ANNEX D – MED A1 COURSE OUTLINE

Transport Canada
Marine Safety

TP 4957 E

Marine Emergency Duties

Training Courses

Responsible Authority	Approval
The Director, Marine Personnel Standards and Pilotage is responsible for this document, including any changes, corrections or updates.	_____ Director, Marine Personnel Standards and Pilotage Date signed: _____

Canada

DOCUMENT INFORMATION			
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Revisions

Chapter No	Title	Date Revised	Revision No
All	Complete revision of the publication	June 2007	01

Important

This publication is subject to periodic reviews and it is updated accordingly /
Cette publication est sujette à des revues périodiques et elle est mise à jour en conséquence.

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General

1.1 Background

1) The International Convention on Standards of Training, Certification and Watchkeeping for seafarers, as amended (STCW Convention), provides standards regarding emergency, occupational safety and survival functions in Chapter VI of the mandatory Code "A".

2) This document describes the revisions to Canadian Marine Emergency Duties (MED) training courses. The revisions are being made in order to align the MED courses with the requirements of Regulation VI of the STCW Convention and Chapter VI of the STCW Code.

1.2 Objectives

1) Compliance with the above standards to meet mandatory minimum requirements for familiarization, basic safety training and instruction for all seafarers, training in advanced firefighting for seafarers designated to control firefighting operations, and knowledge of how to launch and take charge of a survival craft in emergency situations.

1.3 Goals

1) To provide seafarers with an understanding of the hazards associated with the marine environment and with their vessel.

2) To provide, through approved shore-based courses, training in the skills which seafarers require to cope with such hazards, to an extent appropriate to their functions on board.

1.4 Implementation

1) With the coming into force of the *Marine Personnel Regulations*, there are two "streams" of Marine Emergency Duties training: training for the crews of small domestic vessels and applicants for certificates of competency not subject to the Convention, and training which is fully compliant with the Convention, intended for the crews of large vessels, and vessels and applicants for certificates of competency subject to the Convention. The main reason for separating the two streams is that STCW Regulation VI/1 regarding Basic Safety requires extensive firefighting training which is beyond the requirements of small domestic vessels and would impose an onerous training expense on the small vessel industry.

2) Under the *Crewing Regulations*, recognized institutions offered the following courses approved by Marine Safety:

   a) Basic Safety (MED A_1);

   b) Small Vessel Safety (MED A_2);

   c) Small Non-Pleasure Vessel Basic Safety (MED A_3);

   d) Sheltered Non-Pleasure Small Vessel Basic Safety and Operator Proficiency (MED A_4);

e) Small Seasonal Passenger Vessel Safety (certificated personnel);

f) Small Seasonal Passenger Vessel Safety (non-certificated personnel);

g) Survival Craft (MED B_1);

h) Marine Firefighting (MED B_2);

i) Marine Emergency Duties for Officers (MED C);

j) Marine Emergency Duties for Senior Officers (MED D).

3) With the regulatory reform, the following courses are now available:

a) MED not subject to the STCW Convention:

i) Basic Safety (MED A_1);

ii) Small Passenger-carrying Vessel Safety (MED A_2);

iii) Small Non-Pleasure Vessel Basic Safety (MED A_3);

iv) Small Seasonal Passenger-carrying Vessel Safety (certificated personnel);

v) Small Seasonal Passenger-carrying Vessel Safety (non-certificated personnel).

b) MED subject to the STCW Convention:

i) STCW Basic Safety (STCW Regulation VI/1 and STCW Code Section A-VI/1.2);

ii) Proficiency in Survival Craft and Rescue Boats other than Fast Rescue Boats (STCW Regulation VI/2.1 and STCW Code Section A-VI/2-1);

iii) Advanced Firefighting (STCW Regulation VI/3 and STCW Code Section A-VI/3);

iv) MED for Senior Officers (MED D).

Equivalency between Old and New Courses

2.1 Training received before the day of coming into force of the *Marine Personnel Regulations*

Equivalency

Before July 30, 1997	**from July 30, 1997 to the day of coming into force of the *Marine Personnel Regulations***
Marine Emergency Duties 1	Basic Safety (A_1) or Small Vessel Safety (A_2)
Marine Emergency Duties 2, Part A or Marine Emergency Duties 2, Parts A and C	Survival Craft (B_1)
Marine Emergency Duties 2, Part B	Marine Firefighting (B_2)
Marine Emergency Duties 3	MED for Officers (C) and MED for Senior Officers (D)

from July 30, 1997 to the day of coming into force of the *Marine Personnel Regulations*	**Equivalency under the *Marine Personnel Regulations***
Basic Safety (A_1) or Small Vessel Safety (A_2)	Basic Safety (MED A_1) or Small Passenger Vessel Safety (MED A_2)
Small Non-Pleasure Vessel Basic Safety (A_3)	Small Non-Pleasure Vessel Basic Safety (MED A_3)
Sheltered Non-Pleasure Small Vessel Basic Safety and Operator Proficiency (A_4)	
Small Seasonal Passenger Vessel Safety (certificated personnel)	Small Seasonal Passenger-carrying Vessel Safety (certificated personnel)
Small Seasonal Passenger Vessel Safety (non-certificated personnel)	Small Seasonal Passenger-carrying Vessel Safety (non-certificated personnel)
Survival Craft (B_1)	Proficiency in Survival Craft and Rescue Boats other than Fast Rescue Boats
Basic Safety (A_1) and Marine Firefighting (B_2)	STCW Basic Safety
Basic Safety (A_1), Marine Firefighting (B_2) and MED for Officers (C)	Advanced Firefighting
MED for Senior Officers (D)	MED for Senior Officers (MED D)

2.2 Courses not subject to the STCW Convention

The training system undergoes little change: MED A_1, A_2 and A_3 remain the same, while MED A_4 is removed and replaced with the Small Vessel Operator Proficiency training certificate and the Pleasure Craft Operator Competency card, refer to sections 205 and 212 of the Regulations for the applicability of each. The Small Seasonal Passenger-carrying Vessel Safety courses remain unchanged.

2.3 Courses subject to the STCW Convention

1) The previous set of MED training courses met the requirements of Regulation VI of the Convention, when completed in their entirety.

2) Completion of MED A_1 and B_2 substantially meets the Basic Safety requirements of Regulation VI/1 (see subsection 6); however the personal safety and social responsibility elements were contained in MED B_1. A very basic knowledge of pollution prevention duties is also required by the Convention, but this was not covered in the former MED courses and has been added to the STCW Basic Safety course.

3) The MED B_1 course meets the requirements of Regulation VI/2, Proficiency in Survival Craft and Rescue Boats other than Fast Rescue Boats.

4) Compliance with Regulation VI/3, *Advanced Firefighting* is achieved only through completion of MED A_1, B_2 and C. It should be noted that Section A-VI/3-1 of the Code implies that this is an officer level course, as it states that "seafarers designated to control firefighting operations shall have successfully completed advanced training in techniques for fighting fire, with particular emphasis on organization, tactics and command".

5) This situation creates difficulties for schools attempting to offer STCW-compliant courses, and unnecessary duplication of material from one course syllabus to another. Accordingly, a workshop with instructors from Canadian MED training providers and a Transport Canada representative was held on February 4, 5, and 6, 2002 for the purpose of devising an efficient way to realign the MED training courses with the STCW Convention.

6) In general terms, aside from the minor syllabus items mentioned above, the main problem with the former system was that MED A_1 does not contain sufficient training in firefighting to meet the Basic Safety requirements of Regulation VI/1. In addition, MED B_2 does not meet the requirements for advanced firefighting, while at the same time it contains a substantial amount of material which properly belongs in the "officer level" course. Therefore it was decided that the best approach would be to move practical firefighting from MED B_2 to the new STCW Basic Safety course and to put advanced command and control in the new Advanced Firefighting course.

7) This re-alignment has the following effects on the MED courses:

   a) addition of a small amount of new material through the STCW Basic Safety course:

i) basic awareness of pollution prevention duties,

ii) knowledge of SAR transponders and of VHF radios on life rafts;

b) removal of A_1/B_2 duplication concerning fire theory, resulting in an STCW Basic Safety course that is slightly shorter than the A_1- B_1- B_2 combination that was required for crew members assigned duties on the muster list;

c) lengthening of the firefighting training.

2.4 Practical aspects of course delivery

1) MED instructors do not fully cover the command and control aspects of firefighting contained in the B_2 syllabus, because these aspects are beyond the level of knowledge required by the audience of a B_2 course - typically deckhands, oilers and catering personnel. The course is the same length, but schools generally spend more time on practical exercises than the syllabus calls for. Moving the command and control aspects of the B_2 syllabus to the Advanced Firefighting course allocates more hours to the subject, allowing a more thorough coverage, and delivery to the appropriate audience. This results in a course of (approximately) one week.

2) In the past, MED C and D were almost inevitably delivered together, because the two courses could be delivered in a one-week session at the school, and there were no prerequisites for MED D. This meant that material intended for senior officers was delivered to an audience that had not even completed its first level of certification. MED instructors commented that the D level material was simply lost on participants at this level. Not teaching the MED D material at this point, and spending more time on firefighting command and control, will result in improved training for the participants while still devoting approximately one week to emergency training for those preparing for their first certificate of competency.

3) It is suggested that participants not be accepted for the Senior Officers (MED D) course until they hold a Watchkeeping Mate or Fourth-Class Engineer certificate. Delaying the Senior Officers course until a more appropriate time in an officer’s career will have the following effects:

a) There will be more meaningful course participation.

b) Training will be given closer to the time when it is needed (i.e. at the command level).

c) The course can be improved through additional practical training in firefighting command, as in the old MED 3 course.

d) Organizing and managing the provision of medical care on board, required by Table A-II/2 of the STCW Code, will be incorporated in the course.

2.5 Refresher courses

1) The above improvements allow the course MED D to be used as a refresher course for senior officers, thus meeting the *Marine Personnel Regulations* requirements for applicants who wish to renew their certificate after having been away from the marine environment for more than five years.

2) The Basic Safety (MED A_1) course may be used as a refresher course for ratings and officers who have not completed MED D.

Approval of Training Courses

3.1 General

Canada's accession to the STCW Convention means that all approved marine training programs and courses must be delivered and monitored through a quality management system.

3.2 Recognized Institution

1) Courses are to be provided by a "recognized institution" as defined in the *Marine Personnel Regulations*. Approval procedures are provided in the chapter entitled *Approval of Marine Training Courses and Programs* of the *Quality Management Manual – Marine Personnel Standards and Pilotage,* published by the Department of Transport, Marine Personnel Standards and Pilotage Directorate.

2) Institutions must submit for approval their course syllabus, training manual, instructor qualifications and any other information required by the above-mentioned document, to the following address:

Marine Personnel Standards & Pilotage (AMSP)
Transport Canada, Marine Safety
112, Kent Street, Tower B, 4th Floor
Ottawa, Ontario K1A 0N5

On-board Familiarization and Safety Training

4.1 Extent of familiarization

1) The extent of familiarization and basic safety training required of personnel joining a vessel will vary by group. See the table in section 4.3.

2) The master is responsible for ensuring that the training is given and for relating the general topics to the particular circumstances of the vessel.

4.2 Group definitions

There are four groups, defined as follows:

a) Group 1

All persons on board who have not completed the Basic Safety Courses applicable to the vessel

Examples:

- untrained new entrants to industry who have not completed that training
- those aboard for repairs, maintenance or similar purposes
- those aboard whose tasks are confined to a special industrial, scientific or similar purpose

b) Group 2

Persons who have completed the Basic Safety Course applicable to the vessel

Examples:

- small vessel operators and small vessel machinery operators
- non-certificated ratings with more than 6 months' sea time

c) Group 3

Holders of a certificate of competency who have not completed MED D training

Examples:

- Masters, Limited and Chief Mates, Limited
- Watchkeeping Mates and Fourth-Class Engineers
- certificated ratings

d) Group 4

Holders of a certificate of competency who have completed MED D training

Examples:

- Masters
- Chief Mates
- First, Second and Third-Class Engineers

4.3 Assignment of topics to groups

Topic	Group 1	2	3	4
Types of emergencies and individual response	X			
The vessel's muster list, individual responsibilities and functions in the vessel's organization		X		
Vessel's emergency response organization, plans and individual responsibilities and functions				X
Chain of command and muster list	X			
Vessel's alarm system, meanings of alarms, and response	X			
Vessel's alarm system, internal communications		X	X	X
Use and limitations of personal survival equipment provided	X			
Location and types of survival equipment and fire-fighting equipment on board		X	X	X
Location and operation of fixed fire-fighting systems			X	X
Types, use and limitations of portable fire extinguishers	X			
General safety practices on board	X			
Location and nature of special hazards			X	X

Basic Safety (MED A_1)

5.1 Equipment requirements

1) One portable lifeboat or rescue craft;
2) One inflatable life raft (Minimum 4 persons) with equipment, including an emergency position-indicating radio beacon (EPIRB);
3) An approved lifejacket for each participant;
4) A complete firefighter's suit for each participant;
5) A variety of immersion suits for 100% of the participants;
6) Two approved life buoys, one with a line and the other with an approved light;
7) One rescue sling;
8) One rescue blanket;
9) Portable extinguishers:
    a) 6 dry chemical,
    b) 4 CO_2,
    c) 6 water pressure,
    d) 6 foam;
10) One fire hose with sufficient water pressure;
11) Steel trays for containing fires;
12) Training models of luffing, gravity and single arm davits and marine escape systems (may be replaced by an audio-visual presentation);
13) A variety of hand flares;
14) Visual or audio-visual presentation of the following:
    a) Totally enclosed motor propelled survival craft (TEMPSC),
    b) Partially enclosed lifeboat,
    c) Open lifeboat,
    d) Fast rescue craft (FRC),
    e) Emergency multiple person rescue apparatus (EMPRA),
    f) Hypothermia, its effects and ways of overcoming it;
15) Access to open water or to pool facilities suitable for teaching the use of the equipment.

5.2 Duration

19.5 hours.

5.3 Specific instructor qualifications

The main course instructor must hold a Master certificate not lower than a Master 500 Gross Tonnage, Domestic certificate, a Fishing Master, Second Class certificate or a Fourth-Class Engineer certificate. If the course is under the supervision of more than one instructor, the assistant instructors must hold qualifications related to the marine industry or have related skills and be approved in accordance with the *Quality Management Manual – Marine Personnel Standards and Pilotage,* referred to in Chapter 3.

