Model Course 1.23

Proficiency in Survival Craft and Rescue Boats other than Fast Rescue Boats

IMO

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Foreword

Since its inception the International Maritime Organization has recognized the importance of human resources to the development of the maritime industry and has given the highest priority to assisting developing countries in enhancing their maritime training capabilities through the pro\l\s\on Of \mpfO\lement 0' maf\t\me tfa\n\ng 'acmt\es at nat\ona\ and feg\ona\ levels. IMO has also responded to the needs of developing countries for postgraduate training for senior personnel in administration, ports, shipping companies and maritime training institutes by establishing the World Maritime University in Malmo, Sweden, in 1983.

Following the earlier adoption of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, a number of IMO Member Governments had suggested that IMO should develop model training courses to assist in the implementation of the Convention and in achieving a more rapid transfer of information and skills regarding new developments in maritime technology. IMO training advisers and consultants also subsequently determined from their visits to training establishments in developing countries that the provision of model courses could help instructors improve the quality of their existing courses and enhance their effectiveness in meeting the requirements of the Convention and implementing the associated Conference and IMO Assembly resolutions.

In addition, it was appreciated that a comprehensive set of short model courses in various fields of maritime training would supplement the instruction provided by maritime academies and allow administrators and technical specialists already employed in maritime administrations, ports and shipping companies to improve their knowledge and skills in certain specialized fields. IMO has therefore developed the current series of model courses in response to these generally identified needs and with the generous assistance of Norway.

These model courses may be used by any training institution and the Organization is prepared to assist developing countries in implementing any course when the requisite financing is available.

W. A. O'NEIL

Secretary-General

Introduction

● Purpose of the model courses

The purpose of the IMO model courses is to assist maritime training institutes and their teaching staff in organizing and introducing new training courses, or in enhancing, updating or supplementing existing training material where the quality and effectiveness of the training courses may thereby be improved.

It is not the intention of the model course programme to present instructors with a rigid "teaching package" which they are expected to "follow blindly". Nor is it the intention to substitute audio-visual or "programmed" material for the instructor's presence. As in all training endeavours, the knowledge, skills and dedication of the instructor are the key components in the transfer of knowledge and skills to those being trained through IMO model course material.

Because educational systems and the cultural backgrounds of trainees in maritime subjects vary considerably from country to country, the model course material has been designed to identify the basic entry requirements and trainee target group for each course in universally applicable terms, and to specify clearly the technical content and levels of knowledge and skill necessary to meet the technical intent of IMO conventions and related recommendations

● Use of the model course

To use the model course the instructor should review the course plan and detailed syllabus, taking into account the information provided under the entry standards specified in the course framework. The actual level of knowledge and skills and prior technical education of the trainees should be kept in mind during this review, and any areas within the detailed syllabus which may cause difficulties because of differences between the actual trainee entry level and that assumed by the course designer 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 trainees. He should also identify any academic knowledge, skills or technical training which they 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 or, alternatively, insert the elements of academic knowledge required to support the technical training elements concerned at appropriate points within the technical course.

Adjustment of the course objectives, scope and content may also be necessary if in your maritime industry the trainees completing the course are to undertake duties which differ from the course objectives specified in the model course.

Within the course plans, the course designers have indicated their assessment of the time which should be allotted to each learning area. However, it must be appreciated that these allocations are arbitrary and assume that the trainees have fully met all entry requirements of the course. The instructor should therefore review these assessments and may need to reallocate the time required to achieve each specific learning objective.

● Lesson plans

Having adjusted the course content to suit the trainee intake and any revision of the course objectives, the instructor should draw up lesson plans based on the detailed syllabus. The detailed syllabus contains specific references to the textbooks or teaching material proposed to be used in the course. An example of a lesson plan is shown in the instructor manual on page 46. Where no adjustment has been found necessary in the learning objectives of the 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.

● Presentation

The presentation of concepts and methodologies must be repeated in various ways until the instructor is satisfied, by testing and evaluating the trainee's performance and achievements, that the trainee has attained each specific learning objective or training outcome. The syllabus is laid out in learning-objective format and each objective specifies a *required performance* or, *what the trainee must be able to do* as the learning or training outcome. Taken as a whole, these objectives aim to meet the knowledge, understanding and proficiency specified in the appropriate tables of the STCW Code.

● Implementation

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

- properly qualified instructors
- support staff
- rooms and other spaces
- equipment
- textbooks, technical papers
- other reference material.

Thorough preparation is the key to successful implementation of the course. IMO has produced a booklet entitled "Guidance on the implementation of IMO model courses", which deals with this aspect in greater detail.

● Training and the STCW 1995 Convention

The standards of competence that have to be met by seafarers are defined in Part A of the STCW Code in the Standards of Training, Certification and Watchkeeping for Seafarers Convention, as amended in 1995. This IMO model course has been revised and updated to cover the competences in STCW 1995. It sets out the education and training to achieve those standards detailed in Chapter VI, Table A-VI/2-1 of the STCW Code.

Part A provides the framework for the course with its aims and objectives and notes on the suggested teaching facilities and equipment. A list of useful teaching aids, IMO references and textbooks is also included.

Part B provides an outline of lectures, demonstrations and exercises for the course. A suggested timetable is included, but from the teaching and learning point of view, it is more important that the trainee achieves the minimum standard of competence defined in the STCW Code than that a strict timetable is followed. Depending on their experience and ability, some students will naturally take longer to become proficient in some topics than in others. Also included in this section are guidance notes and additional explanations.

A separate IMO model course addresses Assessment of Competence. This course explains the use of various methods for demonstrating competence and criteria for evaluating competence as tabulated in the STCW Code.

Part C gives the detailed teaching syllabus. This is based on the theoretical and practical knowledge specified in the STCW Code. It is written as a series of learning objectives; in other words, what the trainee is expected to be able to do as a result of the teaching and training. Each of the objectives is expanded to define a required performance of knowledge, understanding and proficiency. IMO references, textbook references and suggested teaching aids are included to assist the teacher in designing lessons.

The new training requirements for these competences are addressed in the appropriate parts of the detailed teaching syllabus.

The Convention defines the minimum standards to be maintained in Part A of the STCW Code. Mandatory provisions concerning training and assessment are given in Section A-I/G of the STCW Code. These provisions cover: qualification of instructors; supervisors as assessors; in-service training; assessment of competence; and training and assessment within an institution. The corresponding Part B of the STCW Code contains non-mandatory guidance on training and assessment.

The criteria for evaluating competence in Table A-VI/2-1 of the STCW Code are to be used in the assessment of the competences listed in the table.

As previously mentioned, a separate model course addresses Assessment of Competence and use of the criteria for evaluating competence tabulated in the STCW Code.

● Responsibilities of Administrations

Administrations should ensure that training courses delivered by colleges and academies are such as to ensure those completing training do meet the standards of competence.

● Validation

The information contained in this document has been validated by the Sub-Committee on Standards of Training and Watchkeeping for use by technical advisors, consultants and experts for the training and certification of seafarers so that the minimum standards implemented may be as uniform as possible. Validation, in the context of this document, means that the Sub-Committee has found no grounds to object to its content. The Sub-Committee has not granted its approval to the documents, as it considers that this work must not be regarded as an official interpretation of the Convention.

In reaching a decision in this regard, the Sub-Committee was guided by the advice of a Validation Group comprised of representatives designated by ILO and IMO.

Part A: Course Framework

● Aims

This model course aims to provide the training for candidates to launch and take charge of a survival craft or rescue boat in emergency situations, in accordance with Section A-V1/2 of the STCW Code.

● Objective

This syllabus covers the requirements of the 1995 STCW Convention Chapter VI, Section A-V1/2, Table A-VI/2-1. On meeting the minimum standard of competence in survival craft and rescue boats other than fast rescue boats, a trainee will be competent to operate life-saving appliances and take charge of a survival craft or rescue boat during or after launch. They will also be able to operate a survival craft engine and manage survivors and survival craft after abandoning ship. Trainees will know the correct use of all locating devices, including communication and signalling apparatus and pyrotechnics, how to apply first aid to survivors and the actions to take to preserve the lives of those in their charge.

● Entry standards

For admission to the course, seafarers must be certified by a doctor to be in good health. They must also have completed the four basic courses covering the familiarization and basic safety training and instruction in accordance with Regulation VI/1 of STCW 1995.

● Course certificate

On successful completion of the course and demonstration of competence, a document may be issued certifying that the holder has met the standard of competence specified in Table A-V1/2-1 of STCW 1995.

A certificate may be issued only by centres approved by the Administration.

● Course intake limitations

The maximum number of trainees attending each session will depend on the availability of instructors, equipment and facilities available for conducting the training. It should not exceed the number of persons which the survival craft to be used is permitted to carry, and should not, at any time, exceed that which will allow sufficient opportunity for each trainee to have adequate practical instruction in procedures for the proper use of systems and equipment.

● Staff requirements

The instructor shall have appropriate training in instructional techniques and training methods (STCW Code Section *A-1/6,* paragraph 7).

● Training facilities and equipment

Ordinary classroom facilities and an overhead projector are required for the lecturers. In addition, a demonstration table measuring 3 m by 1 m would be an advantage. When making use of audio-visual material such as videos or slides, make sure the appropriate equipment is available.

The practical lessons require access to a lake or the sea, preferably in harbour or estuarial waters. A swimming pool could be used for certain of the wet drills.

The following items of equipment are required:

1 glass-reinforced plastic lifeboat, approximately 8 metres in length, fitted with an inboard diesel engine, and a full set of oars (new or replacement boats should preferably be fire-protected lifeboats complying with Section 6.1 of the ISA Code) with a set of gravity davits to house the lifeboat, sited so as to allow launching into the water
1 portable hoist unit suitable for recovery of the lifeboat
1 glass-reinforced plastic rescue boat with outboard engine and a full set of oars with a set of launching davits to house the rescue boat, sited so as to allow launching into the water
1 portable hoist unit suitable for recovery of rescue boats
2 20-man inflatable liferafts in containers, one of which can be placed in a float-free stowage with hydrostatic release unit
1 davit-launched inflatable liferaft with launching davit
Sufficient lifejackets for all trainees, instructors, rescue boat and fast rescue boat crews, immersion suits, thermal protective aids, anti-exposure suits
3 portable 2-way radiotelephones approved for use in survival craft
1 demonstration set of survival craft pyrotechnics
1 emergency position-indicating radio beacon (EPIRB) operating on 406 MHz
1 search and rescue transponder (SART) operating on 9 GHz
1 helicopter rescue sling
1 complete set of lifeboat equipment
1 complete set of liferaft equipment
1 life-size dummy for resuscitation training
1 Neil-Robertson stretcher for use in exercises
Safety/first aid equipment comprising:
- MOB boat
- powerful searchlights [1]
- retro-reflective tapes [1]
- first-aid kit
- stretcher
- resuscitation kit with oxygen/suction unit

The practical drills and evaluation could be carried out aboard a ship, making use of its equipment and facilities.

● Teaching aids (A)

A1 Instructor Manual (Part D of the course)

A2 Specimen muster list

A3 Specimen training and survival manual and on-board maintenance manual

A4 Videos:
V1 SOlAS Chapter III Part 1 - Preparing for Abandonment (Code No. 297.1)
V2 SOlAS Chapter III Part 2 - Abandonment by Lifeboat (Code No. 297.2)

[1] Necessary jf drills are performed at night.

V3 SOlAS Chapter III Part 3 - Abandonment by Liferaft (Code No. 297.3)
V4 SOlAS Chapter III Part 4 - Techniques of Survival (Code No. 297.4)
V5 SOlAS Chapter III Part 5 - SOlAS Amendments (Code No. 463)
V6 Personal Survival Part 1 (Code No. 645)
V7 Personal Survival Part 2 (Code No. 646)
V8 Cold Water Casualty (Code No. 527)
V9 Man Overboard (Code No. 644)
V10 Lifeboat On-load Release Mechanism (Code No. 596)
V11 Viking Inflatable Liferaft (Code No. 404)
V12 Viking Davit launchable Liferaft (Code No. 405)
V13 Viking Marine Escape Slide (Code No. 274)
V14 Viking Marine Evacuation System (Code No. 275)

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● Bibliography (B)

B1 C.H. Wright, *Proficiency in Survival Craft Certificates* (Glasgow: Brown, Son and Ferguson, 1988) (ISBN 0-85174-540-7) (OUT OF PRINT)
B2 D.J. House, *Marine Survival and Rescue Systems* (london: Witherby & Co., 1977) (ISBN 1-85609-127-9)

Secondhand copies of out-of-print books may be available from the Warsash Nautical Bookshop, 6 Dibles Road, Warsash, Southampton S031 9HZ, UK. Tel: +44 1489572384, Fax: +44 1489885756, E-mail: orders@nauticalbooks.co.uk URl: www.nauticalbooks.co.uk

● IMO references (R)

R1 The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1995 (STCW 1995), 1998 edition (IMO Sales No. 938E)
R2 International Convention for the Safety of Life at Sea, 1974 (SOlAS 1974), as amended (IMO Sales No. 11OE)
R3 IMO Life-Saving Appliances Code (lSA Code) (IMO Sales No. 982E)
R4 Merchant Ship Search and Rescue Manual (MERSAR) (IMO Sales No. 963E)
R5 A Pocket Guide to Cold Water Survival (IMO Sales No. 946E)
R6 lSA symbols - Poster (IMO Sales No. 981 E)
R7 Assembly resolution A.660(16) - Carriage of satellite emergency position-indicating radio beacons (EPIRBs)
R8 Assembly resolution A.657(16) - Instructions for action in survival craft
R9 Assembly resolution A.694(17) - General requirements for shipborne radio equipment forming part of Global Maritime Distress and Safety System (GMDSS) and for electronic navigation aid
R10 Assembly resolution A.762(18) - Performance standards for survival craft two-way VHF radiotelephone apparatus
R11 Assembly resolution A.763(18) - Performance standards for float-free satellite emergency position-indicating radio beacons (EPIRBs) operating on 406 MHz

R12 Assembly resolution A.802(19) - Performance standards for survival craft radar transponders for use in search and rescue operations
R13 Assembly resolution A.809(19) - Performance standards for survival craft two-way radiotelephone apparatus
R14 Assembly resolution A.81 0(19) - Performance standards for float-free satellite emergency position-indicating Radio Beacons (EPIRBs) operating on 406 MHz
R15 Assembly resolution A.812(19) - Performance standards for float-free satellite emergency position-indicating radio beacons (EPIRBs) operating through the geostationary Inmarsat satellite system on 1.6 GHz

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● Textbooks (T)

No specific textbook is recommended for trainee use.

