

# COMPETENCY-BASED CURRICULUM



Sector:

**MARITIME**

Qualification:

**Able Seafarer Engine NC II (STCW Regulation III/5)**



**TECHNICAL EDUCATION AND SKILLS DEVELOPMENT  
AUTHORITY**

East Service Road, South Luzon expressway, Taguig City, Metro Manila

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## COURSE DESIGN

COURSE TITLE : **ABLE SEAFARER ENGINE**

NOMINAL DURATION : **146 hours**

QUALIFICATION LEVEL : **NC II (STCW Regulation III/5)**

COURSE DESCRIPTION :

This course is designed to equip individual with operational skills, knowledge and attitudes of Able Seafarer Engine in accordance with industry standards. It covers core competencies such as perform engine watchkeeping duties, oversee fuel, bilge and ballast operations, operate equipment and machinery, operate electrical equipment and maintain engine room machinery and spaces.

A person who has achieved this Qualification is competent to be:

- AB Engine

TRAINEE ENTRY REQUIREMENTS:

This section specifies the qualification of trainees and educational experience. Other requirements like health and physical requirements are also stated. Passing entry written examinations may also be indicated if necessary.

- Holder of Certificate of Proficiency (COP) for Rating Forming Part of a Engineering Watch-(STCW Regulation II/4); or
- Must have completed a course on Rating Forming Part of an Engineering Watch from accredited training center of TESDA/MARINA; and
- Must have passed the medical examination for eyesight and hearing as per DOH Administrative Order No. 2013-006

**COURSE STRUCTURE:****BASIC COMPETENCIES  
(18 hours)**

<b>UNIT OF COMPETENCY</b>	<b>MODULE TITLE</b>	<b>LEARNING OUTCOMES</b>	<b>NOMINAL DURATION</b>
1. Participate in workplace communication	1.1 Participating in workplace communication	1.1.1 Obtain and convey workplace information 1.1.2 Participate in workplace meeting and discussion. 1.1.3 Complete relevant work related documents	4 hours
2. Work in a team environment	2.1 Working in a team environment	2.1.1 Describe and identify team role and responsibility in a team. 2.1.2 Describe work as a team member	5 hours
3. Practice career professionalism	3.1 Practicing career professionalism	3.1.1 Integrate personal objectives with organizational goals 3.1.2 Set and meet work priorities 3.1.3 Maintain professional growth and development	4 hours
4. Practice occupational health and safety procedures	4.1 Practicing occupational health and safety procedures	4.1.1 Identify hazards and risks 4.1.2 Evaluate hazards and risks 4.1.3 Control hazards and risks 4.1.4 Maintain occupational health and safety awareness	5 hours

**COMMON COMPETENCIES  
(60 hours)**

<b>UNIT OF COMPETENCY</b>	<b>MODULE TITLE</b>	<b>LEARNING OUTCOMES</b>	<b>NOMINAL DURATION</b>
1. Survive at sea in the event of ship abandonment	1.1 Surviving at sea in the event of ship abandonment	1.1.1 Respond to the indicated emergency 1.1.2 Board a survival craft	4 hours
2. Minimize the risk of fire and maintain a state of readiness to respond to emergency situations involving fire	2.1 Minimizing the risk of fire and maintaining a state of readiness to respond to emergency situations involving fire	2.1.1 Carry out fire minimization procedures 2.1.2 Respond to emergencies involving fire	8 hours

<b>UNIT OF COMPETENCY</b>	<b>MODULE TITLE</b>	<b>LEARNING OUTCOMES</b>	<b>NOMINAL DURATION</b>
3. Fight and extinguish fire	3.1 Fighting and extinguishing fire	3.1.1 Operate portable fire-fighting equipment 3.1.2 Carry out fire-fighting operations	8 hours
4. Take immediate action upon encountering an accident or other medical emergency	4.1 Taking immediate action upon encountering an accident or other medical emergency	4.1.1 Determine the need of casualty 4.1.2 Administer first-aid to the victim	24 hours
5. Comply with emergency procedures	5.1 Complying with emergency procedures	5.1.1 Take action on becoming aware of an emergency 5.1.2 Follow established emergency procedures 5.1.3 Follow procedures for the use of various life-saving equipment	4 hours
6. Take precautions to prevent pollution of the marine environment	6.1 Taking precautions to prevent pollution of the marine environment	6.1.1 Practice compliance with legislative requirements for protection of the marine environment 6.1.2 Practice anti-pollution procedures	4 hours
7. Observe safe working practices	7.1 Observing safe working practices	7.1.1 Identify and follow workplace procedures for hazard identification and risk control 7.1.2 Contribute to arrangements for the management of occupational health and safety 7.1.3 Take necessary actions to control fatigue 7.1.4 Complete occupational health and safety records	4 hours
8. Demonstrate security awareness practices	8.1 Demonstrating security awareness practices	8.1.1 Contribute to the enhancement of maritime security through heightened awareness 8.1.2 Recognize security threats 8.1.3 Maintaining security awareness and vigilance	4 hours