5.4 Goals

1) Provide seafarers with basic understanding of the hazards associated with the marine environment and their own vessel, and of how to prevent shipboard incidents including fire.

2) Provide seafarers with the knowledge necessary to raise and react to alarms and deal with emergencies.

3) Ensure that seafarers are able to provide assistance in fire and abandonment situations.

4) Provide seafarers with the knowledge and skills that will enable them to assist in their own survival and rescue.

5.5 Outline

Subject Area	Hours	
	Lecture	**Practical**
1. Introduction and Safety 1.1 Introduction 1.2 Principles of safety	0.5 hours	
2. Hazards and Emergencies 2.1 Types of emergencies 2.2 Problems and effects	1.0 hour	
3. Firefighting 3.1 Nature of fire 3.2 Fire Tetrahedron 3.3 Principles of extinguishment 3.4 Classes of fire and their symbols 5.5 Extinguishing agents 3.6 Safety rules 3.7 Practical exercises	3.0 hours	3.0 hours
4. Emergency response 4.1 Signals and alarms 4.2 Muster lists 4.3 Drills and training 4.4 Action upon discovering emergency 4.5 Action when called to an emergency	2.0 hours	
5. Lifesaving Appliances and Abandonment 5.1 Lifejackets 5.2 Immersion suits 5.3 Life buoys 5.4 Life rafts and equipment 5.5 Survival craft and launching devices	2.5 hours	2.5 hours
6. Survival 6.1 Factors relating to survival 6.2 Actions to increase chances of survival and rescue 6.3 Actions taken after abandoning in a survival craft	2.0 hours	1.0 hour
7. Rescue 7.1 Rescue by civilian or military personnel 7.2 Rescue equipment 7.3 Recognition and operation of signaling devices 7.4 EPIRBs 7.5 Pyrotechnics 7.6 Helicopter rescue	1.5 hours	0.5 hours
	12.5 hours	**7 hours**
Total	**19.5 hours**	

5.6 Syllabus

Topics and learning objectives	Examined		
	in writing	orally	by practical demonstration
1. Introduction and Safety (0.5 hours)			
1.1 Introduction			
1.2 Principles of safety			
.1 safety rules laid down by the instructor must be followed at all times	X		
.2 when we are handling actual equipment, such as pyrotechnics, all safety precautions must be adhered to	X		
.3 although the incidents are simulated, particular care must be exercised at all times	X		
2. Hazards and Emergencies (1 hour)			
2.1 Types of emergencies	X		
.1 emergencies associated with the marine environment:			
– fire			
– collision			
– stranding			
– explosion			
– icing			
– equipment failure			
– capsizing			
– weather conditions			
– flooding			
– person overboard			
2.2 particular problems associated with various emergencies	X		
3. Firefighting (6 hours)			
3.1 Nature of fire	X		
.1 conditions required for fire to occur:			
– fuel, such as wood, clothes, furniture, gas or oil			
– source of ignition			
– oxygen; fire requires 16% oxygen in order to burn			
.2 flash point			
.3 ignition temperature			
.4 three ways fire is spread:			
– conduction			
– convection			
– radiation			
3.2 Fire Tetrahedron		X	
.1 the three sides of the fire triangle:			
– fuel			
– heat			
– oxygen			
.2 the fourth side of the tetrahedron - the chemical chain reaction			

Topics and learning objectives	Examined		
	in writing	orally	by practical demonstration
3.3 Principles of extinguishment		X	
.1 cooling - water as the easiest method			
.2 smothering - removing the oxygen			
.3 starving - removing the fuel, shut-off valves, etc.			
.4 breaking the chain reaction			
3.4 Classes of fire and their symbols	X		
.1 Class A - wood, clothing, paper, etc.			
.2 Class B - flammable liquids			
.3 Class C - Class A and B with added electricity, e.g. electronics			
.4 Class D - flammable metals (magnesium, lithium, zirconium, sodium, potassium), e.g. flares			
3.5 Extinguishing agents		X	
.1 water - best for Class A fires			
.2 foam - Class A and Class B			
.3 carbon dioxide - Class B and Class C			
.4 dry chemical - Class B and Class C			
.5 Dry Powder - Class D			
3.6 Safety rules		X	X
.1 after discovering fire, raise alarm before attacking fire			
.2 never pass near the fire to obtain an extinguisher			
.3 test the fire extinguisher first			
.4 keep low to the ground			
.5 aim at the base of the fire and use a sweeping motion			
.6 never turn your back on a fire even after it is out			
.7 never use water or foam on an electrical fire; water is a conductor of electrical currents and the result may be electrocution			
.8 water is usually ineffective for flammable liquids and may even make the fire worse or spread it around; the oxygen in the water may feed the fire			
.9 beware of flashbacks			
.10 back up an attack as soon as possible, using a portable fire extinguisher with a hose			
.11 report the use of a portable extinguisher to your supervisor and do not return it to its station			
3.7 Practical firefighting exercises			X
.1 demonstrate the correct use of portable fire extinguishers to extinguish Class A, B and C fires; basic work with fire hoses and nozzles			
4. Emergency Response (2 hours)			
4.1 Signals and alarms		X	
.1 emergency alarm signal			
.2 other alarm signals			
.3 who is responsible for the call to abandon vessel			
4.2 Muster lists		X	
.1 when is a muster list required			
.2 where is the list placed on the vessel			
.3 what information is to be found on a muster list			

Topics and learning objectives	Examined		
	in writing	orally	by practical demonstration
4.3 Drills and training		X	
.1 purpose and importance of regular drills and training			
.2 need to be ready for an emergency			
.3 frequency of drills			
4.4 Action upon discovering emergency situation		X	
.1 fire			
.2 person overboard			
.3 unconscious casualty			
.4 injured person			
.5 flooding			
4.5 Action when called to an emergency		X	
.1 suitable clothing			
.2 bring a lifejacket/ immersion suit			
5. Lifesaving Appliances and Abandonment (5 hours)			
5.1 Lifejackets			X
.1 what is a standard approved lifejacket			
.2 number of lifejackets required on a vessel			
.3 proper method of donning a lifejacket and use of attachments			
.4 entering water from a height and swimming while wearing a lifejacket			
.5 care and stowage			
5.2 Immersion suits			X
.1 qualities of an immersion suit			
.2 proper donning procedure, in darkness, and with necessary speed and use of attachments			
.3 entering water from a height and swimming while wearing an immersion suit			
.4 care and stowage			
5.3 Life buoys			X
.1 number required on a vessel			
.2 markings, colour, vessel name, retro-reflective tape			
.3 lights and smoke signals			
.4 how to correctly use a buoy (throwing, entering and securing in it while in the water and waiting for rescue)			
.5 care and stowage			
5.4 Life raft and equipment			X
.1 the basic types and features of a life raft			
.2 stowage and releasing mechanism			
.3 how to correctly launch an inflatable life raft			
.4 boarding a life raft from the water			
.5 the survival pack and how to use it			
.6 proper righting procedure			
.7 care and stowage			
.8 manoeuvring a life raft and setting the anchor to reduce drift			
5.5 Survival craft and launching devices		X	
.1 characteristics and operation of luffing, gravity and single arm davits			
.2 marine evacuation systems			

Topics and learning objectives	Examined		
	in writing	orally	by practical demonstration
.3 characteristics and operations of T.E.M.P.S.C., enclosed lifeboat, open lifeboat and inflatable life raft			
6. Survival (3 hours)			
6.1 Factors relating to survival		X	
.1 how each factor affects human response and performance in a survival situation			
.2 medical aspects of survival including thermal balance, water balance and energy balance			
6.2 Actions to increase chances of survival and rescue		X	X
.1 need to stay together in the water			
.2 the Heat Escape Lessening Posture (HELP)			
.3 how to swim as a group in a chain			
.4 how to form a huddle in the water			
.5 hypothermia, prevention, recognition and treatment			
.6 stay near spot where vessel went down; stream the sea anchor			
6.3 Action to take after abandoning a vessel in a survival craft	X		
.1 action to take after leaving the vessel in an enclosed lifeboat			
.2 action to take after leaving the vessel in an open lifeboat			
.3 action to take after leaving the vessel in an inflatable life raft			
7. Rescue (2 hours)			
7.1 Rescue by civilian or military personnel	X		
.1 description and use of:			
– sling			
– basket			
– net			
– litter			
7.2 Rescue equipment			X
.1 use of rescue sling			
.2 use of rescue basket			
7.3 Recognition and operation of signalling devices			X
.1 types of hand flare and their use			
.2 daylight signalling mirror (heliograph)			
.3 signalling flashlight			
.4 types of parachute rocket and their use			
7.4 Emergency position-indicating radio beacon (EPIRB)		X	
.1 classes of EPIRB			
.2 frequency specific to EPIRBs			
.3 mounting on the vessel - float free, hydrostatic release, etc.			
.4 registration of the 406 and identification of the signal			
7.5 Pyrotechnics		X	X
.1 classes of flare and their characteristics			
.2 circumstances in which each is to be used			
.3 markings on flares			
.4 expiry dates			
.5 care and stowage			
7.6 Helicopter rescue		X	
.1 action to be taken aboard a vessel			

Topics and learning objectives	Examined		
	in writing	orally	by practical demonstration
.2 action to be taken aboard a raft .3 lifting appliances .4 safety procedures aboard the helicopter			

Small Passenger-carrying Vessel Safety (MED A_2)

6.1 Equipment requirements

1) One portable lifeboat or rescue craft;
2) One inflatable life raft (Minimum 4 persons) with equipment, including an emergency position-indicating radio beacon (EPIRB);
3) An approved lifejacket for each participant;
4) A complete firefighter's suit for each participant;
5) A variety of immersion suits for 100% of the participants;
6) Two approved life buoys, one with a line and the other with an approved light;
7) One rescue sling;
8) One rescue blanket;
9) Portable extinguishers:;
    a) 6 dry chemical,
    b) 4 CO_2,
    c) 6 water pressure,
    d) 6 foam;
10) One fire hose with sufficient water pressure;
11) Steel trays for containing fires;
12) Training models of luffing, gravity and single arm davits and marine escape systems (may be replaced by an audio-visual presentation);
13) A variety of hand flares;
14) Visual or audio-visual presentation of the following:
    a) Totally enclosed motor propelled survival craft (TEMPSC),
    b) Partially enclosed lifeboat,
    c) Open lifeboat,
    d) Fast rescue craft (FRC),
    e) Emergency multiple person rescue apparatus (EMPRA),
    f) Hypothermia, its effects and ways of overcoming it;
15) Access to open water or to pool facilities suitable for teaching the use of the equipment.

6.2 Duration

26 hours.

6.3 Specific instructor qualifications

The main course instructor must hold a Master certificate not lower than a Master 500 Gross Tonnage, Domestic certificate, a Fishing Master, Second Class certificate or a Fourth-Class Engineer certificate. If the course is under the supervision of more than one instructor, the assistant instructors must hold qualifications related to the marine industry or have related skills and be approved in accordance with the *Quality Management Manual – Marine Personnel Standards and Pilotage,* referred to in Chapter 3.

6.4 Goals

1) Provide seafarers with basic understanding of the hazards associated with the marine environment and their own vessel, and of how to prevent shipboard incidents including fire.

2) Provide seafarers with the knowledge necessary to raise and react to alarms and deal with emergencies.

3) Ensure that seafarers are able to provide assistance in fire and abandonment situations.

4) Provide seafarers with the knowledge and skills that will enable them to assist in their own survival and rescue.

5) Provide seafarers with instruction on the proper procedures for maintaining emergency equipment, according to manufacturer’s guidelines.

6) Provide seafarers with the knowledge to maintain the appropriate record-keeping procedures for safety equipment.

7) Ensure that crew members of passenger-carrying vessels have the knowledge and skills necessary to keep passengers safe and give them the assistance needed to survive an emergency.

8) Enable crew members of passenger-carrying vessels to plan, organize and carry out safety drills with the passengers, in order that the passengers will be aware of safety equipment and procedures.

6.5 Outline

Subject Area	Hours	
	Lecture	Practical
1. Introduction and Safety 1.1 Introduction 1.2 Principles of safety	0.5 hours	
2. Hazards and Emergencies 2.1 Types of emergencies 2.2 Problems and affects	1.0 hour	
3. Firefighting 3.1 Nature of fire 3.2 Fire Tetrahedron 3.3 Principles of extinguishment 3.4 Classes of fire and their symbols 3.5 Extinguishing agents 3.6 Safety rules 3.7 Practical exercises	3.0 hours	3.0 hours
4. Emergency Response 4.1 Signals and alarms 4.2 Muster lists 4.3 Drills and training 4.4 Action upon discovering emergency 4.5 Action when called to an emergency	2.0 hours	
5. Lifesaving Appliances and Abandonment 5.1 Lifejackets 5.2 Immersion suits 5.3 Life buoys 5.4 Life raft and equipment 5.5 Survival craft and launching devices	2.5 hours	2.5 hours
6. Survival 6.1 Factors relating to survival 6.2 Actions to increase chances of survival and rescue 6.3 Actions taken after abandoning in a survival craft	2.0 hours	1.0 hour
7. Rescue 7.1 Rescue by civilian or military personnel 7.2 Rescue equipment 7.3 Recognition and operation of signalling devices 7.4 EPIRBs 7.5 Pyrotechnics 7.6 Helicopter rescue	1.5 hours	0.5 hours
8. Maintenance and Inspection of Emergency Equipment 8.1 Manufacturer's guidelines 8.2 Periodic inspections 8.3 Servicing 8.4 Firefighting equipment 8.5 Fixed systems 8.6 Communication equipment	3.0 hours	1.5 hours

Subject Area	Hours	
	Lecture	Practical
8.7 Survival craft, launching systems, personal lifesaving equipment 8.8 Record-keeping		
9. Passenger Control 9.1 Planning 9.2 Conducting drills 9.3 Awareness of life-saving appliances and control plans 9.4 Assisting passengers en route to muster and embarking stations 9.5 Mustering procedures 9.6 The human factor	2.0 hours	
	17.5 hours	**8.5 hours**
Total	**26 hours**	