● *Safety routines*

Safety precautions during drills should be drawn up by the instructors, having regard to the nature of the drills and the facilities in use. Trainees should be fully aware of the safety precautions and be closely supervised at all times.

During abandon-ship drills and exercises in handling survival craft, a rescue boat must be in constant attendance. Night drills must not be performed unless all trainees and instructors have been provided with lifejackets having retro-reflective material complying with LSA Code, section 1.2.2.7 fitted in accordance with the recommendation in Assembly resolution A.658(16). The practice area must be illuminated by searchlights.

Part B: Course Outline and Timetable

● Lectures

As far as possible, lectures should be presented within a familiar context and should make use of practical examples. They should be well illustrated with diagrams, photographs and charts where appropriate, and be related to matter learned during seagoing time.

An effective manner of presentation is to develop a technique of giving information and then reinforcing it. For example, first tell the trainees briefly what you are going to present to them; then cover the topic in detail; and, finally, summarize what you have told them. The use of an overhead projector and the distribution of copies of the transparencies as trainees' handouts contribute to the learning process.

● Course Outline

The tables that follow list the competencies and areas of knowledge, understanding and proficiency, together with the estimated total hours required for lectures and practical exercises. Teaching staff should note that timings are suggestions only and should be adapted to suit individual groups of trainees depending on their experience, ability, equipment and staff available for training.

Course Outline

Course Outline		Approximate Time (Hours)
Knowledge, understanding and proficiency		Lectures, demonstrations and practical exercises
1	*Introduction and safety* 1.1 Introduction 1.2 Safety guidance	0.5
2	*General* 2.1 Emergency situations 2.2 Training, drills and operational readiness 2.3 Actions to be taken when called to survival craft stations	1.5
3	*Abandon ship* 3.1 Actions to be taken when required to abandon ship 3.2 Actions to be taken when in the water	0.5
4	*Survival craft and rescue boats* 4.1 Lifeboats 4.2 Liferafts 4.3 Rescue boats	0.75
5	*Launching arrangements* 5.1 Boat davits 5.2 Liferaft davits 5.3 Rescue boat davits 5.4 Free-fall 5.5 Float-free arrangements 5.6 Marine evacuation systems	1.25
6	*Evacuation and recovery of survival craft and rescue boats* 6.1 Launching 6.2 Clearing the ship's side 6.3 Marshalling liferafts and rescuing survivors from the sea 6.4 Recovery of survival craft and rescue boats 6.5 Launching survival craft and rescue boats in rough sea 6.6 Recovery of rescue boats in rough sea	1.25
7	*Actions to take when clear of the ship*	0.25
8	*Lifeboat engine and accessories* 8.1 Starting the engine 8.2 Cooling systems 8.3 Battery charging 8.4 Fire extinguisher 8.5 Water spray system 8.6 Self-contained air support system	1.5
9	*Rescue boat outboard engine*	1.0

Course Outline (continued)		Approximate Time (Hours)
Knowledge, understanding and proficiency		Lectures, demonstrations and practical work
10	*Handling survival craft and rescue boats in rough weather* 10.1 Boats 10.2 Liferafts 10.3 Beaching	0.75
11	*Actions to take when aboard a survival craft* 11.1 Initial actions 11.2 Routines for survival 11.3 Use of equipment 11.4 Apportionment of food and water 11.5 Action to take to maximize detectability and location of survival craft	1.5
12	*Methods of helicopter rescue* 12.1 Communicating with the helicopter 12.2 Evacuation from ship and survival craft 12.3 Helicopter pick-up	1.25
13	*Hypothermia*	1.0
14	*Radio equipment* 14.1 Two-way VHF radiotelephone apparatus 14.2 Emergency position-indicating radio beacons (EPIRBs) 14.3 Search and rescue transponder beacons (SARTs) 14.4 Distress signals, signalling equipment and pyrotechnics	1.5
15	*First aid* 15.1 Resuscitation techniques 15.2 Use of first-aid kit	2.0
16	*Drills in launching and recovering boats*	3.0
17	*Drills in launching liferafts* 17.1 Davit-launched liferafts 17.2 Throw-overboard liferafts 17.3 Boarding a liferaft from the water 17.4 Righting an inverted liferaft	3.0
18	*Drills in launching and recovering rescue boats*	3.0
19	*Practical exercises and evaluation*	6.0
	TOTAL	31.5

Note: Teaching staff should note that outlines are suggestions only as regards sequence and length of time allocated to each objective. These factors may be adapted by lecturers to suit individual groups of trainees depending on their experience, ability, equipment and staff available for training.

Course Timetable - Example

Day	Period 1 (1% hours)	Period 2 (1½ hours)	Period 3 (1% hours)	Period 4 (1% hours)
1	1 Introduction and safety 2 General	2 General (continued) 3 Abandon ship 4 Survival craft and rescue boats	4 Survival craft and rescue boats (continued) 5 Launching arrangements	6 Evacuation and recovery of survival craft and rescue boats 7 Actions to take when clear of the ship
2	8 Lifeboat engine and accessories	9 Rescue boat outboard engines 10 Handling survival craft and rescue boats in rough weather	10 Handling survival craft and rescue boats in rough weather (continued) 11 Actions to take when aboard a survival craft	11 Actions to take when aboard a survival craft (continued) 12 Methods of helicopter rescue
3	13 Hypothermia 14 Radio equipment	14 Radio equipment (continued) 15 First aid	15 First aid (continued)	16 Drills in launching and recovering boats
4	16 Drills in launching and recovering boats (continued)	17 Drills in launching liferafts	17 Drills in launching liferafts (continued)	18 Drills in launching and recovering rescue boats (3 hours)
5	19 Practical exercises and evaluation	19 Practical exercises and evaluation (continued)	19 Practical exercises and evaluation (continued)	19 Practical exercises and evaluation (continued)

Teaching staff should note that the hours for lectures and exercises are suggestions only as regards sequence and length of time allocated to each objective. These factors may be adapted by lecturers to suit individual groups of trainees depending on their experience, ability, equipment and staff available for teaching.

Part C: Detailed Teaching Syllabus

● Introduction

The detailed teaching syllabus has been written in learning objective format in which the objective describes what the trainee 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 trainee ..... "

In order to assist the instructor, references are shown against the learning objectives to indicate IMO references and publications, textbooks, additional technical material and teaching aids, which the instructor may wish to use when preparing course material. The material listed in the course framework has been used to structure the detailed teaching syllabus; in particular,

Teaching aids (indicated by A),
Bibliography (indicated by B),
IMO references (indicated by R),
Textbooks (indicated by T) and
Audiovisuals (indicated by V)

will provide valuable information to instructors. The abbreviations used are:

Ch.	chapter
col.	column
pa.	paragraph
Pt.	part
Reg.	regulation
Sect.	section.

The following are examples of the use of references:

"R1 - Sect. B-VI/2" refers to Section B-VI/2 of the STeW Code.

"R2 - Reg. 111/19.4" refers to regulation 111/19 paragraph 4, of the 1974 SOlAS Convention.

● Note

Throughout the course, safe working practices are to be clearly defined and emphasized with reference to current international requirements and regulations.

It is expected that the national institution implementing the course will insert references to national requirements and regulations as necessary.

Proficiency in survival craft and rescue boats other than fast rescue boats	IMO reference	Textbooks, bibliography	Detailed teaching syllabus reference
Competence: Take charge of a survival craft or rescue boat during and after launch Knowledge, understanding and proficiency *Construction and outfit of survival craft and rescue boats and individual items of their equipment.* *Particular characteristics and facilities of survival craft and rescue boats.* *Various types of device used for launching survival craft and rescue boats.* *Methods of launching survival craft into a rough sea.* *Methods of recovering survival craft.* *Actions to be taken after leaving the ship.* *Methods of launching and recovering rescue boats in a rough sea.*	R1- Sect. A-VI/2 Table A- VI/2-1		
Objectives are:			
1 right an inverted liferaft while wearing a lifejacket			17.4
2 interpret the markings on survival craft as to the number of persons they are intended to carry			4.1 -4.3
3 give correct commands for launching and boarding survival craft, clearing the ship and handling and disembarking persons from survival craft			3.1,16,17, 18
4 prepare and safely launch survival craft and clear the ship's side quickly			2.3, 5, 6, 16, 17,18
5 safely recover survival craft and rescue boats			6,16,18
Competence: Operate a survival craft engine Knowledge, understanding and proficiency *Methods of starting and operating a survival craft engine and its accessories together with the use of the fire extinguisher provided.*	R1- Sect. A-VI/2 Table A- VI/2-1		
Objectives are:			
start and operate an inboard engine fitted in an open or enclosed lifeboat			8,9

PROFICIENCY IN SURVIVAL CRAFT AND RESCUE BOATS OTHER THAN FAST RESCUE BOATS

Proficency in survival craft and rescue boats other than fast rescue boats	IMO reference	Textbooks, bibliography	Detailed teaching syllabus reference
Competence: Manage survivors and survival craft after abandoning ship	R1 - Sect. A-V1/2 Table A-VI/2-1		
Knowledge, understanding and proficiency *Handling survival craft in rough weather.* *Use of painter, sea-anchor and all other equipment.* *Apportionment of food and water in survival craft.* *Action taken to maximize detectability and location of survival craft.* *Method of helicopter rescue.* *Effects of hypothermia and its prevention, use of protective covers and garments, including immersion suits and thermal protective aids.* *Use of rescue boats and motor lifeboats for marshalling liferafts and rescue of survivors and persons in the sea.* *Beaching survival craft.*			
Objectives are:			
1 row and steer a boat			7,10,16, 18
2 steer by compass			11.3, 16, 18
3 use individual items of equipment of survival craft			11
4 rig devices to aid location			14.2, 14.3
Competence: Use locating devices, including communication and signalling apparatus and pyrotechnics	R1- Sect. A-VI/2 Table A-VI/2-1		
Knowledge, understanding and proficiency *Radio life-saving appliances carried in survival craft, including satellite EPIRBs and SARTs.* *Pyrotechnic distress signals.*			
Objectives are:			
1 use portable radio equipment for survival craft			14.1-14.3,
2 use signalling equipment, including pyrotech nics			14.4

Proficency in survival craft and rescue boats other than fast rescue boats	IMO reference	Textbooks, bibliography	Detailed teaching syllabus reference
Competence: Apply first aid to survivors	R1 Sect. A-VI/2 Table A-VI/2-1		
Knowledge, understanding and proficiency *Use of the first-aid kit and resuscitation techniques. Management of injured persons, including control of bleeding and shock.*			
Objectives are:			
deal with injured persons both during and after abandonment, using first-aid kit and resuscitation techniques.			13,15

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
1 Introduction and safety (0.5 hour)	R1 - Sect. B-VI/2		
Required performance:			A1
1.1 Introduction			
Required performance:			
1.2 Safety guidance			
.1 states the safety rules laid down			
.2 explains the use of the orders ·STILL" and "CARRY ON" and the actions to take on hearing them			
2 General (1.5 hours)			
Required performance:			A1
2.1 Emergency situations			
Types of emergency			
.1 lists emergencies which may lead to abandoning ship as: - fire - collision - stranding - explosion - adverse reaction of dangerous goods or hazardous bulk cargo - shifting of cargo - foundering			
.2 lists the particular difficulties with regard to abandonment which may be encountered in the different emergencies			
.3 states that in the case of fire it may be prudent to launch some or all survival craft immediately to stand by while fire fighting continues			
.4 lists the emergencies that may require launching and operation of rescue boats as: - abandon ship, including marshalling of survival craft - man overboard - towing and rescue of survival craft from a shipwreck			
Emergency signals and public address system	R3- Sect. 7.2		
.5 describes the general emergency alarm signal			
.6 lists the fire alarm signal and other alarms that may exist, e.g. smoke detector alarm			
.7 states that broadcast of emergency messages may also be made on public address system fitted in passenger and crew spaces and to muster stations			