## CORE COMPETENCIES (68 hours)

UNIT OF COMPETENCY	MODULE TITLE	LEARNING OUTCOMES	NOMINAL DURATION
1. Perform marine engineering at the support level	1.1 Performing marine engineering at the support level	1.1.1 Contribute to a safe engineering watch 1.1.2 Contribute to the monitoring and controlling of an engine-room watch 1.1.3 Contribute to fuelling and oil transfer operations 1.1.4 Contribute to bilge and ballast operations 1.1.5 Contribute to the operation of equipment and machinery	30 hours
2. Perform safe usage of electrical equipment at the support level	2.1 Performing safe usage of electrical equipment at the support level	2.1.1 Operate electrical equipment 2.1.2 Follow safety and hazard control procedure.	14 hours
3. Perform maintenance and repair at the support level	3.1 Performing maintenance and repair at the support level	3.1.1 Contribute in routine planned maintenance of equipment and machinery 3.1.2 Contribute in repairs of equipment and machinery 3.1.3 Carry out stores operations	24 hours

### ASSESSMENT METHODS:

- Demonstration with questioning
- Written examination
- Practical performance

### COURSE DELIVERY:

- Competency-based training
- School/Center-based training
- Enterprise-based training
- Virtual training

## RESOURCES:

Recommended list of tools, equipment and materials for a batch of 24 trainees for ABLE SEAFARER ENGINE NC II (STCW Regulation III/5).

TOOLS		EQUIPMENT		MATERIALS	
QTY	Description	QTY	Description	QTY	Description
1 set	• Wrench, socket (various sizes)	2 pcs each type	• Pressure gauges, various types (SI, English)	1 pc.	• Fuel system ( static display)
1 set	• Wrench, combination open / box (various sizes)	2 pcs.	• Vacuum gauge	1 pc.	• Lubrication oil system (static display)
1 set	• Wrench, adjustable (various sizes)	2 pcs each type	• Thermometer, mercury (various ranges)	1 pc.	• Steam system (static display)
1 set	• Wrench, pipe (various sizes)	2 pcs.	• Pressostat	1 pc.	• Seawater cooling system ( static display)
2 pcs.	• Wrench, torque	2 pcs.	• Thermostat	1 pc.	• Freshwater cooling system (static display)
1 set	• Bolt extractor (various sizes)	1 pc. each	• Valves- globe, gate, butterfly, safety, etc.	1 pc.	• Refrigeration system (static display)
1 set	• Allen wrench	2 pc. @ type	• Thermometer, mercury (various ranges)	1 pc.	• Steam system (static display)
2 pcs	• Vernier Calliper	1 pc.	• *Operational 3-cylinder air- starting diesel engine (complete with temperature and pressure monitoring devices)	1 pc.	• Air conditioning system (static display)
1 pc each	• Micrometer (0-25mm, 25-50mm)				
1 set each	• Screw driver, Philips and flat (various sizes)	1 unit	• *Air starting system (compressor, air tank and piping to engine)	1 pc.	• Steering system (static display)
2 pcs	• Circlip plier	1 unit	• Refrigerating unit (open and complete for demo)	1 pc.	• Gas turbine (static display)
1 set	• Feeler gauge (English/metric)	1 set	• *Oil separator (open and complete for demo – not operational)	1 pc. each	• Marine boilers – firetube, watertube, combination (static display)
1 set	• Metal files (various sizes)	1 unit	• Disc grinder, pedestal type with two wheels	1 pc.	• Marine diesel engine (static display)
2 pcs.	• Hack saw	1 each	• Chain block ( 1 & 5 tons)		
2 pcs. each	• Hammer, - ball peen and straight peen	1 set	• Welding, arc (with work bench and complete accessories)	1 pc	• Fresh water generator (static display)
1 set	• Dial gauge	1 set	• Welding, gas (with work bench and complete accessories)	1 each type & size	• Personal Protective Equipment – hard hat, working gloves, coverall, safety shoes, goggles and ear protector
2 sets @ type & size	• Cold chisels (various types and sizes)				
2 pcs each type	• Punches- prick, center, drift	1 unit	• *Air compressor (open and complete for demo – operational)	2 pcs.	• Gland packings (various types and sizes)
5 pcs	• Vice grip	4 sets	• Work benches with vise	10 kls	• Rags (paper/cotton)

