IALA MODEL COURSE

C0103-3
VTS ON-THE-JOB TRAINING

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DOCUMENT REVISION

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

Date	Details	Approval
March 1999	1st issue	Council 22
December 2005	Edition 1.1 Entire document	Council 37
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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 for 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 VTS model courses* sets out the process by which a training organization can be accredited to deliver approved VTS training courses.
- IALA model courses including:
  - 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 model course *C0103-3* is to assist VTS providers and their teaching staff to establish and conduct On-the-Job training that ensures personnel are competent to undertake duties at the VTS where they are employed. It provides guidance on the level of training and knowledge needed to reach levels of competence defined by IALA to obtain a *C0103-3* endorsement.

This model course is designed to provide a consistent approach to the training of VTS Personnel in a specific operational VTS environment, and complements the training delivered in model courses *CO103-1* and *CO103-2.*

It is not the intention of the model course to present OJT instructors with a rigid "teaching package". Rather, this model course provides a standard framework to assist VTS providers in the preparation of their *C0103-3* training programs, or to enhance, update or supplement existing training material.

3. COURSE OBJECTIVE

To successfully complete this course the student will demonstrate the requisite knowledge, practical competence, skills, and attitude to undertake duties at the VTS where they are employed. 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. (Table 1 refers)

Training activities, scenarios, 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.

The model course does not specify the recommended number of hours that should be allotted to each module as it recognizes there are several variables that will affect the time needed for VTS personnel to become familiar with the VTS. In determining course content and duration VTS providers should consider the following elements, as appropriate:

- size and complexity of the geographic VTS area
- functions of the VTS
- the complexity and content of VTS operational procedures
- the complexity and range of VTS equipment
- the complexity of the legal/regulatory aspects in the VTS area
- the human and physical resources available to deliver the training
- the number of students undergoing training
- the recognition of prior learning

Table 1 Summary of C0103-3 Training

Module Title	Overview
1. Communication Coordination and Interaction	This module covers the communications procedures used in VTS operations
2. Legal Framework	This module covers the regulatory and legislative framework of the VTS and the VTS area, including the enforcement of violations and the responsibilities of allied services and participating ships in the VTS area.
3. Provision of VTS	This module covers the practical aspects associated with the provision of VTS including the provision of information, and the issuing of advice, warnings, instructions, and traffic clearances.
4. Local Knowledge	This module provides a broad knowledge of the VTS area where the student will be working. The student will gain both theoretical knowledge as well as practical experience that is required for the provision of VTS in the area.
5. Equipment	This module provides a practical environment to learn the equipment used at the VTS
6. Human Factors	This module addresses the required competences for VTS Operators to perform their duties under all conditions including emergencies and stressful situations. It introduces the personal qualities required as a VTS operator including an understanding of corporate human resource policies / procedures and the personnel support
7. Emergency Situations	This module includes the processes and procedures to respond to emergency situations (internal and external) while maintaining safety of the waterway in the VTS area.

5. ENTRY REQUIREMENTS

It is the intention of the IALA VTS model course program to have successfully completed *C0103-1 VTS Operator Training* prior to undertaking a C0103-3 course. In exceptional cases, where VTS Operator training (*C0103-1*) may not be immediately available, VTS On-the-Job Training (*C0103-3*) may be delivered by a VTS provider in multiple stages. This may include some elements of *C0103-3* prior to, and after the completion of, *C0103-1*. In this case, the VTS provider should consult with the Competent Authority on the proposed process.

The VTS provider may determine, and document, any additional entry requirements that need to be satisfied.

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 to meet the level required for endorsement. For example, where a student has already successfully completed on-the-job training at another VTS or has other qualifications, recognition of

prior learning should be considered as it may reduce the time and content required to meet the desired competence level.

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 VTS provider should determine the number of students enrolled on the course taking into account the number of new VTS personnel, the size of the VTS centre, the number of OJT instructors and the risk of training fatigue. There may be additional training restraints such as:

- for live VTS operations under close supervision a one-to-one ratio is recommended.
- during classroom sessions the group size should allow the instructor(s) to give adequate individual attention to students as required to meet the learning objective(s).
- during practical sessions 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

The VTS provider should have VTS personnel trained as OJT instructors to provide and coordinate local training at the VTS centre (e.g., OJT, adaptation training and updating training). The OJT instructor should have in-depth knowledge of the processes and procedures of the VTS centre(s) where they provide training.

Any trainer delivering and assessing local training at a VTS centre should, as a minimum, hold the IALA *C0103-4 VTS On-the-job Training* instructor qualification, or an equivalent national qualification.

