1. Course Title: Fire Prevention and Fire Fighting

2. Scope With reference to convention Imo Model Course: This training is intended to meet the requirements set out in Table A-VI/1-2 of the STCW Code. The training is part of the Basic Safety Training required for Seafarers employed or engaged in any capacity on board ship on the business of that ship, as part of the ship's complement, with designated safety or pollution prevention duties in the operation of the ship, The training must be undertaken before new entrants are assigned to any such shipboard duties.

3. Objective:

1. This module will provide sufficient knowledge for a person intending to go to sea the essential basic knowledge of the ways in which fires are caused and the precautions to be taken to minimize the risk of fire in ships
2. On successful completion of this module, the trainee should be able to:
   a. Maintain a state of readiness to respond to emergency situations involving fires aboard ship
   b. Fight and extinguish fires using fire fighting apparatus and appliances provided on board
   c. Act as a member of a fire party, including use of self-contained breathing apparatus.

4. Course Outline Shore base & On board Training:

	Subject Area	Hours	
		Lectures	Practical
1.	**Introduction, Safety and Principles**		
	1.1 Causes and dangers of fire	0.75	
	1.2 Principles of survival in relation to fire		
		0.75	
2.	**Theory of Fire**		
	2.1 Conditions of fire		
	2.2 Properties of flammable materials	1.5	
	2.3 Classifications of fires and appropriate extinguishing agents		
	2.4 Fire hazards and spread of fire	0.75	
		2.25	
3.	**Fire Prevention and Detection**		
	3.1 Principles of fire prevention		
	3.2 Ship construction arrangements	3.0	
	3.3 Fire and smoke detection systems		
	3.4 Automatic fire alarm		
	3.5 Safe practices	0.75	
		3.75	
4	**Fixed Fire Extinguishing Systems**		
	4.1 General	0.5	
	4.2 Gas systems	1.0	
	4.3 Foam systems	0.75	
	4.4 Water systems	1.5	
	4.5 Chemical powder applicants	0.5	
	4.6 Emergency fire pump	0.25	
		4.5	
5	**Miscellaneous Fire Fighting Equipment**		
	5.1 Fire hoses and nozzles		

	5.2 Portable fire extinguishers		
	5.3 Fireman's outfit	1.5	1.5
	5.4 Breathing apparatus		
	5.5 Resuscitation apparatus		
	5.6 Fire blankets		
		1.5	1.5
6.	**Ship Fire-fighting Organization**		
	6.1 General emergency alarm		
	6.2 Fire control plans and muster list		
	6.3 Communications	1.5	
	6.4 Personal safety procedures		
	6.5 Periodic shipboard drills		
	6.6 Patrol systems	1.5	
7.	**Fire-fighting Methods**		
	7.1 Knowledge of fire safety arrangements		
	7.2 Fire alarms and first actions	1.5	
	7.3 Fire-fighting	1.5	
8	**Fire-fighting Drills**		
	8.1 Small fires		
	8.2 Extensive fires		6.0
	8.3 Drills in smoke filled spaces		
			6.0
9.	**Assessment**	0.75	3.0
		0.75	3.0
	SUBTOTALS	16.5	10.5
	TOTAL		
		27.0	

5. Competence Standard/Course Syllabus Checked with up-to-date STCW/IMO Model Course:

	Learning Objectives	Hours
1	**Introduction, Safety and Principles**	**0.75**
1.1	**Causes and dangers of fire**	0.25
	.1 States the dangers associated with fire onboard ships .2 Lists the causes of fire onboard ships	
1.2	Principles of survival in relation to fire .1 Understands the importance of following safety rules during the course .2 Knows the importance of regular training and drills .3 Describes how to prepare for any fire emergency .3 Describes how to prepare for any fire emergency .4 States the actions to be taken in case of called to fire stations .5 Knows the dangers associated with smoke and toxic fumes .6 Understands the importance of escape routes	0.5
2	**Theory of Fire**	**2.25**
2.1	**Conciliations of fire** .1 Knows that fire is a chemical reaction between fuel and oxygen in the Presence of heat	0.25