6.6 Syllabus

Topics and learning objectives	Examined		
	in writing	orally	by practical demonstration
1. Introduction and Safety (0.5 hours) 1.1 Introduction 1.2 Principles of safety .1 safety rules laid down by the instructor must be followed at all times .2 when we are handling actual equipment, such as pyrotechnics, all safety precautions must be adhered to .3 because we are simulating incidents in the actual environment, particular care must be exercised at all times	X X X		
2. Hazards and Emergencies (1 hour) 2.1 Types of emergencies .1 emergencies associated with the marine environment: – fire – collision – stranding – explosion – icing – equipment failure – capsizing – weather conditions – flooding – person overboard 2.2 particular problems associated with various emergencies	X X		
3. Firefighting (6 hours) 3.1 Nature of fire .1 conditions required for fire to occur: – fuel, such as wood, clothes, furniture, gas or oil	X		

Topics and learning objectives	Examined		
	in writing	orally	by practical demonstration
– source of ignition – oxygen; fire requires 16% oxygen in order to burn .2 flash point .3 ignition temperature .4 three ways fire is spread: – conduction – convection – radiation			
3.2 Fire Tetrahedron .1 the three sides of the fire triangle: – fuel – heat – oxygen .2 the fourth side of the tetrahedron - the chemical chain reaction		X	
3.3 Principles of extinguishment .1 cooling - water as the easiest method .2 smothering - removing the oxygen .3 starving - removing the fuel, shut-off valves, etc. .4 breaking the chain reaction		X	
3.4 Classes of fire and their symbols .1 Class A - wood, clothing, paper, etc. .2 Class B - flammable liquids .3 Class C - Class A and B with added electricity, e.g. electronics .4 Class D - flammable metals (magnesium, lithium, zirconium, sodium, potassium), e.g. flares	X		
3.5 Extinguishing agents .1 water - best for Class A fires .2 foam - Class A and Class B .3 carbon dioxide - Class B and Class C .4 dry chemical - Class B and Class C .5 Dry Powder - Class D		X	
3.6 Safety rules .1 after discovering fire, raise alarm before attacking fire .2 never pass near the fire to obtain an extinguisher .3 test the fire extinguisher first .4 keep low to the ground .5 aim at the base of the fire and use a sweeping motion .6 never turn your back on a fire even after it is out .7 never use water or foam on an electrical fire; water is a conductor of electrical currents and the result may be electrocution .8 water is usually ineffective for flammable liquids and may even make the fire worse or spread it around; the oxygen in the water may feed the fire .9 beware of flashbacks .10 back up an attack as soon as possible, using a portable fire		X	X

Topics and learning objectives	Examined		
	in writing	orally	by practical demonstration
extinguisher with a hose .11 report the use of a portable extinguisher to your supervisor and do not return it to its station 3.7 Practical firefighting exercises .1 demonstrate the correct use of portable fire extinguishers to extinguish Class A, B and C fires; basic work with fire hoses and nozzles			X
4. Emergency Response (2 hours) 4.1 Signals and alarms .1 emergency alarm signal .2 other alarm signals .3 who is responsible for the call to abandon vessel 4.2 Muster lists .1 when is a muster list required .2 where is the list placed on the vessel .3 what information is to be found on a muster list 4.3 Drills and training .1 purpose and importance of regular drills and training .2 need to be ready for an emergency .3 frequency of drills 4.4 Action upon discovering emergency situation .1 fire .2 person overboard .3 unconscious casualty .4 injured person .5 flooding 4.5 Action when called to an emergency .1 suitable clothing .2 bring a lifejacket/ immersion suit		X X X X	
5. Lifesaving Appliances and Abandonment (5 hours) 5.1 Lifejackets .1 what is a standard approved lifejacket .2 number of lifejackets required on a vessel .3 proper method of donning a lifejacket and use of attachments .4 entering water from a height and swimming while wearing a lifejacket .5 care and stowage 5.2 Immersion suits .1 qualities of an immersion suit .2 proper donning procedure, in darkness, and with necessary speed and use of attachments .3 entering water from a height and swimming while wearing an immersion suit .4 care and stowage			X X

Topics and learning objectives	Examined		
	in writing	orally	by practical demonstration
5.3 Life buoys			X
.1 number required on a vessel			
.2 markings, colour, vessel name, retro-reflective tape			
.3 lights and smoke signals			
.4 how to correctly use a buoy (throwing, entering and securing in it while in the water and waiting for rescue)			
.5 care and stowage			
5.4 Life raft and equipment			X
.1 the basic types and features of a life raft			
.2 stowage and releasing mechanism			
.3 how to correctly launch an inflatable life raft			
.4 boarding a life raft from the water			
.5 the survival pack and how to use it			
.6 proper righting procedure			
.7 care and stowage			
.8 manoeuvring a life raft and setting the anchor to reduce drift			
5.5 Survival craft and launching devices		X	
.1 characteristics and operation of luffing, gravity and single arm davits			
.2 marine evacuation systems			
.3 characteristics and operations of T.E.M.P.S.C., enclosed lifeboat, open lifeboat and inflatable life raft			
6. Survival (3 hours)			
6.1 Factors relating to survival		X	
.1 how each factor affects human response and performance in a survival situation			
.2 medical aspects of survival including thermal balance, water balance and energy balance			
6.2 Actions to increase chances of survival and rescue		X	X
.1 need to stay together in the water			
.2 the Heat Escape Lessening Posture (HELP)			
.3 how to swim as a group in a chain			
.4 how to form a huddle in the water			
.5 hypothermia, prevention, recognition and treatment			
.6 stay near spot where vessel went down; stream the sea anchor			
6.3 Action to take after abandoning a vessel in a survival craft	X		
.1 action to take after leaving the vessel in an enclosed lifeboat			
.2 action to take after leaving the vessel in an open lifeboat			
.3 action to take after leaving the vessel in an inflatable life raft			
7. Rescue (2 hours)			
7.1 Rescue by civilian or military personnel	X		
.1 description and use of:			
– sling			
– basket			
– net			
– litter			

Topics and learning objectives	Examined		
	in writing	orally	by practical demonstration
7.2 Rescue equipment			X
.1 use of rescue sling			
.2 use of rescue basket			
7.3 Recognition and operation of signaling devices			X
.1 types of hand flare and their use			
.2 daylight signaling mirror (heliograph)			
.3 signaling flashlight			
.4 types of parachute rocket and their use			
7.4 Emergency position-indicating radio beacon (EPIRB)		X	
.1 classes of EPIRB			
.2 frequency specific to EPIRBs			
.3 mounting on the vessel - float free, hydrostatic release, etc.			
.4 registration of the 406 and identification of the signal			
7.5 Pyrotechnics		X	X
.1 classes of flare and their characteristics			
.2 circumstances in which each is to be used			
.3 markings on flares			
.4 expiry dates			
.5 care and stowage			
7.6 Helicopter rescue		X	
.1 action to be taken aboard a vessel			
.2 action to be taken aboard a raft			
.3 lifting appliances			
.4 safety procedures aboard the helicopter			
8. Maintenance and Inspection of Emergency Equipment (4.5 hours)			
8.1 Manufacturer's guidelines		X	
8.2 Periodic Inspections		X	
8.3 Servicing		X	
8.4 Firefighting equipment		X	X
.1 fire extinguishers:			
– check gauges on pressurized extinguishers			
– turn over to loosen dry powders			
– be sure that partially used or empty extinguishers are set aside for servicing			
.2 alarm systems			
.3 fire mains and equipment:			
– relief valves			
– leaks and corrosion			
– keep system free of ice			
8.5 Fixed systems		X	X
.1 all sprinkler heads are unobstructed			
.2 checks for air pressure and water levels			
.3 specific checks according to the type of system			
8.6 Communications equipment		X	

Topics and learning objectives	Examined		
	in writing	orally	by practical demonstration
8.7 Survival craft, launching systems and personal lifesaving equipment .1 check that painter is kept dry in raft .2 check launching and release systems for corrosion .3 keep all lifesaving and launching system moving parts lubricated .4 keep covers on lifeboats, seals on rafts .5 replace outdated equipment in lifeboats		X	X
8.8 Record-keeping .1 ensure that written records are kept on all maintenance checks .2 keep records of repairs and updates .3 keep records of any incidents that concern safety equipment and its use .4 ensure that there is easy access to any manuals or written instructions		X	
9. Passenger Control (2 hours) 9.1 Planning .1 provide adequate lighting .2 have exits clearly marked .3 provide easy access to lifejackets and gear .4 provide clear signage system: – life rafts and lifeboats – lifejackets and buoys – muster lists, emergency instructions	X	X	
9.2 Conducting drills .1 assists passengers in an emergency .2 familiarity with drills lessens panic in an actual situation .3 notify passengers that a drill is being held to reduce fright .4 encourage everyone to take part	X	X	
9.3 Lifesaving appliances and control plans .1 knowledge of muster lists and emergency instructions .2 knowledge of emergency exits	X	X	
9.4 Assisting passengers en route to muster and embarkation stations .1 give clear reassuring orders .2 control of passengers in corridors, staircases and passageways .3 keeping escape routes clear of obstructions .4 methods for evacuating disabled persons and persons needing special assistance .5 search of accommodation spaces	X	X	
9.5 Mustering procedures .1 importance of keeping order .2 ability to use procedures for reducing and avoiding panic .3 ability to use, where appropriate, passenger lists for evacuation counts	X	X	

Topics and learning objectives	Examined		
	in writing	orally	by practical demonstration
.4 ability to ensure that passengers are suitably clothed and have donned their lifejackets correctly			
9.6 The human factor	X	X	
.1 identify those who may cause problems - fear, panic, aggression			
.2 for those who may be a problem, find something to keep them busy			
.3 try to keep families and travelling companions together			
.4 make use of anyone who can help - some may have special abilities (medical etc.)			

Small Non-Pleasure Vessel Basic Safety (MED A_3)

7.1 General

1) This chapter describes a course providing basic safety training for crew members of non-pleasure vessels of not more than 150 gross tonnage operating not more than 25 nautical miles from shore.

2) Refer to section 205 of the *Marine Personnel Regulations* for details regarding the applicability of this course, depending on vessel type and voyage class.

7.2 Equipment requirements

1) One approved lifejacket, one immersion suit and one Personal Flotation Device;

2) Two approved life buoys, one with line and the other with light;

3) One dry chemical portable extinguisher;

4) Hand flares and parachute flares (a live demonstration by Coast Guard Boating Safety may be substituted);

5) Visual or audio-visual presentation of cold water shock, swimming failure, hypothermia, post-rescue collapse, their effects, and ways of overcoming them.

7.3 Duration

Minimum 8 hours, including 1.5 hours for practical exercises and 0.5 hours for evaluation, assuming some pre-course reading is assigned. Training providers are cautioned that students who do not complete a certain amount of pre-course reading may require more than 8 hours to complete this course.

7.4 Specific instructor qualifications

The main course instructor must hold a Master certificate not lower than a Fishing Master, Fourth Class certificate, a Master, Limited certificate or a Watchkeeping Engineer, Motor-driven Fishing Vessel certificate. If the course is under the supervision of more than one instructor, the assistant instructors must hold qualifications related to the marine industry or have related skills and be approved in accordance with the *Quality Management Manual – Marine Personnel Standards and Pilotage,* referred to in Chapter 3.

7.5 Goals and criteria

To provide course participants with:

a) a basic understanding of the hazards associated with the marine environment and their own vessel, and of how to prevent shipboard incidents including fire;

b) the knowledge necessary to raise and react to alarms and deal with emergencies;

c) an ability to provide assistance in fire and abandonment situations;

d) the knowledge and skills which will enable them to assist in their own survival and rescue.

7.6 Outline

Subject Area	Hours	
	Theory	**Practical**
1. Introduction and Safety 1. Introduction 2. Course safety	0.25 hours	
2. Hazards and Emergencies 1. Types of emergencies 2. Emergencies on small fishing boats	0.25 hours	
3. Emergency Response 1. Signals and alarms 2. Muster lists 3. Drills and training 4. Action upon discovering emergency 5. Action when called to an emergency	1.0 hour	
4. Marine Firefighting 1. Nature of fire 2. Principles of extinguishment 3. Classes of fire and their symbols 4. Extinguishing agents 5. Portable extinguishers 6. Fire response and fire extinguishing 7. Fire causes and prevention	1.5 hours	
5. Lifesaving Appliances and Abandonment 1. Lifejackets and flotation devices 2. Immersion suits and work suits 3. Life buoys 4. Life rafts, emergency boats and equipment	1.75 hours	0.75 hours
6. Survival 1. Factors relating to survival 2. Actions to increase chances of survival and rescue 3. Actions taken after abandoning in a survival craft	0.5 hours	
7. Signalling 1. Recognition and operation of signalling devices including pyrotechnics 2. Electronic communication	0.25 hours	0.75 hours
8. Rescue 1. Rescue equipment 2. Vessel rescue 3. Helicopter rescue	0.5 hours	
9. Evaluation	0.5 hours	
	6.5 hours	**1.5 hour**
Total	**8.0 hours**	

Small Seasonal Passenger-carrying Vessel Safety (certificated personnel)

8.1 General

1) This course is vessel-specific. When taken after the Basic Safety course (MED A_1) or the Small Seasonal Passenger-carrying Vessel Safety course (for non-certificated personnel), it meets the requirements for training with respect to Small Passenger-carrying Vessel Safety (MED A_2).

2) It is intended for holders of a certificate of competency as Master, Limited, or Chief Mate, Limited, of a passenger vessel of less than 60 gross tonnage.

8.2 Equipment requirements

1) Safety training manual for each participant;

2) The vessel's equipment.

8.3 Duration

Minimum 6 hours' theoretical and practical training, including 0.5 hours for evaluation.

8.4 Specific instructor qualifications

The main course instructor must hold, at a minimum, a certificate of competency as Master, Limited, and have completed MED B_1 and B_2 or MED with respect to STCW basic safety.

8.5 Goals and criteria

1) To provide officers with a knowledge of:

   a) current regulations with regard to fire and boat drills, life saving apparatus and safety equipment;

   b) proper stowage, care, maintenance and servicing requirements for safety equipment and appliances on board the vessel;

   c) crew management with regard to safety, training and organization;

   d) shipboard administration and appropriate record-keeping;

   e) crowd and passenger control.

