IALA MODEL COURSE

V-103/2

VESSEL TRAFFIC SERVICES SUPERVISOR TRAINING

Edition 2.0

December 2009

DOCUMENT REVISION

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

Date	Page / Section Revised	Requirement for Revision
March 2000	1st issue	
December 2005	Ed.1.1 Entire document	Reformatted to reflect IALA documentation Hierarchy
December 2009	Ed.2 Entire document	Reflecting 10 years' experience and the evolution of technology

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FOREWORD

The International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) has been associated with Vessel Traffic Services (VTS) since 1955 and recognises the importance of human resources to the development of efficient Vessel Traffic Services worldwide.

Taking into account the International Convention on Standards of Training, Certification and Watchkeeping of Seafarers, 1978, as amended in 1995 (STCW Convention), the Seafarer's Training, Certification and Watchkeeping Code (STCW Code) and STCW 95 Resolution 10, IALA has adopted Recommendation V-103 on Standards of Training and Certification of VTS Personnel.

The model training courses developed, or being developed, by IALA for VTS personnel are:

- Model Course V-103/1 - VTS Operator Training
- Model Course V-103/2 - VTS Supervisor Training
- Model Course V-103/3 - VTS On-the-Job Training
- Model Course V-103/4 - VTS On-the-Job Training Instructor

These model courses are intended to provide national members and other appropriate authorities charged with the provision of Vessel Traffic Services with specific guidance on the training of VTS Operators and VTS Supervisors. They may be used by maritime training organisations, and assistance in implementing any course may be obtained through IALA at the following address:

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PART A   COURSE OVERVIEW

1   OVERVIEW

IALA recommends that training providers utilise accredited training courses as per IALA Guideline 1014 on the Accreditation of VTS Training Courses.

2   PURPOSE OF THE MODEL COURSE

The purpose of this model course is to assist maritime training organisations and their teaching staff in the preparation and introduction of new training courses for VTS Supervisors, or in enhancing, updating or supplementing existing training material where the quality and effectiveness of the training courses may thereby be improved.

This course provides details of the subject areas for knowledge and practical competence required for a VTS Operator to gain an endorsement as a VTS Supervisor.

3   USE OF THE MODEL COURSE

The complete course comprises six modules, each of which deals with a specific subject representing a requirement or function of a VTS Supervisor. Each module contains a subject framework stating its scope and aims, a subject outline and a detailed teaching syllabus.

The course also provides participants with the opportunity to exercise the role of a VTS Supervisor. These exercises should, wherever practicable, use simulation. Where simulation is not practicable, the exercises should be designed to be fully representative of appropriate situations that occur in a VTS.

PART B   DELIVERY OF THE MODEL COURSE

1   INTRODUCTION

All training and assessment of personnel for gaining the endorsement as a VTS Supervisor 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 persons qualified in accordance with Part C, section 4 - Training Staff Requirements.

Training staff should review the course outline and detailed syllabus in each subject. The actual level of knowledge, skills and prior technical education of the participants in the subject concerned should be kept in mind during this review. Any differences between the level of skills and competencies of the participant and those identified within the detailed training syllabus should be identified. To compensate for such differences, the instructor is expected to delete from the course, or reduce the emphasis on, items dealing with knowledge or skills already attained by the participants. The instructor should also identify any academic knowledge, skills or technical training that the participants may not have acquired.

By analysing the detailed syllabus and the academic knowledge required to allow training in the technical area to proceed, the instructor can design an appropriate pre-entry course in the subjects in which weakness is evident. Alternatively, the elements of academic knowledge required to support the technical training elements concerned may be inserted at appropriate points within the syllabus.

Adjustment of the module objectives, scope and content for each subject may also be necessary if the participants completing the course are to undertake duties which differ from the objectives specified.

2   COURSE MODULES

The modular presentation enables the instructor to adjust the course content to suit the participant intake and provide any revisions of the subject objectives as required. The instructor should draw up lesson plans based on each detailed syllabus and the references in them to the textbooks and teaching material suggested for the course. Where no adjustment has been found necessary in the subjects of a detailed syllabus, the lesson plans may simply consist of the detailed syllabus with keywords or other reminders added to assist the instructor in making his presentation of the material.

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 and levels 3 to 5 are used in the model course for VTS Supervisor. See Table 1, Levels of Competence in Part C.

Each level of competence is defined in terms of the learning outcome, the instructional objectives and the required skills. The recommended level of competence for each subject is indicated in the Subject Outline, of each module.

3   SUBJECT OUTLINE

The subject outline, of each module also includes a total recommended number of hours that should be allotted to each module. However, it should be appreciated that these allocations are arbitrary and assume that the participants have met fully all of the entry requirements specified for each subject. The instructor should therefore carefully review the objectives during course and lesson plan design and consider the need to reallocate the time required to achieve each specific learning objective. In addition, the opportunity to reduce formal

training time through recognition of Accredited Prior Learning (APL) should be taken advantage of whenever documented evidence of prior learning or professional certification can be produced by the course participants.

4 DETAILED TEACHING SYLLABUS

The detailed teaching syllabus, of each module has been written in learning-objective format in which the objective describes what the participant must do to demonstrate that knowledge has been transferred. All objectives are understood to be prefixed by the words:

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

In preparing a teaching scheme and lesson plans, the instructor is free to use any teaching method or combination of methods that will ensure participants can meet the stated objectives. However, it is essential that participants complete the subject matter set-out in each module.

5 PRESENTATION

The presentation of concepts and methodologies may be repeated as necessary in various ways until the instructor is satisfied that the participant has attained a good working knowledge in each subject.

6 EVALUATION OR ASSESSMENT OF THE COURSE PARTICIPANTS

The evaluation criteria are contained in column 4 of the VTS Supervisor competence chart (see **Error! Reference source not found.**), and provide the means for an assessor to judge whether a participant is competent to perform the related tasks, duties and responsibilities.