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
.8 states who would give the signal to abandon ship and how the signal might be made			
Muster list	R2- Reg. 111/37		A2
.9 lists the contents of a muster list			
.10 lists the duties assigned to members of the crew in relation to passengers			
.11 states that the person in charge of a survival craft, rescue boat or marine evacuation system must have a list of its crew			
.12 states that it is that person's duty to see that the crew are acquainted with their duties			
.13 states that the second in command should also have a list of the crew			
.14 states that the muster list specifies substitutes for key persons who may become disabled			
.15 states that the muster list specifies which officers are assigned to ensure that life-saving and fire appliances are maintained in good condition and are ready for immediate use			
.16 recognizes the symbols relating to life-saving appliances and arrangements	RS		
Required performance:			
2.2 Training, drills and operational readiness	R2-		A1 V6
.1 explains the requirements for regular training and drills	Reg. 11119.1, 19.3.1, 19.3.2		
.2 states the requirements for abandon ship drills			
.3 states the requirements for on-board training and instruction in the use of the ship's life-saving appliances	Reg. 111/19.4		
.4 states that there is need to be familiar with all of the ship's life-saving appliances	Reg. 111/19.2		
.5 states the provision and contents of a training manual and on-board training aids	Reg. 111/35		A3
.6 states the requirement for operational readiness, maintenance and inspection	Reg.III/20		
Required performance:			
2.3 Actions to be taken when called to survival craft stations			
.1 lists the personal life-saving appliances as: - lifejackets - lifebuoys - immersion suits - thermal protective aids - anti-exposure suits	R2 - Reg. 111/19.3.3		V1, V5

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
.2 describes personal preparation for abandoning ship			
.3 states that the person in command of each survival craft should check that all crew are present and that crew and passengers are suitably dressed and have correctly donned lifejackets			
.4 describes the preparations which should be made for launching survival craft and deploying marine evacuation systems			
.5 explains that boats should only be lowered to embarkation deck level on instructions from the master			
.6 explains that marine evacuation systems should only be deployed on instructions from the master			
.7 states that persons assigned in the muster list should take two-way VHF radiotelephone apparatus, EPIRBs, SARTs and other items to their stations			A2

3 Abandon ship (0.5 hour)

Required performance:

3.1 Actions to be taken when required to abandon ship

R1 - Table A-VI/2-1 col.3

.1 states that a ship should only be abandoned on the orders of the master or person in charge of the ship

.2 lists additional items which may be put into a lifeboat when time permits

.3 describes the supervision of boarding lifeboats and rescue boats

.4 describes the supervision of boarding liferafts through marine evacuation systems

.5 describes the supervision of boarding davit-launched life rafts

.6 describes how hand-launched life rafts should be boarded from the ship

.7 explains the dangers of jumping on to inflatable life rafts

.8 explains why every effort should be made to keep dry when boarding survival craft

.9 states that the person in charge should ensure that all of the boat's crew are present and all occupants are seated, with safety belts fastened where appropriate, before lowering

.10 states that a check should be made to ensure that hands and arms are clear of the boat's sides

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
.11 states that inboard engines of lifeboat and rescue boats should be started			
.12 states that an outboard motor should never be started out of the water			
.13 states that a water spray and air support systems should be set to operate and the closure of hatches should be checked if launching into oil on the surface			
.14 states that a check should be made to see that it is clear below before lowering a boat, throwing a raft overboard, or deploying a marine evacuation system			
.15 explains what the person in charge should do if it proves impossible to launch a survival craft or deploy a marine evacuation system			
Required performance:			
3.2 Actions to be taken when in the water			V9
.1 states that a person should never enter the water without a lifejacket			
.2 states that an immersion suit, thermal protective aid or anti-exposure suit should be worn if available			
.3 explains that anything buoyant will help a survivor in the water			
.4 explains that a person in the water will cool and suffer from exposure very quickly, even in temperate areas, unless wearing an immersion suit, thermal protective aid or anti-exposure suit			
.5 explains that survivors in the water should swim to survival craft, buoyant wreckage or one another if within range, but otherwise avoid unnecessary exertion			
.6 describes the lifejacket light and whistle as an aid to rescue			
.7 explains how to hold on to a boat or raft			
4 Survival craft and rescue boats (0.75 hour)			A1
Required performance:			
4.1 Lifeboats	R3-Sect. 4.4.1		V2. V3
.1 describes the construction and outfit of the following lifeboats: - partially enclosed - totally enclosed - free-fall - with a self-contained air support system - fire-protected			

PROFICIENCY IN SURVIVAL CRAFT AND RESCUE BOATS OTHER THAN FAST RESCUE BOATS

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
.2 describes the particular characteristics and facilities of each type of boat listed in objective 4.1.1			
.3 interprets the markings on a lifeboat as to the number of persons it is permitted to carry	R1 - Table A-VI/2-1 col. 3		
Required performance:			
4.2 Liferafts	R3 - Sect. 4.1		V6, V11
.1 describes the construction and outfit of: - inflatable life rafts - rigid liferafts			
.2 describes the stowage of liferafts			
.3 interprets the markings on a liferaft as to the number of persons it is permitted to carry	R1 - Table A-VI/2-1 col. 3		
.4 describes the particular characteristics and facilities of each type of liferaft			
Required performance:			
4.3 Rescue boats	R3 - Sect. 5.1		
.1 describes the construction and outfit of the following rescue boats: - rigid boats - inflatable boats - combination of rigid and inflatable boats			
.2 outlines the requirements for the carriage of survival craft and rescue boats in: - passenger ships - cargo ships	R2- Reg. 111/21 Reg. 111/31		
.3 describes the particular characteristics and facilities of rescue boats			
.4 states that arrangements for towing are permanently fitted in rescue boats	R3 - Sect. 5.1.1.9		
.5 interprets the markings on a rescue boat as to the number of persons it is permitted to carry	R1 - Table A-VI/2-1 col. 3		
.6 states that inflatable rescue boats shall be maintained at all times in a fully inflated condition	R3 - Sect. 5.1.3.11		
5 Launching arrangements (1.25 hours)	R1 - Table A-VI/2-1 R2- Reg. 111/12, 17,23,33 R3 - Sect. 6.1		A1 V10, V12
Required performance:			
5.1 Boat davits			
.1 describes the arrangements for stowage, securing, gripes, tricing pendants and the methods of launching and recovering boats with: - gravity davits - luffing davits - single-arm davits			

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
.2 describes methods of disengaging lifting hooks			
.3 outlines on-board maintenance of davits, falls and disengaging gear			
Required performance:			
5.2 Liferaft davits	R3 - Sect. 6.1.5		
.1 describes liferaft launching davits			
.2 explains the operation of the automatic release hook			
.3 describes how the hook is recovered ready for launching another liferaft			
Required performance:			
5.3 Rescue boats davits			
.1 describes the arrangements for stowage, securing, gripes, tracing pendants and the methods of launching and recovering of rescue boats with: - gravity davits - luffing davits - single-arm davits			
.2 describes the methods of disengaging lifting hooks			
.3 states that rescue boat's launching appliance shall be fitted with a powered winch motor capable of raising the rescue boat from the water with its full complement of persons and equipment			
.4 states that means of launching from a position within the rescue boat is provided			
.5 states that foul weather recovery strops shall be provided for safety if heavy fall blocks constitute a danger	R2 - Reg. 111/17.5		
Required performance:			
5.4 Free-fall			
.1 describes the arrangements for free-fall launching over the stern	R3 - Sect. 6.1.4		
.2 explains that a secondary means of launching and for recovery of the boats is provided	R3 - Sect. 6.1.4.7, 6.1.4.8		
Required performance:			
5.5 Float-free arrangements	R3 - Sect. 4.1.6		
.1 describes the working of a hydrostatic release unit for a liferaft securing strap			
.2 explains the sequence of events leading to the release of the fully inflated liferaft in the case of a ship sinking	R2 - Reg. 111/13 R3 - Sect. 6.1.3		

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
.3 describes the on-board maintenance of hydrostatic release units			
Required performance:			
5.6 Marine evacuation systems	R3 - Sect. 6.2		
.1 describes the construction and performance of marine evacuation systems			
.2 states the requirements of life rafts associated with marine evacuation systems			
.3 describes the containers for marine evacuation systems			
.4 interprets the markings on marine evacuation systems as to the capacity of the system			
6 Evacuation and recovery of survival craft and rescue boats (1.25 hours)			
Required performance:			
6.1 Launching	R1 - Table A-V1/2-1		A1
.1 states the importance of seeing that it is clear below before lowering survival craft			
.2 explains how boat painters should be set up before launching			
.3 describes the use of bowsing-in tackles			
.4 explains how to bowse in the falls to reduce swinging while the boat is lowered			
.5 describes lowering the boat from the deck and from on board			
.6 describes the unhooking of falls or operation of disengaging gear			
.7 distinguishes between normal release and on-load release and states when each would be used			
.8 explains the difficulties which could arise if the ship is still making headway			
.9 describes the launching of davit-launched life rafts			
.10 explains that the bowsing lines and painter must be passed into the life rafts before lowering, to ensure that they do not snag on anything			
.11 describes the automatic release hook for davit-launched liferafts			
.12 states when to release the safety-catch on the hook			

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
Required performance:			
6.2 Clearing the ship's side	R1 - Table A-VI/2-1		
.1 describes how to get clear of the ship's side in a lifeboat: - using the engine - under oars			
.2 describes how the painter can be used to assist in clearing the ship's side			
.3 describes how to clear the ship's side in a liferaft			
.4 explains the particular difficulty of getting away from the lee side of a ship			
Required performance:			
6.3 Marshalling life rafts and rescuing survivors from the sea	R1 - Table A-VI/2-1		V9
.1 explains that rescue boats should be used to marshal life rafts clear and pick up survivors and persons in the sea	R2- Reg. 111/21.3		
.2 describes how to pick up a survivor from the water			
.3 describes how to bring an injured or exhausted survivor aboard a lifeboat			
.4 states that anyone entering the water to assist a survivor must have a line attached			
Required performance:			
6.4 Recovery of survival craft and rescue boats	R1 - Table A-VI/2-1		
.1 explains the method of handling boats under power and oars while coming alongside a ship or quay			
.2 explains the use of the painter to aid keeping survival craft and rescue boats alongside			
.3 states that disembarkation from rescue boats should be in an orderly manner, giving priority to injured persons, ladies and children			
.4 states that the coxswain should be the last person to leave the survival craft or rescue boat and it would be his or her responsibility to check that the boat is secure			
.5 states that it would be prudent not to leave the boat unattended			

PROFICIENCY IN SURVIVAL CRAFT AND RESCUE BOATS OTHER THAN FAST RESCUE BOATS

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
Required performance:			
6.5 Launching survival craft and rescue boats in rough sea	R1 - Table A-VI/2-1		
.1 explains how to reduce the risk of danger to survival craft or rescue boats or of injury to occupants during lowering if the ship is rolling heavily			
.2 describes the use of oil to quell breaking seas along the ship's side			
.3 explains how to lower a boat into a heavy swell			
.4 describes how blocks may be lifted as soon as unhooked to prevent injury to occupants			
.5 explains the use of on-load release systems			
.6 describes method of getting clear from ship's side			
Required performance:			
6.6 Recovery of rescue boats in rough sea	R1 - Table A-VI/2-1		
.1 describes arrangements for recovery strops			
.2 describes the method of recovery of rescue boats in rough sea			
7 Actions to take when clear of the ship (0.25 hour)	R1 - Table A-VI/2-1		
Required performance:			
.1 states that boats and rafts should attempt to get about 1,4 mile clear of the ship			
.2 states that all attempts should be made to look for survivors in the water and take them on board			
.3 states that safety equipment such as SARTs and EPIRBs floating in the water shall be taken on board			
.4 states that communication with other survival craft should be maintained			
.5 states that all survival craft should attempt to come in the vicinity of each other			

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
8 Lifeboat engine and accessories (1.5 hours)	R1 - Table A-VI/2-1		A1
Required performance:			
8.1 Starting the engine	R3 - Sect. 4.4.6		
.1 checks levels of fuel and lubricating oil			
.2 checks that the gear lever is in neutral			
.3 follows manufacturer's instructions and sets controls			
.4 primes the fuel system, if necessary			
.5 starts engine and adjusts the throttle			
.6 checks oil pressure gauge and water cooling, if applicable			
.7 operates ahead and astern propulsion			
.8 stops engine and turns oft fuel			
.9 explains how to clean the fuel tank and renew fuel filters			
.10 states the quantity of fuel required for a lifeboat			
Required performance:			
8.2 Cooling systems			
.1 describes the following cooling systems: - air-cooled - fresh-water-cooled - seawater-cooled			
.2 explains that fresh-water cooling systems require protection with antifreeze when trading to cold areas			
.3 states that the engine should be capable of running with the lifeboat out of the water for a minimum of 5 minutes			
Required performance:			
8.3 Battery charging			
.1 states that batteries for engine starting, searchlight and fixed radio installation can be charged from the engine			
.2 describes arrangements for charging batteries from the ship's power supplies			
Required performance:			
8.4 Fire extinguisher			
.1 describes how to extinguish a fuel fire with the extinguisher provided in the boat			