The VTS provider may consider identifying the role of a VTS training manager to coordinate and implement training processes and to assure the objectives of the course are met.

As well as OJT 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.

IALA Guideline G1156 - Recruitment, Training, and Certification of VTS Personnel provides further guidance on the qualifications for instructors.

IALA Model Course C0103-4 On-the-Job Training Instructor model course provides a structure to ensure instructors have the knowledge, skill and proficiency to deliver VTS centre specific OJT, adaptation training and updating training.

9. FACILITIES AND EQUIPMENT

The teaching aids, facilities and equipment students will utilize 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:

- delivery of live VTS under the close supervision by qualified VTS personnel
- scenario based / simulation training
- classroom sessions with presentations and discussion
- case studies and recordings
- online demonstrations, for example locating relevant documents, publications etc

- familiarization activities such as site visits to allied services, shipboard voyages in the VTS area, equipment site
- group based learning activities
- remote learning (e.g., e-learning, online, distance, hybrid, blended)

If provided, simulator training should be managed in a manner consistent with IALA Guideline 1027 in order to provide sufficient behavioural realism to allow students to acquire the knowledge and skills appropriate to the training objectives.

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 training staff 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:

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

Teaching programmes should be designed and tailored to meet the local VTS requirements to ensure VTS personnel (e.g., operator, supervisor) are competent. All pertinent subject elements should be covered and clearly documented.

The presentation of concepts and methodologies may be repeated as necessary in various ways until the OJT 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 training staff to adjust the course content to suit the student intake and provide any revisions of the subject objectives as required. Lesson plans and detailed learning objectives should be developed based on the competence tables, references, and materials as suggested (see Part B).

It is not the intention to present the modules in the order they are 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.

The course timetable may need to be adjusted depending on the student intake as different students may require different lengths of time to cover the same content.

Table 2 Competence Level Taxonomy for VTS Training

Level	Knowledge and/or Attitude	Skill	Verbs (examples)
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	Arrange, define, list, locate, label, identify, select
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	Comply (with), describe, display, give examples, recognize, operate, perform (an action), participate in
Level 3 Skilled work involving a broad range of work activities. Mostly complex and non-routine	Analysis Recognizes un-stated assumptions; recognizes logical inconsistencies in reasoning; distinguishes between facts and inferences; evaluates the relevancy of data; analyses the organizational 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	Analyse, apply, categorize, classify, compare, differentiate, explain, justify, operate, solve
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	Adapt, construct (build), demonstrate, devize, evaluate, interpret, organize, plan, predict, resolve, respond to
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	construct, compose, coordinate, create, criticize, draw conclusion, evaluate, formulate, improve, judge, modify, synthesize

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 with these levels to assist the training staff with the creation of detailed learning objectives. (Table 2 refers to the competence level taxonomy for VTS Training) .

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

The VTS provider should create an OJT task book covering the subject elements in each of the modules. The task book is intended to provide structure for delivering the course and assessing the student's progress.

Detailed competence tables are provided in part B, including competence levels and proposed teaching aids and references. The training materials prepared (eg 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.

10.4. 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 Resolution A.1158(32), Guidelines for Vessel Traffic Services
- IMO GMDSS Manual
- 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)
- IALA Vessel Traffic Services Manual
- IALA S1040 Vessel Traffic Services
- IALA S1050 Training and Certification
- IALA R0103 Training and Certification of VTS Personnel
- IALA G1103 Train the Trainer
- IALA G1141 Operational Procedures for Delivering VTS

- IALA G1156 Recruitment, Training and Certification of VTS Personnel
- IALA C0103-1 VTS Operator 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 related to VTS
- Local Notices to Mariners, navigational warnings related to the VTS area
- National procedures and standards for operation of VTS
- Local procedures for operation of VTS
- Internal and external emergency procedures
- Local charts and geographic knowledge and characteristics of the VTS area
- Meteorological and hydrographic publications/information

10.5. Course review and updating

The course content and OJT task book 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 VTS provider 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 VTS provider 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 to indicate the competence levels that have been attained for each subject of the model course.

12. COURSE ENDORSEMENT

A student should be considered competent when they have:

- demonstrated they have the theoretical and practical knowledge; and
- have passed the appropriate assessments to ensure they have met the required competency as outlined in this model course.

Training records should be maintained by the VTS provider detailing when On-the-Job training was satisfactorily completed for each VTS where the person is employed.