TOOLS		EQUIPMENT		MATERIALS	
QTY	Description	QTY	Description	QTY	Description
25	• Spanner wrench	1 assy	• Centrifugal pump (for dismantling and assembly)	1 pail	• Paint (primer)
5 pcs	• Pliers (assorted sizes)			2 gal.	• Thinner
5 pcs	• Snips			1 kit	• First aids kit
2 sets	• Taps with holder	1 pc	• Freshwater tank (1 m3)	2 pails	• Cleaning solvent
2 pcs.	• Sounding tape	1 assy	• *Duplex oil filter	1 sack	• Powder Detergent Soap
2 units	• Portable grinders	1 assy	• *Duplex fuel filter	1 sack	• Saw dust
5 pcs.	• Mop	1	• *Engine room with control room model		
25 pcs	• Paint brush	1 cu.m.	• *Fuel-oil tank overhead or engine supply	<b>Training Materials / Reference Books</b>	
10 pcs	• Wire brush				
10 pcs	• Chipping hammer	1 unit	• Alarm tower indicating the type of alarm		• 1978 Reed's Marine Engineering series Vol 12 Motor Engineering Marine Engineer
15 pcs	• Buckets	1 unit	• *Alarm system		
5 pcs.	• Broomstick	2 pcs	• Portable VHF radio		• Manuals/ Catalogs/ Brochures
5 pcs.	• Dustpan	2 pcs	• Telephone		• Modules/Les
4 pcs.	• Shovel	2 units	• Bunkering hose with flange ( 2 inch dia, 5 meters in length)		• CDs/Video tapes
2 pcs	• Portable drill			1pc.	• Official engine log Book
1 set	• Dies with holder	1 unit	• *Manifold with at least 2 connection port, each port fitted with valve before the connection flange	25pcs.	• Engine log book (replica)
1 set	• Flaring tool			25pcs.	• Clip board with daily log sheet
1 set	• Drill (various sizes)			1 pc.	• Bunker checklist
		8 pcs.	• Bolt and nuts for securing flange	1 pc	• Video related to unsafe conditions or potential hazard in engine room
		1 unit	• Bunker sampling equipment		
		2 pcs	• Removable stopper for the swing valve	1 pc.	• Video related to emergencies in engine room
		1 unit	• 2 compartment tank (each compartment - W - 0.5 m, L- 1 m, H -1.5 m) with sounding pipe (0.5 meter length from tank top) on all compartment with swing valve at the end of one of the sounding pipe	1 pc.	• Video related to bunkering
		1 unit	• Starter panel for motor which can simulate electrical trouble		
		1 unit	• Motor ( 220 V )		

NOTE: \*The use of simulator (description is in the next table) may be used in lieu of actual equipment.



<b>SIMULATOR/S</b>	
<b>QTY.</b>	<b>Description</b>
<b>1 set</b>	<p><b>ENGINE ROOM SIMULATORS (ERS) EQUIPMENT</b></p> <p>1. The simulated engine room shall as a minimum reflect a typical machinery found on merchant ships. The following main components shall be simulated and all necessary sub-systems, and all necessary sub-systems included for a low speed engine:</p> <ul style="list-style-type: none"> <li>— main engine including turbocharger system</li> <li>— 2 auxiliary diesel generators</li> <li>— lubrication oil separator</li> <li>— steering gear system</li> <li>— fire pump</li> <li>— shaft generator</li> <li>— cooling water system including freshwater generation system</li> <li>— turbo generator</li> <li>— fuel oil Bunkering system</li> <li>— fuel oil Settling and Service systems</li> <li>— 2 heavy fuel oil separators</li> <li>— 1 diesel oil separator</li> <li>— steam generation plant including exhaust and oil-fired boilers</li> <li>— 2 starting air compressors</li> <li>— diesel oil and heavy fuel oil supply to main and auxiliary engines</li> <li>— main engine operation from engine room, engine control room and bridge</li> <li>— turbocharger system</li> <li>— air ventilation system for engine and control room</li> <li>— bilge water system including oily water treatment systems</li> <li>— stern tube system</li> <li>— deck machinery applicable to the ship model</li> <li>— ballast system</li> <li>— Sewage treatment system.</li> </ul> <p><b><i>Medium and High Speed Engines</i></b></p> <p>2. The simulated engine room shall consist of typical machinery found on merchant ships. The following main components shall be simulated and all necessary sub-systems included for a medium and high speed engine:</p> <ul style="list-style-type: none"> <li>— one or more main engines</li> <li>— main SW system</li> <li>— 2 auxiliary engines</li> <li>— fuel oil tanks</li> <li>— fuel oil separator</li> <li>— lubrication oil separator</li> <li>— main engine(s), including: <ul style="list-style-type: none"> <li>— fresh water system</li> <li>— lubrication system</li> <li>— turbocharger system</li> <li>— ME SW system.</li> </ul> </li> <li>— reduction gear system</li> <li>— controllable propeller pitch where applicable</li> <li>— steam generation system as applicable</li> </ul>

SIMULATOR/S	
QTY.	Description
	<ul style="list-style-type: none"> <li>— freshwater generator</li> <li>— bilge wells and bilge separation system</li> <li>— 2 air compressors</li> <li>— steering gear system</li> <li>— fire pump</li> <li>— electrical power plant</li> <li>— deck machinery applicable to the ship model</li> <li>— ballast system</li> <li>— sewage treatment system</li> </ul> <p><b>Steam Propulsion</b></p> <p>3. The simulation model should reflect main steam related subsystems of an actual ship:</p> <ul style="list-style-type: none"> <li>— HFO supply system</li> <li>— DO supply system</li> <li>— boil-off gas supply system if LNG ship is simulated</li> <li>— 1 ½ boiler system or twin boiler systems each including: <ul style="list-style-type: none"> <li>— local and remote control systems</li> <li>— safety systems</li> <li>— burner management system</li> <li>— burner system, incl. minimum 3 burners</li> <li>— air/flue gas system</li> <li>— heating surfaces</li> <li>— water/ steam system.</li> </ul> </li> <li>— main turbine, including: <ul style="list-style-type: none"> <li>— local and remote control systems</li> <li>— safety systems</li> <li>— throttle control</li> <li>— draining and heating system</li> <li>— gland sealing system.</li> </ul> </li> <li>— main reduction gear system including: <ul style="list-style-type: none"> <li>— lubrication system incl. purifier</li> <li>— governor sensor system</li> </ul> </li> <li>— condenser and condensate feed systems <ul style="list-style-type: none"> <li>— SW circ system</li> <li>— aux SW system</li> <li>— vacuum pumps</li> <li>— condenser condensate level control</li> </ul> </li> <li>— atmospheric drain system: <ul style="list-style-type: none"> <li>— atmospheric drain tank</li> <li>— drain pumps</li> <li>— level control</li> </ul> </li> <li>— feed water pre-heaters (one or more)</li> <li>— de-aerator system</li> <li>— boiler feed water pumps</li> <li>— back pressure steam system and auxiliary</li> <li>— ballast system</li> </ul>