7 IMPLEMENTATION

For the course to run smoothly and effectively, considerable attention must be paid to the availability and use of:

- Qualified instructors;
- Support staff;
- Rooms and other spaces;
- Equipment;
- Textbooks, technical papers;
- Other reference material.

Thorough preparation is key to successful implementation of the course.

8 VALIDATION

The information contained in this document has been validated by a group of technical advisers, consultants and experts on training of VTS personnel. These were drawn from the IALA VTS Committee, training organisations of IALA national members and experienced VTS personnel so that the standards implemented may be as uniform as possible. Validation in the context of this document means that the group has found no grounds to object to its contents.

PART C   COURSE FRAMEWORK

1   INTRODUCTION

The model course covers the requirements of the IALA Recommendation V-103. On successful completion of the course and assessments, the participants should have been presented with sufficient training and to carry out with competence the duties of a VTS Supervisor at a VTS centre. In particular they should be fully conversant with the administrative functions of a VTS and the methods of responding to emergency situations as well as the principles of Vessel Traffic Services, the services that a VTS centre can provide to shipping and the resources and means of providing those services.

2   REQUIREMENTS FOR ENDORSEMENT AS A VTS SUPERVISOR

Every candidate for a VTS Supervisor endorsement should:

- be in possession of a valid VTS Operator Certificate;

- have achieved the International English Language Testing System (IELTS) level 6, or its equivalent;

- satisfy the Competent Authority by passing the appropriate assessment for the accredited course of Supervisor training and that they possess the additional theoretical and practical knowledge appropriate to the requirements of a VTS Supervisor.

3   COURSE INTAKE – LIMITATIONS

Class sizes may be limited at the discretion of the Competent Authority in order to allow the instructor to give adequate attention to individual participants. In general it is recommended that a maximum of 12-14 students be the upper limit that a single instructor can be expected to train satisfactorily to the level of competence involved. Larger numbers may be admitted if extra staff and tutorial periods are provided to deal with participants on an individual basis.

During practical sessions and group activities there may be additional restraints on class size. In particular, 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.

4   TRAINING STAFF REQUIREMENTS

All instructors and assessors should be appropriately qualified for the particular types and levels of training or assessment required for the model course.

The accredited training programme for VTS Supervisors should ensure that the qualifications and experiences of instructors and assessors are covered in the application of appropriate quality training standards. Such qualifications, experience and application of quality standards should incorporate appropriate training in instructional techniques, and training and assessment methods and practices, and comply with all applicable recommendations set out in the following paragraphs.

As well as instructors and assessors, additional staff may be required for the maintenance of equipment and for the preparations of materials, work areas and supplies for the practical work.

4.1 Instructors

Any person conducting training of personnel qualifying for certification as VTS Supervisors should:

1   Have an appreciation of the training programme and an understanding of the specific training objectives for the particular type of training being conducted;

2   Be professionally and academically qualified in the task for which training is being conducted;

3   Have an appropriate balance of professional and teaching qualifications;

4   If conducting training with the use of a simulator:

    a   have received appropriate guidance in instructional techniques involving the use of simulators; and

    b   have gained practical operational experience on the particular simulator being used.

Any person responsible for the supervision of training personnel should have a full understanding of the training programme and the specific objectives for each element of training being conducted.

4.2 Assessors

Any person conducting assessment of competence of personnel should:

1   Have an appropriate level of knowledge and understanding of the competence to be assessed;

2   Be qualified in the task for which the assessment is being made;

3   Have received appropriate guidance in assessment methods and practices;

4   Have gained practical assessment experience; and

5   If conducting assessment involving the use of simulators, have gained practical assessment experience on the particular type of simulator under the supervision, and to the satisfaction, of an experienced assessor.

5   TEACHING FACILITIES AND EQUIPMENT

Facilities other than an ordinary classroom fitted with a chalkboard or whiteboard, an overhead projector or computer-assisted projector and screen are given in the individual subject frameworks.

In order to assist instructors, references are shown against the subjects in the modules to indicate references and publications, additional technical material and teaching aids that the instructor may wish to use when preparing and presenting the course, see Annex B, Teaching aids and references. The material listed in the subject frameworks has been used to structure the detailed teaching syllabuses; in particular:

- teaching aids (indicated by A);

- equipment needed by participants (indicated by E); and

- references (indicated by R).

Table 1   Levels of Competence

Level	Knowledge and/or Attitude	Skill
Level 1 Work of a routine and predictable nature generally requiring supervision	**Comprehension** 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** 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
Level 2 More demanding range of work involving greater individual responsibility. Some complex/non-routine activities	**Application** Applies concepts and principles to new situations; applies laws and theories to practical situations; demonstrates correct usage of methods or procedures	**Autonomous response** The learned responses have become habitual and the movement is performed with confidence and proficiency
Level 3 Skilled work involving a broad range of work activities. Mostly complex and non-routine	**Analysis** Recognises un-stated assumptions; recognises logical inconsistencies in reasoning; distinguishes between facts and inferences; evaluates the relevancy of data; analyses the organisational structure of work	**Complex observable response** 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
Level 4 Work that is often complex, technical and professional with a substantial degree of personal responsibility and autonomy	**Synthesis** Integrates learning from different areas into a plan for solving a problem; formulates a new scheme for classifying objects or events	**Adaptation** Skills are so well developed that individuals can adapt rapidly to special requirements or problem situations
Level 5 Complex techniques across wide and often unpredicted variety of contexts. Professional/senior managerial work	**Evaluation** 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** The creation of new practices or procedures to fit a particular situation or specific problem and emphasizes creativity based upon highly developed skills

PART D   GUIDELINES FOR INSTRUCTORS

1   INTRODUCTION

VTS Supervisors are appropriately qualified persons performing one or more tasks contributing to the services of a VTS centre. It is essential that education and training be aimed at minimising incidents due to mistakes or errors of judgement. This model course is designed to meet the requirements for qualified VTS personnel to obtain an endorsement as a VTS Supervisor capable, subject to obtaining satisfactory On-the-Job Training, of supervising and managing an Information, Navigational Assistance or Traffic Organisation Service.