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
Required performance:			
8.5 Water spray system	R3 - Sect. 4.9.2		
.1 states that fire-protected lifeboats are fitted with a water spray system which can be turned on or off			
.2 explains that the spray is driven by a self-priming pump that starts as soon as the boat enters the water			
.3 states that the system should be flushed with fresh water and completely drained after drills			
Required performance:			
8.6 Self-contained air support system	R3- Sect. 4.8		
.1 explains that all entrances and openings should be closed when using the self-contained air support system			
.2 states that the system will provide for the air to remain breathable and for the engine to run normally for not less than 10 minutes			
9 Rescue boat outboard engine (1 hour)	R3 - Sect. 5.1.1.8		
Required performance:			
.1 describes the rescue boat's outboard engine, with special emphasis on: - securing arrangements, normal position during operation and tilted position when stowed - arrangements of fuel tank, connections and priming - cooling system - use of choke - starting, throttle and stopping the engine - changing the gear			
.2 lists the prestart checks			
.3 explains how to start a cold outboard motor engine			
.4 states that the manufacturer's specification for petrol/oil mixture should always be followed to avoid damage to the engine			
.5 lists the checks that are made when: - engine does not start - engine power is reduced - engine is running			
.6 states that starting of outboard motor out of water will quickly heat the engine and will result in seizing of the engines			
.7 explains that outboard engines should never be laid horizontally, when transporting or stowing, as cooling water may drain into the engine			
.8 demonstrates the emergency stop device and method of operation			

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
.9 describes the on board maintenance of outboard motor engines			
.10 states that turning the boat at high speed may capsize the boat			
10 Handling survival craft and rescue boats in rough weather (0.75 hour)	R1 - Table A-VI/2-1		A1
Required performance:			
10.1 Boats			
.1 describes the use of the sea-anchor and how to rig an oil bag			
.2 describes the use of the steering oar when lying to a sea-anchor			
.3 explains how to heave-to when running before the wind			
Required performance:			
10.2 Liferafts			
.1 explains that in strong winds great difficulty will be experienced in getting clear of the lee side of a ship			
.2 explains how to position survivors to minimize the danger of capsizing when lying to a sea-anchor			
.3 explains the precautions when lashing a liferaft to other survival craft in rough weather			
Required performance:			
10.3 Beaching	R1 - Table A-VI/2-1		
.1 states the types of beaches to be avoided if possible			
.2 states that, when possible, beaching should be undertaken in daylight			
.3 describes how to beach a boat under oars through surf			
.4 describes how to beach a boat under power			
.5 explains that persons should leave a boat over the stern to avoid being swept back to sea by the undertow			
.6 explains that an effort should be made to save the boat and its gear			
.7 describes the landing signals for the guidance of small boats with crews or persons in distress			
.8 describes how to beach a liferaft			
.9 states that all gear should be secured and the entrances opened to allow rapid escape			

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
.10 explains that the raft should be carried clear of the beach to provide continuing shelter for survivors			
11 Actions to take when aboard a survival craft (1.5 hours)	R1 - Table A-VI/2-1		A1
Required performance:			
11.1 Initial actions			V4
.1 states that survivors in water should be taken on board			
.2 explains the need to give first aid to injured, giving priority to resuscitation			
.3 states that all persons on board should be given anti-seasickness tablets			
.4 describes how survival craft should be secured together with the painter			
.5 explains the use of sea-anchors			
.6 lists immediate actions as: - streaming the sea-anchor - setting an EPIRB to function - erecting the canopy in boats - issuing anti-seasickness pills - bailing the craft dry - treating the injured - inflating the liferaft floor in cold conditions - getting radio equipment ready - posting lookouts			
.7 explains the need to ventilate a liferaft after it has been inflated before closing the openings			
.8 states that instructions on how to survive are contained in liferafts			
Required performance:			
11.2 Routines for survival	R8		
.1 explains that the person in charge should do everything possible to maintain morale			
.2 explains that organizing survivors to undertake tasks for their safety and comfort helps to maintain morale			
.3 states the importance of maintaining a constant lookout			
.4 lists the instructions which should be given to the lookouts			
.5 lists other tasks which should be assigned to crew members			
.6 states the main dangers to survivors			

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
Required performance:			
11.3 Use of equipment	R1 - Table A-VI/2-1		
.1 lists the normal equipment of a lifeboat	R1 - Sect. 4.4.8		
.2 lists the normal equipment of a rescue boat	R3 - Sect. 5.1.2		
.3 lists the special equipment of an inflated rescue boat	R3 - Sect. 5.1.2.4		
.4 lists the normal equipment of a liferaft	R3 - Sect. 4.1.5		
.5 describes the use of each piece of equipment			
.6 describes the stowage of the equipment			
.7 explains that equipment not actually in use should be stowed in lockers or containers or lashed down so that it will not be lost in the event of a capsize			
.8 describes the markings on a boat compass card			
Required performance:			
11.4 Apportionment of food and water	R1 - Table A-VI/2-1		
.1 states the quantities of food and water carried in a: - lifeboat	R3 - Sect. 4.4.8.9, 4.4.8.12		
- liferaft	Sect. 4.1.5.18, 4.1.5.19		
.2 explains how to ration and issue water and emergency food			
.3 explains the dangers of drinking seawater			
.4 describes the arrangements for collecting rain water and how to store it			
.5 states that eating fish or foods other than the survival craft rations increases dehydration			
.6 explains how to minimize dehydration in hot conditions			
Required performance:			
11.5 Action to take to maximize detectability and location of survival craft			
.1 lists the equipment that may aid detectability and location of survival craft as: - EPIRB - SART - radar reflector - 2-way VHF radio			

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
12 Methods of helicopter rescue (1.25 hours)	R1 - Table A-VI/2-1		A1
Required performance:			
12.1 Communicating with the helicopter	R4		V7
.1 demonstrates the hand and arm hoisting signals			
.2 states that search and rescue service helicopters can communicate on VHF channel 16			
.3 explains that information may be passed to the helicopter through shore-based radio stations to Rescue Co-ordination Centre if suitable equipment is available			
.4 states that visual signals may be used			
.5 describes the information to shore radio station from survival craft that contains fullest possible detailed information for detection from air			
Required performance:			
12.2 Evacuation from ship and survival craft			
.1 describes the requirements for a helicopter pick-up area on board			
.2 explains the importance of lighting obstructions, such as masts and funnel, at night			
.3 describes the fire-fighting preparation for oil fire that should be kept ready			
.4 states that on no account should the helicopter winch cable be secured to any part of the ship			
.5 states that lifejackets should be worn during evacuation by helicopter			
.6 describes the means of evacuation from lifeboats and life rafts			
.7 describes precautions against being turned over in a liferaft by the helicopter's down-draught			
Required performance:			
12.3 Helicopter pick-up			
.1 describes methods of lifting persons by means of a: - rescue sling - rescue basket - rescue net - rescue litter - rescue seat			
.2 describes a rescue sling			
.3 explains that an injured person should be transferred from the ship's stretcher to the litter provided by the helicopter			

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
.4 describes how a member of the helicopter crew may assist in picking up survivors			
.5 demonstrates the correct way to don a rescue sling and adopt a safe posture in it			
13 Hypothermia (1 hour)			
Required performance:	R1 - Table A-VI/2-1		V8
.1 states the cause of hypothermia			
.2 describes the precautions to take to avoid hypothermia			
.3 describes the use of immersion suits. thermal protective aids and anti-exposure suits			
.4 describes the symptoms of hypothermia	R5		
.5 explains that heartbeat and breathing may be very feeble and difficult to detect in severe cases, but heart compression and artificial respiration will do more harm than good			
.6 describes how to treat a person suffering from hypothermia in a survival craft			
14 Radio equipment (1.5 hours)	R1 - Table A-VI/2-1 R2 - Reg. 111/6.2		
Required performance:			
14.1 Two-way **VHF** radiotelephone apparatus	R4. R9. R10, R13		
.1 outlines the requirements of two-way VHF radiotelephone apparatus carried on passenger ships and cargo ships			
.2 states that the equipment is portable and capable of being used for on-scene communication between survival craft and rescue unit			
.3 states that a fixed two-way VHF radiotelephone may additionally be fitted on survival craft			
.4 states that the apparatus is capable of operation on frequency 156.8 MHz (VHF channel 16) and on at least one additional channel			
.5 demonstrates the controls and indicators of the equipment			
.6 states that the equipment is operational within 5 seconds of switching on			
.7 explains the transmitter power, receiver parameters, antenna type and receiver output			
.8 states that the power supply has sufficient capacity for 8 hours operation			

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
.9 describes the arrangement of the power supply and requirements with respect to primary batteries of portable two-way VHF radiotelephone apparatus			
Required performance:			
14.2 Emergency position-indicating radio beacons (EPIRBs)	R2 - Reg. Ivn.1.6, 8.3		
.1 states the requirement for the carriage of EPIRBs in survival craft	R7		
.2 describes survival craft EPIRBs			
.3 states that they are capable only of manual activation and deactivation			
.4 states that the apparatus will operate for a period of 48 hours			
.5 states that survival craft EPIRBs operate on the aeronautical distress frequency	R11		
.6 describes a ship's satellite EPIRB operating on 406 MHz with 121.5 MHz beacon for homing by aircraft	R14		
.7 states that it is automatically activated after floating free			
.8 demonstrates the manual activation and deactivation of the EPIRB			
.9 states that the EPIRB will operate for a period of at least 48 hours			
.10 states that a satellite EPIRB transmits a distress message to a polar orbiting satellite for re-transmission to special receiving stations			
.11 describes a ship's satellite EPIRB operating on 1.6 GHz	R15		
.12 describes an EPIRB for sea area A1			
Required performance:			
14.3 Search and rescue transponder beacons (SARTs)	R2 - Reg. 111/6.2.2 R12		
.1 states the requirements of carriage of SARTs in survival craft			
.2 describes the SART			
.3 states that a SART operates on 9 GHz			
.4 states that they are capable of manual activation and deactivation and that provision of automatic activation may be provided			
.5 states that the apparatus will operate in standby condition for 96 hours and in addition, following the standby position, will provide transmission for 8 hours when being continuously interrogated			

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
Required performance:			
14.4 Distress signals, signalling equipment and pyrotechnics	R1 - Table A-VI/2-1 R2 - Reg. 111/6.3, V/16		A1
Distress signals			
.1 lists various distress signals, including distress flares			
Signalling equipment	R3 - Sect. 4.1.5, 4.4.8. 5.1.2		
.2 lists the devices for signalling or attracting attention as: - pyrotechnics - torch suitable for Morse signalling - daylight signalling mirror - whistle - orange sails in open boat - searchlight			
.3 demonstrates how to use the daylight signalling mirror			
.4 states that a copy of the life-saving signals is provided			
Pyrotechnics			
.5 lists the pyrotechnics carried in survival craft			
.6 demonstrates how to operate: - rocket parachute flares - hand flares - buoyant smoke floats	R3- Sect. 3.1 Sect. 3.2 Sect. 3.3		
.7 describes when and how to use each of the pyrotechnics			
.8 states that pyrotechnics should only be used on the instructions of the person in charge of the craft			
9 states the purpose of distress flares	R2 - Reg . 111/6.3		
15 First aid (2 hours)			
Required performance:	R1 - Table A-VI/2-1		A1
15.1 Resuscitation techniques			
.1 demonstrates on a life-size dummy how to apply mouth-to-mouth or mouth-to-nose respiration			
.2 describes the signs of cardiac arrest			
.3 demonstrates closed-chest cardiac compression on the dummy			
.4 demonstrates how two people combine cardiac compression and mouth-to-mouth respiration			
.5 demonstrates the recovery position for an unconscious person			

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
Required performance:			
15.2 Use of first-aid kit	R1- Table A-VI/2-1 R3 - Sect. 4.1.5.8, 4.4.8.20, 5.1.2.2.9 R5		
.1 lists contents of first-aid kit			
.2 describes how to deal with the following aboard a survival craft: - bleeding - fractures - burns - shock			
.3 describes the cause and signs of frostbite			
.4 describes the treatment of frostbite			
.5 describes the cause of non-freezing cold injury (immersion foot)			
.6 explains how to prevent immersion foot			
.7 describes the treatment of immersion foot			
.8 explains the cause of heat stroke and how to avoid it			
.9 describes the treatment for heat stroke			
.10 describes the treatment for contamination by fuel oil			
16 Drills in launching and recovering boats (3 hours)	R1 - Table A-VI/2-1		A1
Required performance:			
.1 acts as an efficient member of a launching crew			
.2 takes charge and allocates duties for launching, handling and recovery			
.3 gives correct orders for launching and boarding the boats, clearing the ship's side and handling and disembarking persons from boats			
.4 prepares and safely launches survival craft and clears the ship's side quickly			
.5 demonstrates the ability to start and operate an inboard engine fitted in a partial or fully enclosed lifeboat or rescue boat			
.6 demonstrates the ability to row and steer boats and steer by compass			
.7 acts as coxswain in handling boats under power and oars			
.8 streams a sea-anchor			