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)
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities - AISM
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)
IMO	International Maritime Organization
ISPS	International Ship and Port Facility Security (Code)
ITU	International Telecommunication Union
Lat	Latitude
LLTV	Low light television
Long	Longitude
LOP	Line(s) of position
MARPOL	International Convention for the Prevention of Pollutions from Ships (IMO)
MASS	Maritime Autonomous Surface Ships
MAtoN	Mobile Marine Aid to Navigation
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)

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 procedures 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).*
- Minimize 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 VTS Provider 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
- Processes and procedures used to collect and dissemination of VTS information
- Dealing with enquires from the media or complaints from the public/allied services

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
- IALA G1132 VTS Voice Communications and Phraseology

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*'.

- IALA G1141 Operational procedures for delivering VTS
- National and local procedures communications manual

1.2 DETAILED COMPETENCE TABLE FOR MODULE 1 – COMMUNICATION COORDINATION AND INTERACTION

Table 3 Competence Table – Communication Coordination and Interaction

Element	*Session Objective*	Sub-element	Subject Elements	Level of Competence
1.1	**General Communication Skills**			
1.1.1	*Construct VTS messages using standard phraseology.*	1.1.1.1	Use of standard phraseology consistent with G1132 and SMCP	4
		1.1.1.2	Structure to compile a message and use of message markers	4
		1.1.1.3	Techniques to deliver a message, covering areas such as: • Tone and volume • Rate of speech • Questioning techniques • Ambiguous terminology	3
		1.1.1.4	Dealing with linguistic diversity and non-English speakers	2
		1.1.1.5	Cultural differences	2
		1.1.1.6	Use of standard phrases to elicit predictable actions	3
		1.1.1.7	Identifying options for alternative wording to clarify understanding	3
1.1.2	*Demonstrate appropriate and correct communication procedures to gather and disseminate VTS information.*	1.1.2.1	Communication with participating ships and allied services	4
		1.1.2.2	Communication with local traffic	4
		1.1.2.3	Handover with adjacent VTS areas / sectors	4
		1.1.2.4	Provision of safety and advisory broadcasts	4
		1.1.2.5	Responding to distress and safety communications (e.g., Distress (Mayday), urgency (Pan Pan) or safety (Securite) messages)	4
		1.1.2.6	Other communication procedures (e.g., radar assistance communication, search and rescue communication)	3
1.2	**Dealing with enquiries or complaints**			
1.2.1		1.2.1.1	VTS procedures	2

Element	*Session Objective*	Sub-element	Subject Elements	Level of Competence
	Describe the processes and procedures for dealing with the media.	1.2.1.2	Protection / security of sensitive information	2
1.2.2	*Describe the processes and procedures for dealing with enquires or complaints from the public / allied services.*	1.2.2.1	VTS procedures	2
1.2.3	*Describe the processes and procedures when improper use of radio procedures are reported or observed.*	1.2.3.1	Improper language	2
		1.2.3.2	Open microphone situations	2

MODULE 2 LEGAL FRAMEWORK

2.1 SUBJECT FRAMEWORK

2.1.1 Scope

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

2.1.2 Objective of Module 2

On completion of the module the student will understand the local legal and regulatory framework relevant to VTS, including:

- National and local regulations
- The objectives set for the VTS
- The roles, responsibilities of and relationships between ship masters, marine pilots, VTS and allied services
- Compliance and enforcement in the VTS area

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 legislation and regulations relevant to the VTS area, including the port and harbour, pilotage, and allied services
- National procedures and standards for operation of VTS
- Local procedures for operation of VTS
- Local Notices to Mariners, navigational warnings related to the VTS area

2.2 DETAILED COMPETENCE TABLE FOR MODULE 2 – LEGAL FRAMEWORK

Table 4 Competence Table – Legal Framework

Element	*Session Objective*	Sub-element	Subject Elements	Level of Competence
2.1	**Regulatory Framework**			
2.1.1	*Explain the national VTS legislative framework.*	2.1.1.1	National regulations related to VTS	3
		2.1.1.2	National regulations related to SAR and pilotage	2
		2.1.1.3	National regulations related to allied services	2
		2.1.1.4	Bilateral or multilateral regulations related to VTS	3
2.1.2	*Explain the local regulations relevant to the VTS.*	2.1.2.1	Local regulations, including port regulations	3
		2.1.2.2	Local VTS publications such as notices to mariners	3
		2.1.2.3	Local agreements between VTS and the competent authority or allied services	3
2.1.3	*Explain VTS Objectives*	2.1.3.1	Objectives that have been set for the VTS	3
2.2	**Roles and Responsibilities**			
2.2.1	*Describe the different authorities and their responsibilities.*	2.2.1.1	Competent authority	2
		2.2.1.2	VTS provider	2
		2.2.1.3	VTS centre	2
2.2.2	*Explain the responsibilities of VTS personnel.*	2.2.2.1	Role and responsibility of VTS personnel in the provision of VTS including the relationships between the: • Master • Pilot • Allied services	3
2.3	**Enforcement of legislation/VTS procedures**			
2.3.1	*Explain the compliance and enforcement framework with respect to violations of VTS regulatory requirements.*	2.3.1.1	Compliance and enforcement in the VTS area including: • Provision of guidance/warnings • Reporting arrangements • Escalation procedures	3