The demonstration of a high level of responsibility, watchfulness and precision characterise a competent VTS Supervisor. Training and education should therefore aim at stimulating these qualities.

Those parts of the subject that are important from the point of view of safety should be emphasised. The instructor should therefore be thoroughly acquainted with the relevant rules that regulate Vessel Traffic Services.

It is important to keep in mind the close relationship of all subjects in the VTS Supervisors course. In particular, instructors should continuously monitor the additional personal attributes of participants and, when appropriate, draw their attention to the need to meet the subjects of that module.

In Vessel Traffic Services new techniques and equipment are developed very quickly. This makes it necessary for instructors to keep up to date in new techniques and in national and international rules and regulations. Instructors should also be encouraged to teach relevant new developments and techniques not mentioned in this syllabus.

2   CURRICULUM

The subject modules into which the course is divided reflect the competence headings of the VTS Supervisor Competence Chart (see ANNEX 1). The syllabuses are presented this way to show clearly the relationship of the syllabus with the IALA recommendations.

The subjects shown in the detailed syllabus are not listed in order of priority. Instructors should treat them in the order, which they consider to be the most effective for their course participants and circumstances.

Great care should be taken when using the levels of competence in Table 1. They have been phrased in a precise form to indicate exactly what the participant should be capable of doing. This then becomes the means of demonstrating that the intended level of knowledge or skill has been attained.

The recommended hours given in the syllabuses are intended to be used as approximate guidelines for planning purposes. The hours should be adjusted as necessary to suit local circumstances in the light of experience with previous courses. If possible the course should be implemented with some flexibility to allow for adjustments during its running. It is normal for different participants to require different lengths of time to cover the same work. For practical reasons some minor adjustments will probably be needed when drawing up the timetable to fit the work to be covered into fixed teaching periods and term times.

The success of the course will depend, to a large extent, upon detailed co-ordination of the individual subjects into a coherent teaching scheme. It is important that an experienced instructor acts as course co-ordinator to plan and supervise the implementation of the course.

Using the time estimates, modified as appropriate, a timetable should be drawn up to suit the normal working day and terms of the training organisation. Teaching schemes should be prepared by the teaching staff outlining the subject areas to be covered week by week. All members of the teaching team should have a copy of the proposed schemes so that they are aware of what is being done in subjects other than their own.

The teaching schemes should be scrutinised carefully to ensure that all of the listed subjects are covered, that repetition is avoided and that essential pre-requisite knowledge at any stage has already been covered. Only those additional requirements set by the Competent Authority should be introduced.

The course co-ordinator should monitor the running of the course. There should be regular discussions with the teaching staff involved concerning the progress of participants and any problems that have become apparent. Modifications of the teaching scheme should be made where necessary to ensure that participants are attaining the objectives laid down. If necessary, extra tuition should be arranged to enable weaker students to reach the required standard. At the conclusion of the course a discussion should be held to determine whether changes should be made to improve future courses.

Procedures should be in place to follow the On-the-Job Training (OJT) of students, using comments from both participants and OJT Instructors to help ensure relevancy and validity of future courses. The transition from advanced training to OJT should appear as continuous as possible.

3   EVALUATION OR ASSESSMENT

Continual assessment of participants should be undertaken. In many cases the assessment can be based on the marks given to participants' course work, providing a proper record of it is kept. That can be supplemented by occasional short test papers. These assessments are additional to any examination required for the purposes of certification.

Assessments should use the following five levels to indicate the progressive learning attained by participants. It is recommended that, for the VTS Supervisor, an average level of four to five should be considered as being satisfactory.

Table 2   Assessment levels

Level	Description
LEVEL 1	The participant demonstrates a willingness to learn.
LEVEL 2	The participant demonstrates active participation in the learning process.
LEVEL 3	The training positively influences the participant's behaviour and attitude, and there is a measurable increase in knowledge and skills.
LEVEL 4	The participant demonstrates the ability to adapt existing knowledge, skills and attitude when dealing with new and unplanned situations.
LEVEL 5	The participant demonstrates a permanent positive change in knowledge, skills and attitude and is ready to positively influence others. The participant may exhibit some positive changes in co-related behaviours.

The form and timing of examinations for endorsement as a VTS Supervisor is a matter for the Competent Authority concerned.

An adequate period of time should be allowed at the end of the course for revision and review of the course content. That period and the time occupied by examinations would be additional to the times shown in the syllabuses.

The Competent Authority may recognize documented evidence including assessments completed for the attainment of related certificates as equivalencies for parts or all of specific VTS modules.

PART E COURSE MODULES

The complete course comprises six modules, each of which deals with a specific course module and subject representing a requirement or function of a VTS Supervisor, followed by simulated exercises and assessment intended to be representative of events and incidents likely to be experienced in a VTS centre.

Table 3 Recommended Course Hours

Subject	Recommended Duration in Hours[1]	
	Presentations / Lectures	Exercises / Simulation[2,3]
1. Advanced Traffic Management	14	18
2. VTS Equipment	3	3
3. Additional Personal Attributes	6	4
4. Responding to Emergency Situations	12	18
5. Administrative Functions	12	6
6. Legal Knowledge	6	3[4]
Total	53	52

Notes:
1. The recommended times are based on the assumption that participant have no knowledge on any subject in excess of that gained during the VTS Operators basic training. The actual time required for each module will vary, depending on previous knowledge and the entrance level of the participant.
2. The times recommended include simulation time, but do not include the time necessary for examinations or tests of proficiency.
3. Simulation will provide an opportunity to combine several of the required teaching points of all modules concurrently.
4. Aspects pertaining to legal implications will be evidenced throughout all simulation exercises

MODULE 1   ADVANCED TRAFFIC MANAGEMENT

1.1   INTRODUCTION

Instructors for this module should have knowledge and comprehension of ship bridge activities as well as qualifications in the VTS/Maritime field and the ability to apply nautical techniques in a VTS environment. If this cannot be achieved, then an appropriate expert should cover sections of this module relevant to their field of expertise. Ideally, every instructor should have full access to simulated VTS.