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
.9 demonstrates the ability to: - use individual items of lifeboats and rescue boats - rig devices to aid location			
.10 demonstrates the ability to safely recover the boats			
17 Drills in launching life rafts (3 hours)	R1 - Table A-VI/2-1		A1
Required performance:			
17.1 Davit-launched life rafts			
.1 acts as an efficient member of a launching crew			
.2 takes charge and allocates duties for launching			
.3 gives correct orders for swinging out the raft. securing it and boarding			
.4 lowers a liferaft			
.5 operates the safety catch of the lifting hook at the correct time			
.6 recovers the hook ready for the next launch			
.7 clears away from ship's side and streams a sea-anchor			
Required performance:			
17.2 Throw-overboard liferafts			
.1 checks that the painter is securely fastened to a strong point or to the hydrostatic release unit (where fitted)			
.2 releases the liferaft manually			
.3 throws the liferaft into the water and hauls in the slack of the painter, causing the raft to inflate			
.4 boards the liferaft and explains how to get clear of ship's side			
Required performance:			
17.3 Boarding a liferaft from the water			
.1 dons a lifejacket/immersion suit correctly, without assistance, within a period of 1 minute			
.2 jumps into the water from a height while wearing a lifejacket/immersion suit			
.3 uses the attached whistle			
.4 demonstrates the "heat-escape-lessening posture" (HELP)			
.5 rights an inverted liferaft			
.6 boards a liferaft from the water while wearing a lifejacket			

Knowledge, understanding and proficiency	IMO reference	Textbooks, bibliography	Teaching aid
.7 assists an exhausted survivor to board a liferaft			
.8 throws the rescue quoit and line to a person in the water			
Required performance:			
17.4 Righting an inverted liferaft		R1 - Table A-VI/2-1	
.1 rights an inverted liferaft while wearing a lifejackeVimmersion suit			
18 Drills in launching and recovering rescue boats (3 hours)			
Required performance:			
.1 acts as an efficient member of a launching crew			
.2 takes charge and allocates duties for launching, handling and recovery			
.3 gives correct commands for launching and boarding the rescue boats, clearing the ship's side and handling and disembarking persons from rescue boats			
.4 prepares and safely launches rescue boats and clears the ship's side quickly			
.5 demonstrates the ability to install, start, operate and safely remove and stow an outboard engine in a rescue boat			
.6 demonstrates the ability to row and steer the rescue boat and to steer by compass			
.7 acts as coxswain in handling rescue boats under power and oars			
.8 streams a sea-anchor			
.9 picks up a survivor from the water			
.10 places a survivor in a stretcher			
.11 safely brings rescue boats alongside			
.12 demonstrates the ability to safely disembark the survivor			
.13 uses foul weather strop for recovery of rescue boats			
19 Practical exercises and evaluation (6 hours)			A1

Part D: Instructor Manual

Introduction

The instructor manual provides guidance on the material that is to be presented during the course. The course material reflects the requirements for the issue of certificates of proficiency in survival craft and rescue boats other than fast rescue boats, as specified in regulation VI/2 of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 as amended in 1995.

The material has been arranged under nineteen main headings:

1 Introduction and safety
2 General
3 Abandon ship
4 Survival craft and rescue boats
5 launching arrangements
6 Evacuation and recovery of survival craft and rescue boats
7 Actions to take when clear of the ship
8 Lifeboat engine and accessories
9 Rescue boat outboard engine
10 Handling survival craft and rescue boats in rough weather
11 Actions to take when aboard a survival craft
12 Methods of helicopter rescue
13 Hypothermia
14 Radio equipment
15 First aid
16 Drills in launching and recovering boats
17 Drills in launching life rafts
18 Drills in launching and recovering rescue boats
19 Practical exercises and evaluation

The consolidated text of the 1974 SOlAS Convention and the 1978 SOlAS Protocol and amendments (R2) and the International Life-Saving Appliance Code (R3) are used as a basic reference throughout the course. Reference is particularly made to those sections which directly concern the person in charge of the survival craft.

The course outline and timetable provide guidance on the time allocation for the course material, but the instructor is free to make adjustments as necessary. The practical exercises in launching and recovery of boats, allowing each trainee to be in charge of the operation, are very time-demanding. If facilities and instructors are available, the class may be split into two groups to reduce the overall time needed for these exercises. Where that is not possible, the number admitted to the course should be set at a level which will allow each trainee sufficient time in charge. Alternatively, the course could be extended, allowing more time for the final exercises and evaluation, to accommodate a larger number of trainees.

The detailed teaching syllabus must be studied carefully and lesson plans or lecture notes compiled where appropriate. An example of a lesson plan is given on page 46.

Instruction should be made as practical as possible and actual equipment should be used, where available, to illustrate lessons in the classroom. To illustrate the range of boats and davit types, photographs, manufacturers' drawings, videos or models can be used.

Intending trainees should be advised to bring with them a suitable change of clothes, including suitable footwear, for use in wet drills with liferafts and in other practical sessions.

Guidance Notes

1 Introduction and safety 0.5 hour

1.1 Introduction

Trainees should be given a brief description of the course and how it will be conducted. They should be advised what clothing to wear for the wet drills and practical sessions, and be informed of arrangements for changing.

1.2 Safety guidance

The chief instructor should explain the safety rules to be followed by trainees during practical sessions. He should also explain the measures taken by instructors for the safety of trainees and how to attract attention if they are in difficulties. On hearing the order "STILL" issued by the trainee in charge of an operation or by an instructor, everything should be stopped and trainees should keep quiet and listen for further instructions. When ready to continue, the order "CARRY ON" should be given.

2 General 1.5 hours

2.1 Emergency situations

Types of emergency

Emphasis should be on the particular problems or difficulties which may be encountered in the various emergency situations. In the case of a fire that threatens to damage survival craft, they should be launched to preserve them. If possible, liferafts should be moved to a safe place on board or placed in the boats in their containers, so that they can be returned on board ready for use if abandonment is unnecessary. They can be launched and inflated from the boat should it be necessary to abandon the ship.

Muster list

A specimen muster list should be used to illustrate this section. Trainees should draw up a muster list for the class as a boat's crew; this list can be used later in the practical exercises.

2.2 Training, drills and operational readiness

The instructor should remind trainees that they are training to act as the person in charge of a survival craft and as such they will be responsible for ensuring that their own crews are familiar with their duties.

A training manual should be available for this session, preferably based on the equipment fitted at the training establishment. Trainees should have access to a copy of the manual throughout the course.

2.3 Actions to be taken when called to survival craft stations

In some ships there may be standing instructions to lower boats to embarkation deck level as soon as the crew is assembled. The boats in new cargo ships musts be capable of being

boarded and launched from the stowed position. In passenger ships, boats can be boarded either at the stowed position or at an embarkation deck, but not both.

3 Abandon ship 0.5 hour

Actions to be taken when required to abandon ship
The fastening of safety belts in free-fall boats is essential. An unfastened occupant will be thrown when the boat strikes the water and may seriously injure both himself and other occupants.

Totally enclosed boats depend for their self-righting properties on the occupants remaining securely in place when capsized.

Supervision of boarding life rafts through marine evacuation system may be demonstrated through the videos 'Viking Marine Escape Slide' (V13) and 'Viking Marine Evacuation System' (V14).

4 Survival craft and rescue boats 0.75 hour

The boats and liferafts to be used in practical drills should be used to demonstrate the construction and fittings. Photographs, drawings or videos of other types of boats should be used.

5 Launching arrangements 1.25 hours

This section could well be dealt with at the same time as Section 4. For example, a particular type of survival craft and its launching arrangements could be treated together.

The subsection on marine evacuation system is covered in video cassettes V13 and V14.

Trainees should be warned that hydrostatic release units should not be painted. Paint may block the holes through which water must enter to operate the release.

6 Evacuation and recovery of survival craft and rescue boats 1.25 hours

Subject areas 6.1 and 6.2 are in preparation for the practical exercises in launching and clearing the ship's side. Bowsing-in tackles and tracing pendants are not fitted to boats which are launched from the stowed position.

In objective 6.3.2 a motor lifeboat or rescue boat should be used.

The instructor should impress on trainees that an inflatable liferaft, even when a sea-anchor is streamed, will drift faster than a survivor can swim. A person who has hold of a liferaft should never let go of it and anyone entering the water to assist another person must have a line attached so that he can be pulled back to the raft.

Launching survival craft and rescue boats in rough weather

A ship stopped in a high wind will probably lie with the wind approximately abeam and will drift quite rapidly to leeward. Survival craft, particularly liferafts, will experience difficulty in getting clear of the lee side and will probably be dependent on a motor lifeboat or rescue boat to tow them clear.

On the weather side, conditions will be much rougher and it will be difficult to hold craft alongside for boarding. Streaming a sea-anchor will slow the drift of survival craft sufficiently to allow the ship to drift away from them.

When beaching in deserted or remote areas, efforts should be made to save the survival craft and its equipment. They will continue to be useful for shelter and much of the equipment can be put to use, particularly the means of attracting attention and, of course, the food and water.

7 Actions to take when clear of the ship 0.25 hour

The instructor should stress the need to quickly get away from a sinking ship to avoid violent local suction due to foundering. Every attempt, however, shall be made to pick up survivors and other items of use floating in the water.

8 Lifeboat engine and accessories 1.5 hours

The instruction should be made as practical as possible, using the engine in the lifeboat or a workshop. Details of operating procedures and maintenance for the engines installed in a ship's lifeboats are contained in the training manual and instructions for on-board maintenance. Starting and operating instructions are also mounted near the engine starting controls.

Trainees should be aware of the amount of fuel carried, to enable them to plan its use to best advantage.

9 Rescue boat outboard engine 1 hour

The instructions should be made as practical as possible. Details of securing, priming, starting, throttling and stopping the engine should be demonstrated using an outboard engine and a waterdrum.

10 Handling survival craft and rescue boats in rough weather 0.75 hour

It should be explained to trainees that short choppy seas will inevitably lead to a "wet" ride in the rescue boats. The pounding of the hull and resultant vibrations can lead to the crew becoming injured. Great care is needed until craft arrive in a safe area.

Use of oil bags and a sea-anchor should be made to heave-to in heavy seas and swell.

11 Actions to take when aboard a survival craft 1.5 hours

In objective 11.1.6, the order in which the actions would be taken would depend upon circumstances; some of them could be taken simultaneously. If the survival craft are all

secured together, only one EPIRB should be activated. The other one should be activated after 48 hours, when the first will be reaching the end of its transmission capability.

A watch system should be organised, giving some duty to each occupant of a survival craft. Having something to do or to be responsible for improves the morale of individual survivors and of the group in general. A constant lookout should be maintained, changing the lookout at about 2 hourly intervals or less in cold conditions, or if there is a danger of sunburn. lookouts should be instructed to keep watch all round the horizon and to listen as well as watch. They should be alert for signs of ships, aircraft, land, dangers and rain showers, which may provide an opportunity to supplement the water ration. On making any sighting, the lookout should inform the person in charge of the craft before doing anything else.

Complete sets of lifeboat and liferaft equipment should be available for demonstration. For the equipment which is dealt with fully elsewhere, reference should be made to its stowage in the survival craft.

When apportioning water, it should be remembered that survivors suffering from shock, after burns or loss of blood for example, will need more water than the recommended 0.5 litre per day to keep them alive.

12 Methods of helicopter rescue 1.25 hours

Procedures for rescue from the ship, from survival craft and from the water should be covered. Search and rescue helicopters are mostly equipped to communicate on VHF channel 16, which allows direct communication between the helicopter and a ship or a survival craft carrying a portable two-way radiotelephone. Each trainee should demonstrate how to don a rescue sling and signal that he is ready to be lifted.

In all cases it is important to try to follow any instructions from the helicopter crew as closely as possible.

13 Hypothermia 1 hour

In many cases this is the most likely condition which will need recognition and treatment, particularly with survivors who have been immersed before boarding a survival craft. A Pocket Guide to Cold Water Survival (R5) deals with the avoidance and treatment of hypothermia.

14 Radio equipment 1.5 hours

The amendments to SOlAS 1974 regulation 111/6'Communications", entered into force on 1 January 1998. The regulation stipulates that all passenger ships and cargo ships of 500 gross tonnage and upwards will require at least three portable two-way VHF radiotelephones and, in addition, a radar transponder on each side of the ship, stowed so that they can be rapidly placed in any survival craft other than the additional liferaft or liferafts that must be carried when the survival craft are more than 100 metres from the stem or stern. Cargo ships of 300 gross tonnage and upwards but less than 500 tons will require at least two portable two-way VHF radiotelephones and one radar transponder.

Lifeboats may have fixed two-way VHF radiotelephones fitted. The requirements for radar transponders may be met by having a transponder stowed in each survival craft, in which case they would replace the radar reflectors required under the existing rules.