	.2 Sketches a *fire triangle* to represent the above conditions .3 Explains a continuously burning fire as a *fire square* with the addition for chain *reaction* to the fire triangle	
2.3	**Classifications of fire and appropriate extinguishing** .1 Lists the different types of fire as material, oil gas, chemical fires etc. .2 Knows the classification letters associated with different types of fire .3 States the appropriate extinguishing agents for each type of fire	0.75
2.4	**Fire hazards and spread of fire** .1 Explains how fire spreads via *conduction, radiation, heat flow and convection* .2 Lists the fire hazards onboard the ships with specific examples in the: - engine room, e.g. combustible liquids, oil leaks, oil soaked surfaces, hot surfaces, hot works etc. - galley, e.g. cooking oil, hot fat, ovens, hot plates, frying pans, faulty electrical appliances and connection etc. - accommodation, e.g. combustible materials, furnishings, personal effects, matches/lighters, cigarettes, defective electrical connections etc. - cargo space, e.g. self-heating cargo, oxidizing cargo, compressed flammable gas, pyrophoric cargoes, explosives etc. .3 Knows that careless smoking is a major cause accommodation fires	0.75

	.4 Lists four phases of fire development as: - ignition (incipient) - developing (surface fire) - absolute fir (fire in depth in solids) - burning out .5 Knows that the temperature of a burning metal is much higher than that of a normal fire .6 Understands *fire intensity* as the effect of temperature rise on the rate of chain reaction.	
3	**Fire Prevention and Detecting**	**3.75**
3.1	**Principles of fire prevention** .1 Explains how the concepts of *fire triangle* and *fire square* may be used to prevent and extinguish fires .2 Gives examples how a fire can be prevented from spreading by reducing or blocking *conduction, radiation, heat flow and convection currents*	
3.2	**Ship construction arrangements** .1 States the basic principles in ship construction to prevent and fight fires .2 States hw escape routes are protected .3 Describes class A, B and C divisions .4 Understands the purpose and means of gas-freeing and inerting of cargo tanks	1.0
3.3	**Fire and smoke detection systems** .1 Understands the difference between manual and automatic detection of fire .2 Understands the basic principles of an automatic fire detection system .3 Lists the different types of automatic fire detectors .4 Lists the alarms and actions that are automatically activated by detectors .5 Knows that sprinkler system for accommodation is a combination of automatic detection, alarm and fighting system .6 States the main requirements of fire detectors and alarm system for accommodation, cargo spaces and machinery spaces	1.25
3.4	**Automatic fire alarms** .1 Knows how an automatic fire alarm operates	0.25

	.2 Understands the benefits of fire detection zone wise	
3.5	**Safe practices** .1 Lists the general safe practices onboard ships to prevent and fight fires .2 States the safety measures requires to reduce fire hazards in the *machinery spaces, accommodation, galley and cargo spaces*	0.75
4	**Fixed Fire Extinguishing Systems**	**4.5**
4.1	**General** .1 Lists the general requirements for a fixed fire extinguishing system .2 Lists all the different fixed systems	0.5
4.2	**Gas systems** .1 Lists the two main fixed gas systems as CO2 and Halon systems .2 States with regard to CO2 systems: - in which spaces it is used - basic working layout - actions to be taken when CO2 alarm sounds - the actions to be taken before CO2 is released .3 States with regard to Halon systems: - in which spaces it is used - how it works - actions to be taken when Halon alarm sounds - the actions to be taken before Halon is released why it is phasing out	1.0
4.3	**Foam systems** .1 States with regard to foam systems: - different types of foam - in which spaces it may be used - how it works - different components of a foam system	075
4.4	**Water systems** .1 Lists different water systems as fire main, sprinkler system, high pressure water system and fog system .2 States the spaces in which each of the systems may be used .3 Understands the sketch of a fire main .4 Lists the different components of a fire main e.g. fire pumps, hydrants, hoses, nozzles, isolating valve etc. .5 States the purpose of each component .6 Explains the purpose of international shore connection .7 States the main requirements of a fire main	0.75
4.5	**Chemical powder applicants** .1 Describes a typical fixed powder apparatus with each container holding 250 kg of powder .2 Describes how this equipment is used for best results	0.5
5	**Miscellaneous Fire Fighting Equipment**	3.0
5.1	**Fire hoses and nozzles** .1 Knows that the nozzles are combination of jet and spray type .2 States the main regulations regarding hoses and nozzles .3 Explains how hoses are joined together and connected to the hydrants .4 Knows the correct maintenance and storage of hoses and nozzles	
5.2	**Portable fire extinguishers** .1 Lists the different types of portable fire extinguishers	0.5

