |
| | | 4.1.1.6 | Updating charts and publications:<br>• Notices to Mariners<br>• Temporary and Preliminary corrections (T & Ps) | 1 |
| 4.1.2 | Describe positioning of ships on charts. | 4.1.2.1 | Provision and representation of positions on charts (paper, ECDIS) | 2 |
| | | 4.1.2.2 | Measuring distances on charts | 2 |
| | | 4.1.2.3 | Lines of position (LOPs) (bearings, ranges) | 2 |
| 4.1.3 | Apply speed/distance/time calculations | 4.1.3.1 | Overview of speed/distance/time formula (S x T = D) | 3 |
| | | 4.1.3.2 | Simple scenarios | 3 |
| | | 4.1.3.3 | Complex scenarios | 3 |
| 4.1.4 | Define the theory and practice of compass corrections. | 4.1.4.1 | Gyro and magnetic compass | 1 |
| | | 4.1.4.2 | Compass directions | 1 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| 1 | | 4.1.4.3 | Variation, deviation, compass error | 1 |
| | | 4.1.4.4 | Course made good vs course to steer | 1 |
| | | 4.1.4.5 | Responding to developing unsafe situations – provision of course to make good (realistic, true) | 1 |
| **4.2** | **Voyage (Passage) Planning** | | | |
| 4.2.1 | Identify the process of voyage planning (passage planning) | 4.2.1.1 | Requirement for the ship to create a berth to berth voyage plan (IMO A.893(21); A.999(25)) | 1 |
| | | 4.2.1.2 | The four elements of a voyage plan (appraisal, planning, execution, monitoring) | 1 |
| | | 4.2.1.3 | Information to support passage plan | 1 |
| | | 4.2.1.4 | Contingency planning (by the ship) | 1 |
| **4.3** | **Tides, Tidal Streams and Currents** | | | |
| 4.3.1 | Define terms related to tides and tidal streams | 4.3.1.1 | Introduction to tides and tidal stream | 1 |
| | | 4.3.1.2 | terms relating to tides and tidal streams:<br>• Chart datum<br>• Spring/neap tides<br>• Ebb/flow/slack/eddies<br>• Set/drift/rate<br>• Diurnal/semi-diurnal | 1 |
| 4.3.2 | Interpret tide and current tables | 4.3.2.1 | Information contained in tide tables | 2 |
| | | 4.3.2.2 | Reading tide tables and current tables | 2 |
| | | 4.3.2.3 | Intermediate heights and times | 2 |
| | | 4.3.2.4 | Primary and secondary ports | 2 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| 4.3.3 | Explain the effect of tides, tidal streams and currents on vessel movements in the VTS area. | 4.3.3.1 | Estimated position (EP) and Dead Reckoning (DR) | 3 |
| | | 4.3.3.2 | Effect of tides, tidal streams and ship positions | 3 |
| **4.4** | **Collision Regulations** | | | |
| 4.4.1 | Describe the international Regulations for Preventing Collisions as Sea (COLREGS) | 4.4.1.1 | Overview of COLREGS (Part A, B, C, D, E, F) | 1 |
| | | 4.4.1.2 | Part A – General | 2 |
| | | 4.4.1.3 | International distress signals (annex IV to the COLREGS) | 2 |
| | | 4.4.1.4 | Enforcement of COLREGS | 1 |
| 4.4.2 | Explain the role of COLREGS within a VTS area | 4.4.2.1 | Part B – Steering and sailing rules | 3 |
| | | 4.4.2.2 | Conduct of vessel in specific conditions:<br>• Reduced visibility<br>• Narrow channels<br>• Traffic separation schemes | 3 |
| **4.5** | **Marine Aids to Navigation (AtoN)** | | | |
| 4.5.1 | Explain the role of aids to navigation and the IALA International Maritime Buoyage System (MBS) in safe navigation | 4.5.1.1 | Regulations pertaining to buoyage systems | 3 |
| | | 4.5.1.2 | Types of AtoN:<br>• Physical<br>• Virtual | 3 |
| | | 4.5.1.3 | Introduction to the International Maritime Buoyage System:<br>• Lateral systems (IALA A & B)<br>• Cardinal systems<br>• Special AtoN | 3 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| | | | • Implications of different systems<br>• RACONS | |
| | | 4.5.1.4 | Characteristics of floating aids and Mobile AtoN (MAtoN):<br>• Placement of buoys<br>• Fundamental rules for safe navigation<br>• Chart symbols and abbreviations<br>• Numbering of AtoN | 3 |
| | | 4.5.1.5 | Characteristics of fixed aids:<br>• Day beacons<br>• Light stations<br>• Ranges<br>• Sector lights<br>• Leading lights<br>• Fog signals | 3 |
| | | 4.5.1.6 | Characteristics of Virtual AtoN, types and uses | 3 |
| **4.6** | **Position, Navigation and Timing (PNT)** | | | |
| 4.6.1 | Describe the role of position, navigation, and timing (PNT) in safe, efficient and pollution free transits. | 4.6.1.1 | Introduction to global navigation satellite systems (GNSS):<br>• Purpose of GNSS<br>• Types of GNSS | 1 |
| | | 4.6.1.2 | Implications to VTS:<br>• Benefits and Limitations | 1 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| **4.7** | **Navigational equipment (shipborne)** | | | |