The radar transponder is triggered by radar pulses in the 9 GHz band (3 cm wavelength) to transmit a signal showing as a row of dots on the display of the radar which triggered it. An audible or visual signal will indicate to survivors that the transponder has been triggered. Distress alerting will be carried out by the ship's satellite EPIRB, which would be transferred to a survival craft on abandoning the ship.

Survival craft EPIRBs may not be activated by being placed in the water; they must be manually activated. Ship's float-free satellite EPIRBs operating on 406 MHz are automatically activated when in the water and can also be manually activated and deactivated. No transmission should be possible from the EPIRB used for demonstration purposes.

Signalling equipment and pyrotechnics

A set of dummy pyrotechnics should be available for demonstration purposes. Only a small number of pyrotechnics is carried, so it is important that trainees know when to use them effectively and do not waste them in circumstances where they are unlikely to be seen.

15 First aid 2 hours

15.1 Resuscitation techniques

Trainees should have undertaken a course in basic first aid which included resuscitation early in their sea-going careers. This section should be treated as an opportunity to check that they can still apply the methods correctly. Some trainees should be asked to demonstrate resuscitation in the crowded and confined space of a survival craft, which need not be afloat for this exercise.

15.2 Use of first-aid kit

The contents of a first-aid kit and how they can be used to treat injuries likely to be sustained by survivors are dealt with in this section. Treatments should be confined to what is possible in a survival craft and the equipment to hand.

Survivors may be affected by oil on the water when abandoning ship, which will result in some or all of the following:

- swallowing oil
- oil covering the skin and clothes
- inhalation of oil into the lungs
- inflammation of the eyes

Swallowed oil will cause vomiting, and the sufferer should be given additional water. Oil should be wiped off the skin with anything available in the survival craft. A complete covering of oil, preventing perspiration, can prove fatal if not cleaned off. Clothes can be trailed in the water to remove as much oil as possible. Eyes should be washed out and protected from bright sunlight as far as possible until the inflammation has gone. Inhaled oil prevents efficient

oxygen exchange in the lungs and may lead to pneumonia, but there is little that can be done for a victim in a survival craft.

16 Drills in launching and recovering boats 3 hours

The trainees will act as members of the boat's crew or passengers for the drills. Use should be made of the muster list drawn up on the first morning. Each trainee should take charge of a launching operation and clear the boat away from alongside. A trainee's duties will be changed to cover all items in the muster list in the course of the drills.

Each trainee should also take a turn as coxswain to practise handling the boat, including coming alongside for recovery of the boat.

The sea anchor should be streamed and recovered at some point during the practises to ensure that trainees know what is involved.

In one or two of the drills, the evacuation of a stretcher case should be practised. The Neil-Robertson stretcher should be padded and weighted to represent the casualty.

17 Drills in launching liferafts 3 hours

Trainees should be warned to wear their change of clothes for a wet drill and the instructor should check that their footwear will not damage the liferafts.

Abandon ship drills should be held, using both a davit-launched and hand-launched liferaft.

Boarding a davit-launched liferaft, the positioning of occupants, the release of the safety catch and the automatic release of the hook on removal of the load can be exercised by suspending the raft at a small height above the deck or platform adjacent to the davit and lowering it on to the deck.

Positioning a stretcher casualty should be included in one of the boarding drills.

Finally, the liferaft should be launched and cleared away from the side by the crew, using paddles and a suitably weighted sea-anchor. Trainees should be instructed to try to board the liferaft dry. It will almost certainly be necessary to tow the liferaft back with the boat; the securing and towing should form part of the exercise.

It is recommended that all trainees are made to jump into the water from a height of at least 4.5 m, wearing a lifejacket, during an abandon ship drill with a hand-launched liferaft. For that reason it is advisable to make it the final drill of the day.

Trainees should use the whistle, swim a short distance, right an inverted liferaft, board the liferaft from water and once on board help others to board the liferaft. When ready to clear away from the side, the instructor can let go of the painter instead of having it cut at the raft. As with the previous exercise, the safety boat will be needed to bring the liferaft back.

The rescue boat should be kept on stand-by to help and in towing the liferaft back.

18 Drills in launching and recovering rescue boats 3 hours

The trainees will act as members of rescue boat crews for the drills. Each trainee should take charge of a launching operation and clear the rescue boats away from alongside. A trainee's duties will be changed to cover all items of rescue boats' crew.

Each trainee should take turns to act as coxswain to practise boat handling, including coming alongside for recovery of rescue boats.

The sea anchor should be streamed and recovered at some point during the practise.

Practise drills for picking up survivors in water should be carried out with emphasis on recovery in horizontal posture. In one or two drills, the evacuation of a stretcher case should be practised. The Neil-Robertson stretcher should be padded and weighted to represent the casualty.

Finally, the recovery of rescue boats should be carried out with the help of foul weather strops, demonstrating the transfer of the weight of boat between the strop and fall wire.

19 Practical exercises and evaluation 6 hours

The final day should be used to complete the drills in launching and recovering survival craft and rescue boats, started in subject area 16, and for evaluation of trainees. The time spent on this section should be extended if necessary.

Evaluation should be based mainly on the trainees' performance in practical exercises. Before issue of a course document, a trainee must demonstrate proficiency in the operations of survival craft and rescue boats that are specified in column 3 of Table A-VI/2-1 of the STCW Code.

In evaluating proficiency, special consideration should be given to the trainee's ability to:

(a) understand and carry out, promptly and correctly, the orders and instructions of the person in charge of an operation;

(b) co-ordinate his actions with those of other members of the crew;

(c) take charge of boarding, launching and clearing away from the side with confidence, controlling the operation with timely and clear commands; and

(d) manage a survival craft afloat, and in the case of a boat, manoeuvre it as required.

The minimum standard of competence required for the issue of certificates of proficiency in survival craft is contained in column 1 of Table A-VI/2-1 of the STCW Code.

Example of a Lesson Plan

COURSE: PROFICIENCY IN SURVIVAL CRAFT AND RESCUE BOATS OTHER THAN FAST RESCUE BOATS **LESSON NUMBER:** **DURATION:** 15 minutes

Training Area: Actions to take when clear of the ship

KNOWLEDGE, UNDERSTANDING AND PROFICIENCY Required performance (In teaching sequence with memory keys)	TEACHING METHOD	IMO REFERENCE	A/V AIDS	INSTRUCTOR GUIDELINES	TIME MINS
7 Actions to take when clear of the ship					
.1 ¼ mile clear of ship: – clear of masts, rigging, flotsam and surfacing wreckage – oil on surface - further off if volatile cargo oil – local suction from ship foundering	*Classroom lecture*	R1 Table. A-VI/2-1 Col.2		A1 - Para 7	3
.2 recovery of survivors: – head count – lookout – searchlights and other means – early recovery preferred – recovery in horizontal posture					3
.3 equipment recovery: – safety equipment, viz. SART, EPIRB – other items of use – method of launch and recovery					3
.4 communication: – importance of communication – information exchange between craft – available means of communication – VHF channel to use					3
.5 action by survival craft: – importance of this action – leaks in flotation chambers, distribution of survivors and equipment – help each other in need – plan course of action					3

Appendix

Table of Life-Saving Signals

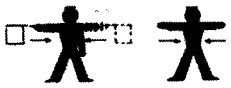
1 Landing signals for the guidance of small boats with crews or persons in distress.

	MANUAL SIGNALS	LIGHT SIGNALS	OTHER SIGNALS	SIGNIFICATION
Day signals	 **Vertical** motion of a white flag or of the arms	 or firing of a green star signal	 or code letter **K** given by light or sound-signal apparatus	**This is the best place to land**
Night signals	 **Vertical** motion of a white light or flare	 or firing of a green star signal	 or code letter **K** given by light or sound-signal apparatus	

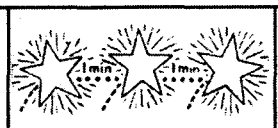
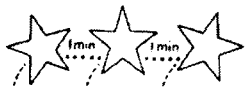
A range (indication of direction) may be given by placing a steady white light or flare at a lower level and in line with the observer.

Day signals	 **Horizontal** motion of a white flag or of the arms extended horizontally	 or firing of a **red** star signal	or code letter **S** given by light or sound-signal apparatus	**Landing here highly dangerous**
Night signals	 **Horizontal** motion of a light or flare	 or firing of a **red** star signal	or code letter **S** given by light or sound-signal apparatus	
Day signals	 1 **Horizontal** motion of a white flag, followed by 2 the placing of the white flag in the ground and 3 by the carrying of another white flag in the direction to be indicated	 1 or firing of a **red** star signal vertically and 2 a **white** star signal in the direction towards the better landing place	1 or signalling the code letter **S** (. . .) followed by the code letter **R** (. _ .) if a better landing place for the craft in distress is located more to the *right* in the direction of approach 2 or signalling the code letter **S** (. . .) followed by the code letter **L** (. _ . .) if a better landing place for the craft in distress is located more to the *left* in the direction of approach	**Landing here highly dangerous. A more favourable location for landing is in the direction indicated**
Night signals	 1 **Horizontal** motion of a white light, or flare 2 followed by the placing of the white light or flare on the ground and 3 the carrying of another white light or flare in the direction to be indicated	 1 or firing of a **red** star signal vertically and a 2 **white** star signal in the direction towards the better landing place	1 or signalling the code letter **S** (. . .) followed by the code letter **R** (. _ .) if a better landing place for the craft in distress is located more to the *right* in the direction of approach 2 or signalling the code letter **S** (. . .) followed by the code letter **L** (. _ . .) if a better landing place for the craft in distress is located more to the *left* in the direction of approach	

2 Signals to be employed in connection with the use of shore life-saving apparatus.

	MANUAL SIGNALS	LIGHT SIGNALS	OTHER SIGNALS	SIGNIFICATION
Day signals	 **Vertical** motion of a white flag or of the arms	or firing of a green star signal		**In general: affirmative** **Specifically: rocket line is held – tail block is made fast – hawser is made fast – man is in the breeches buoy – haul away**
Night signals	 **Vertical** motion of a white light or flare	or firing of a green star signal		
Day signals	 **Horizontal** motion of a white flag or of the arms extended horizontally	or firing of a **red** star signal		**In general: negative** **Specifically: slack away – avast hauling**
Night signals	 **Horizontal** motion of a white light or flare	or firing of a **red** star signal		

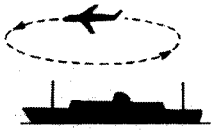
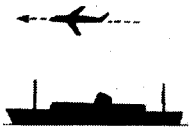
3 Replies from life-saving stations or maritime rescue units to distress signals made by a ship or person.

Day signals		 Orange smoke signal	 or combined *light and sound* signal (thunder-light) consisting of 3 single signals which are fired at intervals of approximately one minute	**You are seen – assistance will be given as soon as possible** (Repetition of such signal shall have the same meaning)
Night signals		 **White** star rocket consisting of 3 single signals which are fired at intervals of approximately one minute		

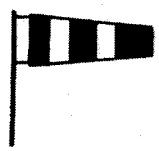
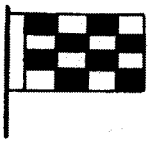
If necessary, the day signals may be given at night or the night signals by day.

4 Air-to-surface visual signals.

Signals used by aircraft engaged in search and rescue operations to direct ships towards an aircraft, ship or person in distress

PROCEDURES PERFORMED IN SEQUENCE BY AN AIRCRAFT			SIGNIFICATION
 1 CIRCLE the vessel at least once.	 2 CROSS the vessel's projected course close AHEAD at a low altitude while ROCKING the wings. (See Note).	 3 HEAD in the direction in which the vessel is to be directed.	The aircraft is directing a vessel towards an aircraft or vessel in distress. (Repetition of such signals shall have the same meaning)
4 CROSS the vessel's wake close ASTERN at low altitude while ROCKING the wings. (See Note)  NOTE Opening and closing the throttle or changing the propeller pitch may also be practiced as an alternative means of attracting attention to that of rocking the wings. However, this form of sound signal may be less effective than the visual signal of rocking the wings owing to high noise level on board the vessel.			The assistance of the vessel is no longer required. (Repetition of such signals shall have the same meaning)

Signals used by a vessel in response to an aircraft engaged in search and rescue operations

			SIGNIFICATION
 Hoist "Code and Answering" pendant Close up; or	 Change the heading to the required direction; or	Flash Morse Code signal "T" by signal lamp.	Acknowledges receipt of aircraft's signal
 Hoist international flag "N" (NOVEMBER); or		Flash Morse Code signal "N" by signal lamp.	Indicates inability to comply

5 Surface-to-air visual signals.

Communication from surface craft or survivors to an aircraft.

Use the following surface-to-air visual signals by displaying the appropriate signal on the deck or on the ground

Message	ICAO*/IMO** visual signals
– Require assistance	V
– Require medical assistance	X
– No or negative	N
– Yes or affirmative	Y
– Proceeding in this direction	↑

* ICAO annex 12 – Search and rescue.
** IMOSAR and MERSAR Manuals .

Reply from an aircraft observing the above signals from surface craft or survivors.