MODULE 3 PROVISION OF VTS

3.1 SUBJECT FRAMEWORK

3.1.1 Scope

This module covers the practical aspects associated with the provision of VTS including the provision of information, and the issuing of advice, warnings, instructions, and traffic clearances.

3.1.2 Objective of Module 3

On completion of the module the student will implement the VTSs processes and procedures associated with the provision of VTS to provide maintain a traffic image, timely and relevant information, monitor and manage ship traffic and respond to developing unsafe situations. This includes:

- VTS operational procedures
- Provision of timely and relevant information
- Monitoring and managing ship traffic
- Responding to unsafe situations
- Expected daily routines such as watch handover

3.1.3 Additional references relevant to this module

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

- VTS operational procedures
- IALA G1089 Provision of a VTS
- IALA G1070 VTS role in managing Restricted or Limited Access Areas
- IALA 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
- Regional/national/local legislations and regulations relevant to VTS, ports, harbours, pilotage and allied services
- Local procedure manual

3.2 DETAILED COMPETENCE TABLE FOR MODULE 3 – PROVISION OF VTS

Table 5 Competence Table – Provision of VTS

Element	*Session Objective*	Sub-element	Subject Elements	Level of Competence
3.1	**VTS Operational Procedures**			
3.1.1	*Explain the structure of the VTS operational procedures and where to locate them at the VTS.*	3.1.1.1	Introduction to operational procedure structure: • Internal routine procedures • Internal emergency procedures • External routine procedures • External emergency procedures	3
		3.1.1.2	Location of procedures at the VTS	2
		3.1.1.3	Document control / update procedures	1
3.1.2	*Explain procedures and reporting arrangements / interactions with participating vessels in the VTS area.*	3.1.2.1	Pre-arrival information	3
		3.1.2.2	Vessels entering the VTS area	3
		3.1.2.3	Vessels movements within the VTS area	3
		3.1.2.4	Vessels at anchor	3
		3.1.2.5	Vessels at berth	3
		3.1.2.6	Vessels departing the VTS area	3
		3.1.2.7	Transition between adjacent VTS areas or sectors including the arrangements for vessel handover	3
3.2	**Provision of Information**			
3.2.1	*Demonstrate the VTS's processes and procedure to provide timely and relevant information to influence ship movements and assist with onboard decision making.*	3.2.1.1	Dissemination of information about navigational situations such as: • Ship traffic information (identity, position, intention (IPI) of other traffic) • Scheduling information • Limitations of ships (restricted manoeuvrability, potential hindrances) • Information concerning the safe navigation of the ship.	4
		3.2.1.2	Dissemination of maritime safety information such as:	4

Element	*Session Objective*	Sub-element	Subject Elements	Level of Competence
			• Navigational warnings (diving operations, uncharted obstacles) • Meteorological and hydrographic conditions and warnings, including weather operational limits • Notices to mariners, status of marine aids to navigation)	
		3.2.1.3	Dissemination of other types of information such as: • Port information • Pilotage or Tugs • Cargo information • Health condition • Port State Control (PSC) • International Ship and Port Facility Security (ISPS)	4
		3.2.1.4	Priority of information to be provided	4
		3.2.1.5	Anticipating calls using information available / sensors	4
3.3	**Monitor and Manage Ship Traffic**			
3.3.1	*Demonstrate the VTS's processes and procedures used to monitor and manage vessel traffic at the VTS such as:* • *Forward planning of vessel movements* • *Organizing vessels underway* • *Organizing space allocation* • *Establishing a system of voyage or passage plans*	3.3.1.1	Rules / measures used to organize and manage the waterway such as: • Shipping routeing measures and separation criteria • Constraints (geographic, operational requirement, priorities, vessel types and characteristics, etc)	4
		3.3.1.2	Ship scheduling of movements	4
		3.3.1.3	Traffic clearance / issuing permission to proceed	4
		3.3.1.4	Conditions applied during the conduct of non-routine activities (eg hot works, lifeboat drills, testing of navigational equipment)	3
		3.3.1.5	Organizing movements to anchorage areas including assigning positions (if relevant)	3
		3.3.1.6	Adverse environmental conditions such as poor visibility, strong currents or tidal streams, high winds, ice etc.	3
		3.3.1.7	Assisting in environmental protection such as mitigating interactions with marine mammals, ship wash, protecting sensitive areas.	3