| 4.7.1 | Describe the use of different navigational equipment used onboard ships. | 4.7.1.1 | Navigational equipment, benefits and limitations:<br>• Radar / ARPA<br>• AIS<br>• Compass (gyro, magnetic)<br>• Echo sounders<br>• ECDIS | 2 |
| | | 4.7.1.2 | Regulatory framework for carriage of equipment | 2 |
| **4.8** | **Shipboard Knowledge** | | | |
| 4.8.1 | Define terms related to ships, shipping, and cargo | 4.8.1.1 | Parts of a ship:<br>• General (bow, stern, etc.)<br>• Dimensions (Length overall, length between perpendiculars, beam, draft)<br>• Loadlines and draft marks | 1 |
| | | 4.8.1.2 | Nautical terminology:<br>• Directions/relative bearings<br>• Numbers<br>• Mooring / anchoring terms<br>• Mooring lines | 1 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| 4.8.2 | Identify types of vessels and cargos | 4.8.2.1 | Types of vessels including:<br>• General cargo ships<br>• Tankers<br>• Bulk carriers<br>• Combination carriers<br>• Container ships<br>• Passenger ships<br>• Ro-ro ships<br>• Fishing vessels<br>• Offshore vessels | 1 |
| | | 4.8.2.2 | Other vessels including:<br>• Rigs<br>• Offshore supply<br>• Offshore tugs<br>• Tugs<br>• Pilot boats<br>• SAR vessels<br>• Seaplanes<br>• WIG<br>• MASS<br>• Vessels operated by allied services | 1 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| 1 | | 4.8.2.3 | Cargo, including: <br>• General cargo <br>• Palletized cargo <br>• Container cargo <br>• Bulk cargo <br>• Bulk cargo – liquid | 1 |
| 4.8.3 | Identify different types of propulsion systems for ships | 4.8.3.1 | Common systems: <br>• Fuel Oil, Diesel, diesel electric <br>• Gas turbine <br>• Steam | 1 |
| | | 4.8.3.2 | Developing systems / Alternative energy | 1 |
| 4.8.4 | List considerations for carriage of dangerous goods | 4.8.4.1 | International Maritime Dangerous Goods Code (IMDG) | 1 |
| | | 4.8.4.2 | Implications for movements in the VTS area | 1 |
| **4.9** | **Ship handling** | | | |
| 4.9.1 | Explain factors influencing ship movement and stability | 4.9.1.1 | Ship movements / six motions | 3 |
| | | 4.9.1.2 | Introduction to ship stability: <br>• Definitions of heel, list and trim <br>• Factors influencing ship stability <br>• Dangerous situations regarding ship stability | 3 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---------|-------------------|-------------|------------------|---------------------|
| 4.9.2 | Describe factors affecting ship handling | 4.9.2.1 | Overview of theory and practice of ship handling:<br>• Effect of pivot point on ship handling<br>• Line of approach<br>• Stopping characteristics<br>• Turning characteristics | 2 |
| | | 4.9.2.2 | External forces on ship handling:<br>• Winds<br>• Tides<br>• Ship-ship interaction<br>• Bank suction<br>• Squat | 2 |
| | | 4.9.2.3 | Factors affecting manoeuvrability:<br>• Types of rudders<br>• Types of propellers<br>• Thrusters<br>• Use of tugs | 2 |
| 4.9.3 | Describe the effect of meteorology and hydrographic factors on vessels | 4.9.3.1 | Meteorological elements – effect of:<br>• Wind on safety of waterway and ship manoeuvrability<br>• Reduced visibility on safety of waterway<br>• High and low pressure systems on water height, depth<br>• Effect of wind/leeway | 2 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| 2 | | 4.9.3.2 | Hydrographic factors:<br>• Effect of tides and current on safety of waterway and ship manoeuvrability<br>• Planning waterway movements considering tides and currents | 2 |
| **4.10** | **Bridge Procedures** | | | |
| 4.10.1 | Describe vessel bridge procedures | 4.10.1.1 | Maintaining a navigational watch:<br>• Under routine circumstances<br>• In pilotage waters<br>• In non-pilotage restricted waters<br>• Bridge Resource Management | 2 |
| | | 4.10.1.2 | Vessel response to emergencies in a VTS area:<br>• Regulations governing transit of vessels with regard to special circumstances<br>• Expected actions on board vessels during special circumstances | 2 |
| 2 | | 4.10.1.3 | Bridge operations (arrival & departure):<br>• Berthing and unberthing<br>• Anchoring | 2 |
| **4.11** | **Port Operations and allied services** | | | |
| 4.11.1 | Describe port operations | 4.11.1.1 | Overview of port operations | 2 |
| | | 4.11.1.2 | Overview of pilotage operations:<br>• Responsibilities of pilots<br>• Master/pilot/VTS relationship | 2 |
| | | 4.11.1.3 | Overview of allied services in the port | 2 |
| | | 4.11.1.4 | Overview of ISPS Code and security levels | 2 |