8.6 Outline

Subject Area	Hours	
	Theory	**Practical**
1. Maintenance and Inspection of Emergency Equipment 1. Manufacturer's guidelines 2. Periodic inspections 3. Servicing 4. Firefighting equipment 5. Fixed systems 6. Communication equipment 7. Survival craft and launching systems 8. Personal lifesaving equipment 9. Record-keeping	2	1.5
2. Passenger Control 1. Planning 2. Conducting drills 3. Lifesaving appliances and control plans 4. Assisting passengers en route to muster and embarking stations 5. Muster procedures 6. The human factor	2	
3. Evaluation	0.5	
	4.5 hours	**1.5 hours**
Total	**6 hours**	

Small Seasonal Passenger-carrying Vessel Safety (non-certificated personnel)

9.1 General

There are a large number of non-certificated personnel on vessels who are summer students employed on a short-term basis, many for one season only. This chapter describes vessel-specific, on-board basic safety training to be given when these employees commence their shipboard employment.

9.2 Equipment requirements

1) Safety training manual for each participant;
2) Safety training log for crew members;
3) One approved lifejacket for each participant;
4) One approved life buoy with line;
5) One approved life buoy light;
6) One dry chemical portable extinguisher;
7) One fire hose with water pressure;
8) Steel tray for containing fire;
9) Supply of gasoline and lubricating oil for the fire tray;
10) Hand flares;
11) Visual or audio-visual presentation on:
    a) launching and operation of life rafts / platforms,
    b) nature of fire.

9.3 Duration

Minimum 6 hours including 1.5 hours for practical exercise and 0.5 hours for evaluation, assuming some pre-course reading is assigned. Training providers are cautioned that students who do not complete a certain amount of pre-course reading may require more than 6 hours to complete this course.

9.4 Specific instructor qualifications

The main course instructor must hold a certificate of competency and have completed MED B_1 and B_2 or MED with respect to STCW Basic Safety. If the course is under the supervision of more than one instructor, the assistant instructors must hold qualifications related to the marine industry or have related skills and be approved in accordance with the *Quality Management Manual – Marine Personnel Standards and Pilotage* referred to in Chapter 3.

9.5 Goals and criteria

To provide crew members with:

a) a basic understanding of the hazards associated with the marine environment and their own vessel;

b) the knowledge necessary to raise and react to alarms and deal with the initial stage of an emergency;

c) an ability to provide assistance in fire, abandonment and other emergency situations;

d) the knowledge and skills to assist in their own survival and rescue;

e) the ability to knowledgeably follow orders from the vessel's officers in emergency situations.

9.6 Outline

Subject Area	Hours	
	Theory	**Practical**
1. Types of Emergency 1. Fire and explosion 2. Collision 3. Structural failure 4. Grounding 5. Stranding 6. Capsizing 7. Weather conditions	0.25	
2. Emergency Response 1. Muster stations and station 2. Drill – general alarm 3. Fire alarm 4. Duties of individuals and groups 5. Chain of command 6. Location of escape routes 7. Response to the discovery of a fire 8. Response to person overboard 9. Response to flooding 10. Response to unconscious casualty / injured person	0.5	
3. Lifesaving Appliances 1. Lifejackets 2. Life buoys 3. Buoyant apparatus 4. Inflatable platforms 5. Inflatable life rafts	1.0	
4. Abandonment and Survival (includes video presentation on life rafts) 1. Life rafts / platforms & buoyant apparatus – drills 2. Survival: hypothermia, panic, crowd control	0.5	
5. Rescue (includes video presentation on flares) 1. Knowledge and use of flares	0.5	
6. First Aid 1. Emergency response and reporting procedures (not First Aid training as such)	0.25	
7. Firefighting (includes video presentation) 1. Knowledge of on-board hoses and fire hydrants 2. Knowledge of dry chemical fire extinguishers 3. Hands-on extinguishing of a pan fire using dry chemical extinguisher 4. Use of and familiarization with fire hose and nozzle	1	1.5
8. Evaluation	0.5	
	4.5 hours	**1.5 hours**
Total	**6 hours**	

STCW Basic Safety

10.1 General

1) This course meets the requirements of STCW Convention Regulation VI/1 and STCW Code Tables VI/1-1 through VI/1-4, *Basic Safety Training for Seafarers*.

2) STCW Code Table VI/1-3 specifies the minimum standard of competence in elementary first aid. Therefore presentation of a valid certificate of completion of the Marine Basic First Aid course is required before the school can issue an STCW Basic Safety Training certificate.

10.2 Equipment requirements

1) One portable lifeboat or rescue boat;

2) One inflatable life raft (Minimum 4 persons) with equipment, including emergency position-indicating radio beacon (EPIRB);

3) An approved lifejacket for each participant;

4) A complete firefighter's suit for each participant;

5) A variety of immersion suits for 100% of the participants;

6) Two approved life buoys, one with a line and the other with an approved light and buoyant smoke signal;

7) One rescue sling;

8) One rescue blanket;

9) Training models of luffing, gravity and single arm davits and marine evacuation systems (may be replaced by audio-visual presentation);

10) A variety of hand flares, parachute rockets and day smoke signals;

11) Two portable 2-way radiotelephones approved for use in survival craft;

12) One demonstration Class 1 EPIRB;

13) One demonstration search and rescue transponder (SART);

14) Instructional models and audiovisual facilities;

15) Access to swimming pool with facilities to jump from a height of 3 metres, showers, changing rooms and drying room for wet gear;

16) Visual or audio-visual presentation on:

    a) totally enclosed motor propelled survival craft (TEMPSC),

    b) partially enclosed lifeboat,

    c) open lifeboat,

    d) fast rescue craft (FRC),

e) emergency multiple person rescue apparatus (EMPRA),

f) hypothermia, its effects and ways of overcoming it;

17) A two-storey steel vessel mock-up, rectangular in shape and measuring approximately 11m x 6m. The mock-up is to be divided into compartments such as cabins, corridors, open rooms, an electric switchboard room, an engine room with a grating floor, and connecting doors, so as to expose participants in a realistic manner to shipboard fires. Means shall also be provided to teach participants how to use escape ladders and hatchways and how to effectively cope with engine-room fires. There must be an efficient communication system whereby commands from a command post can be relayed to participants at the emergency locations within the mock-up;

18) A fire box with an open top and with its front divided into compartments, in which the three types of fire can be lit and extinguished by the participants. Alternatively, steel trays approximately 1m x 1m x .3m high with a raised back plate can be used;

19) A steel or open concrete pit approximately 2.5m x 2.5m x .3m for simulating large oil fires;

20) Means of simulating engine-room bilge oil fires;

21) Steel trays for containing fires;

22) One smoke generator;

23) Two fire hydrants with two outlets each, with keys and bars to operate the hydrant supply;

24) A large supply of carbonaceous matter and hydrocarbons (wood, diesel and lubricating oils, etc.) for the fire trays;

25) Six fire hoses (65 mm in diameter);

26) Eight fire hoses (38 mm in diameter);

27) Six fire nozzles (2 standard, 2 diffuser, 2 jetspray);

28) Sufficient hoses and water pressure to supply a minimum of 3 (38 mm) nozzles at each live fire location;

29) One generator of high-expansion foam, and foam compound;

30) Two mechanical foam branches;

31) One international shore connection;

32) Thirty sets of protective clothing, overalls, gloves, fire boots, helmets, and rain-proof clothing;

33) Twenty-five sets of self-contained breathing apparatus (SCBA) with visor and neck protector, complete with spare cylinders, spare parts and maintenance tools including sets for instructors only;

34) Facilities and equipment for cleaning, inspection and maintenance of SCBA after use;

35) Portable extinguishers with refills:

a) Six water (9 litres),

b) Six foam (9 litres),

c) Six carbon dioxide (5 kilograms),

d) Twelve dry powder (10 kilograms).

10.3 Duration

43 hours.

10.4 Specific instructor qualifications

The main course instructor must hold a Master certificate not lower than a Master 500 Gross Tonnage, Near Coastal certificate, a Fishing Master, First Class certificate or a Third-Class Engineer certificate. If the course is under the supervision of more than one instructor, the assistant instructors must hold qualifications related to the marine industry or have related skills and be approved in accordance with the *Quality Management Manual – Marine Personnel Standards and Pilotage* referred to in Chapter 3.

10.5 Outline

Subject Area	Hours	
	Lecture	Practical
1. Introduction and Safety	0.5	
2. Hazards, Emergencies and Pollution Prevention	2.5	
3. Firefighting Theory	2.0	
4. Fire Control Aboard Vessels	1.0	
5. Shipboard Firefighting Organization	1.5	
6. On-board Training and Practical Firefighting	5.0	14.0
7. Use and Care of Firefighting Equipment		2.0
8. Lifesaving Equipment and Abandonment	2.5	2.5
9. Survival	2.0	1.0
10. Communications	1.0	
11. Rescue	0.5	0.5
12. Safe Working Practices	0.75	
13. Effective Human Relationships on Board Vessels	0.75	
14. Practical Exercises and Evaluation	1.0	2.0
Sub-total	**21.0**	**22.0**
Total	**43.0 hours**	

10.6 Syllabus

Subject Area	Hours	
	Lecture	Practical
1. Introduction, Safety and Principles **1.1 Introduction** **1.2 Safety during the course** .1 safety rules laid down by the instructor must be followed at all times .2 when we are handling actual equipment, such as pyrotechnics, all safety precautions must be adhered to .3 because we are simulating incidents in the actual environment, particular care must be exercised at all times	**0.5**	
2. Hazards, Emergencies and Pollution Prevention **2.1 Types of emergencies** .1 emergencies associated with the marine environment: – fire – collision – stranding – explosion – icing	**2.5**	

Subject Area	Hours	
	Lecture	Practical
– equipment failure – capsizing – weather conditions – flooding – person overboard .2 medical emergencies **2.2 Problems and effects** .1 particular problems associated with emergencies listed in 2.1.1 **2.3 Principles of safety on board vessels** .1 principles of survival in relation to shipboard emergencies, including: – fire theory and fire precautions – regular training and drills – preparedness for any emergency – escape routes – regular inspection and maintenance of: – fire detection equipment – firefighting equipment – firefighter's outfits and breathing apparatus – personal survival equipment – shipboard lifesaving equipment – communications equipment **2.4 Pollution prevention** .1 shipboard duties in relation to prevention of pollution from the vessel .2 shipboard emergency response plans		
3. Firefighting Theory **3.1 Conditions for fires** .1 conditions for fire to occur .2 how the three conditions can be represented as a triangle (the fire triangle) .3 how the addition of a "chain reaction", forming a square or a tetrahedron, represents a continuously burning fire **3.2 Principles of firefighting** .1 removal of one of the sides of the fire tetrahedron .2 use of water as a firefighting medium .3 dangers of using water in certain circumstances .4 use of carbon dioxide as a firefighting medium .5 use of halon or alternatives as a firefighting medium .6 use of foam as a firefighting medium .7 use of chemical powder as firefighting medium .8 importance of cutting off the fuel supply in certain situations .9 ways of cutting off the supply of fuel .10 importance of controlling the ingress of air and ways of doing so	**2.0**	

Subject Area	Hours	
	Lecture	Practical
3.3 Properties of flammable materials .1 definitions: – flammability – ignition point – burning temperature – burning speed – thermal value – lower flammable limit (LFL) – upper flammable limit (UFL) – flammable range – flashpoint – auto-ignition .2 examples of how static electricity can occur .3 reactivity .4 ignition sources **3.4 Fire hazard and spread of fire** .1 heat flow – conduction – radiation – convection currents .2 spread of fire as result of equalization in temperature between fire and surroundings, through the above methods .3 examples of each method of propagation .4 fire hazards in the engine-room .5 fire hazards in the galley .6 fire hazards in accommodation .7 fire hazards from cargoes .8 fire hazards from smokers .9 four phases of fire development: – ignition (incipient fire) – developing (surface fire) – absolute fire (fire in depth in solids) – burning out .10 temperature of a normal fire, such as a coal, wood or hydrocarbon fire, and temperature of burning metals .11 effect of temperature rise on the rate of the chain reaction, i.e. fire intensity **3.5 Classification of fires and appropriate extinguishing agents** .1 classification letters (of one or both systems of classification) and appropriate extinguishing agents .2 the need to know which system of classification has been used by the manufacturer of an extinguisher and the importance of heeding diagrammatic or written warnings of the types of fire for which it is unsuitable .3 importance of selecting suitable extinguisher to fight a fire in energized electrical equipment because using some extinguishers marked as suitable for Type C fires (ISO classification) could result in electrocution of the operator or of		

Subject Area	Hours	
	Lecture	Practical
personnel nearby, whereas all extinguishers marked as suitable for class C fires (NFPA classification) are suitable for electrical fires.		
4. Fire Control Aboard Vessels **4.1 Areas of fire hazard** .1 causes, and methods of detecting, containing and extinguishing fires in: – machinery spaces – accommodation – galley spaces – radio room, battery room and other electrical equipment spaces – holds and containers – spaces containing flammable stores **4.2 Fire precautions** .1 structural fire protection provisions .2 firefighting equipment and systems and their distribution and quantity .3 fire safety procedures .4 precautions for storage of flammable stores .5 procedures to be observed when a vessel is in dry dock for repairs	**1.0**	
5. Shipboard Firefighting Organization **5.1 Basic knowledge of vessel organization during a fire, sufficient for crew member who is part of fire team** .1 central control station is on the bridge; master is in charge and fire officer(s) reports to bridge and receives instructions .2 information required by central control station .3 information which must be available to central control station .4 methods of communicating with central control station .5 methods of damage control and containment of fires, including: – closing, manually or from the bridge, of watertight and fire doors – stopping of ventilation fans and closing of dampers – closing of all windows and portholes in accommodation, galley and other spaces – turning the vessel to give best position relative to wind direction for fighting the fire – cooling boundary bulkheads – using fire blankets as necessary – maintaining a fire watch after the fire is extinguished .6 organization of emergency parties, including: – how each emergency party is identified – how each member of an emergency party is identified and the safeguards for keeping in contact with each person and monitoring his position	**1.5**	