1.2   SUBJECT FRAMEWORK

1.2.1 Scope

This syllabus covers the requirement of candidates for VTS Supervisors to have nautical knowledge and management skills additional to those required for VTS Operators. This is to ensure effective traffic management and port operations.

This module also provides detailed knowledge of port operations and the means by which management information can be co-ordinated between all authorities associated with port management activities.

The syllabus provides candidates with an understanding of the conduct and safe management of dangerous cargoes and the ability to initiate effective actions in the event of accidental discharge, ingress of water or fire.

1.2.2 Aims

On completion of this module candidates will demonstrate the ability to manage a VTS watch responsible for the provision of VTS traffic and port operations services and ensure that VTS is capable of co-ordinating effectively with authorities responsible for other port management services.

1.3 SUBJECT OUTLINE OF MODULE 1

Table 4   Subject outline – Advanced Traffic Management

Subject Area	Recommended Competence Level	Recommended Hours	
		Presentations/ Lectures	Exercises/ Simulation[1]
Data used in VTS Charts and publications Monitoring normal operation of aids to navigation Other data sources	Level 4		
Marine Organisations International/national/local organisations Roles and functions of maritime organisations	Level 4		
Traffic/Port Management Principles of waterway and traffic management Traffic monitoring and organisation Supervisory responsibilities and interaction Harbour operations Coastal VTS	Level 5		
Dangerous Cargoes Types of dangerous cargo Special considerations for ships carrying dangerous cargoes in a VTS area Pollution control and response	Level 4		
		14 hours total	18 hours total

Note 1   *This should, where possible, include participation in a major regional pollution control exercise.*

1.4 DETAILED TEACHING SYLLABUS OF MODULE 1

Table 5   Detailed teaching syllabus – Advanced traffic management

Subjects / Learning Objectives	Reference	Teaching Aid
Data used in VTS		

Charts and publications
    Systems for correcting charts and publications
    Means of promulgating changes to charts and publications
    Significance of failure to correct and promulgate changes to charts and publications
	R4, R22, R27, R43	A1, A2, A3, A4, A6, A7

Monitoring normal operation of aids to navigation
    Visual confirmation of position and operation
    Radar confirmation of position
    Monitoring of remote sites
	R42, R43	

Other data sources
    International, regional, national and local data bases
    Other data inputs		

Subjects / Learning Objectives	Reference	Teaching Aid
Marine Organisations		

International/national/local organisations
    International, national and regional SAR arrangements
    IMO/IHO/ITU
    IALA
    IMPA/IHMA/IAPH
    National/local governmental body/ ministry (*)
    National/local maritime executive/operational body (where different from (*))
    Other organisations
Roles and functions of maritime organisations
    Establish chain of authority (relevant to the body of trainees under instruction)
	R13, R35	A17

Traffic/Port Management		

Principles of waterway and traffic management
    Types of traffic / port management service
    Planning
    Risk management
    Allocation of space
    Criteria which determines the parameters for the safe passage of shipping
    Guidelines on Navigational Assistance Service (NAS)
    Required nautical knowledge
	R1 to R7 inclusive, R17, R35, R41, R58, R59	A1, A2, A3, A5
		E1
		E2 during simulated exercises

Traffic monitoring and organisation
    Traffic patterns
    VTS sailing or route plans
    Situation analysis
    Monitoring and surveillance requirements
	R17, R37, R41	

Subjects / Learning Objectives	Reference	Teaching Aid
Related nautical knowledge		
Supervisory responsibilities and interaction		
Ship masters (including PEC holders)		
Marine pilots		
VTS		
Ships agents		
Tugs and towing		
Allied services		
Other government departments/agencies		
Related nautical knowledge		
Harbour operations		
Harbour master – Port authority		
Port users/stakeholders		
Terminal operators		
Security		
Role of VTS within the harbour		
Other government organizations		
Special operations		
Related nautical knowledge		
Ship Reporting Systems	R1, R2, R3, R7, R12, R16, R35, R60	
Reporting and recording of alleged/observed breaches of COLREGS, mandatory ship reporting system requirements and SOLAS		
Coastal VTS		
Concept of coast state control waters		
Geographical limits of territorial waters SAR regions, EEZ and other special zones		

Subjects / Learning Objectives	Reference	Teaching Aid
National emergency towing protocol		
Related diplomatic protocols		
Related nautical knowledge		
Dangerous Cargoes	R8, R38,R40	A17, A18
Types of dangerous cargo		
International Maritime Dangerous Goods Code (IMDG)		
International Convention for the prevention of pollution from ships (MARPOL)		
Local/regional contingency and emergency requirements		
Special considerations for ships carrying dangerous cargoes in a VTS area		
International Maritime Dangerous Goods Code (IMDG)		
International Convention for the prevention of pollution from ships (MARPOL)		
Local/regional contingency and emergency requirements		
VTS concerns		
Pilotage concerns		
Pollution control and response		Standard Hazmat course
Methods of containing		
Methods of recovery		
Role of VTS in national and local contingency/response plans		

MODULE 2   VTS EQUIPMENT

2.1   INTRODUCTION

Instructors for this module should have comprehension of the equipment and systems used in vessel traffic services and how they are applied in a VTS environment. If this cannot be achieved, then the appropriate expert should cover certain sections of this module. Every instructor should have full access to a simulator capable of representing the VTS environment. In addition, if possible arrangements should be made for participants to visit operational VTS centres.

2.2   SUBJECT FRAMEWORK

2.2.1 Scope

This syllabus covers the theory and practice of maintaining the satisfactory operation of VTS systems, including monitoring the performance of equipment and sub-systems and organising maintenance requirements as and when necessary.

2.2.2 Aims

On completion of the module participants will demonstrate a knowledge of generic system operation, as appropriate to the integration of VTS equipment, redundancy arrangements for the collection, analysis and dissemination of traffic information. Participants will explain rationale and demonstrate skills to identify the malfunction or degradation in performance of equipment and to keep the system operational on a 24/7 basis. Specific knowledge will be considered in On–the-Job Training.