# MODULE 5    EQUIPMENT

## 5.1    SUBJECT FRAMEWORK

### 5.1.1 Scope

This module covers the requirement for VTS Operators to be able to understand the operational limitations and benefits of equipment used in VTS.

### 5.1.2 Objectives of Module 5

On completion of the module the student will use VTS equipment to provide VTS.

### 5.1.3 Additional references relevant to this module

The following references are relevant to the planning and delivery of this module:

- SOLAS regulation V/19 (AIS)
- IALA R0128 Operational and Technical Performance of VTS Systems (V-128)
- IALA R0126 The Use of the AIS in Marine Aids to Navigation Services(A-126)
- IALA G1110 Use of Decision Support Tools for VTS Personnel
- IALA G1027 Simulation in VTS Training
- IALA R0128 Operational and Technical Performance of VTS Systems
- IALA G1111 Establishing Functional & Performance Requirements for VTS Systems
- IALA G1111-1 Producing Requirements for the Core VTS System
- IALA G1111-2 Producing Requirements for Voice Communications
- IALA G1111-3 Producing Requirements for RADAR
- IALA G1111-4 Producing Requirements for AIS and VDES
- IALA G1111-5 Producing Requirements for Environment Monitoring Systems
- IALA G1111-6 Producing Requirements for Electro Optical Systems
- IALA G1111-7 Producing Requirements for Radio Direction Finders
- IALA G1111-8 Producing Requirements for Long Range Sensors
- IALA G1111-9 Framework for Acceptance of VTS Systems
- Radio Operators Certificate (ROC) and/or General Operators Certificate (GOC)