Subject Area	Hours	
	Lecture	Practical
– the duties of each emergency party, including: – reconnaissance team, equipped with portable fire extinguishers – fire hose team(s) – help, search and first aid team – engine-room team – bridge team – lifeboat/raft team .7 awareness of possible detrimental effect of extinguishing water on stability		
6. On-board Training and Practical Firefighting	**5.0**	**14.0**
6.1 On-board training .1 upon joining a vessel, crew members must receive instruction on emergency procedures and be trained in the use of the vessel's firefighting equipment, paying particular attention to: – the location and use of portable and mobile fire extinguishers – the location and use of fixed firefighting equipment – the location and use of firefighter's outfits, including compressed air breathing apparatus .2 upon joining a vessel, members of emergency parties must receive training in: – the duties of each party to which a crew member may be assigned – the duties of each member of a party and how these duties are allocated – other duties to make each party proficient, including first aid and other emergency duties .3 crew members who operate a fire patrol system must receive training to ensure that they are familiar with the arrangements of the vessel, including: – manually operated call points – fixed fire-detection and alarm system – telephones – portable fire extinguishers and their limitations – hydrants, hoses and nozzles .4 that crew members must receive ongoing training in the form of realistic but safe fire and emergency drills held in various areas of the vessel, including training in: – manually operating watertight doors – moving and finding one's way in spaces with restricted visibility – moving through small apertures – finding and removing casualties – using compressed-air breathing apparatus and firefighter's outfits – fighting mock fires in machinery spaces, accommodation		

Subject Area	Hours	
	Lecture	Practical
spaces, galley, deck containers and cargo spaces **6.2 Practical firefighting** Knowledge of the function of the following equipment and an ability to: .1 use portable fire extinguishers, including: – water – foam – dry chemical – carbon dioxide – halon or alternate agent .2 use mobile fire extinguishers, including: – foam – dry chemical – carbon dioxide .3 use fixed fire equipment, including: – fire hydrants, hoses and nozzles – water sprinklers and water sprays – foam system .4 don firefighter's outfit, including: – protective clothing – breathing apparatus, including check on its operation and air supply – lifeline, including knowledge and use of signaling codes .5 perform general functions, including: – starting emergency fire pumps – opening and closing valves, remote shutoffs and ventilation – identifying emergency controls and their function .6 move through spaces in firefighter's outfit and breathing apparatus, in low visibility, and conduct rescue .7 participate in a team to fight fires in the mock-up, using fire hose and nozzles, including: – small fires – extensive fires – fighting fires with foam		
7. Use and Care of Firefighting Equipment .1 proper stowage of firefighter's outfits after use to ensure they are ready to use again, including replacement of air cylinders and reporting of defects .2 proper stowage of firefighting equipment after use and reporting of defects		**2.0**
8. Lifesaving Equipment and Abandonment	**2.5**	**2.5**
8.1 Lifejackets .1 what is a standard approved lifejacket .2 number of lifejackets required on a vessel .3 proper method of donning a lifejacket and use of attachments .4 entering water from a height and swimming while wearing a lifejacket		

Subject Area	Hours	
	Lecture	Practical
.5 care and stowage **8.2 Immersion suits** .1 qualities of an immersion suit .2 proper procedure for donning suit in darkness, and with necessary speed, and use of attachments .3 entering water from a height and swimming while wearing an immersion suit .4 care and stowage **8.3 Life buoys** .1 number of life buoys required on a vessel .2 markings, colour, vessel name, retro-reflective tape .3 lights and smoke signals .4 how to correctly use a life buoy (throwing, entering and securing in it while in the water and waiting for rescue) .5 care and stowage **8.4 Survival craft and equipment** .1 basic types and qualities of a life raft .2 stowage and releasing mechanism .3 how to correctly launch an inflatable life raft .4 boarding the life raft from the water .5 the survival pack and how to use it .6 proper righting procedure .7 care and stowage .8 manoeuvring a life raft and setting the anchor to reduce drift **8.5 Survival craft launching devices** .1 characteristics and operation of luffing, gravity and single arm davits .2 marine evacuation systems .3 characteristics and operations of TEMPSC, enclosed lifeboat, open lifeboat and inflatable life raft		
9. Survival (3 hours) **9.1 Survival factors** .1 how each factor affects human response and performance in a survival situation .2 medical aspects of survival, including thermal balance, water balance and energy balance **9.2 Actions to increase chances of survival and rescue** .1 need to stay together in the water .2 Heat Escape Lessening Posture (HELP) .3 how to swim as a group in a chain .4 how to form a huddle in the water .5 dangers of cold water shock and swimming failure .6 dangers of hypothermia: prevention, recognition and treatment .7 stay near spot where vessel went down and stream the sea anchor **9.3 Actions taken in a survival craft after abandoning vessel** .1 action to take after leaving the vessel in an enclosed lifeboat	**2.0**	**1.0**

Subject Area	Hours	
	Lecture	Practical
.2 action to take after leaving the vessel in an open lifeboat .3 action to take after leaving the vessel in an inflatable life raft		
10. Communications **10.1 Recognition and operation of signalling devices & pyrotechnics** .1 daylight signalling mirror (heliograph) .2 signalling flashlight .3 classes of flare, their characteristics and the circumstances in which each is to be used .4 hand flares .5 parachute rockets .6 markings on flares .7 expiry dates .8 care and stowage of flares **10.2 Radio communication equipment** .1 Use of: – EPIRBs – SARTs – Global Marine Distress and Safety System (GMDSS) VHF portable radios	**1.0**	
11. Rescue **11.1 Rescue by civilian or military personnel** .1 description and use of: – sling – basket – net – litter **11.2 Rescue equipment** .1 use of rescue sling .2 use of rescue basket **11.3 Helicopter rescue** .1 action to be taken aboard a vessel .2 action to be taken aboard a raft .3 lifting appliances .4 safety procedures aboard the helicopter	**0.5**	**0.5**
12. Safe Working Practices **12.1 Potential hazards** .1 lifting appliances, other equipment and moving machinery parts .2 unsafe work area, including slippery decks .3 enclosed spaces/holds, tanks and other compartments .4 hot work operations, fire prevention and protection .5 scaffolds and stages .6 ladders and gangways .7 electric equipment, bright lights and noise .8 ineffective safeguards or safety devices .9 pressure vessels .10 obstructed emergency exit	**.75**	

Subject Area	Hours	
	Lecture	Practical
12.2 Protective equipment and devices .1 personal protective equipment .2 notices and signs .3 fitting of guards on fixed and mobile equipment .4 audible warning devices **12.3 Employer's responsibilities** .1 provide safe work environment .2 adopt preventive procedures .3 ensure compliance with safe working practices .4 have periodic inspections by qualified persons .5 provide approved safety equipment and ensure its use **12.4 Employees' responsibilities** .1 acquire knowledge and familiarity with equipment .2 follow instructions .3 obey orders .4 report substandard and dangerous equipment and procedures		
13. Effective Human Relationships on Board Vessels **13.1 Good human and working relationships** .1 social responsibilities .2 employment conditions .3 individuals rights .4 obeying orders of superiors **13.2 Drug and alcohol abuse** .1 dangers .2 symptoms .3 awareness and actions to be taken	**.75**	
14. Practical Exercises and Evaluation	**1.0**	**2.0**

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

11.1 General

This course meets STCW Regulation VI/2-1, *Proficiency in Survival Craft and Rescue Boats other than Fast Rescue Boats*.

11.2 Equipment requirements

1) One set of gravity davits to house the lifeboat, sited so as to allow launching into the open water and recovery;

2) One open motor-propelled lifeboat, approximately 8 metres in length, complete with associated gear (new or replacement boat must be fire-protected TEL complying with SOLAS 1974 Chapter III);

3) One davit-launched inflatable life raft with launching davit;

4) Two inflatable life rafts for 12 or more persons, in containers, one of which is in float-free stowage with hydrostatic release unit;

5) One approved lifejacket for each participant and instructor;

6) A variety of immersion suits for 100% of the participants;

7) Thermal protective aids for at least 50% of the participants;

8) Two approved life buoys, one with a line and the other with an approved light and buoyant smoke signal;

9) One approved line-throwing apparatus;

10) Two portable 2-way radiotelephones approved for use in survival craft;

11) Variety of hand flares, parachute rockets and day smoke signals;

12) One demonstration Class 1 emergency position-indicating radio beacon (EPIRB);

13) One demonstration search and rescue transponder (SART);

14) One rescue sling;

15) One rescue basket;

16) One rescue net;

17) One basket-type stretcher;

18) Instructional models and audiovisual facilities;

19) Access to swimming pool with facilities to jump from a height of 3 metres, showers, changing rooms and drying room for wet gear.

11.3 Duration

28 hours.

11.4 Specific instructor qualifications

The main course instructor must hold a Master certificate not lower than a Master 500 Gross Tonnage, Near Coastal certificate, a Fishing Master, First Class certificate or a Third-class Engineer certificate. If the course is under the supervision of more than one instructor, the assistant instructors must hold qualifications related to the marine industry or have related skills and be approved in accordance with the *Quality Management Manual – Marine Personnel Standards and Pilotage* referred to in Chapter 3.

11.5 Outline

Subject Area		Hours	
		Lecture	**Practical**
1.	Introduction and safety	0.75	
2.	Emergency situations	0.5	
3.	Principles of survival	0.75	
4.	Use of personal survival equipment		3.0
5.	Methods of helicopter rescue	1.0	0.5
6.	Survival craft and rescue boat	0.75	
7.	Launching arrangements	0.75	
8.	Lifeboat engine and accessories	1.0	0.5
9.	Evacuation	0.75	0.5
10.	Signalling equipment and pyrotechnics	0.25	0.5
11.	Actions to take when aboard a survival craft	1.5	
12.	Drills in launching and recovering boats		3.0
13.	Launching and handling survival craft in rough weather	1.5	
14.	Radio equipment	0.5	1.0
15.	Drills in launching life rafts		3.0
16.	Practical exercises and evaluation	2.0	4.0
	Sub-total	**12.0**	**16.0**
	Total	**28.0**	

11.6 Syllabus

Subject Area	Hours	
	Lecture	Practical
1. Introduction and Safety 1.1 Introduction 1.2 Safety guidance .1 safety rules laid down for the course by the chief instructor .2 use of the orders "STILL" and "CARRY ON" and the actions to be taken on hearing them	**0.75**	
2. Emergency Situations 2.1 Types of emergency .1 emergencies which may lead to abandoning vessel, such as: – fire – collision – stranding – explosion – adverse reaction of dangerous goods or hazardous bulk cargo – shifting of cargo – foundering .2 particular difficulties with regard to abandonment which may be encountered in the various types of emergency .3 in the case of fire, it may be prudent to launch or prepare to launch some or all survival craft immediately, for stand-by while firefighting continues 2.2 Emergency signals .1 general emergency alarm signal .2 fire alarm signal .3 who would give the signal to abandon vessel and how the signal might be made .4 emergency signs and symbols 2.3 Muster list .1 contents of a muster list .2 duties assigned to each member of the crew .3 person in charge of a survival craft must have a list of its crew .4 person in charge of the survival craft has duty to see that the crew under his command are acquainted with their duties .5 second in command must also have a list of the crew .6 muster list specifies substitutes for key persons who may become disabled .7 muster list specifies which officers are assigned to ensuring that lifesaving and fire appliances are maintained in good condition and are ready for immediate use	**0.5**	
3. Principles of Survival 3.1 Training and drills .1 need for regular training and drills .2 requirements for abandon vessel drills .3 requirements for on-board training and instruction in the use of the vessel's lifesaving appliances	**0.75**	

Subject Area	Hours	
	Lecture	Practical
.4 need to be familiar with all of the vessel's lifesaving appliances .5 contents of training manual(s) .6 symbols related to lifesaving appliances and arrangements 3.2 Actions to be taken when called to survival craft stations .1 personal preparation for abandoning vessel .2 person in command of each survival craft must check that all crew are present and that crew and passengers are suitably dressed and have correctly donned lifejackets .3 preparations which must be made for launching survival craft .4 boats must only be lowered to embarkation deck level on instructions from the master .5 persons assigned in the muster list must take emergency radio equipment, EPIRBs and other items to their stations 3.3 Actions to be taken when required to abandon vessel .1 vessel must only be abandoned on the orders of the master or person in charge of the vessel .2 additional items which may be put into a lifeboat when time permits .3 supervising the process of boarding lifeboats .4 supervising the process of boarding davit-launched life rafts .5 method of boarding throw-over life rafts from the vessel .6 jumping onto inflatable life rafts .7 keeping dry when boarding survival craft .8 immersion suit or thermal protective aid must be worn if required .9 person in charge must ensure that all of the boat's crew are present and all occupants are seated, with safety belts fastened where appropriate, before lowering .10 check to ensure that hands and arms are clear of the boat's sides .11 when lifeboat engines must be started .12 water spray and air support systems must be set to operate and the closure of hatches must be checked if launching into oil on the surface .13 check that it is clear below before lowering a boat or throwing a raft overboard .14 what the person in charge must do 3.4 Actions to be taken when in the water .1 never enter water without a lifejacket .2 anything buoyant will help a survivor in the water .3 a person in the water will cool and suffer from exposure very quickly, even in temperate areas, unless wearing an immersion suit .4 survivors in the water must swim to survival craft, buoyant wreckage or one another if within range, but otherwise avoid unnecessary exertion .5 lifejacket light and whistle as an aid to rescue .6 how to hold on to a boat or raft		
4. Use of Personal Survival Equipment 4.3 Immersion suits .1 maintenance, storage and operation of immersion suit .2 unpacking and donning an immersion suit .3 while wearing an immersion suit and lifejacket: – jump from a height into the water – swim a short distance		**3.0**

