Model Course V-103/3

Vessel Traffic Services

On-the-Job Training

VTS Operator

VTS Supervisor



June 1999

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Foreword

The International Association of Lighthouse Authorities has been associated with Vessel Traffic Services 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 by IALA for VTS Personnel are:

Model Course V-103/1 - VTS Operators; Model Course V-103/2 - VTS Supervisor, Model Course V-103/3 - On-the-Job Training.

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 institutes, and assistance in implementing any course may be obtained through the Association at the following address:

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Section 1 - Introduction

Purpose of the Model Course

The purpose of the model course are to assist VTS Centres and their instructors in organising and introducing new On-the-Job training courses, and in enhancing and complementing existing training material where the quality and effectiveness of the training courses may thereby be improved to fully meet the intent of IALA Recommendation V-103. The course will also ensure that VTS Personnel are competent in the performance of their duties at VTS Centres.

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

The required standard of competence is considered to be the level of proficiency that should be achieved for the proper performance of the functions carried out at the particular VTS Centre concerned. The training should take into account the level of competence already acquired and build on this to meet the needs of the VTS Centre.

To assist in the development of lesson plans and training courses five levels of competence are used in the Model Courses for VTS Personnel. Each level of competence is defined in terms of the learning outcome, the instructional objectives and the required skills.

In Section 3 "Course Outline" Levels 1 to 4 are used to recommend the competence level for the On-the-Job training of VTS Operators and levels 3 to 5 are used for On-the-Job training of VTS Supervisors.

Learning Outcome	Instructional Objectives	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 an action demonstrated by the instructor and using a multiresponse 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	Complex overt 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	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
Level 4 Work that is often complex, technical and professional with a substantial degree of personal responsibility and autonomy	Adaptation. Skills are so well developed that individuals can modify movement patterns to fit special requirements or to meet a problem situation	Synthesis. Integrates learning from different areas into a plan for solving a problem; formulates a new scheme for classifying objects or events
Level 5 Complex techniques across wide and often unpredicted variety of contexts. Professional/ senior managerial work	Origination. The creation of new practices or procedures to fit a particular situation or specific problem and emphasise creativity based upon highly developed skills	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

Levels of Competence

Use of the Model Course

This course is intended to cover the knowledge and practical competence required for an endorsement to be made in a VTS Certification Log that the holder has completed On-the-Job training at the VTS Centre at which he/she will be employed. The course is aimed at providing the "on-the-job training" described in IALA Recommendation V-103.

All training and assessment of personnel for endorsement in their VTS Certification Log should be:

- 1. Structured in accordance with job performance, standard operating procedures and elements specific to the VTS centre concerned;
- 2. Presented in a realistic, job-centred atmosphere; and,
- 3. Conducted, monitored, evaluated and supported by persons qualified in accordance with the "Staff Requirements" set out in Section 2.

To use the model course as a guide for the development of On-the-Job training programmes, instructors and operational personnel should review Section 3 "Course Outline", for VTS Operators and VTS Supervisors together with the specific services provided by the VTS centre.

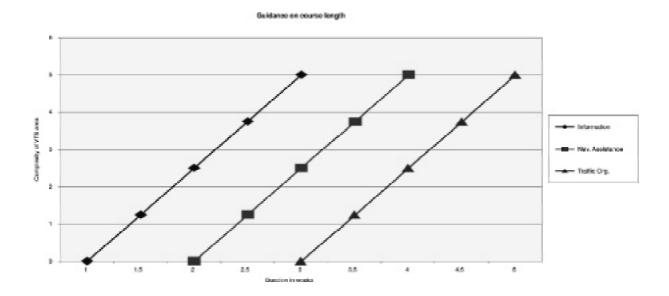
From this review each centre should develop, document and instigate On-the-Job training courses that ensure the competence of the trainees to perform all the duties required by a VTS Operator or VTS Supervisor, as appropriate, at the centre.

Presentation

As this is a practical, job-centred course, there may not necessarily be any formal presentation of lessons. However, some centres may find a requirement for equipment, geographical and/or other training to be presented in a formal, classroom setting. If this is the case, then lesson plans will be required for these sections, based on the Course Outline. These lesson plans must contain references to textbooks, teaching materials, teaching aids and student material that will be required during the presentation of the course.

The presentation, and subsequent completion of the various assignments and tasks in the Onthe-Job training should be repeated until the On-the-job Instructor is satisfied that the trainee has attained the required level of competence. If, at any time, the instructor feels that the trainee is unable to meet the required level of competence, then the instructor must provide remedial training, or initiate action as deemed necessary by the VTS centre or the VTS Authority.