Element	*Session Objective*	Sub-element	Subject Elements	Level of Competence
3.3.2	*Interpret the regulatory provisions which vessels need to comply with in the VTS area.*	3.3.2.1	Rules / requirements vessels need to comply with such as speed limits, routeing measures, pilotage requirements, local by-laws etc.	4
		3.3.2.2	Contravention and non-conformity reporting	4
3.4	**Respond to unsafe situations**			
3.4.1	*Demonstrate the VTS's processes and procedures to respond to developing unsafe situations to maintain a safe and efficient waterway.*	3.4.1.1	Request information, such as: • Ship identification and details such as position, course, speed and destination • Status of ship's equipment/defects or deficiencies	4
		3.4.1.2	Provide information, such as: • Range and bearing from fixed objects, fairway/channel or waypoints • Proximity to navigational hazards • Information related to navigating into a channel/fairway/lane (i.e., track is parallel/diverging/converging with/from/to reference line) • Guidance to an anchoring position • Meteorological conditions (e.g., low visibility, strong winds) • Ship(s) manoeuvring with difficulty or with unknown intentions • Condition of the waterway that may affect safety of ship traffic	4
		3.4.1.3	Provide advice, such as: • Advising a ship to alter the course, speed. • Advising a ship to close up/drop back on/from another ship • Advising a ship to keep clear from area/position • Assisting where a key bridge team member is incapacitated	4
		3.4.1.4	Provide warnings such as: • Deviating from the planned or recommended route towards shallow water, dangerous wrecks or other obstacles not otherwise promulgated • Diving operations • Ships not under command	4
		3.4.1.5	Providing instructions, such as keep clear of area/position	4

Element	*Session Objective*	Sub-element	Subject Elements	Level of Competence
3.4.2	*Explain the considerations when providing navigational support.*	3.4.2.1	Considerations for navigational support, such as: • Status of waterway • Equipment capabilities and limitations • Clarity of communications – VTS and ship	3
3.5	**Daily Routines**			
3.5.1	*Explain what daily routines are required and where the routines are detailed.*	3.5.1.1	Daily activities at the VTS such as compiling pertinent maritime information	2
		3.5.1.2	Time management and prioritizing tasks	3
		3.5.1.3	Dealing with high workload scenarios and multitasking	3
		3.5.1.4	Equipment / system checks	3
		3.5.1.5	Log keeping and the retention of logs	2
3.5.2	*Describe the information required for a watch handover.*	3.5.2.1	Information elements for an effective handover	3
3.5.3	*Demonstrate watch hand over procedures.*	3.5.3.1	Handover process such as when, how, method of documenting the handover	4

MODULE 4 LOCAL KNOWLEDGE

4.1 SUBJECT FRAMEWORK

4.1.1 Scope

This module provides a broad knowledge of the VTS area where the student will be working. The student will gain both theoretical knowledge as well as practical experience that is required for the provision of VTS in the area.

4.1.2 Objective of Module 4

On completion of the module the student will:

- Have in depth knowledge of the nautical, geographical and navigational characteristics of the VTS area
- Understand vessel traffic in the VTS area
- Identify the services allied to VTS and their respective roles
- Gain practical insight in the VTS area with site visits and familiarization trip

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
- 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)
- VTS operational procedures
- Local charts and nautical publications
- Local VTS publications
- Notices to mariners
- Local VTS publications such as user guides, notices to mariners

4.2 DETAILED COMPETENCE TABLE FOR MODULE 4 – LOCAL KNOWLEDGE

Table 6 Competence Table – Local Knowledge

Element	*Session Objective*	Sub-element	Subject Elements	Level of Competence
4.1	**VTS Area**			
4.1.1	*Describe the key characteristics of the VTS area*	4.1.1.1	Overview to the VTS area including: • area limits / boundaries • traffic separation schemes • precautionary areas • areas to be avoided • restricted areas • prohibited or dangerous areas • shipping lanes, channels, and canals • anchorage areas • pilotage areas / pilot boarding area • docks and berths • geographical locations • locks • docks (tidal and non-tidal) • bridges and other fixed structures • abort points	2
		4.1.1.2	Key characteristics of the adjacent VTS areas	1
4.1.2	*Describe the use of VHF in the VTS area*	4.1.2.1	Overview to VHF in the VTS area including: • VHF Sectors • VHF Channels • Reporting Points	2