Subject Area	Hours	
	Lecture	Practical
– join or leave a group 4.4 Thermal protective aids .1 unpack and don a thermal protective aid in a life raft/lifeboat .2 put a thermal protective aid on a person simulating unconsciousness in a life raft/lifeboat 4.5 Boarding a life raft from the water .1 board a life raft from the water while wearing a lifejacket/immersion suit .2 assist an exhausted survivor to board a life raft .3 throw the rescue quoit and line to a person in the water 4.6 Righting an inverted life raft .1 right an inverted life raft while wearing a lifejacket 4.7 Boarding a survival craft on vessel while wearing a lifejacket/ immersion suit		
5. Methods of Helicopter Rescue 5.1 Communicating with the helicopter .1 hand and arm hoisting signals .2 information may be passed to the helicopter through shore-based radio stations or shipboard radio if suitable equipment is available 5.2 Evacuation from vessel and survival craft .1 requirements for a helicopter pick-up area on board .2 importance of flood lighting obstructions such as masts and funnel at night .3 helicopter winch cable must never be secured to any part of the vessel .4 lifejackets must be worn during evacuation by helicopter .5 how to evacuate lifeboats and life rafts .6 precautions against helicopter down-draft overturning life raft .7 method of discharging static electricity .8 pilot's instructions must be followed .9 need to prepare evacuation area .10 .11 importance of attaching medical requirements and documents to injured person 5.3 Helicopter assistance .1 methods of lifting people with a: – sling – basket – net – litter .2 an injured person must be transferred from the vessel's stretcher to the rescue litter provided by the helicopter .3 how a member of the helicopter crew may assist in picking up survivors .4 correct way to don a rescue sling when on deck or in water, and adopting a safe posture in the sling	**1.0**	**0.5**
6. Survival Craft and Rescue Boats 6.1 Lifeboats .1 construction and fittings of the following lifeboats: – open	**.75**	

Subject Area	Hours	
	Lecture	Practical
– partially enclosed – self-righting partially enclosed – totally enclosed – with a self-contained air support system – fire-protected .2 particular characteristics and facilities of each type of boat listed in 6.1.1 .3 interpreting the markings on a lifeboat to determine the number of people it can carry, including numbering of lifeboats 6.2 Life rafts .1 construction, particular characteristics and facilities of: – inflatable life rafts – rigid life rafts – evacuation systems/platform .2 stowage of life rafts .3 interpreting the markings on a life raft container to determine the number of people it can carry and how to move it 6.3 Rescue boats .1 construction, particular characteristics and facilities of rescue boats .2 requirements for survival craft and rescue boats on: – passenger vessels – cargo vessels .3 interpreting the markings on a rescue boat to determine the number of people it can carry		
7. Launching Arrangements 7.1 Boat davits .1 stowage arrangements, securing, gripes, tricing pendants and methods of launching and recovering boats with: – gravity davits – luffing davits – single-arm davits .2 methods of disengaging lifting hooks .3 on-board maintenance of davits, falls and disengaging gear 7.2 Life raft davits and related systems .1 life raft launching davits .2 operation of the release hooks .3 how the hook is recovered and made ready for launching another life raft 7.3 Free-fall lifeboat .1 arrangements for free-fall launching over the stern .2 a gantry as an alternative method for launching and recovering the boat 7.4 Float-free arrangements .1 working of a hydrostatic release unit for the life raft securing strap .2 sequence of events leading to the release of the fully inflated life raft in the case of a sinking vessel .3 on-board maintenance of hydrostatic release units	**.75**	
8. Lifeboat Engine and Accessories 8.1 Starting the engine (manual, electric, hydraulic)	**1.0**	**0.5**

Subject Area	Hours	
	Lecture	Practical
.1 check levels of fuel and lubricating oil .2 check that gear lever is in neutral .3 follow manufacturer's instructions and set controls .4 prime fuel system, if necessary .5 start engine and adjust fuel setting .6 check oil pressure gauge and water cooling, if applicable .7 operate ahead and astern propulsion .8 stop engine and turn off fuel .9 how to clean the fuel tank .10 quantity of fuel required for a lifeboat .11 use of block heaters, when fitted .12 how to start a cold outboard motor engine .13 manufacturer's specification for petrol/oil mixture must always be followed to avoid damage to the engine .14 manual/hydraulic/electric start 8.2 Cooling systems .1 description of the following cooling systems: – air-cooled – freshwater-cooled – seawater-cooled .2 freshwater cooling systems require protection with antifreeze when in cold areas .3 engine must be capable of running with the lifeboat out of the water for a minimum of 5 minutes .4 outboard engines must never be started out of the water .5 outboard engines must never be positioned horizontally because cooling water may drain into them 8.3 Battery charging and block heater .1 batteries for engine starting, searchlight and fixed radio installation can be charged from the engine .2 arrangements for charging batteries from the vessel’s power supplies 8.4 Water spray system .1 fire-protected lifeboats are fitted with a water spray system which can be turned on or off .2 how to activate/engage a water spray system .3 spray is driven by a self-priming pump that starts as soon as the boat enters the water .4 system must be flushed with fresh water and completely drained after drills 8.5 Self-contained air support system .1 all entrances and openings must be closed when using the self-contained air support system .2 system will keep air breathable and allow engine to run normally for at least 10 minutes .3 how to activate air supply system		
9. Evacuation	**0.75**	**0.5**
9.1 Launching .1 importance of checking that launching area is clear below before lowering survival craft		

Subject Area	Hours	
	Lecture	Practical
.2 how boat painters must be set up before launching .3 use of bowsing-in for boarding and slacking off with tackles .4 how to bowse-in tackles .5 lowering the boat from the dock and from on board .6 unhooking of falls or operation of disengaging gear .7 difference between normal release and on-load release, and when each would be used .8 the difficulties which could arise if the vessel is still making headway and the boat is launched at more than 5 knots .9 launching of davit-launched life rafts .10 bowsing lines and painter must be passed into the life rafts before lowering, to ensure that they do not snag .11 release hooks for davit-launched life rafts .12 when to release the safety-catch on the hook, if fitted .13 when to unload lifeboat ladder .14 keep the lifelines clear .15 watch waves before launching .16 watch overboard discharges .17 wait for winch operator before leaving vessel		
9.2 Clearing the vessel's side .1 how to get clear of the vessel's side in a lifeboat: – using the engine – under oars .2 how the painter can be used to assist in clearing the vessel's side .3 how to clear the vessel's side in a life raft .4 hot to get away from the lee side of a vessel		
9.3 Marshalling life rafts and rescuing survivors from the sea .1 explains that motor lifeboats and rescue boats must be used to tow life rafts clear and pick up survivors in the water .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		
9.4 Actions to take when clear of the vessel .1 boats and rafts must attempt to get about 100 m clear of the vessel .2 how survival craft should be secured together .3 use of sea anchors .4 immediate actions: – inventory of survivors – stream sea anchor – turn on EPIRB – erect canopy in boats – issue anti-seasickness pills – bail craft dry – treat the injured – inflate life raft floor in cold conditions – get radio equipment ready – post lookouts		

Subject Area	Hours	
	Lecture	Practical
– use daylight signalling mirror (heliograph) – instruction and practice in the use of pyrotechnics – secure to other survival craft and look for survivors in the water .5 need to ventilate a life raft after it has been inflated before closing the openings .6 instructions on how to survive are available aboard life rafts		
10. Signalling Equipment and Pyrotechnics 10.1 Actions to take when clear of the vessel .1 devices for signalling or attracting attention: – pyrotechnics – torch suitable for Morse signalling – daylight signalling mirror – whistle – EPIRB/SART/VHF .2 how to use the daylight signalling mirror .3 a copy of the lifesaving signals is provided 10.2 Line-throwing apparatus .1 Safe and effective use of line-throwing apparatus	**0.25**	**0.5**
11. Actions to Take when Aboard a Survival Craft 11.1 Routines for survival .1 person in charge must do everything possible to maintain morale by displaying knowledge and leadership .2 organizing survivors to undertake tasks for their safety and comfort helps to maintain morale .3 importance of maintaining a constant lookout .4 instructions which must be given to the lookouts .5 other tasks which must be assigned to crew members .6 main dangers to survivors 11.2 Use of equipment .1 normal equipment of a lifeboat .2 normal equipment of a life raft .3 use of each piece of equipment .4 stowage of the equipment .5 equipment not actually in use must be stowed in lockers or containers or lashed down so that it will not be lost in the event of a capsize .6 markings and use of a boat compass 11.3 Apportionment of food and water .1 quantities of food and water carried in a: – lifeboat – life raft .2 how to ration and issue water and emergency food .3 dangers of drinking seawater .4 arrangements for collecting rain water and how to store it .5 eating fish or foods other than the survival craft rations increases dehydration .6 how to minimize dehydration in hot conditions .7 necessity of portable water in winter conditions	**1.5**	

Subject Area	Hours	
	Lecture	Practical
12. Drills in Launching and Recovering Boats .1 act as an efficient member of a launching crew .2 take charge of and allocate duties for launching, handling and recovery .3 give correct orders for embarkation, launching and clearing the vessel's side .4 demonstrate the ability to row and to steer by compass .5 act as coxswain in handling a lifeboat under power and oars .6 stream a sea anchor		**3.0**
13. Launching and Handling Survival Craft in Rough Weather 13.1 Boats .1 how to reduce the risk of damage to a lifeboat or injury to occupants during lowering if the vessel is rolling heavily .2 use of oil to quell breaking seas along the vessel's side .3 how to lower a boat into heavy swell .4 how blocks may be lifted as soon as unhooked to prevent injury to occupants .5 use of the sea anchor and how to rig an oil bag .6 use of the steering oar when lying to a sea anchor .7 how to heave-to when running before the wind 13.2 Life rafts .1 difficulty getting clear of the lee side of a vessel in strong winds .2 launching position may be different from original location aboard .3 how to position survivors to minimize the danger of capsizing when lying to a sea anchor .4 precautions when lashing a life raft to other survival craft in rough weather .5 towing the raft into open sea for better visibility 13.3 Beaching .1 types of beaches to be avoided if possible .2 beaching should be undertaken in daylight if possible .3 how to beach a boat under oars through surf .4 how to beach a boat under power .5 people must leave a boat over the stern to avoid being swept back to sea by the undertow .6 an effort must be made to save the boat and its gear .7 landing signals for the guidance of small boats with crews or persons in distress .8 how to beach a life raft .9 all gear must be secured and the entrances opened to allow rapid escape .10 raft must be carried clear of the beach to provide continuing shelter for survivors and visibility for search and rescue .11 problems associated with beaching and disembarking an enclosed boat	**1.5**	
14. Radio Equipment 14.1 Portable VHF radio apparatus .1 how to use GMDSS portable two-way VHF radiotelephones, including the need for a dedicated primary battery .2 simulating a MAYDAY call, with the information to be included	**0.5**	**1.0**

Subject Area	Hours	
	Lecture	Practical
14.2 Emergency position-indicating radio beacons (EPIRBs) and search and rescue transponders (SARTs) .1 the requirement for carrying EPIRBs in survival craft .2 Class II EPIRBs .3 Class II EPIRBs are capable only of manual activation and deactivation .4 apparatus will operate for a period of at least 48 hours .5 survival craft class II EPIRBs operate on the 406 MHz frequency .6 Class I EPIRBs operating on 406 MHz .7 test procedures .8 Class I EPIRB is automatically activated after floating free .9 manual activation and deactivation of the EPIRB .10 EPIRB will operate for a period of at least 48 hours .11 a satellite EPIRB transmits a distress message with a special identification code to a polar orbiting satellite for retransmission to special receiving stations .12 the inspection of EPIRBs and VHF radios is done in conjunction with the ship's radio inspection .13 requirements for carrying search and rescue transponder (SART) .14 stowage requirements of search and rescue transponder (SART) .15 purpose, function and inspection standards for SARTs		
15. Launching Life Rafts 15.1 Davit-launched life rafts .1 act as an efficient member of a launching crew .2 take charge of and allocate duties for launching .3 give correct orders for swinging out the raft, securing it and boarding .4 lower life raft .5 operate the safety catch of the lifting hook, if fitted, at the correct time .6 recover the hook and ready it for the next launch .7 clear away from vessel's side and stream a sea anchor		**3.0**
16. Practical Exercises and Evaluation	**2.0**	**4.0**

Advanced Firefighting

12.1 General

This course meets the requirements of STCW Regulation VI/3, *Advanced Firefighting*.

12.2 Equipment requirements

1) A two-storey steel vessel mock-up having a rectangular shape measuring approximately 11m x 6m. The mock-up is to be divided into compartments such as cabins, corridors, open rooms, an electric switchboard room, an engine room with a grating floor, and connecting doors, in such a manner as to expose the participant in a realistic manner to shipboard fires. Means shall also be provided to teach participants how to use escape ladders and hatchways and how to effectively cope with engine-room fires. There must be an efficient communication system whereby commands from a command post can be relayed to participants at the emergency locations within the mock-up.

2) A fire box with an open top and with its front divided into compartments, in which the three types of fire can be lit and extinguished by the participants. Alternatively steel trays approximately 1m x 1m x .3m high with a raised back plate can be used.

3) A steel or open concrete pit approximately 2.5m x 2.5m x .3m for simulating large oil fires

4) Means of simulating engine-room bilge oil fires

5) Two fire hydrants with two outlets each with keys and bars to operate the hydrant supply;

6) A large supply of carbonaceous matter and hydrocarbons (wood, diesel and lubricating oils etc.) for the fire trays, subject to provincial regulations

7) Portable extinguishers with refills:

   a) Six water (9 litres)

   b) Six foam (9 litres)

   c) Six carbon dioxide (5 kilograms)

   d) Twelve dry powder (10 kilograms)

8) Six fire hoses (65 mm in 0diameter)

9) Eight fire hoses (38 mm in diameter)

10) Six fire nozzles (2 standard, 2 diffuser, 2 jetspray)

11) Sufficient hoses and water pressure to supply a minimum of 3 nozzles (38 mm) at each live fire location

12) One generator of high-expansion foam, and foam compound

13) Two mechanical foam branches

14) One international shore connection

15) Thirty sets of protective clothing, overalls, gloves, fire boots, helmets, and rain-proof clothing

16) Twenty-five sets of self-contained breathing apparatus (SCBA) with visor and neck protector, complete with spare cylinders, spare parts and maintenance tools including sets for instructors only;

17) One smoke generator

18) Approved facilities for recharging compressed-air bottles

19) Facilities and equipment for cleaning, inspection and maintenance of SCBA after use

20) Classroom, showers, changing rooms and storage space for equipment.

12.3 Duration

35 hours.

12.4 Specific instructor qualifications

The main course instructor must hold a Master certificate not lower than a Master 500 Gross Tonnage, Near Coastal certificate, a Fishing Master, First Class certificate or a Third-class Engineer certificate. If the course is under the supervision of more than one instructor, the assistant instructors must hold qualifications related to the marine industry or have related skills and be approved in accordance with the *Quality Management Manual – Marine Personnel Standards and Pilotage* referred to in Chapter 3.