It is difficult to recommend a fixed duration for On-the-Job training because there are several variables that will effect the time needed for personnel to become familiar with a VTS area. Firstly a VTS may be providing an "Information", "Navigation Assistance" or "Traffic Organization" service and secondly, whatever service is being provided the characteristics of the marine traffic, topography and geography of the VTS area and the location of allied services will influence the complexity of work of the VTS Centre.



The graph above has therefore been developed to provide a means of estimating the duration of training depending upon the type of service provided and the complexity of the VTS area. However, the graph is intended only as a guide and the duration of the course should be determined mainly from local experience.

The five levels of complexity of service in a VTS area used in the graph are:

- Level 1- Service of a routine and predictable nature;
- Level 2 Service involving a more demanding range of work with some complex/non-routine activities;
- Level 3 Service involving a broad range of work activities, most of which are complex and non-routine:
- Level 4 Service that is often complex, technical and professional with a substantial degree of responsibility;
- Level 5 Service involving complex techniques with a wide and often unpredictable variety of circumstances.

Implementation

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

- The need for the OJI to create an OJT task book in accordance with the headings provided in Section 3, Course Outline. The task book is intended to provide structure for and means of, monitoring this training.
- The availability and use of qualified On-the-job Instructors.
- The availability and use of support staff.
- The need for trainees to have access to all equipment at the VTS Centre and its remote sites, operating manuals, textbooks, publications and other reference materials.
- The need for trainees to have full and ample opportunity to carry out and practice VTS tasks under supervision.

Validation

The information contained in this document has been validated by a group of technical advisers, consultants and experts on training of VTS personnel for use in the training and certification of VTS Operators so that the minimum standards implemented may be as uniform as possible. The technical advisers were drawn from the IALA VTS Committee, training institutions of IALA National Members and experienced VTS Operators. Validation in the context of this document means that the group has found no grounds to objects to its contents.

Section 2 - Course Framework

Scope

This course is intended to provide the practical on site experience required to become an efficient and competent VTS Operator. It supplements and reinforces the classroom and exercises/simulation learning undertaken to meet the requirements of the IALA Model Course V-103/1 for VTS Operators. Trainees will be required to complete On-the-Job Training for each centre in which they work and their competence to work in a centre will be indicated in their VTS Certification Log issued in accordance with IALA Recommendation V-103.

Objective

The trainees will acquire basic skills and a practical awareness of the need to follow set procedures according to international, national and regional acts, regulations and agreements. They will also become fully conversant with local geography, centre equipment and standard operating procedures for the specific VTS in which the On-the-Job training takes place. Endorsement of the Certification Log to carry out the duties of a VTS Operator will be subject to the terms set out in IALA Recommendation V-103.

Entry Standard

Minimum entry standards for On-the-Job training for a:

- VTS Operator: successful completion of VTS Operator Training as laid out in Model Course V-103/1; and,
- VTS Supervisor: successful completion of VTS Operator Training as laid out in Model Course V-103/1 and VTS Supervisor Training as laid out in Model course V-103/2.

Some trainees may have already successfully completed On-the-Job Training at other VTS Centres, and their overall competence and confidence may enable them to complete On-the-Job Training in a shorter time frame.

Requirements for gaining an endorsement in the VTS Certification Log

Every candidate for gaining an endorsement in the VTS Certification Log should satisfy the requirements of the Competent Authority by successfully completing the assignments and tasks set out in the On-the-Job Training Course developed for the particular VTS centre.

The form and timing of examinations for the issue of an endorsement in the VTS Certification Log 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, should be additional to the times shown in the lesson plan.

If the Competent Authority does not require an examination at the end of On-the-Job training, an evaluation of each trainee should be made (see Section 5) to judge whether the required levels of competence have been reached before an endorsement is made in the VTS Certification Log.

Course intake - limitations

On-the-Job trainees must have opportunities to perform various assignments and tasks in an operational environment under the direct supervision of an On-the-Job Instructor. An On-the-Job Instructor may be responsible for more than one trainee. However, when the training involves undertaking, under direct supervision, some of the duties of a VTS Operator, trainees should be assigned on a one-on-one basis to the On-the-Job Instructor.

Should there be a requirement for classroom work during On-the Job training, class sizes may be limited at the discretion of the VTS Authority in order to allow the instructor to give adequate attention to individual trainees. 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.