## 5.2   SUBJECT OUTLINE OF MODULE 5

*Table 11*        *Subject outline - Equipment*

| Subject Area | Recommended Competence Level | Recommended Hours | |
|---|---|---|---|
| | | Presentations/ Lectures | Exercises/ Simulation |
| **Sensors in VTS** | | 4 to 8 hrs | 1 to 2 hrs |
| Operational benefits and limitations | Level 2 | | |
| Fundamentals of radar theory | Level 3 | | |
| Operation of VHF radio in VTS | Level 2 | | |
| Use of AIS in VTS | Level 2 | | |
| Imaging systems in VTS | Level 2 | | |
| Environmental sensors in VTS | Level 2 | | |
| **Decision Support Tool** | | 2 to 4 hrs | 1 to 2 hrs |
| Principles of DST | Level 3 | | |
| Use of DST | Level 4 | | |
| **Equipment Performance Monitoring** | | 0.5 to 1 hrs | 1 to 2 hrs |
| Importance of equipment performance monitoring | Level 1 | | |
| **Evolving Technologies** | | 1.5 to 2 hrs | ----- |
| Impact of developing and evolving technologies | Level 1 | | |
| | *Total time range* | *8 to 15 hrs* | *3 to 6 hrs* |

## 5.2.1 DETAILED competence table OF MODULE 5 – Equipment

*Table 12          Competence Table – Equipment*

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| **5.1** | **Sensors in VTS** | | | |
| 5.1.1 | Describe the operational benefits and limitations of sensors in VTS | 5.1.1.1 | Sensors to support monitoring and management of ship traffic - Radar, radio, AIS, CCTV | 2 |
| | | 5.1.1.2 | Sensors related to the VTS environment – meteorology, hydrographic sensors | 2 |
| | | 5.1.1.3 | Recording / replay equipment for sensor data | 1 |
| 5.1.2 | Explain the fundamentals of radar theory. | 5.1.2.1 | Principles of radar theory | 1 |
| | | 5.1.2.2 | Application of radar for VTS | 3 |
| | | 5.1.2.3 | Features of generic VTS radar display:<br><br>• Detection, acquisition and tracking<br><br>• Difference in radar bands (X, S, etc) | 3 |
| | | 5.1.2.4 | Alerts and warnings in radar | 3 |
| | | 5.1.2.5 | Limitations:<br><br>• Factors affecting radar detection<br><br>• Factors affecting radar interpretation | 3 |
| 5.1.3 | Describe the operation of VHF Radio in VTS. | 5.1.3.1 | Frequencies in the international VHF maritime mobile band | 2 |
| | | 5.1.3.2 | Restrictions on the use of Radio Regulations (RR) Appendix 18 frequencies | 2 |
| | | 5.1.3.3 | Principles of VHF operation:<br><br>• Channel spacing<br><br>• channel saturation | 1 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---------|-------------------|-------------|------------------|---------------------|
| | | 5.1.3.4 | VHF benefits / limitations (including interference and range) | 2 |
| | | 5.1.3.5 | Operation of radio equipment:<br>• General Communications – working frequencies, Simplex, Duplex<br>• Safety, Urgency and Distress | 2 |
| | | 5.1.3.6 | Digital Selective Calling (DSC) | 1 |
| | | 5.1.3.7 | VHF Radio Direction Finder (VHF RDF) | 1 |
| 5.1.4 | Describe the use of the Automatic Identification System (AIS) in VTS | 5.1.4.1 | Introduction to AIS, including Satellite AIS | 2 |
| | | 5.1.4.2 | Modes of operation of AIS:<br>• AIS units<br>• AIS messages | 2 |
| | | 5.1.4.3 | Benefits and limitations of AIS | 2 |
| 5.1.5 | Describe the use of imaging systems in VTS | 5.1.5.1 | Overview of:<br>• Close circuit TV (CCTV)<br>• Low Light TV (LLTV)<br>• Infra-red CCTV | 2 |
| 5.1.6 | Describe the use of environmental sensors in VTS | 5.1.6.1 | Hydrographic sensors:<br>• Tide gauges / remote height of tide indicators<br>• Tidal stream indicator – remote indications<br>• Data from wave monitoring sites | 2 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| 2 | | 5.1.6.2 | Meteorological sensors:<br>• Barometer<br>• Temperature/humidity indicators<br>• Anemometers (wind measurement)<br>• Visibility sensors | 2 |
| **5.2** | **Decision Support Tool** | | | |
| 5.2.1 | Explain the principles of DST in VTS | 5.2.1.1 | General Principles of DST | 3 |
| | | 5.2.1.2 | Types of DST (long-term (planning); near real-time; real-time) | 3 |
| | | 5.2.1.3 | Integration of data from different sources (data fusion) | 3 |
| | | 5.2.1.4 | Alerts and alarms | 3 |
| | | 5.2.1.5 | Benefits / limitations | 3 |
| 5.2.2 | Use Decision Support Tools (DST) in VTS. | 5.2.2.1 | Providing relevant and timely information | 4 |
| | | 5.2.2.2 | Monitoring and managing vessel traffic | 4 |
| | | 5.2.2.3 | Responding to developing unsafe situations | 4 |
| **5.3** | **Equipment Performance Monitoring** | | | |
| 5.3.1 | Identify the importance of equipment performance monitoring | 5.3.1.1 | Expected normal operating parameters | 1 |
| | | 5.3.1.3 | Reporting outages | 1 |
| **5.4** | **Evolving Technologies** | | | |
| 5.4.1 | Describe the impact of developing and evolving technologies on VTS | 5.4.1.1 | Digital developments | 1 |
| | | 5.4.1.2 | Operational developments | 1 |
| | | 5.4.1.3 | Other developments | 1 |