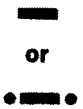
					SIGNIFICATION
 Drop a message or	 Rock the wings (during daylight) or	 Flash the landing lights or navigation lights on and off twice (during hours of darkness) or	 Flash Morse Code signal "T" or "R" by light or	Use any other suitable signal	Message understood
 Fly straight and level without rocking wings or	 Flash Morse Code signal "RPT" by light or	Use any other suitable signal			Message not understood (repeat)

6 Signals to survivors.

Procedures performed by an aircraft.

			SIGNIFICATION
 Drop a message or	 Drop communication equipment suitable for establishing direct contact		The aircraft wishes to inform or instruct survivors

Signals used by survivors in response to a message dropped by an aircraft

			SIGNIFICATION
 Flash Morse Code signal "T" or "R" by light or	use any other suitable signal		Dropped message is understood by the survivors
 Flash Morse Code signal "RPT" by light			Dropped message is not understood by the survivors

* High visibility coloured streamer

Attachment

GUIDANCE ON THE IMPLEMENTATION OF MODEL COURSES

Contents

Part 1 - Preparation

1 Introduction

1.1 The success of any enterprise depends heavily on sound and effective preparations.

1.2 Although the IMO model course ·package" has been made as comprehensive as possible, it is nonetheless vital that sufficient time and resources are devoted to preparation. Preparation not only involves matters concerning administration or organization, but also includes the preparation of any course notes, drawings, sketches, overhead transparencies, etc., which may be necessary.

2 General considerations

2.1 The course ·package" should be studied carefully; in particular, the course syllabus and associated material must be attentively and thoroughly studied. This is vital if a clear understanding is to be obtained of what is required, in terms of resources necessary to successfully implement the course.

2.2 A ·checklisr, such as that set out in annex A1, should be used throughout all stages of preparation to ensure that all necessary actions and activities are being carried out in good time and in an effective manner. The checklist allows the status of the preparation procedures to be monitored, and helps in identifying the remedial actions necessary to meet deadlines. It will be necessary to hold meetings of all those concerned in presenting the course from time to time in order to assess the status of the preparation and -UOuble-shoor any difficulties.

2.3 The course syllabus should be discussed with the teaching staff who are to present the course, and their views received on the particular parts they are to present. A study of the syllabus will determine whether the incoming trainees need preparatory work to meet the entry standard. The detailed teaching syllabus is constructed in -Uaining outcome" format. Each specific outcome states precisely what the trainee must do to show that the outcome has been achieved. An example of a model course syllabus is given in annex A2.. Part 3 deals with curriculum development and explains how a syllabus is constructed and used.

2.4 The teaching staff who are to present the course should construct notes or lesson plans to achieve these outcomes. A sample lesson plan for one of the areas of the sample syllabus is provided in annex A3.

2.5 It is important that the staff who present the course convey, to the person in charge of the course, their assessment of the course as it progresses.

3 Specific considerations

3.1 Scope of course

In reviewing the scope of the course, the instructor should determine whether it needs any adjustment in order to meet additional local or national requirements (see Part 3).

3.2 Course objective

3.2.1 The course objective, as stated in the course material, should be very carefully considered so that its meaning is fully understood. Does the course objective require expansion to encompass any additional task that national or local requirements will impose upon those who successfully complete the course? Conversely, are there elements included which are not validated by national industry requirements?

3.2.2 It is important that any subsequent assessment made of the course should include a review of the course objectives.

3.3 Entry standards

3.3.1 If the entry standard will not be met by your intended trainee intake, those entering the course should first be required to complete an upgrading course to raise them to the stated entry level. Alternatively, those parts of the course affected could be augmented by inserting course material which will cover the knowledge required.

3.3.2 If the entry standard will be exceeded by your planned trainee intake, you may wish to abridge or omit those parts of the course the teaching of which would be unnecessary, or which could be dealt with as revision.

3.3.3 Study the course material with the above questions in mind and with a view to assessing whether or not it will be necessary for the trainees to carry out preparatory work prior to joining the course. Preparatory material for the trainees can range from refresher notes, selected topics from textbooks and reading of selected technical papers, through to formal courses of instruction. It may be necessary to use a combination of preparatory work and the model course material in modified form. It must be emphasized that where the model course material involves an international requirement, such as a regulation of the International Convention on Standards of Training, Certification and Watch keeping (STCW) 1978, as amended, the standard must not be relaxed; in many instances, the intention of the Convention is to require review, revision or increased depth of knowledge by candidates undergoing training for higher certificates.

3.4 Course certificate, diploma or document

Where a certificate, diploma or document is to be issued to trainees who successfully complete the course, ensure that this is available and properly worded and that the industry and all authorities concerned are fully aware of its purpose and intent.

3.5 Course intake limitations

3.5.1 The course designers have recommended limitations regarding the numbers of trainees who may participate in the course. As far as possible, these limitations should not be exceeded; otherwise, the quality of the course will be diluted.

3.5.2 It may be necessary to make arrangements for accommodating the trainees and providing facilities for food and transportation. These aspects must be considered at an early stage of the preparations.

3.6 Staff requirements

3.6.1 It is important that an experienced person, preferably someone with experience in course and curriculum development, is given the responsibility of implementing the course.

3.6.2 Such a person is often termed a "course co-ordinator" or "course director". Other staff, such as lecturers, instructors, laboratory technicians, workshop instructors, etc., will be needed to implement the course effectively. Staff involved in presenting the course will need to be properly briefed about the course work they will be dealing with, and a system must be set up for checking the material they may be required to prepare. To do this, it will be essential to make a thorough study of the syllabus and apportion the parts of the course work according to the abilities of the staff called upon to present the work.

3.6.3 The person responsible for implementing the course should consider monitoring the quality of teaching in such areas as variety and form of approach, relationship with trainees, and communicative and interactive skills; where necessary, this person should also provide appropriate counselling and support.

3.7 Teaching facilities and equipment

Rooms and other services

3.7.1 It is important to make reservations as soon as is practicable for the use of lecture rooms, laboratories, workshops and other spaces.

Equipment

3.7.2 Arrangements must be made at an early stage for the use of equipment needed in the spaces mentioned in 3.7.1 to support and carry through the work of the course. For example:

.1 blackboards and writing materials

.2 apparatus in laboratories for any associated demonstrations and experiments

.3 machinery and related equipment in workshops

.4 equipment and materials in other spaces (e.g. for demonstrating fire fighting, personal survival, etc.).

3.8 Teaching aids

Any training aids specified as being essential to the course should be constructed, or checked for availability and working order.

3.9 Audio-visual aids

Audio-visual aids (AVA) may be recommended in order to reinforce the learning process in some parts of the course. Such recommendations will be identified in Part A of the model course. The following points should be borne in mind:

.1 *Overhead projectors*

Check through any illustrations provided in the course for producing overhead projector (OHP) transparencies, and arrange them in order of presentation. To produce transparencies, a supply of transparency sheets is required; the illustrations can be transferred to these via photocopying. Alternatively, transparencies can be produced by writing or drawing on the sheet. Coloured pens are useful for emphasizing salient points. Ensure that spare projector lamps (bulbs) are available .

2 *Slide projectors*

If you order slides indicated in the course framework, check through them and arrange them in order of presentation. Slides are usually produced from photographic negatives. If further slides are considered necessary and cannot be produced locally, OHP transparencies should be resorted to.

3 *Cine projector*

If films are to be used, check their compatibility with the projector (i.e. 16 mm, 35 mm, sound, etc.). The films must be test-run to ensure there are no breakages .

.4 *Video equipment*

It is essential to check the type of video tape to be used. The two types commonly used are VHS and Betamax. Although special machines exist which can play either format, the majority of machines play only one or the other type. Note that VHS and Betamax are not compatible; the correct machine type is required to match the tape. Check also that the TV raster format used in the tapes (i.e. number of lines, frames/second, scanning order, etc.) is appropriate to the TV equipment available. (Specialist advice may have to be sought on this aspect.) All video tapes should be test-run prior to their use on the course .

5 *Computer equipment*

If computer-based aids are used, check their compatibility with the projector and the available software .

.6 *General note*

The electricity supply must be checked for voltage and whether it is AC or DC, and every precaution must be taken to ensure that the equipment operates properly and safely. It is important to use a proper screen which is correctly positioned; it may be necessary to exclude daylight in some cases. A check must be made to ensure that appropriate screens or blinds are available. All material to be presented should be test-run to eliminate any possible troubles, arranged in the correct sequence in which it is to be shown, and properly identified and cross-referenced in the course timetable and lesson plans.

3.10 IMO references

The content of the course, and therefore its standard, reflects the requirements of all the relevant IMO international conventions and the provisions of other instruments as indicated in the model course. The relevant publications can be obtained from the Publication Service of IMO, and should be available, at least to those involved in presenting the course, if the indicated extracts are not included in a compendium supplied with the course.

3.11 Textbooks

The detailed syllabus may refer to a particular textbook or textbooks. It is essential that these books are available to each student taking the course. If supplies of textbooks are limited, a copy should be loaned to each student, who will return it at the end of the course. Again, some courses are provided with a compendium which includes all or part of the training material required to support the course.

3.12 Bibliography

Any useful supplementary source material is identified by the course designers and listed in the model course. This list should be supplied to the participants so that they are aware where additional information can be obtained, and at least two copies of each book or publication should be available for reference in the training institute library.

3.13 Timetable

If a timetable is provided in a model course, it is for guidance only. It may only take one or two presentations of the course to achieve an optimal timetable. However, even then it must be borne in mind that any timetable is subject to variation, depending on the general needs of the trainees in any one class and the availability of instructors and equipment.

Part 2 - Notes on Teaching Technique

1 Preparation

1.1 Identify the section of the syllabus which is to be dealt with.

1.2 Read and study thoroughly all the syllabus elements.

1.3 Obtain the necessary textbooks or reference papers which cover the training area to be presented.

1.4 Identify the equipment which will be needed, together with support staff necessary for its operation.

1.5 It is essential to use a "lesson plan", which can provide a simplified format for co-ordinating lecture notes and supporting activities. The lesson plan breaks the material down into identifiable steps, making use of brief statements, possibly with keywords added, and indicating suitable allocations of time for each step. The use of audio-visual material should be indexed at the correct point in the lecture with an appropriate allowance of time. The audio-visual material should be test-run prior to its being used in the lecture. An example of a lesson plan is shown in annex A3.

1.6 The syllabus is structured in training outcome format and it is thereby relatively straightforward to assess each trainee's grasp of the subject matter presented during the lecture. Such assessment may take the form of further discussion, oral questions, written tests or selection-type tests, such as multiple-choice questions, based on the objectives used in the syllabus. Selection-type tests and short-answer tests can provide an objective assessment independent of any bias on the part of the assessor. For certification purposes, assessors should be appropriately qualified for the particular type of training or assessment.

REMEMBER - POOR PREPARATION IS A SURE WAY TO LOSE THE INTEREST OF A GROUP

1.7 Check the rooms to be used before the lecture is delivered. Make sure that all the equipment and apparatus are ready for use and that any support staff are also prepared and ready. In particular, check that all blackboards are clean and that a supply of writing and cleaning materials is readily available.

2 Delivery

2.1 AJways face the people you are talking to; never talk with your back to the group.

2.2 Talk clearly and sufficiently loudly to reach everyone.

2.3 Maintain eye contact with the whole group as a way of securing their interest and maintaining it (Le. do not look continuously at one particular person, nor at a point in space).

2.4 People are all different, and they behave and react in different ways. An important function of a lecturer is to maintain interest and interaction between members of a group.

2.5 Some points or statements are more important than others and should therefore be emphasized. To ensure that such points or statements are remembered, they must be restated a number of times, preferably in different words.

2.6 If a blackboard is to be used, any writing on it must be clear and large enough for everyone to see. Use colour to emphasize important points, particularly in sketches.

2.7 It is only possible to maintain a high level of interest for a relatively short period of time; therefore, break the lecture up into different periods of activity to keep interest at its highest level. Speaking, writing, sketching, use of audio-visual material, questions, and discussions can all be used to accomplish this. When a group is writing or sketching, walk amongst the group, looking at their work, and provide comment or advice to individual members of the group when necessary.

2.8 When holding a discussion, do not allow individual members of the group to monopolize the activity, but ensure that all members have a chance to express opinions or ideas.

2.9 If addressing questions to a group, do not ask them collectively; otherwise, the same person may reply each time. Instead, address the questions to individuals in turn, so that everyone is invited to participate.

2.10 It is important to be guided by the syllabus content and not to be tempted to introduce material which may be too advanced, or may contribute little to the course objective. There is often competition between instructors to achieve a level which is too advanced. Also, instructors often strongly resist attempts to reduce the level to that required by a syllabus.

2.11 Finally, effective preparation makes a major contribution to the success of a lecture. Things often go wrong; preparedness and good planning will contribute to putting things right. Poor teaching cannot be improved by good accommodation or advanced equipment, but good teaching can overcome any disadvantages that poor accommodation and lack of equipment can present.