In addition, the participants will demonstrate understanding of systems to enable services to be maintained, to the maximum extent practicable, in the event of equipment becoming unserviceable or malfunctioning.

Participants will communicate with technical staff to ensure that relevant documentation concerning the technical characteristics of the equipment, its operation, performance checks and maintenance, including routine servicing and repair work, is current.

2.3   SUBJECT OUTLINE OF MODULE 2

Table 6   Subject outline – VTS equipment

Subject Area	Recommended Competence Level	Recommended Hours	
		Presentations/ Lectures	Exercises/ Simulation
VTS Equipment Operation of equipment and systems Maintenance procedures Redundancy of equipment	Level 3	3 hours total	3 hours total

2.4   DETAILED TEACHING SYLLABUS OF MODULE 2

Table 7   Detailed teaching syllabus – VTS equipment

Subjects /Learning objectives	Reference	Teaching Aid
VTS Equipment	R31, R33, R34, R37, R41, R49, R57	A1, A2, A4, A6, A11, A12, A13, A15, A17, A18

Operation of equipment and systems
    Monitoring and maintaining optimum performance and types of:
        Equipment and systems for collecting data
        Equipment and systems for data analysis
        Equipment and systems for disseminating data
    Shutdowns/equipment degradation
        Scheduled
        Unscheduled
        Rectification
        Impact on operational procedures and levels of service
        New technology		

Maintenance procedures
    Routine maintenance
        Daily
        Weekly
        Monthly and longer intervals of time
    Unscheduled maintenance		

Redundancy of equipment
    Systems and equipment for data collection
    Systems and equipment for data analysis
    Systems and equipment for data dissemination		

MODULE 3   ADDITIONAL PERSONAL ATTRIBUTES

3.1   INTRODUCTION

Instructors for this module should have experience of human relationships in particular, in the VTS field. If this cannot be achieved, then an appropriate expert should cover certain sections of this module.

In addition, the instructors of other modules should be aware of the requirements for participants to develop specific personal attributes. The instructors should continuously monitor the personal attributes of participants and, when appropriate, draw their attention to the need to meet the subjects of this module.

3.2   SUBJECT FRAMEWORK

3.2.1 Scope

This syllabus covers the personal attributes needed by VTS Supervisors to enable their administrative and supervisory duties to be performed properly under all conditions likely to be encountered in a VTS centre.

3.2.2 Aims

On completion of the module participants will be able to demonstrate that they have acquired the knowledge and ability to conduct the duties of a VTS Supervisor in a manner which is tactful, courteous and conforms with accepted principles and procedures established by the Competent Authority.

In addition, the participant should be able to demonstrate a sense of responsibility, independence, a willingness to co-operate with others and the ability to motivate and lead a VTS team. In this context, 'co-operation with others' needs to include those outside of the VTS centre such as ship masters, pilots, tug masters and other allied services. The use of simulation integrated into training will enable participants to develop their leadership skills for handling external communications during all types of emergency likely to be experienced operationally.

Participants should also be able to recognise when stressful situations are developing and have knowledge of the management techniques necessary to minimise the effect of such situations on the efficient operation of a VTS centre.

3.3   SUBJECT OUTLINE OF MODULE 3

Table 8   Subject outline – Additional personal attributes

Subject Area	Recommended Competence Level	Recommended Hours	
		Presentations/ Lectures	Exercises/ Simulation
Leadership Team management Job performance and professional development	Level 4		
Communication Skills Effective communication Media and general public Operational communications	Level 4		
Stress Management Recognizing stress/stressful situations and fatigue Responding to stress/fatigue	Level 4		
		6 hours total	4 hours total

3.4 DETAILED TEACHING SYLLABUS OF MODULE 3

Table 9   Detailed teaching syllabus – Additional personal attributes

Subjects /Learning Objectives	Reference	Teaching Aid
Leadership		

Team management
 	
    Leadership qualities
 	
    Diplomacy
 	
    Motivational skills
 	
    Dealing with difficult situations
 	
    Self directed work teams		

Job performance and professional development
 	
    Technological and other advances
 	
    Credibility
 	
    Internal
 	
    External
 	
    Limitations
		A16

Communication Skills		A17 (Police, press, Coast Guard etc.)

Effective communication
 	
    Listening skills
 	
    Effective oral/written communication
 	
    Barriers to communication
 	
    Counselling		

Media and general public
 	
    Confidential information
 	
    Press releases and public relations		

Subjects /Learning Objectives	Reference	Teaching Aid
Responding to requests/questions Information management		

Operational communications
    Internal
    External, such as VHF communications		

Stress Management	R15, R24, R55	
Recognising stress/stressful situations and fatigue		
Responding to stress/fatigue Counselling		

MODULE 4   RESPONDING TO EMERGENCY SITUATIONS

4.1   INTRODUCTION

Instructors for this module should have the knowledge, comprehension and the ability to contribute to the development of contingency plans and to apply emergency procedures in a VTS environment. Every instructor should have full access to a simulator capable of representing the VTS environment. If practicable, arrangements should be made for participants to visit operational VTS centres.

4.2   SUBJECT FRAMEWORK

4.2.1 Scope

This syllabus covers the knowledge and skills necessary to supervise the response to emergency situations likely to occur within a VTS area, identify and maintain accurate records of additional resources which are available for emergency situations, and the circumstances under which they should be used.

4.2.2 Aims

On completion of the module participants will demonstrate knowledge of how to assess and implement contingency plans relating to distress, emergencies and other special circumstances. Participants should have the knowledge to contribute to the development of local contingency plans.

The knowledge that the participants acquire should also assist them in the co-ordination of training exercises related to emergency situations. They should also understand the need to learn lessons from training exercises and the requirement to modify plans in the light of the lessons learned.