# MODULE 6 HUMAN FACTORS

## 6.1 SUBJECT FRAMEWORK

### 6.1.1 Scope

This module addresses the requirement for VTS Operators to perform their duties under all conditions, including emergencies and stressful situations. It is recommended that the contents of this module be presented to the students in the early stages of the course.

### 6.1.2 Objectives of Module 6

On completion of the module the student will demonstrate personal competence and qualities suitable to conduct their duties in a manner that supports a healthy work environment in VTS.

### 6.1.3 Additional References relevant to this module

The following references are relevant to the planning and delivery of this module:

- IMO MSC.1/Circ. 1598 Guidelines on Fatigue
- IALA G1171 Human Factors and Ergonomics in VTS
- IALA G1086 The Global Sharing of Maritime Data and Information
- IALA G1102 VTS Interaction with Allied or Other Services
- IALA G1110 Use of Decision Support Tools for VTS Personnel
- IALA G1167 VTS Management
- Internal Standard Operating Procedures
- Internal Human Resource policies and practices
- Information management policies or regulations, data protection regulations
- Material on leadership, conflict resolution and interpersonal skills.

## 6.1 SUBJECT OUTLINE OF MODULE 6

Table 13      Subject outline – Human Factors

| Subject Area | Recommended Competence Level | Recommended Hours | |
|---|---|---|---|
| | | Presentations and Lectures | Exercises and Simulations |
| **Teamwork** | | **2 to 4 hrs** | **2 to 4 hrs** |
| Theory of teamwork | Level 2 | | |
| Teamworking skills | Level 2 | | |
| **Responsibility and reliability** | | **2 to 3 hrs** | - - - - |
| Responsibility and reliability in VTS | Level 4 | | |
| **Fatigue Management and shiftwork** | | 1 to 3 hrs | 1 to 2 hrs |
| Fatigue and stress in VTS working environment | Level 2 | | |
| | *Total time range* | *5 to 10 hrs* | *3 to 6 hrs* |