Element	*Session Objective*	Sub-element	Subject Elements	Level of Competence
4.1.3	*Describe the aids to navigation in the VTS Area*	4.1.3.1	Overview to aids to navigation in the area such as: • Buoys • Lighthouses • Fixed Land Marks • Lights	2
4.1.4	*Explain the navigational restrictions on vessel movements in the VTS area.*	4.1.4.1	Geographical, hydrographical and environmental aspects such as: • Depths • Maximum drafts / beam / LOA • Maximum air drafts required (region specific) • Effects of meteorological and hydrological conditions (ice, fog, winds, …) • Tidal streams • Squat	3
4.2	**Traffic Profile**			
4.2.1	*Describe the traffic composition in the VTS area.*	4.2.1.1	Types of vessels expected	2
		4.2.1.2	Movements of dangerous goods	2
		4.2.1.3	Special cargoes	2
		4.2.1.4	Typical ship movement characteristics/conditions	2
		4.2.1.5	Typical cargoes handled and their characteristics/conditions	2
		4.2.1.6	Special vessel movements	2
		4.2.1.7	Local traffic (fishing, leisure, …)	2
4.3	**Allied Services**			
4.3.1	*Describe the interactions between VTS and allied services.*	4.3.1.1	Pilotage Services	2
		4.3.1.2	Tugs and Tug operators	2
		4.3.1.3	Icebreakers and icebreaker operators	2
		4.3.1.4	Shipping agents	2
		4.3.1.5	Government agencies, including law enforcement agencies, Customs and Immigration Services	2

Element	*Session Objective*	Sub-element	Subject Elements	Level of Competence
4.4	**Familiarization Activities**			
4.4.1	*Participate in relevant familiarization activities and site visits.*	4.4.1.1	Allied services	2
		4.4.1.2	Adjacent VTS centres	2
		4.4.1.3	Shipboard voyages such as: • Pilot trajectory • Tugs • SAR units • Patrol vessels • Buoy tenders	2
		4.4.1.4	Technical installations	1

MODULE 5 EQUIPMENT

5.1 SUBJECT FRAMEWORK

5.1.1 Scope

This module provides a practical environment to learn the equipment used at the VTS.

5.1.2 Objective of Module 5

On completion of the module the student will:

- Use the various equipment at the VTS including their geographical location, limitations, and coverage
- Understand the key business rules and functionality of the decision support tool (DST)
- Recognize the importance of equipment performance monitoring
- Explain the procedures on the storage, dissemination, and release of data

5.1.3 Additional references relevant to this module

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

- User manuals for equipment at the VTS
- Local VTS operational procedures
- VTS providers information management policies or regulations and data protection regulations
- IALA G1132 VTS Voice Communications and Phraseology
- IALA G1110 Use of Decision Support Tools for VTS Personnel
- IALA G1082 An overview of AIS
- 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 and Equipment
- IALA G1111-2 Producing Requirements for Voice Communications
- IALA G1111-3 Producing Requirements for RADAR
- IALA G1111-4 Producing Requirements for AIS
- IALA G1111-5 Producing Requirements for Environment Monitoring Sensors
- 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 and Equipment
- Radio Operators Certificate (ROC) and/or General Operators Certificate (GOC)

5.2 DETAILED COMPETENCE TABLE FOR MODULE 5 – EQUIPMENT

Table 7 Competence Table – Equipment

Element	*Session Objective*	Sub-element	Subject Elements	Level of Competence
5.1	**Voice Communication Systems and Procedures**			
5.1.1	*Explain VHF base stations and their working channels in the VTS area.*	5.1.1.1	VHF base stations in the VTS area including their geographical location, limitations, and coverage	3
		5.1.1.2	VHF channels and management of multiple channels	3
5.1.2	*Demonstrate the use of the voice communication systems at the VTS.*	5.1.2.1	Key components and functions of the voice communications system	3
		5.1.2.2	Use of telephone system	4
		5.1.2.3	Use of satellite voice communication system	3
		5.1.2.4	Access recordings to replay voice records	4
5.1.3	*Demonstrate the use of the Radio Direction Finder (RDF) at the VTS.*	5.1.3.1	RDF base stations in the VTS area including geographical location, limitations, and coverage	3
		5.1.3.2	Functions of the RDF	3
		5.1.3.3	Recording and replaying of records	3
5.2	**Equipment at the VTS**			
5.2.1	*Demonstrate the use of radar equipment at the VTS.*	5.2.1.1	Radar sites in the VTS area including their geographical location, limitations, and coverage	3
		5.2.1.2	Key components and functions of radar system	2
		5.2.1.3	Access recordings to replay radar data	4
5.2.2	*Demonstrate of the use of AIS equipment at the VTS.*	5.2.2.1	AIS sites in the VTS area including their geographical location, limitations, and coverage	4
5.2.3	*Demonstrate the use of imaging systems at the VTS centre.*	5.2.3.1	CCTV sites in the VTS area including their geographical location, limitations, and coverage	4