Staff Requirements

All On-the-Job Instructors should be appropriately qualified for the particular type and level of training and assessment required. As a minimum, an On-the-Job Instructor should possess:

- A valid VTS Operator Certificate and endorsements in the VTS Certification log. These should include a VTS Supervisors endorsement when the trainees are VTS Supervisors.
- On-the-Job Instructor training, including coaching and supervisory skills

Except when conducting training, On-the-Job Instructors may carry out normal duties within a VTS centre in accordance with their qualifications.

Facilities and equipment

The facilities needed to ensure adequate training depends on the VTS centre in which the trainee is undergoing On-the-Job training. They should include access to and ability to manipulate all equipment related to the operations performed by the centre and the services that it provides.

References

The references that are relevant to the planning of VTS training are listed below.

- R1 SOLAS' 74 Regulation V/8 Routeing
- R2 SOLAS '74 Regulation V/8-1 Ship Reporting Systems
- R3 SOLAS '74 Regulation V/8-2 Vessel Traffic Services
- R4 SOLAS '74 Regulation V/12 Shipborne navigation equipment
- R5 SOLAS '74 Regulation V/14 Aids to navigation
- R6 SOLAS '74 Regulation V/20 Nautical publications
- R7 International Regulations for Preventing Collisions at Sea, 1972 (COLREGS)
- R8* IMO publication on Ships' Routeing (IMO-927E, IMO-928F, IMO-929S)
- R9 International Maritime Dangerous Goods Code (IMDG Code) 1994, as amended
- R10 International Convention on Standards of Training, Certification and Watchkeeping of Seafarers, 1978, as amended in 1995 (STCW Convention)
- R11 Seafarer's Training, Certification and Watchkeeping Code (STCW Code)
- R12 Resolution 10 of the 1995 Conference of Parties to the International Convention on standards of Training, Certification and Watchkeeping for Seafarers, 1978
- R13* IMO Assembly resolution A.851(20), General principles for ship reporting
- R14* IMO Assembly resolution A.857(20), Guidelines on VTS
- R15* IMO Publication "International Aeronautical and Maritime Search and Rescue (IAMSAR) manual" in three volumes:

Vol 1 (IMO 960) ISBN 92-801-1462-X Vol 2 (IMO 961) ISBN 92-801-6087-7 Vol 3 (IMO 962) ISBN 92-801-6085-0

- R16 IALA Recommendation V-103, Standards of Training and Certification of VTS Personnel.
- R17 IALA Vessel Traffic Services Manual
- R18 IALA Aids to Navigation Guide (NAVGUIDE)
- R19* IMO Standard Marine Navigational Vocabulary (IMO-985E, IMO986F, IMO-988S)
- R20* IMO Standard Marine Communication Phrases (IMO MSC/Circ. 794 (May 30, 1997))
- R21* International Code of Signals (IMO-994E, IMO-995F, IMO-996S)
- R22 IELTS Handbook British Council, or equivalent
- R23 Practice Tests for IELTS. Jakeman & McDowell. Cambridge University Press. ISBN 0521 497 671, 0521 497 663
- R24 United Nations Law of the Sea (UNCLOS)
- R25 Seaspeak Training Manual ISBN 0-08-031555-0
- R26 Marine engineering knowledge (such as: General Engineering Knowledge, by McGeorge, H.D.(Kandy publication), ISBN 0750600063)
- R27 Marine Communications Handbook Lloyds of London