	.2 Describes the correct use of each of them .3 States the normal capacity of each type of portable extinguishers .4 Explains how to recharge empty extinguishers .5 Describes a portable foam applicator and how it is connected to the fire main .6 States the normal capacity of such and applicator	
5.3	**Fireman's outfit** .1 Describes a fireman's outfit .2 Lists the two main types of breathing apparatus used with fireman's outfit and their relative advantages and disadvantages .3 States the requirements for the lifeline .4 States the minimum number requirements of fireman's outfit for a ship	0.25
5.4	**Breathing apparatus** .1 Describes a self-contained compressed air-operated breathing apparatus (CABA) .2 Demonstrates how to dismantle and reassemble a CABA .3 Describes and demonstrates how to service a CABA .4 Demonstrates the correct way to fit a face mask of a CABA and to check that it is air tight .5 Lists the checks which must be made on a CABA before it is used and after it has been strapped on .6 Demonstrates the correct breathing technique to give a low a air consumption for a particular exertion when using a CABA .7 Explains the reasons for not remaining in a toxic atmosphere until the CABA air bottles are empty .9 Explains the actions which must be taken when the warning signal is given on a CABA that the air pressure is low .10 Describes a breathing apparatus having a smoke helmet, air pump, air line and fittings	1.25
5.5	**Resuscitation apparatus** .1 Describes the apparatus .2 Demonstrates how it is used to revive a person affected by smoke .3 Explains how the use of this equipment may reduce the CABA wearer's endurance time in smoke-filled space .4 Demonstrates the knowledge of other resuscitation methods	0.5
5.6	**Fire blankets** .1 Describes a fire blanket .2 Demonstrates how to use it .3 States the normal locations of these blankets	0.25
6	**Ship Fire Fighting Organization**	**1.5**
6.1	**General emergency alarm** .1 Recognizes the difference between general emergency alarm and fire alarm .2 Lists and identifies all other different alarm sounds	0.25
6.2	**Fire control plans and muster list** .1 Knows the purpose and location of the fire control plan .2 Describes the muster list .3 Understands the duties of individual crew members as per the muster list	0.25
6.3	**Communications** .1 Explains the different methods of communications during a fire emergency as: - messengers - telephone - walkie-talkies	0.25

	- ship-to-shore VHF - public address system	
6.4	**Personal safety procedures** .1 States how a fire fighting team is made up and understands the importance of following orders from the person in-charge especially prior entering a fire zone .2 Explains the need to be familiar with the fire zone, escape route and properly equipped to enter the fire zone .3 Lists how to be dressed and equipment requirements such as breathing apparatus, hand lantern, axe and fireproof lifelines with fittings. .4 Describes the use of lifelines for signaling .5 States the need for flexibility in filling vacancies in the fire party	0.25
6.5	**Periodic shipboard drills** .1 Describes typical exercises for use during fire drills as: - extinguishing a fire in a deep fryer - entering a closed room on fire - extinguishing a major deck fire - extinguishing an engine room fire - rescuing an unconscious person from a smoke-filled space	0.25
6.6	**Patrol systems** .1 States that on ships with more than 36 passengers an efficient patrol system must be maintained .2 Knows that importance of patrol system during dry-docking, after departure ports and after shore personnel finished working in the ship .3 List the duties of the patrol	0.25
7	**Fire fighting Methods**	**1.5**
7.1	**Knowledge of fire safety arrangements** .1 Knows the importance of understanding the fire plan .2 States the location and use of fire alarms .3 States the location and use of emergency controls e.g. remote stoppage of oil pumps/purifiers, fans, closing of flaps/openings, quick closing valves etc. .4 Lists all the fire fighting appliances onboard ships and states the need to know how they work .5 Lists the potential fire hazards and causes of fire in the ship	0.75
7.2	**Fire alarms and first actions** .1 States the actions to be taken in correct order on discovery of a fire as: - activate the alarm - if possible, remove the cause of the fire - if possible, restrict ventilation - fight fire with appropriate medium and appliance	0.25
7.3	**Fire fighting** .1 Explains the factors to be considered in deciding fire fighting methods: - accessibility of the location of the fire - personal present at the location of the fire - reactions with the cargo - equipment and fire fighting agents appropriate to the fire .2 Explains the reasons for a reflash watch	0.5
8	**Fire fighting Drills**	**6.2**
8.1	**Small fires** .1 Demonstrates the correct use of all different types of portable fire extinguishers to fight different types of fires e.g. material, oil gas, etc.	1.5