Part 3 – Curriculum Development

1 Curriculum

The dictionary defines *curriculum* as a "regular course of study", while *syllabus* is defined as "a concise statement of the subjects forming a course of study". Thus, in general terms, a curriculum is simply a course, while a syllabus can be thought of as a list (traditionally, a "list of things to be taught").

2 Course content

The subjects which are needed to form a training course, and the precise skills and depth of knowledge required in the various subjects, can only be determined through an in-depth assessment of the job functions which the course participants are to be trained to perform (job analysis). This analysis determines the training needs, thence the purpose of the course (course objective). After ascertaining this, it is possible to define the scope of the course.

(NOTE: Determination of whether or not the course objective has been achieved may quite possibly entail assessment, over a period of time, of the "on-the-job performance" of those completing the course. However, the detailed learning objectives are quite specific and immediately assessable.)

3 Job analysis

A job analysis can only be properly carried out by a group whose members are representative of the organizations and bodies involved in the area of work to be covered by the course. The validation of results, via review with persons currently employed in the job concerned, is essential if undertraining and overtraining are to be avoided.

4 Course plan

Following definition of the course objective and scope, a course plan or outline can be drawn up. The potential students for the course (the trainee target group) must then be identified, the entry standard to the course decided and the prerequisites defined.

5 Syllabus

The final step in the process is the preparation of the detailed syllabus with associated time scales; the identification of those parts of textbooks and technical papers which cover the training areas to a sufficient degree to meet, but not exceed, each learning objective; and the drawing up of a bibliography of additional material for supplementary reading.

6 Syllabus content

The material contained in a syllabus is not static; technology is continuously undergoing change and there must therefore be a means for reviewing course material in order to eliminate what is redundant and introduce new material reflecting current practice. As defined above, a syllabus can be though of as a list and, traditionally, there have always been an "examination syllabus" and a "teaching syllabus"; these indicate, respectively, the subject matter contained in an examination paper, and the subject matter a teacher is to use in preparing lessons or lectures.

7 Training outcomes

7.1 The prime communication difficulty presented by any syllabus is how to convey the "depth" of knowledge required. A syllabus is usually constructed as a series of "training outcomes" to help resolve this difficulty.

7.2 Thus, curriculum development makes use of training outcomes to ensure that a common minimum level and breadth of attainment is achieved by all the trainees following the same course, irrespective of the training institution (i.e. teaching/lecturing staff).

7.3 Training outcomes are trainee-oriented, in that they describe an end result which is to be achieved by the trainee as a result of a learning process.

7.4 In many cases, the learning process is linked to a skill or work activity and, to demonstrate properly the attainment of the objective, the trainee response may have to be based on practical application or use, or on work experience.

7.5 The training outcome, although aimed principally at the trainee to ensure achievement of a specific learning step, also provides a framework for the teacher or lecturer upon which lessons or lectures can be constructed.

7.6 A training outcome is specific and describes precisely what a trainee must do to demonstrate his knowledge, understanding or skill as an end product of a learning process.

7.7 The learning process is the "knowledge acquisition" or "skill development" that takes place during a course. The outcome of the process is an acquired "knowledge", "understanding", "skill"; but these terms alone are not sufficiently precise for describing a training outcome.

7.8 Verbs, such as "calculates", "defines", "explains", "lists", "solves" and "states", must be used when constructing a specific training outcome, so as to define precisely what the trainee will be enabled to do.

7.9 In the IMO model course project, the aim is to provide a series of model courses to assist instructors in developing countries to enhance or update the maritime training they provide, and to allow a common minimum standard to be achieved throughout the world. The use of training outcomes is a tangible way of achieving this desired aim.

7.10 As an example, a syllabus in training-outcome format for the subject of ship construction appears in annex A2. This is a standard way of structuring this kind of syllabus. Although, in this case, an outcome for each area has been identified – and could be used in an assessment procedure – this stage is often dropped to obtain a more compact syllabus structure.

8 Assessment

Training outcomes describe an outcome which is to be achieved by the trainee. Of equal importance is the fact that such an achievement can be measured OBJECTIVELY through an evaluation which will not be influenced by the personal opinions and judgements of the examiner. Objective testing or evaluation provides a sound base on which to make reliable judgements concerning the levels of understanding and knowledge achieved, thus allowing an effective evaluation to be made of the progress of trainees in a course.

Annex A1 – Preparation checklist

Ref.	Component	Identified	Reserved	Electricity supply	Purchases	Tested	Accepted	Started	Finished	Status OK
1	Course plan									
2	Timetable									
3	Syllabus									
4	Scope									
5	Objective									
6	Entry standard									
7	Preparatory course									
8	Course certificate									
9	Participant numbers									
10	Staffing									
	Co-ordinator									
	Lecturers									
	Instructors									
	Technicians									
	Other									

Annex A1 – Preparation checklist *(continued)*

Ref.	Component	Identified	Reserved	Electricity supply	Purchases	Tested	Accepted	Started	Finished	Status OK
11	Facilities									
(a)	Rooms									
	Lab									
	Workshop									
	Other									
	Class									
(b)	Equipment									
	Lab									
	Workshop									
	Other									
12	AVA Equipment and materials									
	OHP									
	Slide									
	Cine									
	Video									
13	IMO ref.									
14	Textbooks									
15	Bibliography									

Annex A2 – Example of a Model Course Syllabus in a Subject Area

Subject area:	Ship construction
Prerequisite:	Have a broad understanding of shipyard practice
General aims:	Have knowledge of materials used in shipbuilding, specification of shipbuilding steel and process of approval
Textbooks:	No specific textbook has been used to construct the syllabus, but the instructor would be assisted in preparation of lecture notes by referring to suitable books on ship construction, such as *Ship Construction* by Eyres (T12) and *Merchant Ship Construction* by Taylor (T58)

COURSE OUTLINE

Knowledge, understanding and proficiency		Total hours for each topic	Total hours for each subject area of Required performance
Competence:			
3.1 CONTROL TRIM, STABILITY and STRESS			
3.1.1 FUNDAMENTAL PRINCIPLES OF SHIP CONSTRUCTION, TRIM AND STABILITY			
.1	Shipbuilding materials	3	
.2	Welding	3	
.3	Bulkheads	4	
.4	Watertight and weathertight doors	3	
.5	Corrosion and its prevention	4	
.6	Surveys and dry-docking	2	
.7	Stability	83	102

Part C3: Detailed Teaching Syllabus

Introduction

The detailed teaching syllabus is presented as a series of learning objectives. The objective, therefore, describes what the trainee must do to demonstrate that the specified knowledge or skill has been transferred.

Thus each training outcome is supported by a number of related performance elements in which the trainee is required to be proficient. The teaching syllabus shows the *Required performance* expected of the trainee in the tables that follow.

In order to assist the instructor, references are shown to indicate IMO references and publications, textbooks and teaching aids that instructors may wish to use in preparing and presenting their lessons.

The material listed in the course framework has been used to structure the detailed teaching syllabus; in particular,

Teaching aids (indicated by A)
IMO references (indicated by R) and
Textbooks (indicated by T)

will provide valuable information to instructors.

Explanation of information contained in the syllabus tables

The information on each table is systematically organized in the following way. The line at the head of the table describes the FUNCTION with which the training is concerned. A function means a group of tasks, duties and responsibilities as specified in the STCW Code. It describes related activities which make up a professional discipline or traditional departmental responsibility on board.

The header of the first column denotes the **COMPETENCE** concerned. Each function comprises a number of competences. For example, the Function 3, Controlling the Operation of the Ship and Care for Persons on board at the Management Level, comprises a number of COMPETENCES. Each competence is uniquely and consistently numbered in this model course.

In this function the competence is **Control trim, stability and stress**. It is numbered 3.1, that is the first competence in Function 3. The term "competence" should be understood as the application of knowledge, understanding, proficiency, skills, experience for an individual to perform a task, duty or responsibility on board in a safe, efficient and timely manner.

Shown next is the required TRAINING OUTCOME. The training outcomes are the areas of knowledge, understanding and proficiency in which the trainee must be able to demonstrate knowledge and understanding. Each COMPETENCE comprises a number of training outcomes. For example, the above competence comprises three training outcomes. The first is concerned with the fundamental principles of FUNDAMENTAL PRINCIPLES OF SHIP CONSTRUCTION, TRIM AND STABILITY. Each training outcome is uniquely and consistently numbered in

this model course. That concerned with fundamental principles of Ship Construction, Trim And Stability is uniquely numbered 3.1.1. For clarity, training outcomes are printed in black type on grey, for example TRAINING OUTCOME.

Finally, each training outcome embodies a variable number of Required performances - as evidence of competence. The instruction, training and learning should lead to the trainee meeting the specified Required performance. For the training outcome concerned with fundamental principles of ship construction, trim and stability there are three areas of performance. These are:

3.1.1.1 Shipbuilding materials
3.1.1.2 Welding
3.1.1.3 Bulkheads

Following each numbered area of Required performance there is a list of activities that the trainee should complete and which collectively specify the standard of competence that the trainee must meet. These are for the guidance of teachers and instructors in designing lessons, lectures, tests and exercises for use in the teaching process. For example, under the topic 3.1.1.1, to meet the Required performance, the trainee should be able to:

- state that steels are alloys of iron, with properties dependent upon the type and amounts of alloying materials used
- state that the specifications of shipbuilding steels are laid down by classification societies
- state that shipbuilding steel is tested and graded by classification society surveyors who stamp it with approval marks

and so on.

IMO references (R*x*) are listed in the column to the right-hand side. Teaching aids (A*x*), videos (V*x*) and textbooks (T*x*) relevant to the training outcome and required performances are placed immediately following the TRAINING OUTCOME title.

It is not intended that lessons are organized to follow the sequence of Required performances listed in the Tables. The Syllabus Tables are organized to match with the competence in the STCW Code Table A-II/2. Lessons and teaching should follow college practices. It is not necessary, for example, for ship building materials to be studied before stability. What is necessary is that all the material is covered and that teaching is effective to allow trainees to meet the standard of the Required performance.

FUNCTION 3: CONTROLLING THE OPERATION OF THE SHIP AND CARE FOR PERSONS ON BOARD AT THE MANAGEMENT LEVEL

COMPETENCE 3.1 Control trim, stability and stress **IMO reference**

3.1.1 FUNDAMENTAL PRINCIPLES OF SHIP CONSTRUCTION, TRIM AND STABILITY

Textbooks: T11, T12, T35, T58, T69

Teaching aids: A1, A4, V5, V6, V7

Required performance:

1.1 Shipbuilding materials *(3 hours)* *R1*

- states that steels are alloys of iron, with properties dependent upon the type and amounts of alloying materials used
- states that the specifications of shipbuilding steels are laid down by classification societies
- states that shipbuilding steel is tested and graded by classification society surveyors, who stamp it with approval marks
- explains that mild steel, graded A to E, is used for most parts of the ship
- states why higher tensile steel may be used in areas of high stress, such as the sheer strake
- explains that the use of higher tensile steel in place of mild steel results in a saving of weight for the same strength
- explains what is meant by:
  - tensile strength
  - ductility
  - hardness
  - toughness
- defines strain as extension divided by original length
- sketches a stress–strain curve for mild steel
- explains:
  - yield point
  - ultimate tensile stress
  - modulus of elasticity
- explains that toughness is related to the tendency to brittle fracture
- explains that stress fracture may be initiated by a small crack or notch in a plate
- states that cold conditions increase the chances of brittle fracture
- states why mild steel is unsuitable for the very low temperatures involved in the containment of liquefied gases
- lists examples where castings or forgings are used in ship construction
- explains the advantages of the use of aluminium alloys in the construction of superstructures
- states that aluminium alloys are tested and graded by classification society surveyors
- explains how strength is preserved in aluminium superstructures in the event of fire
- describes the special precautions against corrosion that are needed where aluminium alloy is connected to steelwork

Annex A3 – Example of a Lesson Plan for Annex A2

Subject Area: 3.1 Control trim, stability and stress Lesson Number 1 Duration 3 hours

Training Area: 3.1.1 Fundamental principles of ship construction, trim and stability

Main element Specific training outcome in teaching sequence, with memory keys	Teaching method	Textbook	IMO ref.	A/V aid	Instructor guidelines	Lecture notes	Time (minutes)
1.1 Shipbuilding materials (3 hours)							
States that steels are alloys of iron, with properties dependent upon the type and amounts of alloying materials used	Lecture	T12, T58	STCW II/2, A-II/2	V5 to V7	A1	Compiled by the lecturer	10
States that the specifications of shipbuilding steels are laid down by classification societies	Lecture	T12, T58	STCW II/2, A-II/2	V5 to V7	A1	Compiled by the lecturer	20
Explains that mild steel, graded A to E, is used for most parts of the ship	Lecture	T12, T58	STCW II/2, A-II/2	V5 to V7	A1	Compiled by the lecturer	15
States why higher tensile steel may be used in areas of high stress, such as the sheer strake	Lecture	T12, T58	STCW II/2, A-II/2	V5 to V7	A1	Compiled by the lecturer	10
Explains that use of higher tensile steel in place of mild steel results in a saving of weight for the same strength	Lecture	T12, T58	STCW II/2, A-II/2	V5 to V7	A1	Compiled by the lecturer	15