- R28 Marine Communications Handbook Inmarsat
- R29 ITU Radio Regulations, including Appendicies
- R30 English for Maritime Sudies, 2nd edition, Blakely, published by Prentice Hall ISBN 0-13-281-379-3
- R31 Ship to shore: Nautical Terms in everyday English
- R32 Glossary of Marine Technology Terms. Institute of Marine Engineers, ISBN 0434908401
- R33 STCW Code, Section B, Chapter VIII, Part 3-1, Guidance on keeping a navigational watch
- R34* IMO Resolution A.705(17) Promulgation of Maritime Safety Information (MSI)
- R35 Equipment and system operating manuals
- R36 Radar and Electronic Navigation G J Sonneberg, ISBN 0-408-00272-7
- R37 Handbook of Data Communications, published by NCC Publications, ISBN 0-85012-363-1
- R38 GMDSS Handbook (IMO-970E and IMO-971E)
- R39 International Maritime Buoyage System, published by IALA
- R40 IHO approved documents of charts and publications
- R41 Fundamentals of Human Communications, Revised Edition, King, R. G., (1991), Macmillan Publishing Company, New York. ISBN 0023642815
- R42 Articulation and Voice: Improving Oral Communication, King, R. G., and DiMichael, E. M., (1978), Macmillan Publishing Company, New York
- R43 Developing Your Communication Skills, McMaster, R. G., (1978), Longman Canada Limited, Ontario. ISBN 0774711167
- R44 Communication Skills, Panton, P., (1980), Hutchinson & Co. (Publishers) Ltd, London. ISBN 0091412811
- R45 ITU-R M Recommendation 493
- R46 ITU-R M Recommendation 541
- R47 ITU-R M Recommendation [8C/XA], Technical characteristics for a universal shipborne automatic identification system using time division multiple access in the maritime mobile band
- R48 United Nations Convention on the Law of the Sea (UNCLOS)
- R49 SOLAS '74 Regulation V/15 Search and Rescue
- R50* IMO COMSAR/Circ.15 Joint IMO/IHO/WMO Manual on Maritime Safety Information (MSI)
- R51 National procedures and standards for operation of International Convention for the prevention of pollution from ships (MARPOL)
- R52 Local/Regional Contingency requirements
- R53 National, Regional and Local Legislation and Regulations on VTS, Ports, Harbours, Pilotage and Allied Services
- R54 National Notices to Mariners pertaining to VTS
- R55 National procedures and standards for operation of VTS
- R56 How to use the IMO SMCP. Weeks, published by Witherby, London ISBN 8420507679
- R57 PIANC Bulletin No. 16 'Big Tankers and their Reception' (1973)
- R58 PIANC Bulletin No. 35 'Reception of Large Ships' (1985)
- R59 PIANC Bulletin No. 51 'Underkeel Clearance for large ships' (1985)
- R60 PIANC-IAPH Report, Bulletin No. 87 'Approach Channels' (April, 1995)

*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 Institutions and Course Co-ordinators should note that groups of publications are also made available on CD-ROM, and may be a more convenient method of obtaining some of the data that they require.

The catalogue contains a list of national distributors situated in 43 countries world-wide who maintain stocks of IMO Publications.

The IMO Publications catalogue is available free of charge from:

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LONDON SE1 7SR

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e-mail: publications.sales@imo.org

Section 3 - Course Outline

The course should contain a range of practical assignments and tasks to be performed by trainees during the period of On-the-Job training required for endorsement of their VTS Certification Log. The assignments and tasks should be set to provide knowledge of the particular VTS area or region and should include, but not necessarily be limited to, the following subjects:

	Recommended Competence		Competence Level
	SUBJECT	VTS Operator	VTS Supervisor
1. Shipp	ing traffic regulations		
1.1	Local Bye-Laws, Acts and Regulations	Level 2	Level 4
1.2	Agreements, special rules and definitions	Level 2	Level 4
1.3	VHF frequencies used in the area and their functions	Level 4	Level 5
1.4	Communication procedures	Level 3	Level 4
2. Topog	raphy and Geography		
2.1	Limits of VTS area or region	Level 3	Level 4
2.2	Traffic routeing schemes	Level 3	Level 4
2.3	Fairways, sea-lanes and anchorages	Level 3	Level 4
2.4	Port and harbour facilities, basins, berths	Level 2	Level 4
	etc.		
2.5	Aids to navigation	Level 3	Level 4
3. Hydro	ological and Meteorological characteristics		
3.1	Tides and currents	Level 3	Level 3
3.2	Climate and weather	Level 3	Level 3
4. Marin	e traffic characteristics		
4.1	Density and composition	Level 3	Level 5
4.2	Local traffic patterns	Level 3	Level 5
4.3	Types of cargo	Level 3	Level 4