SIMULATOR/S	
QTY.	Description
	<p>— deck machinery applicable to the ship model</p> <p><b>Electric Propulsion Motors (Diesel and/or Gas)</b></p> <p>4. The simulated engine room shall reflect typical machinery found on merchant or passenger ships. The following main components shall, as a minimum be simulated and all necessary sub-systems included for a diesel and/or gas turbine electric propulsion plant:</p> <ul style="list-style-type: none"> <li>— propulsion electric motor(s)</li> <li>— 2 or more high voltage generators</li> <li>— 2 or more prime movers (diesel engines or gas-turbines)</li> <li>— cooling water system including freshwater generation system</li> <li>— fuel oil Bunkering system</li> <li>— fuel oil Settling and Service systems</li> <li>— fuel oil separator system</li> <li>— lubrication oil separator system</li> <li>— steam generation plant as applicable</li> <li>— starting air and service air system</li> <li>— main engine operation from engine room, engine control room and bridge</li> <li>— bilge water system including oily water treatment systems.</li> <li>— ballast system</li> <li>— stern tube system</li> <li>— steering gear system</li> <li>— deck machinery applicable to the ship model</li> <li>— fire pump</li> </ul>
<b>REMARKS:</b>	
<p>Above tools, equipment and materials are applicable for the training delivery of the CORE COMPETENCIES.</p> <p>The tools, equipment and materials for the delivery of the COMMON COMPETENCIES shall comply with the standards prescribed by the MARITIME INDUSTRY AUTHORITY (MARINA) in their prescribed and regulated training program in BASIC SAFETY TRAINING (BST) and SECURITY AWARENESS TRAINING courses.</p>	

## TRAINER'S QUALIFICATIONS FOR MARITIME SECTOR

### ABLE SEAFARER ENGINE NC II (STCW Regulation III/5)

- Must be a licensed Officer-in-charge of an Engineering Watch and with at least 12 months seagoing service in that position
- Must be proficient in English communication
- Must be holder of NTTC I in Able Seafarer Engine NC II (STCW Regulation III/5)

#### REMARKS:

1. Above trainer's qualifications are applicable for the delivery of the CORE COMPETENCIES.
2. The trainer's qualifications for the delivery of the common competencies shall comply with the standards prescribed by the MARITIME INDUSTRY AUTHORITY (MARINA) in their prescribed and regulated training in Basic Safety Training (BST) and SECURITY AWARENESS TRAINING courses.

# **MODULES OF INSTRUCTION**

## **BASIC COMPETENCIES**

**ABLE SEAFARER ENGINE NC II (STCW REGULATION III/5)**

UNIT OF COMPETENCY : **PARTICIPATE IN WORKPLACE COMMUNICATION**

MODULE TITLE : **PARTICIPATING IN WORKPLACE COMMUNICATION**

MODULE DESCRIPTION : This module covers the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements.

NOMINAL DURATION : 4 hours

**SUMMARY OF LEARNING OUTCOMES:**

Upon completion of the module the student trainees must be able to:

- LO1. Obtain and convey workplace information
- LO2. Participate in workplace meetings and discussions
- LO3. Complete relevant work related documents

**LO1. OBTAIN AND CONVEY WORKPLACE INFORMATION****ASSESSMENT CRITERIA:**

1. Specific and relevant information is accessed from appropriate sources.
2. Effective questioning, active listening and speaking skills are used to gather and convey information.
3. Appropriate medium is used to transfer information and ideas.
4. Appropriate non-verbal communication is used.
5. Appropriate lines of communication with supervisors and colleagues are identified and followed.
6. Defined workplace procedures for the location and storage of information are used.
7. Personal interaction is carried out clearly and concisely.