	.2 Demonstrates how to extinguish fires using a hose with water jet and spray nozzles and with foam applicators	
8.2	**Extensive fires** .1 Demonstrates the extinguishing of extensive fires of various types, including an oil fire, using as appropriate water (jet, spray and fog application), foams including aqueous film forming (AFFF) type, dry powder and CO2 .2 Using a lifeline but without breathing apparatus, demonstrates entering and passing through a compartment into which high expansion foam has been injected	1.5
8.3	**Drills in smoke filled spaces** .1 Demonstrates how to check and use the following breathing apparatus: - smoke helmet type with air pump and hose - Compressed air operated breathing apparatus (CABA) .2 Demonstrates entering a small room using CABA when the room is filled with non-toxic artificial smoke .3 Demonstrates the use of the lifeline as signal line in the smoke filled space while wearing CABA .4 Demonstrates how to search for persons (using dummies) in a smoke filled space while wearing CABA .5 Takes part in team exercises communicating with other team members while wearing CABA in a smoke filled space .6 Demonstrates the use of various types of portable fire extinguishers on fires in the smoke filled space while wearing CABA .7 Demonstrates extinguishing an extensive fire when wearing CABA in a smoke filled enclosed spaces, including an accommodation room or simulated engine room and using as appropriate water, foam and powder	3.0
9	**Assessment**	**3.75**
9.1	**Theory**	0.75
9.2	**Practical and Orals**	3.0

6. Entry Standard, Selection Criteria of Students:

Passed Secondary School Certificate.

Age limits: 16-20 years.

Good health condition to be certified by a qualified doctor.

7. Intake limitation, with specific mention Instructor-student ratio:

The number of trainees on each Module will depend upon the availability of instructors and equipment and the facilities for conducting realistic exercise involving live fires. The number should not exceed that which will allow sufficient opportunity for each trainee to participate in practical exercises and demonstrations (see staff requirements below).

8. Qualification and experience of instructors:

Minimum qualification of any instructor must be Class 2 Deck Officer/Class 2 Marine Engineer Officer Certificate of Competency of equivalent with sea experience in merchant vessels as required by Department of Shipping.

9. Qualification and experience of assessors: The practical exercises must be conducted and achievement of competency must be assessed under the supervision of a retained or serving fire fighter (or a person with equivalent qualifications and experience). The person conducting the practical training must be in possession of a recognized

First Aid qualification. The ratio of staff to students for the practical exercises involving live fires or the use of breathing apparatus should not exceed 1:8.

10. Details Facilities & Equipment, materials and resources available for the training; Visual aids lecture Notes, Library facilities, Rental documents, Workshops Training Equipment: Navigational, Engineering, Communication, Seamanship etc:

The Centre provides a normal classroom facility with an overhead projector, Television and instructional video.

- A fire fighting house for firefighting exercises under realistic conditions (e.g. simulated shipboard conditions) in darkness as well as by daylight.
- Facilities for recharging compressed air bottles, with spare parts for maintenance
- Room with work-bench area for inspection and maintenance of breathing apparatus
- 2 steel fire trays approximately 1m × 1m × 0.3m
- 2 fire hydrants with 2 outlets each and a fire pump
- 1 hose reel
- Carbonaceous and hydrocarbon fuels that can provide a realistic simulation for internal or external fires
- Dummies for search and rescue procedures
- Fire hoses , branch pipes and jet/spray nozzles of a type normally found aboard merchant ships in accordance with international requirements
- 1 foam applicator
- 2 mechanical foam branches
- 1 in-line inductor for use with above
- 1 high-expansion foam generator and foam compound
- 9-littre water extinguishers
- 9-littre foam extinguishers
- 5-kilogram carbon-dioxide extinguisher
- 10-kilogram dry powder extinguisher
- Refills for all types of extinguishers
- Fire suit (e.g. fire-protective clothing, gloves, fire-boots, and helmets
- For each Module participant
- 2 full harnesses for use with lifelines.
- Self-contained breathing apparatuses sufficient in number for all trainees during the practical exercises, complete with spare cylinders, spare parts and maintenance tools (plus steps for use by instructors only
- Distress Signal Units (DSUs for use by instructors)
- Smoke generator
- Smoke helmets with air pump
- 1 stretcher
- 1 first aid kit
- 1 resuscitation kit with oxygen/suction unit
- 2 fire axes
- 2 36-metre life/signaling lines with snap hooks