4.3   SUBJECT OUTLINE OF MODULE 4

Table 10   Subject outline – Responding to emergency situations

Subject Area	Recommended Competence Level	Recommended Hours	
		Presentations/ Lectures	Exercises/ Simulation
Contingency Plans Description and purpose of contingency plans Implementation of and participating in contingency plans Incident response Special circumstances Delegation of responsibilities	Level 4	12 hours total	18 hours total

4.4 DETAILED TEACHING SYLLABUS OF MODULE 4

Table 11   Detailed teaching syllabus – Responding to emergency situations

Subjects /Learning Objectives	Reference	Teaching Aid
Contingency Plans	R5, R13, R35, R37, R38, R39, R40, R41	A1, A13, A14, A17, A18
Description and purpose of contingency plans 　International 　National 　Regional 　Local 　In-centre 　Command and control structure 　Training exercises		A12
Implementation of and participation in contingency plans (e.g. man overboard, fire, collision, grounding, pollution, toxic-chemical spill, piracy, terrorism, medevac etc.) 　Immediate response according to contingency plans 　Use of check lists 　Co-ordination, evaluation and dissemination of information 　Liaison with other services as required 　Importance of maintaining communications		A12
Incident response (e.g. close quarters, loss of power) 　Management of traffic 　Importance of maintaining VTS services during incident		
Special circumstances 　Shifting of dangerous cargoes/materials 　Incidents not fully covered by contingency plans 　Incidents at the VTS centre (e.g. fire, flooding, terrorism, security, etc.)		A12

Subjects /Learning Objectives	Reference	Teaching Aid

Delegation of responsibilities
    Prioritization
    Lines of authority
    Standard Operating Procedures (SOPs)
    Organisation of duties of subordinates
    Resource management		

MODULE 5   ADMINISTRATIVE FUNCTIONS

5.1   INTRODUCTION

Instructors for this module should have knowledge and comprehension of the administration techniques and the ability to apply them in a VTS environment. If this cannot be achieved, then the appropriate expert should cover certain sections of this module. Every instructor should have full access to a simulator capable of representing the VTS environment.

5.2   SUBJECT FRAMEWORK

5.2.1 Scope

This syllabus covers the knowledge and skills necessary to plan and organise the administrative functions required for maintaining the operational efficiency of a VTS centre.

5.2.2 Aims

On completion of the module participants will demonstrate knowledge to coordinate communications with allied services, manage traffic schedules, prepare reports and assess the performance of VTS centres and personnel.

Participants will also demonstrate knowledge enabling them to manage sailing or route plans and develop traffic plans based on forecast traffic movements within the VTS area.

5.3   SUBJECT OUTLINE OF MODULE 5

Table 12   Subject outline – Administrative functions

Subject Area	Recommended Competence Level	Recommended Hours	
		Presentations/ Lectures	Exercises/ Simulation[1]
Planning and Organisation Traffic schedules Performance of a VTS centre Performance of VTS personnel Preparation of reports (internal and external) Allied services	Level 4	12 hours total	6 hours total

Note 1 – Aspects pertaining to legal implications should be integrated in all simulation exercises.

5.4 DETAILED TEACHING SYLLABUS OF MODULE 5

Table 13   Detailed teaching syllabus – Administrative functions

Subjects /Learning Objectives	Reference	Teaching Aid
Planning and Organisation		

Traffic schedules
 	
    Monitoring traffic schedules
 	
    Promulgating traffic schedules
 	
    Managing traffic schedules
	R37	

Performance of VTS centre
 	
    Supervising/maintaining log keeping functions
 	
    Shift scheduling
	R37, R44, R49, R55	

Performance of VTS personnel
 	
    Assessing performance
 	
    Documenting performance and record keeping
 	
    Training, and improving performance
	R37, R41, R44, R50, R55	

Preparation of reports (internal and external)
 	
    Routine reports
 	
    Incident reports
 	
    Technical reports
 	
    Other reports as required by operations (e.g. statistical, medical, comments, etc.)
 	
    Billing arrangements
	R35, R37, R41	

Allied services
 	
    Co-ordination and communication with allied services
 	
    Producing/approving VTS sailing/route plans
	R17, R37, R41	

MODULE 6   LEGAL KNOWLEDGE

6.1   INTRODUCTION

Instructors for this module should have relevant knowledge and comprehension of the legal implications of operating a VTS and the ability to apply these when guidance on practices and procedures for VTS personnel is being developed.

6.2   SUBJECT FRAMEWORK

6.2.1 Scope

This syllabus covers the relevant knowledge and comprehension necessary to understand the legal requirements and their implications on all parties involved in traffic movements in a VTS area.

6.2.2 Aims

On completion of the module, candidates will demonstrate an understanding of the basis in international and national law for the establishment of VTS as well as the legal requirements, limitations and liabilities of those involved in traffic movements in a VTS area, including ships' masters, marine pilots, port and harbour authorities and VTS personnel.

Candidates will demonstrate an understanding of international, national and local legislative requirements and regulations.

6.3   SUBJECT OUTLINE OF MODULE 6

Table 14   Subject outline – Legal knowledge

Subject Area	Recommended Competence Level	Recommended Hours	
		Presentations/ Lectures	Exercises/ Simulation[1]
General			
Legal basis for VTS in international law	Level 4		
Legal liabilities and their implications to VTS	Level 3	6 hours total	3 hours total
Legal liabilities and the implication to others in a VTS area	Level 3		
Shipping acts and regulations relating to VTS	Level 4		

Note 1 – Aspects pertaining to legal implications should be integrated in all simulation exercises.