**CONTENTS:**

- Effective communication
- Different Modes of communication
- Written communication
- Organizational policies
- Communication procedures and systems
- Technology relevant to the enterprise and the individual's work responsibilities

**CONDITIONS:**

The following resources must be provided:

- Fax machine
- Telephone
- Writing Materials
- Internet facilities
- Manual filing system
- Computer-based filing system
- Electronic memos, instruction and forms
- Signals, signs and diagrams (sample)
- Circular (sample)
- Notices (sample)

**METHODOLOGIES:**

- Lecture
- Group discussion
- Interaction

**ASSESSMENT METHODS:**

- Direct observation
- Oral interview
- Written test

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## LO2. PARTICIPATE IN WORKPLACE MEETINGS AND DISCUSSIONS

### ASSESSMENT CRITERIA:

1. Team meetings are attended on time.
2. Own opinions are clearly expressed and those of others are listened to without interruptions.
3. Meeting inputs are consistent with the meeting purpose and established protocols
4. Workplace interactions are listened to without interruptions.
5. Questions about simple routine workplace procedures and matters concerning working conditions of employment are asked and responded to.
6. Meeting outcomes are interpreted and implemented.

### CONTENTS:

- Following simple languages
- Organizational policies
- Communication procedures and systems
- Technology relevant to the enterprise and the individual's work responsibilities

### CONDITIONS:

The following resources must be provided:

- Fax machine
- Telephone
- Writing Materials
- Internet facilities
- Manual filing system
- Computer-based filing system
- Electronic memos, instruction and forms
- Signals, signs and diagrams (sample)
- Circular (sample)
- Notices (sample)

### METHODOLOGIES:

- Lecture
- Group discussion
- Interaction

### ASSESSMENT METHODS:

- Direct observation
- Oral interview
- Written test

### LO3. COMPLETE RELEVANT WORK RELATED DOCUMENTS

#### ASSESSMENT CRITERIA:

1. Ranges of forms relating to conditions of employment are completed accurately and legibly.
2. Workplace data is recorded on standard workplace forms and documents.
3. Errors on recording information on forms/documents are identified and properly acted upon.
4. Reporting requirements to supervisor are completed according to organizational guidelines.

#### CONTENTS:

- Participation in workplace meetings
- Completion of work related documents
- Recording routine workplace measures
- Provision of information in response to workplace requirements

#### CONDITIONS:

The following resources must be provided:

- Fax machine
- Telephone
- Writing Materials
- Internet facilities
- Manual filing system
- Computer-based filing system
- Electronic memos, instruction and forms
- Signals, signs and diagrams (sample)
- Circular (sample)
- Notices (sample)

#### METHODOLOGIES:

- Lecture
- Group discussion
- Interaction

#### ASSESSMENT METHODS:

- Direct observation
- Interview
- Oral questioning



UNIT OF COMPETENCY : **WORK IN TEAM ENVIRONMENT**

MODULE TITLE : **WORKING IN TEAM ENVIRONMENT**

MODULE DESCRIPTION : This module covers the knowledge, skills and attitudes required to identify role and responsibility as a member of a team.

NOMINAL DURATION : 5 hours

**SUMMARY OF LEARNING OUTCOMES:**

Upon completion of the module the student trainees must be able to:

LO1. Describe team role and scope

LO2. Identify own role and responsibility within team

LO3. Work as a team member

**LO1. DESCRIBE TEAM ROLE AND SCOPE****ASSESSMENT CRITERIA:**

1. The role and objective of the team is identified from available resources of information.
2. Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources.

**CONTENTS:**

- The communication process
- Team structure
- Team roles
- Team culture
- Group planning and decision making

**CONDITIONS:**

The following resources must be provided:

- Standard operating and other workplace procedure (sample)
- Job procedures (sample)
- Machine/equipment with manufacturer's specifications and instructions
- Organizational and personnel chart
- Client/supplier instructions (sample)
- Quality standards system
- OHS and environmental standards
- Work procedures and practices
- Safety, environmental, housekeeping and quality guidelines

**METHODOLOGIES:**

- Lecture
- Group discussion
- Interaction

**ASSESSMENT METHODS:**

- Portfolio assessment
- Interview
- Simulation/role play
- Observation
- Third party report
- Written tests

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**LO2. IDENTIFY OWN ROLE AND RESPONSIBILITY WITHIN TEAM****ASSESSMENT CRITERIA:**

1. Individual role and responsibilities within the team environment are identified.
2. Roles and responsibility of other team members are identified and recognized.
3. Reporting relationships within and external to team are identified.

**CONTENTS:**

- The communication process
- Team structure
- Team roles
- Group planning and decision making

**CONDITIONS:**

The following resources must be provided:

- Standard operating and other workplace procedure (sample)
- Job procedures (sample)
- Machine/equipment with manufacturer's specifications and instructions
- Organizational and personnel chart
- Client/supplier instructions (sample)
- Quality standards system
- OHS and environmental standards
- Work procedures and practices
- Safety, environmental, housekeeping and quality guidelines

**METHODOLOGIES:**

- Lecture
- Group discussion
- Interaction

**ASSESSMENT METHODS:**

- Portfolio assessment
- Interview
- Simulation/role play
- Observation
- Third party report
- Written tests

### LO3. WORK AS A TEAM MEMBER

#### ASSESSMENT CRITERIA:

1. Effective and appropriate forms of communications used and interactions undertaken with team members who contributed to known team activities and objectives.
2. Effective and appropriate contributions made to complement team activities and objectives, based on individual skills and competencies and workplace context.
3. Observed protocols in reporting using standard operating procedures.
4. Contribute to the development of team work plans based on an understanding of team's role and objectives and individual competencies of the members.