## 6.1.1 DETAILED competence table OF MODULE 6 – Human Factors

*Table 14        Competence Table – Human Factors*

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| 6.1 | Teamwork | | | |
| 6.1.1 | Describe the theory of teamwork. | 6.1.1.1 | Characteristics of leaders and followers | 2 |
| | | 6.1.1.2 | Adaptability, Flexibility, Assertiveness, Diplomacy | 2 |
| | | 6.1.1.3 | Decision making:<br>• Taking initiative<br>• Prioritising tasks<br>• Thinking critically<br>• Communicating with team members | 2 |
| | | 6.1.1.4 | Conflict resolution / negotiation:<br>• Identifying methods of conflict resolution<br>• When and how to intervene | 2 |
| 6.1.2 | Demonstrate teamwork skills in support of VTS operations. | 6.1.2.1 | Working relationship within the VTS team | 4 |
| | | 6.1.2.2 | Working relationship within the VTS | 1 |
| | | 6.1.2.3 | Working relationship with VTS and port team (ships, pilots, tugs) | 2 |
| | | 6.1.2.4 | Working relationship with VTS and allied services | 2 |
| 6.2 | Responsibility and Reliability | | | |
| 6.2.1 | | 6.2.1.1 | Personal Safety and safety of others | 4 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| | Explain the importance of responsibility and reliability in VTS. | 6.2.1.2 | Responsibility for actions including:<br>• attention to detail<br>• respect<br>• attitude<br>• reliability | 4 |
| 6.3 | Fatigue management and shift work | | | |
| 6.3.1 | Describe strategies to address fatigue and stress related in the VTS working environment. | 6.3.1.1 | Workplace health and safety:<br>• Physical safety<br>• Psychological safety<br>• Implications of shift work environment<br>• Personal fitness for duty<br>• Health strategies | 2 |
| | | 6.3.1.2 | Stress and Fatigue:<br>• Causes of stress and fatigue<br>• Recognise the dangers of stress and fatigue<br>• Strategies to cope with stress and fatigue | 2 |
| | | 6.3.1.3 | Dealing with traumatic experiences | 2 |
| | | 6.3.1.4 | Healthy work/life balance with shift work | 2 |

# MODULE 7    EMERGENCY SITUATIONS

## 7.1    SUBJECT FRAMEWORK

### 7.1.1 Scope

This module covers the response to emergency situations while maintaining safety of the waterway in the VTS area.

### 7.1.2 Objective of Module 7

On completion of the course, the student will:

- identify the actions required when responding to internal and external emergencies to ensure the protection of the VTS area and, as far as practicable, maintain a safe and efficient flow of traffic;

- learn to apply contingency plans;

- co-ordinate effectively with and provide support to agencies responsible for emergency response and search and rescue activities; and

- understand the importance of reporting incidents and near-miss situations.

### 7.1.3 Additional references relevant to this module

The following references are relevant to the planning and delivery of this module:

- IMO Resolution MSC.255(84) Casualty Investigation Code

- IMO MSC-MEPC.7/Circ.7 Guidance on near-miss reporting

- International Ship and Port Facility Security (ISPS) Code

- International Safety Management (ISM) Code

- IALA G1118 Marine Casualty/Incident Reporting and Recording, Including Near-Miss Situations as it Relates to VTS

- IALA G1141 Operational Procedures for Delivering VTS

- IALA G1110 Use of Decision Support Tools for VTS Personnel

## 7.2 SUBJECT OUTLINE OF MODULE 7

*Table 15*        *Subject outline – Emergency situations*

| Subject Area | Recommended Competence Level | Recommended Hours | |
|---|---|---|---|
| | | Presentations and Lectures | Exercises and Simulations |
| **Contingency plans** | | 2 to 3 hrs | 1 to 2 hrs |
| Role of Contingency plans | Level 2 | | |
| **Emergency Response** | | 4 to 6 hrs | 6 to 8 hrs |
| Internal / External emergencies | Level 1 | | |
| Responding to emergencies | Level 4 | | |
| **Reporting incidents and near miss situations** | | 0.5 to 1.5 hrs | 0.5 to 1.5 hrs |
| Terms related to emergency response | Level 1 | | |
| Procedures for recording | Level 2 | | |
| **Ship and Port Security** | | 0.5 to 1.5 hrs | 0.5 to 1.5 hrs |
| Obligations and requirements related to ship and port security | Level 2 | | |
| | *Total time range* | *7 to 12 hrs* | *8 to 13 hrs* |