6.4 DETAILED TEACHING SYLLABUS OF MODULE 6

Table 15   Detailed teaching syllabus – Legal knowledge

Subjects /Learning Objectives	Reference	Teaching Aid
General		

Legal basis for VTS in international law
    UNCLOS
    SOLAS (Chapter V)
    COLREGS
    IMO resolutions and recommendations
    IALA recommendations and guidelines
	R1, R2, R3, R6, R7, R12, R16, R17, R35, R41, R46, R58, R59, R60	A17, A18

Legal liabilities and their implications to VTS
    Routine operations
    Incidents
    Accuracy of information promulgated
    Legal responsibilities/consequences of actions
    Requirements and limitations of their authority
	R35, R37, R58, R59, R60	A18

Legal liabilities and the implication to others in a VTS area
    Routine operations
    Incidents
    Other circumstances
	R35, R37, R58, R59	A18

Shipping acts and regulations relating to VTS
    International regulations and resolutions
    National shipping acts and regulations
    Local bye-laws, circulars, guidance notes and accepted procedures
    Means of commenting on/promulgating changes to acts and regulations
	R1, R2, R3, R6, R7, R12, R16, R17, R35, R36, R37, R41, R45, R46, R48, R58, R59, R60	A4

Competence area	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Module 1 Advanced traffic management	*Traffic management* Apply traffic monitoring and management techniques. Understand roles and responsibilities.	Examination and assessment of evidence obtained from approved simulator and on the job training.	Methods by which INS, TOS and NAS as well as other services are applied in an operational environment. The roles, responsibilities and activities relating to the services are known.
	Chartwork / publications Ensure that: 1. all charts and publications are kept up to date in a timely and accurate manner and relevant documentation completed; 2. changes in data in use within the VTS are recorded accurately; 3. aids to navigation in a VTS area are operating within normal parameters.	Examination and assessment of evidence obtained from approved simulator and on the job training.	Interpretation and implementation of changes are correct and applied as soon as practicable after receipt. Malfunction of any aid to navigation in the area is identified in a timely manner.
	Maritime organisations Knowledge of maritime related organisations	Examination and assessment of evidence obtained from practical instruction and approved simulator and on the job training	The responsibilities and activities of the organisations are understood
	Port management Knowledge and ability to coordinate information management of: 1. pilotage; 2. harbour operations (including contingency plans); 3. security; 4. tugs and towing; 5. allied services; 6. ships agents.		The responsibilities and activities relating to the services are known. Methods by which liaison can be made with each of the services are known and understood.

Competence area	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	Dangerous cargoes Knowledge of dangerous cargoes. Application of precautions to be taken. Knowledge and application of response methods	Examination and assessment of evidence obtained from practical instruction and approved simulator and on the job training;	Methods by dangerous cargoes are recognized and classified are understood Application of methods to respond to threats and incidents affecting the environment are taken in accordance with national and local requirements.
Module 2 VTS equipment	*Equipment operation and availability* The ability to determine that the VTS equipment is operating satisfactorily and, when necessary, to take appropriate action to ensure that the service is maintained at an operational level, and any defects are rectified and relevant documentation is kept up to date.	Examination and assessment of evidence obtained from practical instruction and approved simulator and on the job training;	The methods of comparing actual operational performance with normal performance is known. A good understanding of the overall system, including all equipment and sub-system redundancy arrangements.
Module 3 Additional personal attributes	*Effective Communication* Thorough knowledge of, and ability to perform: 1. dealing with the media and the general public; 2. operational telephone conversations; 3. negotiations with other interested parties.	Assessment of evidence obtained from approved simulated and on the job training.	Conduct conforms with acceptable principles, including confidentiality, and procedures established by the Competent Authority concerned.
	Leadership Demonstrate the ability to: 1. effect team work procedures; 2. administer and organise work programmes; *3.* manage a VTS watch.	Assessment of evidence obtained from approved simulated and on the job training.	Conduct conforms with acceptable principles and procedures established by the Competent Authority concerned.
	Stress and fatigue management	Assessment of evidence obtained from approved simulation and on the job training.	Conduct conforms with acceptable principles and procedures

Competence area	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	An appropriate knowledge of stress and fatigue management techniques.		established by the Competent Authority concerned.
Module 4 Respond to emergency situations	*Implement contingency plans relating to distress, pollution and special circumstances* Demonstrate knowledge of: 1. pre-determined procedures concerning international, national and local emergency situations and coordinating their implementation; 2. the availability of additional resources and the circumstances under which they should be used; 3. the circumstances under which delegation of responsibilities may take place. Assisting in the coordination of training exercises related to emergency situations.	Assessment of evidence obtained from approved simulation and on the job training.	Actions taken in an emergency are in accordance with the appropriate agreed contingency plan.
Module 5 Administrative functions	*Planning and organisation* *Demonstrate the ability to:* 1. co-operate with users and allied services in the preparation of VTS sailing or route plans for traffic joining, departing or moving within a VTS area; 2. develop and promulgate a traffic plan; 3. prepare reports; 4. perform manual and electronic log keeping functions; 5. assess and document performance.	Examination and assessment of evidence obtained from practical instruction and report writing.	VTS sailing or route plans, traffic plans, reports, logs and performance records are in formats suitable for easy reference and correctly follow established procedures and practices.
Module 6 Legal knowledge	*General* Related knowledge of:	Examination and assessment of evidence obtained from instruction.	Action taken and procedures followed correctly apply and make full use of

Competence area	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
	1. legal responsibilities, limitations and liabilities and their implications; 2. safety related ship certificates; 3. acts and regulations.		advice available and correctly follow established procedures and practices

ANNEX 2   TEACHING AIDS AND REFERENCES

Teaching aids that the participants ideally should have access to:

A1   Simulated VTS environment capable of meeting the training objectives

A2   Briefing/debriefing area for simulations, including facilities for modelling performance and reviewing recorded exercises

A3   Charts and associated publications

A4   Examples of Notices to Mariners applicable to a VTS area

A5   Ship models

A6   Video recording and playing facilities

A7   Audio recording and playing facilities

A8   Interactive language laboratory

A9   Personal computer

A10   Simulator exercises to practice operational maritime English

A11   Examples of equipment and systems capable of being manipulated in a manner similar to the equipment and systems used in VTS centres

A12   Interactive VTS simulator, including VHF facilities

A13   Simulated VHF DF system including digital selective calling facilities

A14   Appropriate video films;

A15   Manuals, strip cards and other facilities for use with the monitoring systems being taught

A16   Appropriate interactive video

A17   Guest speakers

A18   Case studies

Equipment recommended for each participant:

E1   Headset/microphone with press to talk (PTT) facilities

E2   Logging system

E3   For chartwork exercises, desks approximately 1 metre long by 0.7 metres width, with drawers for chart stowage

E4   Protractor, parallel ruler, dividers, nautical almanac, charts of a VTS area, calculator, chart correcting facilities

E5   Audio tapes of recorded VTS communications

References relevant to the planning of VTS training:

R1*   SOLAS' 74 Regulation V/10 – Ships' routeing

R2*   SOLAS '74 Regulation V/11 - Ship reporting systems

R3*   SOLAS '74 Regulation V/12 - Vessel traffic services

R4*   SOLAS '74 Regulation V/27 - Nautical charts and nautical publications

R5*   SOLAS '74 Regulation V/7 – Search and rescue services

R6*   United Nations Convention on the Law of the Sea (UNCLOS)

R7*   International Regulations for Preventing Collisions at Sea, 1972 (COLREGS)

R8*   International Maritime Dangerous Goods Code (IMDG Code) - 1994, as amended

R9*   International Convention on Standards of Training, Certification and Watchkeeping of Seafarers, 1978, as amended in 1995 (STCW Convention)

R10*   Seafarer's Training, Certification and Watchkeeping Code (STCW 95 Code)

R11*   IMO GMDSS Manual

R12*   IMO publication on Ships' Routeing

R13*   IMO/ICAO Publication "International Aeronautical and Maritime Search and Rescue (IAMSAR) manual" - in three volumes:

         Vol 1 – Organization and management   (IMO 960)

         Vol 2 – Mission co-ordination (IMO 961)

         Vol 3 – Mobile facilities   (IMO 962)

R14*   IMO Assembly resolution A.705(17), Promulgation of Maritime Safety Information (MSI)

R15*   IMO Assembly resolution A.772(18), Fatigue factors in manning and safety

R16*   IMO Assembly resolution A.851(20), General principles for ship reporting systems and ship reporting requirements, including guidelines for reporting incidents involving dangerous goods, harmful substances and/or marine pollutants

R17*   IMO Assembly resolution A.857(20), Guidelines for Vessel Traffic Services

R18*   IMO Assembly resolution A.917(22), as amended by resolution A.956(23) on Guidelines for the onboard operational use of shipborne automatic identification systems (AIS)

R19*   IMO Assembly resolution A.918(22), Standard Marine Communication Phrases

R20*   IMO Assembly resolution A.950(23), Maritime Assistance Service (MAS)

R21*   IMO Assembly resolution A.954(23), Proper use of VHF channels at sea

R22*   IMO Maritime Safety Committee resolution MSC.232(82), Revised performance standards for Electronic Chart Display and Information Systems (ECDIS)

R23*   IMO COMSAR/Circ.15 - Joint IMO/IHO/WMO Manual on Maritime Safety Information (MSI)

R24*   IMO MSC/Circ.1014, Guidelines on fatigue mitigation and management

R25*   IMO SN/Circ.244, Guidance on the use of the UN/Locode in the destination field in AIS messages

R26*   International Code of Signals

R27   IHO approved documents of charts and publications

R28   ITU Radio Regulations, including Appendices

R29	ITU-R Recommendation M.493, DSC for use in the maritime mobile services
R30	ITU-R Recommendation M.541, Operational procedures for the use of DSC equipment in the maritime mobile services
R31	ITU-R Recommendation M.1371, Technical characteristics for an automatic identification system using time division multiple access in the VHF maritime mobile band
R32	IELTS Handbook - British Council, or equivalent.
R33	Marine Communications Handbook - Lloyds of London
R34	Equipment and system operating manuals
R35	National, regional and local legislation and regulations on VTS, ports, harbours, pilotage and allied services
R36	National Notices to Mariners pertaining to VTS
R37	National procedures and standards for operation of VTS
R38	National procedures and standards for operation of International Convention for the Prevention of Pollution from Ships (MARPOL)
R39	National arrangements for intervention, pollution and salvage
R40	Local/regional contingency and emergency requirements
R41	IALA Vessel Traffic Services Manual
R42	IALA Aids to Navigation Guide (NAVGUIDE)
R43	International Maritime Buoyage System (MBS), published by IALA
R44	IALA Recommendation V-103, Standards of training and certification of VTS Personnel
R45	IALA Recommendation V-119, Implementation of Vessel Traffic Services
R46	IALA Recommendation V-120, Vessel Traffic Services in Inland Waters
R47	IALA Recommendation V-125, The Use and Presentation of Symbology at a VTS Centre (including AIS)
R48	IALA Recommendation V-127, Operational procedures for Vessel Traffic Services
R49	IALA Recommendation V-128, Operational and technical performance requirements for VTS equipment
R50	IALA Guideline 1017, Assessment of Training Requirements for Existing VTS Personnel, Candidate VTS Operators and Revalidation of VTS Operator Certificates
R51	IALA Guideline 1026, AIS as a VTS tool
R52	IALA Guideline 1027, Designing and implementing simulation in VTS Training at Training Institutes/VTS Centres
R53	IALA Guidelines 1028, The Automatic Identification System (AIS) Volume 1, Part I Operational Issues
R54	IALA Guideline 1032, Aspects of Training of VTS Personnel relevant to the introduction of the Automatic Identification System
R55	IALA Guideline 1045, Staffing levels at VTS centres
R56	IALA Guideline 1050, Management and Monitoring of AIS Information
R57	IALA Guideline 1056, Establishment of VTS Radar Services (Ed 1)
R58	IALA Guideline 1068, Provision of a Navigational Assistance Service by Vessel Traffic Services

R59   IALA Guideline 1070, VTS role in managing Restricted or Limited Access Areas

R60   IALA Guideline 1071, Establishment of a Vessel Traffic Service beyond territorial seas

*There is an annual catalogue of IMO Publications, many of which are printed in languages other than English. The catalogue provides ISBN and IMO references to these publications and the price, together with order forms which may be faxed. Additionally, training organisations and course co-ordinators should note that groups of publications are also made available online, and may be a more convenient method of obtaining some of the data that they require.

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