#### CONTENTS:

- The communication process
- Team structure
- Team roles
- Group planning and decision making

#### CONDITIONS:

The following resources must be provided:

- Standard operating and other workplace procedure (sample)
- Job procedures (sample)
- Machine/equipment with manufacturer's specifications and instructions
- Organizational and personnel chart
- Client/supplier instructions (sample)
- Quality standards system
- OHS and environmental standards
- Work procedures and practices
- Safety, environmental, housekeeping and quality guidelines

#### METHODOLOGIES:

- Group discussion
- Interaction

#### ASSESSMENT METHODS:

- Portfolio assessment
- Interview
- Simulation/role play
- Observation
- Third party report
- Written tests

UNIT OF COMPETENCY : **PRACTICE CAREER PROFESSIONALISM**

MODULE TITLE : **PRACTICING CAREER PROFESSIONALISM**

MODULE DESCRIPTION : This module covers the knowledge, skills and attitudes required in promoting career growth and advancement

NOMINAL DURATION : 4 hours

**SUMMARY OF LEARNING OUTCOMES:**

Upon completion of the module the student trainees must be able to:

- LO1. Integrate personal objectives with organizational goals.
- LO2. Set and meet work priorities
- LO3. Maintain professional growth and development

**LO1. INTEGRATE PERSONAL OBJECTIVES WITH ORGANIZATIONAL GOALS****ASSESSMENT CRITERIA:**

1. Professional growth and work plans are pursued towards improving the qualifications set for the profession.
2. Intra and interpersonal relationships are maintained in the course of managing oneself based on performance evaluation.
3. Commitment to the organization and its goal is demonstrated in the performance of duties.

**CONTENTS:**

- Work values and ethics (Code of Conduct, Code of Ethics)
- Company policies
- Company operations, procedures and standards
- Fundamental rights at work including gender sensitivity
- Personal Hygiene practices

**CONDITIONS:**

The following resources must be provided:

- Performance Appraisal System (sample)
- Psychological Profiles
- Aptitude Tests
- Computers - Hardware/ software
- Recognitions certificates (samples)
- Licenses/certifications (samples)
- Conference room
- Chairs and tables
- Code of Conduct (copy)
- Code of Ethics (copy)
- Company policies
- Fundamental rights of workers/gender sensitivity
- Simulation room

**METHODOLOGIES:**

- Lecture
- Group discussion
- Interaction

**ASSESSMENT METHODS:**

- Portfolio assessment
- Interview
- Simulation/role play
- Observation
- Third party report
- Written tests

## LO2. SET AND MEET WORK PRIORITIES

### ASSESSMENT CRITERIA:

1. Competing demands and prioritized to achieve personal, team and organizational goals and objectives.
2. Resources are utilized efficiently and effectively to manage work priorities and commitments.
3. Practice along economic use and maintenance of equipment and facilities are allowed as per established procedures.

### CONTENTS:

- Work values and ethics (Code of Conduct, Code of Ethics)
- Company policies
- Company operations, procedures and standards
- Fundamental rights at work including gender sensitivity
- Meeting the deadlines
- Time management

### CONDITIONS:

The following resources must be provided:

- Performance Appraisal system (sample)
- Psychological Profiles
- Aptitude Tests
- Computers - Hardware/ software
- Recognitions certificates (samples)
- Licenses/certifications (samples)
- Conference room
- Chairs and tables
- Code of Conduct (copy)
- Code of Ethics (copy)
- Company policies
- Fundamental rights of workers/gender sensitivity
- Simulation room

### METHODOLOGIES:

- Lecture
- Group discussion
- Interaction

### ASSESSMENT METHODS:

- Portfolio assessment
- Interview
- Simulation/role play
- Observation
- Third party report
- Written tests

### LO3. MAINTAIN PROFESSIONAL GROWTH AND DEVELOPMENT

#### ASSESSMENT CRITERIA:

1. Trainings and career opportunities are identified and availed of based on the job requirements.
2. Recognition are sought/received and demonstrated as proof of career development.
3. Licenses/certifications relevant to job and career are obtained.

#### CONTENTS:

- Performance Appraisal System
- Personal and professional profile
- Work values and ethics (Code of Conduct, Code of Ethics)
- Company policies and procedures
- Fundamental rights at work including gender sensitivity
- Licenses, awards and recognition

#### CONDITIONS:

The following resources must be provided:

- Performance Appraisal System (sample)
- Psychological Profiles
- Aptitude Tests
- Computers - Hardware/ software
- Recognitions certificates (samples)
- Licenses/certifications (samples)
- Conference room
- Chairs and tables
- Code of Conduct (copy)
- Code of Ethics (copy)
- Company policies
- Fundamental rights of workers/gender sensitivity
- Simulation room

#### METHODOLOGIES:

- Group discussion
- Interaction

#### ASSESSMENT METHODS:

- Portfolio assessment
- Interview
- Simulation/role play
- Observation
- Third party report
- Written tests