Element	*Session Objective*	Sub-element	Subject Elements	Level of Competence
		5.2.3.2	Key components/functions of the CCTV systems	2
		5.2.3.3	Access recordings to replay CCTV data	4
5.2.4	*Demonstrate the use of environmental sensors at the VTS centre.*	5.2.4.1	Hydrographic sensor equipment (eg tide gauges, tidal stream indicators, wave monitoring) in the VTS area including their geographical location, limitations and coverage	3
		5.2.4.2	Meteorological sensor equipment (eg wind speed and direction indicators, ice coverage data) used in the VTS area	3
		5.2.4.3	Application of environmental sensor data in VTS operations	4
5.3	**Decision Support Tools**			
5.3.1	*Demonstrate the use of the decision support tool.*	5.3.1.1	Key components/functions of the decision support tool	4
		5.3.1.2	Business rules used by the system including actions required to respond to alerts and alarms	4
		5.3.1.3	Accessing DST replay functions	3
5.4	**Equipment Performance Monitoring**			
5.4.1	*Explain the importance of equipment performance monitoring.*	5.4.1.1	Expected normal operating parameters	3
		5.4.1.2	Shutdown for planned maintenance procedures	3
		5.4.1.3	Fault identification, and correcting equipment faults	3
		5.4.1.4	Procedures to report equipment faults	3
		5.4.1.5	Procedures to initiate back up or redundant equipment	3
		5.4.1.6	Procedures to return equipment to service	3
5.6	**VTS Data**			
5.6.1	*Describe corporate procedures on the storage, dissemination, and release of data.*	5.6.1.1	Storage and retention of data at the VTS	2
		5.6.1.2	Data release policies and procedures	2

MODULE 6 HUMAN FACTORS

6.1 SUBJECT FRAMEWORK

6.1.1 Scope

This module addresses the required competences for VTS Operators to perform their duties under all conditions including emergencies and stressful situations. It introduces the personal qualities and competences required as a VTS operator, including an understanding of corporate human resource policies/procedures and the personnel support.

6.1.2 Objective of Module 6

On completion of the module the student will:

- Understand the relevant corporate human resource policies/procedures
- Perform duties in a manner that supports a healthy work environment in VTS
- Understand the impact of stress, fatigue, safety and workload
- Act with the professionalism expected of the VTSO role, specifically in the areas of responsibility and reliability
- Identify support services available to VTS personnel

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
- National health requirements
- 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.

6.2 DETAILED COMPETENCE TABLE FOR MODULE 6 – PERSONAL ATTRIBUTES

Table 8 Competence Table – Personal Attributes

Element	*Session Objective*	Sub-element	Subject Elements	Level of Competence
6.1	**Relevant Human Resources Policies / procedures**			
6.1.1	*Explain the corporate procedures relevant to the VTS provider.*	6.1.1.1	General Corporate procedures	3
		6.1.1.2	Code of conduct / professionalism	3
		6.1.1.3	Human Resource Policies and Procedures	3
		6.1.1.4	Rostering procedures and absences (sickness, holiday, …)	3
6.2	**Impact of workload and work environment**			
6.2.1	*Explain the importance of health and safety in the VTS operations and working environment.*	6.2.1.1	Workplace health and safety aspects such as: • Physical safety • Psychological safety • Implications of shift work environment • Awareness of personal fitness for duty • Awareness of health strategies	3
		6.2.1.2	Healthy work/life balance with shift work	3
6.2.2	*Explain how to address stress and fatigue in the VTS operations and working environment.*	6.2.2.1	Stress and Fatigue aspects such as: • Causes of stress and fatigue • Recognize the dangers of stress and fatigue • Strategies to cope with stress and fatigue	3
		6.2.2.2	Dealing with traumatic experiences	3
6.2.3	*Explain workload coping strategies.*	6.2.3.1	Variability of the VTS task load	3
		6.2.3.2	Switching between different tasks	3
		6.2.3.3	Coping strategies to manage workload (too low/too high)	3
6.3	**Roles, responsibilities, and teamwork**			