12.5 Outline

Subject Area	Hours	
	Lecture	**Practical**
1. Introduction, Safety and Principles	0.5	
2. Training of Seafarers in Firefighting	2.0	
3. Firefighting Process Hazards	1.5	
4. Ventilation Control, including Smoke Extraction	1.5	1.5
5. Monitoring and Control of Stability during Firefighting	0.5	
6. Response of Bridge, Deck and Engine-Room Watch Officers to Emergencies	1.0	
7. Emergency Response Team Leadership	1.0	
8. On-Scene Leaders' Plan of Attack	1.0	1.5
9. Co-ordination of Shipboard Firefighting	3.0	7.0
10. Co-ordination with Shore-based Firefighters	0.5	
11. Management and Control of Injured Persons	0.5	
12. Fixed Fire Detection and Extinguishing Facilities	1.0	3.0
13. Inspection and Maintenance of Emergency Equipment	1.5	2.0
14. Incident Recording	0.5	0.5
15. Crowd Management	1.0	
16. Search and Rescue	1.5	1.5
17. Communications	0.5	0.5
Subtotal	**19.0**	**18.5**
Total	**36.5**	

12.6 Syllabus

Subject Area	Hours	
	Lecture	Practical
1. Introduction, Safety and Principles .1 safety rules laid down by the main instructor, which must be adhered to during the course .2 principles of shipboard emergency response: – knowledge of fire theory and fire precautions – preparedness for any emergency through training and drills – ability to deal with emergencies in a controlled manner by: – providing leadership in emergencies – having a plan of attack for dealing with fire and other emergencies – dealing with other factors in an emergency including: – management of injured personnel – communication with sources of outside help – preparing vessel and personnel for search and rescue – crowd management – coordination with shore-based firefighters	**0.5**	
2. Training of Seafarers in Firefighting .1 how on-board familiarization and safety training is conducted for new crew members, using STCW Convention Chapter VI, STCW Code section A-VI/1, SOLAS Chapter III Regulation 18 and Chapter 4 of this TP .2 methods of instruction suitable for on-board familiarization training: – identify topics or subjects requiring instruction – construct a lesson plan for delivery of the information required – select, identify or produce informative materials and instructional aids – compose evaluation questions to determine whether learning has taken place – select strategies for delivery of training to reflect the education and background of the individuals or class – determine suitable timing and duration of training session – provide documentation on training delivered and evaluation .3 how realistic but safe fire drills can be held in various areas of the vessel, including: – general functions: – starting the emergency generator – starting the emergency fire and bilge pump – selecting the appropriate valves for providing water for firefighting, flooding holds or pumping out bilges – identifying the emergency controls and their functions – improving personal safety by practising: – moving and finding one's way in spaces with restricted visibility – moving through small apertures – finding and removing casualties – using compressed-air breathing apparatus and the fireproof lifeline in these conditions – fighting fires in machinery spaces, accommodation spaces, galley,	**2.0**	

Subject Area	Hours	
	Lecture	Practical
deck containers and cargo spaces, including fires affecting dangerous goods		
.4 how members of fire parties are trained: – instruction in the duties of each fire party to which a crew member may be assigned – instruction in the duties of each member of a fire party and how these duties are allocated, e.g. by number or otherwise – exercises to make each fire party proficient, including first aid		
.5 how crew members who operate a fire patrol system are trained to ensure that they are familiar with the arrangement of the vessel as well as the location and operation of equipment, including: – manually operated call points – fixed fire detection and alarm system – telephones – portable fire extinguishers and their limitations – hydrants, hoses and nozzles		
3. Firefighting Process Hazards	**1.5**	
3.1 Dry distillation .1 dry distillation is a combustion process in which a flammable material burns with insufficient oxygen to achieve complete combustion of the material (an example of dry distillation is the making of charcoal) .2 the following sequence of events is an example of the danger of dry distillation: – fire is in a closed space – heat builds up but there is incomplete burning – the opening of an access introduces fresh air – the result is a flash towards the access opening – people entering will be injured or burned unless they are protected .3 dangers of dry distillation may be mitigated by: – cooling the compartment externally by hosing it with water – entering the access in a crouched position behind a water screen (spray nozzle) – directing water towards the deckhead of the space on fire .4 inadvisability, for the above reasons, of taking hurried action when smoke is seen issuing from a closed cabin **3.2 Chemical reactions** .1 chemical reactions result from adding one or more of the following substances to a chemical: – water – heat – steam – oil – foam – carbon dioxide – sand .2 some of the effects: – explosion following production of flammable gas		

Subject Area	Hours	
	Lecture	Practical
– spontaneous combustion – toxic fumes generated – smoke generated .3 chemical reactions during firefighting are more likely to occur with fire in cargoes and in accommodation areas .4 examples of chemical reactions causing or exacerbating fires, including: – production of acetylene when calcium carbide comes into contact with water – decomposition of steam when applied to coal fires – production of hydrogen when direct reduced iron (DRI) comes into contact with water – oxidizing cargoes, such as some fertilizers, sustaining a fire even if blanketed in an extinguishing gas – cargoes spontaneously igniting in air, e.g. phosphorus when its packaging gets damaged – self-heating of cargoes such as grain when wet – production of dangerous levels of methane in coal cargoes when ventilation is restricted .5 correct response to fire in dangerous goods is given in the IMO publication *Emergency Procedures for Ships Carrying Dangerous Goods* .6 correct response to fire in bulk materials presenting chemical hazards is given in the Emergency Schedules of the *Code of Safe Practice for Solid Bulk Cargoes* published by the IMO .7 determine correct response to fire in a given substance using the General Index of the IMDG Code and the *Emergency Procedures for Ships Carrying Dangerous Goods* .8 determine correct response to fire in a given bulk cargo using the IMO publication *Code of Safe Practice for Solid Bulk Cargoes* **3.3 Boiler uptake fires** .1 boiler uptake fires are those occurring in: – uptakes, economizers and air heaters of steamships – exhaust pipes, economizers and waste-heat boilers of vessels propelled by internal-combustion engines .2 usual cause of such fires is an accumulation of carbon deposits, with or without oil, which become overheated and catch fire .3 difficulties and hazards of fighting these fires: – inaccessibility of all sections of the uptake in the upper section of the engine-room – the possibility of explosion if access doors to the economizer are opened – the possibility of the economizer tubes reaching a temperature of 700°C, when the following can take place: – the iron in the tubes will burn in the presence of steam – the reaction will be self-sustaining and will generate black oxide of iron and free hydrogen as combustion products – the burning of iron in steam will be independent of a supply of oxygen		

Subject Area	Hours	
	Lecture	Practical
– the hydrogen produced will burn if air is introduced – explosion .4 procedure for containing and extinguishing the fire: – shut down the boiler or main engine – spray external surfaces in the way of the fire with water to keep the temperature down – close dampers and boiler crossovers to exclude air from fire – protect essential electrical and other equipment below the fire zone against water damage – continue cooling until it is safe to open the economizer for examination and thorough cleaning on the fire side **3.4 Fires in water-tube boilers** .1 iron-in-steam fires can occur in water-tube boilers due to: – shortage of water in the boiler causing overheating of the tubes above the water level and undue delay in shutting down the boiler – an uncontrollable soot fire in the furnace after a boiler has been shut down in a port, coupled with a shortage of water in the boiler causing overheating of the tubes above the water level .2 if fire is discovered before the temperature of the tube has reached 700°C, the preferred method of firefighting is: – to direct to the source of the fire, through burner apertures or equivalent, the maximum amount of water available as solid jets and through feed pumps, assuming boiler tubes have fractured or burned – to keep air casings and uptakes cool by hosing them with water – to avoid using fire spray nozzles, foam appliances or carbon dioxide directly on the fire .3 firefighting procedures in section 3.3 must be used if an iron-in-steam fire has developed		
4. Ventilation Control, including Smoke Extraction .1 horizontal, vertical and combined ventilation .2 mechanical, hydraulic and natural ventilation .3 positive and negative ventilation techniques .4 manoeuvring of vessel to achieve ventilation .5 use of positive pressure ventilation fans .6 hazards expected during overhaul; need for and use of ventilation	**1.5**	**1.5**
5. Monitoring and Control of Stability during Firefighting .1 how the stability of the vessel is monitored and controlled, including: – calculating the change in GM caused by the weight of the extinguishing water and its free surface effect – arranging pumping or draining of firefighting water from affected spaces, including cutting holes in vessel's side – for cargo fires, calculating the effect of having to move cargo to attack a fire – assessing the effect of any damage which causes spaces to be flooded by seawater	**.5**	

Subject Area	Hours	
	Lecture	Practical
– considering the possibility of moving the vessel to shallow water or even allowing it to ground		
6. Response of Bridge, Deck and Engine-Room Watch Officer to Emergencies .1 initial reactions of the bridge, deck and engine room watch to a specific emergency situation when: – in port – at sea – in drydock or undergoing refit – during lay-up .2 actions to be considered during an emergency situation .3 process of handing over responsibility to senior officers or responsible parties .4 overview of response of the bridge or deck watch to a person overboard situation: – at sea – when secured alongside – at anchor	**1.0**	
7. Emergency Response Team Leadership .1 given information on an emergency situation, assimilate and interpret orders from the Master and pass them on to the available team members, keeping the Master appraised of the ongoing situation – participate in a simulated emergency situation involving various teams and group leaders – discuss leadership style – discuss the need for concise positive orders – discuss leadership by example – discuss the role of the emergency response team within the overall orders and objectives set by senior officers – discuss the response team's communications with senior officers – follow pre-planned actions for emergencies and adjust to meet specific needs – organize equipment and personnel so they are available as required – recognize the value of pre-planning and the use of emergency plans as a reminder of location and for coordination and communication during an emergency	**1.0**	
8. On-Scene Leaders' Plan of Attack .1 identify emergency equipment, fire and watertight subdivisions, stairways, ventilation trunking, fire mains, electric cable runs and hazardous locations on various vessels' plans .2 uses of vessels' plans during emergency .3 establish a preliminary plan for fighting a fire in a specific location indicated on the vessel's plan. Select the appropriate approach and hydrant, including the provision of sufficient hose for the task, establish a staging area and determine how ventilation can be utilized to advantage. Brief the team and communicate readiness, start of firefighting action and progress.	**1.0**	**1.5**

Subject Area	Hours	
	Lecture	Practical
.4 coordinate and control team members and support groups or individuals as required to bring about a positive outcome .5 establish boundary cooling and/or fire patrols around perimeter of fire area and on ventilation trunking passing through area .6 control electric power in the fire area for protection of fire team, bearing in mind the possibility that essential circuits may also pass through the area .7 fire scenarios: – cabin fires – engine-room fires – boatswain's locker or paint locker fires – cargo hold fires on cargo vessels – car deck fires on Ro-Ro vessels – container fires on container vessels – fires on passenger vessels or ferries – helicopter pad fires involving helicopters – tank deck fires on tankers .8 importance of a plexiglass-covered set of plan views and elevations of the vessel for use on the bridge during an emergency, and importance of team leaders having pocket-size plans available		
9. Co-ordination of Shipboard Firefighting	**3.0**	**7.0**
9.1 Vessel at sea .1 how the fire procedure and the emergency stations procedure are put into effect when the fire alarm is given; for example: – the crew assembles at the designated fire stations as given on the muster list – the fire parties assemble, on orders from the bridge, and carry out their tasks aimed at containing the fire – the vessel's course and speed are altered as necessary to assist in containing the fire – the pumps are prepared to dispose of extinguishing water – for engine-room fires, the vessel is stopped – the master decides the most appropriate method for fighting the fire and this is implemented by the fire officer – early preparations are made to launch lifeboats – the appropriate Mayday/Pan Pan or Security message is broadcast .2 how the master controls firefighting operations **9.2 Vessel in port** .1 how the fire procedure and the emergency stations procedure are put into effect when the fire alarm is given (see section 9.1) .2 how the following additional procedures are carried out: – call the port fire brigade – inform the appropriate authority – confirm with harbour master that the master of the vessel will remain in overall charge – confirm with harbour master that the fire brigade will take charge of firefighting operations, assisted by the crew as required – confirm with harbour master that he will keep the master informed of		

Subject Area	Hours	
	Lecture	Practical
any hazards to the dock installation and any actions required – check who is on board – make preparations for vessel to leave port if required, either by own power or with help of tugs – evacuate non-essential personnel **9.3 Vessel with cargo of dangerous goods** .1 how the stowage plan must be marked to show the position and class of dangerous goods .2 how the firefighting plan must be prepared, showing which firefighting media and appliances can safely be used .3 how the dangers and the consequent risk to the crew must be assessed when the cargo is loaded .4 how the fire procedure and the emergency procedure are put into effect when the fire alarm is given (see section 9.1) .5 the danger of rushing into action without knowing the nature of the cargo **9.4 Oil Tankers** .1 how the fire procedure and the emergency procedure are put into effect when the fire alarm is given (see section 9.1) .2 the additional requirements for a tanker, including: – a fixed fire-extinguishing system in the pump-room – remotely controlled foam monitors on the deck – inert-gas or steam-smothering system for the cargo tanks – isolation valves fitted in the fire main at the poop front and at specified distances forward of the poop front to allow: – control of the water supply to the foam monitors in the event of damage to the fire main – control of the water supply if the emergency fire pump is in use – a division into gas-dangerous and gas-free spaces – strict segregation between cargo, machinery/accommodation spaces and water supply systems **9.5 Follow-up action** .1 how, when the fire has been extinguished: – a fire-watch is set up – the requirement for emergency stations is cancelled – an investigation into the fire is begun		
10. Coordination with Shore-based Firefighters .1 procedures relating to: – availability of vessel's plans – consultation with master/OIC on plans to fight fire and roles and responsibilities .2 records must show actions taken and drills conducted	**.5**	
11. Management and Control of Injured Persons .1 describes the immediate and follow-up actions taken .2 describes documentation of reports received from doctors or hospitals	**0.5**	