- UNIT OF COMPETENCY : **PRACTICE OCCUPATIONAL HEALTH AND SAFETY PROCEDURES**
- MODULE TITLE : **PRACTICING OCCUPATIONAL HEALTH AND SAFETY PROCEDURES**
- MODULE DESCRIPTION : This module covers the knowledge, skills and attitudes required to comply with regulatory and organizational requirements for health and safety.
- NOMINAL DURATION : 5 hours

**SUMMARY OF LEARNING OUTCOMES:**

Upon completion of the module the student trainees must be able to:

- LO1. Identify hazards and risks
- LO2. Evaluate hazards and risks
- LO3. Control hazards and risks
- LO4. Maintain OHS awareness

## LO1. IDENTIFY HAZARDS AND RISKS

### ASSESSMENT CRITERIA:

1. Safety regulations and workplace safety and hazard control practices and procedures are classified and explained based on organization procedures.
2. Hazards/risks in the workplace and their corresponding indicators are identified to minimize or eliminate risk to co-workers, workplace and environment in accordance with organization procedures.
3. Contingency measures during workplace accidents, fires and other emergencies are recognized and established in accordance with organization procedures.

### CONTENTS:

- OHS procedures and policies and regulations
- PPE types and uses
- Personal hygiene practices
- Hazard risks identification and control
- Threshold Limit Value
- Organization safety and health protocol
- Safety and health consciousness

### CONDITIONS: The following resources must be provided:

- Clean air act (copy)
- Building code
- National electrical and fire safety codes
- Waste management statutes and rules
- Philippine occupational safety and health standards
- DOLE regulations on safety legal requirements
- ECC regulations
- Physical hazards
- Biological hazards
- Ergonomics
- Contingency measures – evacuation, isolation, decontamination facilities
- Personal Protective Equipment – mask, gloves, goggles, hair net/cap/bonnet, face mask, shield, apron, gown, coverall, suit, anti-static suit
- Medical health records
- Incident reports/accident reports
- OHS training related completed

### METHODOLOGIES:

- Lecture
- Group discussion
- Interaction

### ASSESSMENT METHODS:

- Portfolio assessment
- Interview
- Simulation/role play
- Observation
- Third party report
- Written tests

## LO2. EVALUATE HAZARDS AND RISKS

### ASSESSMENT CRITERIA:

1. Terms of maximum tolerance limits which when exceeded will result in harm or damage are identified based on threshold limit values
2. Effects of hazards are determined
3. OHS issues and/or concerns and identified safety hazards are reported to designated personnel in accordance with workforce requirements and relevant workplace OHS legislation

### CONTENTS:

- OHS procedures and policies and regulations
- PPE types and uses
- Hazard risks identification and control
- Threshold Limit Value
- Organization safety and health protocol
- Safety and health consciousness

### CONDITIONS: The following resources must be provided:

- Clean air act (copy)
- Building code
- National electrical and fire safety codes
- Waste management statutes and rules
- Philippine occupational safety and health standards
- DOLE regulations on safety legal requirements
- ECC regulations
- Physical hazards
- Biological hazards
- Ergonomics
- Contingency measures – evacuation, isolation, decontamination facilities
- Personal Protective Equipment – mask, gloves, goggles, hair net/cap/bonnet, face mask, shield, apron, gown, coverall, suit, anti-static suit
- Medical health records
- Incident reports/accident reports
- OHS training related completed

### METHODOLOGIES:

- Lecture
- Group discussion
- Interaction

### ASSESSMENT METHODS:

- Portfolio assessment
- Interview
- Simulation/role play
- Observation
- Third party report
- Written tests

### LO3. CONTROL HAZARDS AND RISKS

#### ASSESSMENT CRITERIA:

1. Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace are consistently followed
2. Procedures for dealing with workplace accidents, fire and emergencies are followed in accordance with organization OHS policies
3. Personal protective equipment (PPE) is correctly used in accordance with organization OHS procedures and practices
4. Appropriate assistance is provided in the event of a workplace emergency in accordance with established organization protocols.

#### CONTENTS:

- OHS procedures and policies and regulations
- PPE types and uses
- Hazard risks identification and control
- Threshold Limit Value
- Organization safety and health protocol
- Safety and health consciousness

#### CONDITIONS: The following resources must be provided:

- Clean air act (copy)
- Building code
- National electrical and fire safety codes
- Waste management statutes and rules
- Philippine occupational safety and health standards
- DOLE regulations on safety legal requirements
- ECC regulations
- Physical hazards
- Biological hazards
- Ergonomics
- Contingency measures – evacuation, isolation, decontamination facilities
- Personal Protective Equipment – mask, gloves, goggles, hair net/cap/bonnet, face mask, shield, apron, gown, coverall, suit, anti-static suit
- Medical health records
- Incident reports/accident reports
- OHS training related completed

#### METHODOLOGIES:

- Lecture
- Group discussion
- Interaction

#### ASSESSMENT METHODS:

- Portfolio assessment
- Interview
- Simulation/role play
- Observation
- Third party report
- Written tests

**LO4. MAINTAIN OHS AWARENESS****ASSESSMENT CRITERIA:**

1. Emergency related drills and training are participated in as per established organization guidelines and procedures
2. OHS personal records are completed and updated in accordance with workplace requirements