11. Conduct of Training with number of classroom lectures, practical work use of simulator, video etc:

Period → Day ↓	0900-0945	0945-1030	1030-1115	1115-1145	1145-1230	1230-1315	1315-1400	1400-1500	1500-1545	1545-1630	1630-1715	1715-1800	1800-1845
1st Day	Introductions, safety and principles Concept and application of the fire triangle to fire and Explosion (RA)			Tea Break	Organization of shipboard fire fighting (RA)	Practical (NI)		Launch Break	Fight and extinguish fires (MN)				-
2nd Day	Organization of shipboard fire fighting (MN)				Organization of shipboard fire fighting (MN)	Practical (NI)			Fight and extinguish fires (RA)				-
3rd Day	Fight and extinguish fires (MN)				Fight and extinguish fires (MN)	Practical (NI)			Fight and extinguish fires (RA)			Assessment	

Legend:

(1) MN: C/E Mahmudun Nabi

(2) RA: C/E Sayed Rowshon Ansar

(3) NI: Nazrul Islam

12. Total duration of Training; Duration of Practical's:

Theory- 15.75 hrs.
Practical- 7.5 hrs.
Assessment- 3.75 hrs.

13. Assessment procedure, whether independent of instruction or continuous performance evaluation:

The training is organized so that, by demonstration, trainees are able to show that they meet the requirements of column 2 of Table A-VI-1 in accordance with the methods for demonstrating competence shown in column 3 of that table and the criteria for evaluating competence in column4.

A variety of sources of evidence are used which include evidence of candidates' ability, under realistic conditions, to prevent and fight fires aboard ships.

Short answer, multiple choices, fills in the blanks and true/false type questions in a written test are used for assessment. Practical assessment includes direct observation, oral questioning, simulation and role-play.

14. Formats of certificate to be issued with correct reference to STCW and reference to approval and authorization by the Department of Shipping and contact point of the issuing institution for verifying authenticity:

Cert No: 2016.02.039.0000382 DoS Reg. No: 2016.02.039.0014507

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH

ন্যাশনাল মেরিটাইম ইন্সটিটিউট

NATIONAL MARITIME INSTITUTE

South Halishahar, P.O. Bandar, Chittagong-4100, Bangladesh.
Phone : +88-031-740569, Fax : +88-031-800620, E-mail : info@nmi.gov.bd

Course Completion Certificate

BASIC TRAINING IN PERSONAL SURVIVAL TECHNIQUES AS SET OUT IN TABLE A-VI/1-1

This is to certify that, Mr. ATAUR RAHMAN Son of Mr. HAFIZUR RAHMAN, Date & Place of Birth 04-01-1975 & NOAKHALI, C.D.C.No. C/O/3015 has successfully completed course on **BASIC TRAINING IN PERSONAL SURVIVAL TECHNIQUES AS SET OUT IN TABLE A-VI/1-1** conducted from **19-10-2016** to **23-10-2016** at the National Maritime Institute, Chittagong, Bangladesh

Issue Date: 24-10-2016 and Expiry Date 24-10-2021

Has been found duly qualified and satisfied the condition in accordance with the provisions of Regulation VI/1 Paragraph 1 & 2 and Section A-VI/1, Paragraph 2.1.1.1 of Annex to the international convention on standards of Training, certification and watch keeping for seafarers(STCW), 1978 as amended.

Signature of the Holder

CERTIFIED TRAINING INSTITUTE

Principal

to verify this certificate visit- **www.nmi.gov.bd**

15. Maintenance of records in Data-base for facilitation of checking including assessments:
NMI will maintain a data-base of all the students who have completed the course. The following records for each individual will be kept so as to ensure that the certificate is issued to a candidate who has met the requirements as laid down by the governing authority regarding issuance of a certificate on Bridge Resource Management.

- Application form
- Assessment papers after completion of course
- Attendance Sheet
- Attested Xerox copy of the issued certificates & licenses
- A registered data-base in hard copy and soft form

16. Internal Quality Standard System if any. Students Impressions, past results:
The institute maintains quality standard system ISO 9001:2008, Certified by DNV GL

17. Course notice served, course conducted as per course notice, progression report served:
Will be complied as per DOS Instruction.

18. Attendance of Students and Instructors:
Students and Instructor attendance sheet attached.

Annex- 03

NATIONAL MARITIME INSTITUTE

TRAINING RECORD

Instructor:

Venue:

Subject:

Brief description on training material:

Attendance:

Name & rank	Sign	Name & rank	Sign	Name & rank	Sign

Signature
Management Representative

Signature
Principal