Subject Area	Hours	
	Lecture	Practical
12. Fixed Fire Detection and Extinguishing Facilities .1 fixed firefighting systems, the areas they would protect, their limitations and the correct procedure for using: – fire main – water sprinkler – water deluge – water curtain – foam – carbon dioxide – halon – deck dry chemical – galley dry chemical – inert gas .2 correct operation of water, halon, dry chemical, foam and CO_2 fixed firefighting systems: – pre-activation check and actions – activation, and injection of agent into protected area – post-activation check and actions	**1.0**	**3.0**
13. Inspection and Maintenance of Emergency Equipment **13.1 Fire alarms** .1 for the fire alarms and actuating switches: – a plan must be available which shows their positions – a schedule must be prepared that shows dates when surveys, inspections, maintenance and testing must be carried out – a record must be kept of defects found and repairs carried out – the manufacturer's instruction manual must be used as a basis for the schedule referred to above **13.2 Fire detection equipment** .1 a scheme similar to that in 13.1 must be prepared and implemented .2 the maintenance schedule must also include testing the operation of: – smoke (ion) detectors – flame detectors (infrared or ultraviolet rays from the flames) – heat detectors (thermal contact) – rate-of-change-of-temperature detector – bursting temperature of sprinkler bulb in a sprinkler system **13.3 Fixed fire-extinguishing equipment** .1 a scheme similar to that in section 13.1 must be prepared and implemented for each type of fixed fire-extinguishing equipment .2 additional maintenance required for a sprinkler system .3 additional maintenance required for a carbon dioxide system; maintenance schedule for a carbon dioxide system must also include testing the level of liquid / gas in the cylinders .4 additional maintenance required for a halon system .5 additional maintenance required for a fixed-pressure water-spraying system .6 additional maintenance required for a foam making system	**1.5**	**2.0**

Subject Area	Hours	
	Lecture	Practical
13.4 Fire main, hydrants, hoses and nozzles .1 a scheme similar to that in section 13.1 must be prepared and implemented .2 additional maintenance required for the fire mains, hydrants and nozzles .3 measures that have to be taken in icy conditions to keep the fire-main system free of ice: – shut down the pump and close valves as required – drain all water from the pipes – keep checking that the system is empty of water – put up warning notices on the bridge that the fire main has been drained of water .4 the practice of opening one or more hydrant valves does not prevent the system from becoming frozen in icy conditions **13.5 Portable and mobile fire extinguishing equipment** .1 a scheme similar to that in section 13.1 must be prepared and implemented .2 how a portable or mobile fire extinguisher which has been discharged is prepared for further use .3 partially discharged or empty extinguishers must not be placed in their previous positions before being refilled **13.6 Firefighter's outfits** .1 a scheme similar to that in section 13.1 must be prepared and implemented .2 additional maintenance required for the firefighter's outfit **13.7 Fire control plans** .1 fire-control plans must be checked monthly to ensure they are legible and up to date .2 the duplicate set of fire-control plans or the booklet containing them, which are for the assistance of shore-side firefighting personnel, must be checked to confirm that they are in good condition .3 the guide signs to the duplicate plans must be checked to ensure they are intact and easily visible **13.8 Life rafts** .1 for life rafts, a plan must be available which shows their positions, and a regular inspection must be made of the raft, its stowage and securing / releasing system **13.9 Lifejackets, immersion suits and life buoys** .1 a scheme similar to that in section 13.1 must be prepared and implemented .2 additional maintenance required for lifejackets .3 additional maintenance required for immersion suits .4 additional maintenance required for life buoys and their fittings .5 the stowage location and signage for lifejackets and immersion suits must be accessible, adequate, dry and ventilated **13.10 Pyrotechnic distress signals and line-throwing equipment** .1 a scheme similar to that in section 13.1 must be prepared and implemented .2 additional maintenance required for pyrotechnic distress signals and line-throwing equipment **13.11 EPIRBs, SARTs and radio communications** .1 a scheme similar to that in section 13.1 must be prepared and implemented .2 additional maintenance required for EPIRBs and SARTs		

Subject Area	Hours	
	Lecture	Practical
13.12 Lifeboats .1 a scheme similar to that in section 13.1 must be prepared and implemented .2 additional maintenance required for lifeboats **13.13 Survival craft launching systems** .1 a scheme similar to that in section 13.1 must be prepared and implemented .2 additional maintenance required for survival craft launching systems		
14. Incident Recording .1 relevant information such as time, situation, progress, decisions, results and communications must be recorded, in chronological order. This real time record is then used for the deck logbook, official logbook entries, reports and investigations. A chronological record is to be maintained in the engine-room as a resource for the engine-room logbook. .2 photographic evidence of the situation, with time, angle, scale and other information, would be valuable to the investigation .3 accident investigations may be made by regulatory authorities in specific instances; consequently evidence and the accident scene must be preserved as much as possible.	**.5**	**.5**
14.1 Fire investigation and reporting .1 what information must be recorded to assist in handling the incident and to prepare a log for the purpose of investing and reporting on the incident .2 the report must also contain conclusions from the facts established, including: – an analysis and discussion of the facts – the conclusions reached from this analysis and discussion – recommendations on the actions required to avoid a recurrence – any recommendations to improve fire prevention and firefighting procedures **14.2 Abandonment investigation and reporting** .1 what information must be recorded to assist in handling the incident and to prepare a log for the purpose of investing and reporting on the incident .2 the report must also contain conclusions from the facts established, including: – an analysis and discussion of the facts – the conclusions reached from this analysis and discussion – recommendations on the actions required to avoid a recurrence – any recommendations to improve fire prevention and firefighting procedures **14.3 Search and rescue investigation and reporting** .1 what information must be recorded to assist in handling the incident and to prepare a log for the purpose of investing and reporting on the incident		
15. Crowd Management .1 ability to direct passengers and personnel other than trained crew members during an emergency .2 the need to prevent panic, and how to control passengers during an emergency	**1.0**	

Subject Area	Hours	
	Lecture	Practical
.3 how assistance may be obtained from passengers, such as: – medical assistance from physicians or nurses – firefighters – mariners .4 methods of forming passengers into groups for movement to survival craft or to other parts of the vessel, and how to keep families together .5 information to be given to passengers to prepare them for the abandonment and survival phases of an emergency situation .6 how to secure lifejacket and check all lifejackets are secured properly – check passengers are wearing the correct size lifejacket – check tie tapes are secured properly		
16. Search and Rescue .1 contents of the Merchant Ship Search and Rescue (MERSAR) Manual .2 the following search patterns and their advantages and limitations: – expanding square – parallel track – sector – vessel-aircraft co-ordinated .3 the duties of the: – Rescue Coordination Centre (RCC) – On Scene Commander (OSC) .4 plot and conduct search pattern as directed by Master with information from the On Scene Commander (OSC) or Coordinator Surface Search (C.S.S.), taking account of: – set and drift – leeway – sea conditions – size of vessel – navigational considerations and equipment .5 brief lookouts and establish a watch system for those conducting the search .6 provide the communications link between Master and OSC/CSS to update progress of search .7 the most effective methods of rescue available on different types and sizes of vessel, such as: – guest wrap – rescue boat – own lifeboat – vessel's cranes or booms – rescue baskets or net – scramble nets – pilot or jacob's ladder – vegetable oil or making a lee – accommodation ladder .8 organize and lead crew on deck to conduct the rescue on a specific vessel, stating preferred rescue method, location and required equipment, and methods of rescuing survivors	**1.5**	**1.5**

Subject Area	Hours	
	Lecture	Practical
.9 type of after-rescue care survivors may require; organize and provide the care, given different crew and vessel parameters		
17. Communications .1 ability to operate internal communications systems such as telephone and hand-held walkie-talkies, using marine terminology and standard communication procedures .2 advantages of different types of internal communications systems and when and how each may be most effective .3 the need to keep a log of communications and critical incidents as they happen during an emergency	**0.5**	**0.5**

Marine Emergency Duties for Senior Officers (MED D)

13.1 Equipment requirements

1) Particulars and plans of various types of vessels

2) Copies of C.S.A., and of national, international and I.M.O. documents

3) Marine casualty investigation reports (national and international)

4) Access to a fully operational approved MED establishment or to a vessel is essential.

13.2 Duration

15 hours.

13.3 Specific instructor qualifications

The course instructor must hold a Master certificate not lower than a Master 500 Gross Tonnage, Near Coastal certificate, a Fishing Master, First Class certificate or a Third-Class Engineer certificate.

13.4 Pre-requisites

Completion of the following courses: STCW Basic Safety, Proficiency in Survival Craft and Rescue Boats other than Fast Rescue Boats, Advanced Firefighting.

13.5 Goals

1) To provide a vessel's senior management with the knowledge and skills necessary to ensure that their junior officers, key personnel and emergency response teams are properly prepared and organized to deal with any emergency situation.

2) To provide a vessel's senior management with the knowledge and skills necessary to assess damage to the vessel and coordinate the response to minimize the consequences of damage.

3) To provide a vessel's senior management with the knowledge and skills necessary to coordinate the vessel's response to an emergency on their own vessel and on other vessels in distress.

13.6 Outline

Subject Area	Hours	
	Lecture	Practical
1. Contingency Plans 1.1 Prepare muster lists 1.2 Marine casualty reports	0.5	1
2. Orientation and Emergency Training of Crew Members	1	1
3. Emergency Management	1	1
4. Damage Control	1.5	1
5. Abandon Vessel Decision	0.5	-
6. Search & Rescue	1.5	1
7. Organization and Management of Medical Care On Board	4	-
	10 hours	**5 hours**
Total	**15 hours**	

13.7 Syllabus

Subject Area	Examined		
	in writing	orally	by practical application
1. Contingency Plans (1.5 hours)			
1.1 Prepare an emergency muster list, an emergency procedures guide and a contingency plan for a given vessel in response to various types of emergency: – at sea – in port – during refit	X		X
1.2 Using marine casualty reports, discuss the response of vessel's crew to emergencies and the effects of their actions			X
2. Orientation and Emergency Training of Crew Members (2 hours)	X	X	
2.1 Discuss the statutory requirements for boat and fire drills	X		
2.2 List the types of emergency that may be encountered	X	X	
2.3 Discuss the requirements for drilling and training of crew for the emergencies of section 2.2		X	
2.4 Discuss the planning, preparation and conduct of formal and informal training sessions		X	

Subject Area	Examined		
	in writing	orally	by practical application
2.5 Discuss the planning, management and conduct of emergency drills, including universal drills and emergency squad and team drills			X
2.6 Plan, prepare, manage and conduct training drills for a given vessel in the following anticipated emergencies: – fire – collision – structural failure – grounding – foundering			
3. Emergency Management (2 hours)			
3.1 Discuss management of emergency response and the senior officers' responsibilities and duties during an emergency	X	X	
3.2 Discuss the decision-making process and the provision of adequate information		X	
3.3 Discuss the dangers of decision-making based on inadequate information		X	
3.4 Discuss internal communications on board a vessel		X	
3.5 Conduct a simulated communications exercise using correct procedures, language and methods			X
3.6 Assess an emergency situation, organize a response and manage the response			X
3.7 Discuss case studies of marine emergencies to highlight leadership styles (see 1.2)	X	X	X
4. Damage Control (2.5 hours)			
4.1 Assess damage and its effects on vessels' seaworthiness			
.1 know the SOLAS requirements for stability and subdivisions	X		
.2 discuss permeability and the use of stability data to assess the consequences of damage for a vessel's seaworthiness	X	X	
.3 discuss pressure points on bulkheads in flooded compartments	X	X	
.4 discuss flooding rates from damage and from firefighting water	X		
.5 effects of excess water (free surface effects); pumping and drainage of excess water	X		
4.2 Assess the feasibility of a plan for damage control and emergency response	X		
.1 discuss the theory of damage control to minimize the effects of damage and preserve a vessel's sea-worthiness under the following situations: – pressurizing tanks, double bottoms, cofferdams – shoring hatches, bulk-heads – cement boxes, collision mats – jury rigs – engine-room leaks			

Subject Area	Examined		
	in writing	orally	by practical application
.2 discuss the feasibility of damage control	X		
.3 discuss methods of reducing or preventing oil pollution due to a damaged hull	X		
4.3 Assess effects on vessel stability of large quantities of water, including firefighting water			
.1 understand the flow rate of water from firefighting equipment such as: - sprinkler systems - deluge systems - water containers - hoses and nozzles	X	X	
.2 calculate the effect of firefighting water on vessel stability, given data for separate decks concerning: – shift of the centre of gravity – reduction in ability to remain in the upright position (G.Z.) – list – angle of downflooding – effect of free surface on vessel stability			X
5. Abandon Vessel Decision (0.5 hours)			
5.1 Assess emergency situation and make a decision to: – stay with the vessel – partially abandon the vessel			
.1 discuss emergency conditions which would make abandonment a consideration		X	
.2 discuss conditions and reasons to delay abandonment or only partially abandon a vessel		X	
.3 discuss methods of abandonment and their relative advantages and disadvantages	X	X	
.4 discuss command and control required and the communications necessary for: – delayed abandonment of a vessel – partial abandonment of a vessel – total abandonment of a vessel		X	
6. Search & Rescue (2.5 hours)			
6.1 Explain the organization of search & rescue operations, search & rescue agencies and their functions, areas of responsibility, geographic areas of operation and equipment available			
.1 discuss search and rescue in Canadian and adjacent waters, referring to the *Canada Shipping Act, 2001* and the Annual Notice to Mariners concerning: – rescue coordination centres – marine rescue subcentres – geographic division and search & rescue responsibilities	X	X	

Subject Area	Examined		
	in writing	orally	by practical application
– responsibilities and obligations of the Master of a Canadian vessel	X	X	
.2 discuss the role of the AMVER system	X	X	
.3 discuss the role of the Global Marine Distress and Safety System (GMDSS)			
.4 discuss the resources available for search & rescue in Canadian and adjacent waters:		X	
– vessels			
– aircraft			
– associated equipment			
6.2 Coordinate a search and rescue operation	X	X	
.1 explain the role of the "on scene coordinator" with reference to the Merchant Ship Search and Rescue (MERSAR) Manual and the Merchant Ship Search and Rescue Manual with Canadian Modifications (CANMERSAR)	X	X	
.2 discuss, with reference to MERSAR and CANMERSAR, the role of a vessel's Master in planning and conducting a search and rescue operation		X	
.3 discuss the vessel handling required for search & rescue work, and discuss rendering of assistance to other vessels and survivors, given weather conditions, survival equipment and vessel types			
7. Organization and Management of Medical Care On Board (4 hours)			
7.1 Thorough knowledge of the use and content of the following publications:			
.1 International Medical Guide for ships	X		
.2 Medical section of the International Code of Signals	X		
.3 Medical First Aid Guide for use in accidents involving dangerous goods	X		