Element	*Session Objective*	Sub-element	Subject Elements	Level of Competence
6.3.1	*Identify the different relationships within the organization, their roles, and their responsibilities.*	6.3.1.1	Relationship between: • VTS management • VTS supervisors • VTS operators • VTS instructors	1
		6.3.1.2	Accessing a confidential personnel/counsellor or employee assistant programs	1
6.3.2	*Demonstrate effective teamwork skills in support of VTS operations.*	6.3.2.1	Working relationship within the VTS team	4
		6.3.2.2	Working relationship within the VTS	4
		6.3.2.3	Working relationship with VTS and port team (ships, pilots, tugs)	3
		6.3.2.4	Working relationship with VTS and allied services	3
6.4	**Individual behaviour**			
6.4.1	*Explain the different aspects of individual behaviour that may influence performance.*	6.4.1.1	Such as: • Apply self-learning techniques • Impact of periods of reduced task load • Complacency with repeated tasks • Recognize the impact of distracting factors (smartphone, tablets, books) • Recognize the factors influence human error (system usability) • Recognize the factors that influence work satisfaction (stress, workload, relationships)	3

MODULE 7 EMERGENCY SITUATIONS

7.1 SUBJECT FRAMEWORK

7.1.1 Scope

This module includes the processes and procedures to respond to internal and external 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:

- Learn to apply the internal emergency procedures to ensure the continuation of the VTS operations, including the safety and health of VTS personnel.
- Learn to apply the external emergency procedures, including the collection of information and response activities during an emergency.
- Learn to apply contingency plans.
- Recognize the importance of recording and reporting activities during incidents and emergency situations at the VTS.

7.1.3 Additional references relevant to this module

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

- Local VTS Operational procedures
- Local VTS Business continuity plan
- Local contingency plans such as pollution response
- IALA G1141 Operational Procedures for Delivering VTS
- IALA G1118 Marine Casualty/Incident Reporting and Recording, Including Near-Miss Situations as it Relates to VTS

7.2 DETAILED COMPETENCE TABLE FOR MODULE 7 – EMERGENCY SITUATIONS

Table 9 Competence Table – Emergency Situations

Element	*Session Objective*	Sub-element	Subject Elements	Level of Competence
7.1	**Internal Emergencies**			
7.1.1	*Demonstrate an understanding of internal emergency procedures to ensure the continuation of VTS operations and the health and safety of VTS personnel.*	7.1.1.1	System and equipment failures, such as: • Loss of external communications • Loss of internal communications • Loss of functionality of sensor equipment • Loss of information management systems / decision support tools • Loss of power	4
		7.1.1.2	Evacuation of the VTS centre	4
		7.1.1.3	Medical emergencies of VTS personnel	4
		7.1.1.4	Security incidents	4
7.2	**External Emergencies**			
7.2.1	*Describe the roles and responsibilities of allied services for handling external emergencies within the VTS area.*	7.2.1.1	Authorities / Allied services responsible for emergency response (eg Port operations / marine operations, water police, Rescue Coordination Centre (RCC, JRCC)	2
7.2.2	*Demonstrate VTS procedures while interacting with allied services during an external emergency.*	7.2.2.1	Including: • Collection of information • Analyse the information • Dissemination of information	4
7.2.3	*Demonstrate how to maintain VTS operations during an external emergency within the VTS area.*	7.2.3.1	Advising ships in the VTS area	4
7.2.4	*Demonstrate external emergency procedures to assist in the collection of information and response activities during an emergency.*	7.2.4.1	Collision, capsizing, sinking, grounding, fire onboard and man overboard	4
		7.2.4.2	Pollution incidents	4
		7.2.4.3	Places of refuge	4
		7.2.4.4	Medical emergency	4

Element	*Session Objective*	Sub-element	Subject Elements	Level of Competence
		7.2.4.5	Vessel not under command	4
		7.2.4.6	Security incident including piracy or unauthorized boarding	4
		7.2.4.7	Protest action	4
		7.2.4.8	Natural disasters	4
7.2.5	*Describe the local contingency plans available for the VTS.*	7.2.5.1	Pollution response plans	2
		7.2.5.2	Other, as required	2
7.3	**Reporting of incidents and near miss situations**			
7.3.1	*Demonstrate the processes and procedures for recording activities during incidents and emergency situations at the VTS.*	7.3.1.1	Recording of activities during incidents and near miss situations	4
		7.3.1.2	Reporting incidents and near miss situations	4
		7.3.1.3	Dissemination of incident and near miss reports	4
		7.3.1.4	Protection / security of sensitive information	4