## 7.2.1 DETAILED COMPETENCE TABLE OF MODULE 7 – EMERGENCY SITUATIONS

*Table 16*      *Competence Table – Emergency Situations*

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| **7.1** | **Contingency Plans** | | | |
| **7.1.1** | *Describe the role of contingency plans in VTS operations.* | 7.1.1.1 | Overview of Contingency Planning | 2 |
| | | 7.1.1.2 | Implementation of contingency plans for emergency scenarios such as:<br>• Collisions<br>• Grounding<br>• Marine pollution<br>• Fire<br>• Hazardous cargo<br>• Search and Rescue (SAR) incidents | 2 |
| **7.2** | **Emergency response** | | | |
| **7.2.1** | *Identify response actions for internal and external emergencies* | 7.2.1.1 | Internal emergencies (internal to the VTS centre), such as:<br>• System failure<br>• Fire/flood<br>• Evacuation of VTS centre | 1 |
| | | 7.2.1.2 | External emergencies (external to the VTS centre), such as:<br>• Collisions<br>• Allisions<br>• Groundings<br>• Marine Pollution<br>• Fire<br>• Hazardous cargoes<br>• SAR incidents<br>• Severe weather events<br>• Other special circumstances | 1 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---------|-------------------|-------------|------------------|---------------------|
| 7.2.2 | *Respond to emergency situations while ensuring the protection of the VTS area and, as far as practicable, maintaining a safe and efficient flow of traffic.* | 7.2.2.1 | Initial response to emergency situation:<br>• Data collection<br>• Evaluate and prioritise the situation<br>• Inform relevant emergency response agencies | 4 |
| | | 7.2.2.2 | Monitoring and managing ship traffic during emergencies:<br>• Alternative routing arrangements<br>• Water space management (spatial separation / temporal separation)<br>• Emergency alteration to route plans, speed restrictions | 4 |
| | | 7.2.2.3 | Maintain communications:<br>• Alerting procedures<br>• Co-ordination with, and support to relevant emergency response agencies<br>• Situation reports<br>• Navigational warnings (when required) | 4 |
| | | 7.2.2.4 | Role of:<br>• Checklists<br>• Standard operating procedures | 3 |
| **7.3** | **Reporting incidents and near miss situations** | | | |
| **7.3.1** | *Define terms related to emergency response.* | 7.3.1.1 | Definitions and differences between:<br>• emergency<br>• accident<br>• near miss<br>• incident<br>• casualty<br>• serious casualty | 1 |
| **7.3.2** | *Describe procedures for recording activities during incidents and emergency situations.* | 7.3.2.1 | Importance of recording activities during incidents and emergencies | 2 |
| | | 7.3.2.2 | Methods of recording | 2 |
| | | 7.3.2.3 | Security of information | 2 |

| Element | Session Objective | Sub-element | Subject Elements | Level of Competence |
|---|---|---|---|---|
| | | 7.3.2.4 | Developing incident reports:<br>• content<br>• process | 1 |
| **7.4** | **Ship and Port Security** | | | |
| **7.4.1** | *Describe reporting obligations and requirements related to ship and port security* | 7.4.1.1 | Introduction to International Ship and Port Security (ISPS) Code | 2 |
| | | 7.4.1.2 | Overview of ISPS code and security levels | 2 |
| | | 7.4.1.3 | Introduction to International Ship Management (ISM) Code | 1 |