		Recommended Competence Lev	
	SUBJECT	VTS Operator	VTS Supervisor
5. Equip	ment		
5.1	Means of collecting data	Level 3	Level 4
5.2	Means of assessing data	Level 3	Level 4
5.3	Means of disseminating results of data assessment	Level 3	Level 4
6. Watch	keeping responsibilities		
6.1	Duties of VTS Operators and Supervisors	Level 4	Level 5
6.2	Transfer of traffic from one sub-area to	Level 4	Level 5
	another		
6.3	Transfer of traffic/information from one	Level 3	Level 5
	VTS Centre to another		
7. Routii	ne procedures		
7.1	Ships entering the area	Level 4	Level 5
7.2	1 0	Level 4	Level 5
7.3	Anchoring and berthing	Level 4	Level 5
7.4	Ships leaving the area	Level 4	Level 5
7.5	Reporting arrangements	Level 3	Level 5
7.6	Dealing with enquiries from the public,	Level 3	Level 5
	media and press		
7.7	VTS Sail Planning	Level 4	Level 5
8. Specia	al circumstances		
8.1	Movements of Dangerous goods	Level 3	Level 5
8.2	Circumstances affecting movement of	Level 3	Level 5
	vessels or breach of the law		
8.3	Unusual operations in the area	Level 3	Level 5
9. Allied	d services		
9.1	Port and Harbour services, tugs etc.	Level 3	Level 4
9.2	Pilotage services	Level 3	Level 4
9.3	Search and rescue services	Level 3	Level 4
9.4	Customs and immigration services	Level 2	Level 3
9.5	Meteorological services	Level 3	Level 4

		Recommended Competence Level	
	SUBJECT	VTS Operator	VTS Supervisor
10. Emerg	gency Procedures		
10.1	Potential resources available to the VTS centre	Level 3	Level 5
10.2	VTS role in search and rescue operations	Level 3	Level 5
10.3	Emergency procedures in response to specific incidents, including reporting arrangements	Level 4	Level 5
10.4	Communications network to co-ordinate information flow	Level 3	Level 5
10.5	Contingency plans	Level 3	Level 5
10.6	Pollution prevention	Level 3	Level 5
11. Other	activities		
11.1	Familiarisation visits to allied services and adjacent VTS centres	_	_
11.2	Obtaining experience of the VTS area by sailing through it on board vessels	_	_

Section 4 - Guidance for Instructors

Introduction

The courses should be designed to enable VTS Personnel to obtain an endorsement in their Certification Log to permit:

- A VTS Operator to provide an information, navigation assistance or traffic organisation service at the VTS centre concerned; or,
- A VTS Supervisor to manage, administrate and supervise a VTS centre providing an information, navigation assistance or traffic organisation service.

Curriculum

The Course Outline is not set out in a teaching order and On-the-Job Instructors are not obliged to follow the order in which they appear but should treat them in the order that is considered to be the most effective for the trainees.

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 On-the-Job Instructor acts as course co-ordinator to plan and supervise the implementation of the course.

The teaching schemes should be reviewed 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. Care should be taken to see that items not included in the syllabus or treatments beyond the depth indicated by the objectives have not been introduced except where necessary to meet additional requirements of the Competent Authority.

The course co-ordinator should monitor the running of the course. There should be regular discussions with the On-the-Job Instructors involved concerning the progress of trainees and any problems that have become apparent. Modifications of the teaching scheme should be made where necessary to ensure that trainees are attaining the required levels of competence. Extra tuition should be arranged to enable weaker trainees to achieve competence.

Section 5 - Evaluation or Assessment

To evaluate trainee progress regular assessment must be undertaken. The evaluation criteria will depend on the needs of the particular VTS centre and the style of training used. Assessors must be able to ascertain the competence of the trainee to carry out the duties of a VTS Operator in a job-centred environment before the Certification Log of the trainee is endorsed.

Records should be maintained of the progress made by trainees. All task completed should be recorded by the Instructor, together with any comments which would assist trainees to obtain the "On-the-Job training" endorsement in their Certification Log.

These assessments are additional to any examination required for the purposes of endorsing the VTS Certification Log. However, if the Competent Authority does not require an examination at the end of On-the-Job training they should be taken into account during the evaluation of trainees. It is recommended that when assessments are being made Instructors use the following five levels to indicate the learning level attained by trainees. An average level of three to four should be considered as being satisfactory.

LEVEL	CATEGORY	DESCRIPTION
LEVEL 1	RECEIVING	The trainee's willingness to participate in the learning activity.
LEVEL 2	RESPONDING	The trainee's active participation in the learning activity.
LEVEL 3	SIGNIFICANCE	The worth that the trainee attaches to a particular object, phenomena or behaviour.
LEVEL 4	ORGANISATION	The trainee's ability in bringing together different values, resolving conflicts between them and beginning the building of an internally consistent value system.
LEVEL 5	VALUE COMPLEX	The value system that has been achieved due to contrary, consistent and predictable behaviour for a sufficiently long time for the trainee to have developed a characteristic 'life style'.

Assessment Levels