**CONTENTS:**

- OHS procedures and policies and regulations
- PPE types and uses
- Hazard risks identification and control
- Threshold Limit Value
- Organization safety and health protocol
- Safety and health consciousness

**CONDITIONS:** The following resources must be provided:

- Clean air act (copy)
- Building code
- National electrical and fire safety codes
- Waste management statutes and rules
- Philippine occupational safety and health standards
- DOLE regulations on safety legal requirements
- ECC regulations
- Physical hazards
- Biological hazards
- Ergonomics
- Contingency measures – evacuation, isolation, decontamination facilities
- Personal Protective Equipment – mask, gloves, goggles, hair net/cap/bonnet, face mask, shield, apron, gown, coverall, suit, anti-static suit
- Medical health records
- Incident reports/accident reports
- OHS training related completed

**METHODOLOGIES:**

- Lecture
- Group discussion
- Interaction

**ASSESSMENT METHODS:**

- Portfolio assessment
- Interview
- Simulation/role play
- Observation
- Third party report
- Written tests

# **MODULES OF INSTRUCTION**

## **COMMON COMPETENCIES**

**ABLE SEAFARER ENGINE NC II (STCW REGULATION III/5)**

- UNIT OF COMPETENCY : **SURVIVE AT SEA IN THE EVENT OF SHIP ABANDONMENT**
- MODULE TITLE : **SURVIVING AT SEA IN THE EVENT OF SHIP ABANDONMENT**
- MODULE DESCRIPTOR : This module identifies the competence required to launch and operate survival craft and life boats on a vessel under the direction of Officer of the Watch in compliance with the Philippines and International regulations and guidelines.
- NOMINAL DURATION : 4 hours

**SUMMARY OF LEARNING OUTCOMES:**

Upon completion of the module the student trainees must be able to:

LO1: Respond to the indicated emergency

LO2: Board a survival craft

**LO1. RESPOND TO THE INDICATED EMERGENCY****ASSESSMENT CRITERIA:**

1. Muster signal is identified and appropriate action to respond to the identified emergency is taken based on established procedures.
2. Timing and sequence of individual actions are practiced based on prevailing circumstances and conditions and potential dangers and threats to survival are minimized.
3. Life-saving appliances are used in accordance with standards operating procedures.
4. Recommended swimming techniques are practiced with or without wearing a lifejacket.

**CONTENTS:**

- Identification of Muster Signal
- Identified Emergency on board the ship
- Practicing individual action in terms of timing and sequence on prevailing circumstances and conditions
- Identifying dangers and threats to survival
- Different life saving appliances its type and location
- Recommended swimming techniques

**CONDITIONS:** The following resources must be provided:

- Survival craft (free fall lifeboat, devit launched lifeboats, liferafts)
- Lifejackets
- Lifebuoys
- Hard hats
- Immersion suits and other thermal protective aids
- Rocket line throwing appliances
- Pyrotechnic distress signals
- GMDSS survival craft VHF radios
- EPIRBs
- SARTs
- Whistles

**METHODOLOGIES:**

- Discussion
- Lecture
- Demonstration

**ASSESSMENT METHODS:**

- Demonstration with questioning
- Written examination
- Portfolio



## LO2. BOARD A SURVIVAL CRAFT

### ASSESSMENT CRITERIA:

1. Boarding on survival craft is performed and dangers to other survivors are avoided based on recommended method.
2. Initial actions after leaving the ship are taken to minimize threats to survivors.
3. Survival craft devices are operated based on established procedures and manufacturer's instruction.

### CONTENTS:

- Types of Survival Craft and its operation
- Dangers and threats to survivors
- Methods of boarding survival craft
- Operating survival craft devices
- Avoiding dangers to other survivors while on survival craft
- Identification of Initial actions after leaving the ship
- Different survival craft equipment and its location
- Survival craft equipment and how to operate them

### CONDITIONS: The following resources must be provided:

- Survival craft (free fall lifeboat, devit launched lifeboats, liferafts)
- Lifejackets
- Lifebuoys
- Hard hats
- Immersion suits and other thermal protective aids
- Whistles
- Rocket line throwing appliances
- Pyrotechnic distress signals
- GMDSS survival craft VHF radios
- Navigational map
- Compass
- EPIRBs
- SARTs

### METHODOLOGIES:

- Discussion
- Lecture
- Demonstration

### ASSESSMENT METHODS:

- Demonstration with questioning
- Written examination
- Portfolio

UNIT OF COMPETENCY : **MINIMIZE THE RISK OF FIRE AND MAINTAIN A STATE OF READINESS TO RESPOND TO EMERGENCY SITUATIONS INVOLVING FIRE**

MODULE TITLE : **MINIMIZING THE RISK OF FIRE AND MAINTAINING A STATE OF READINESS TO RESPOND TO EMERGENCY SITUATIONS INVOLVING FIRE**

MODULE DESCRIPTOR : This module identifies the competence required to prevent and fight fires on board a vessel, including firefighting activities.

NOMINAL DURATION : 8 hours

**SUMMARY OF LEARNING OUTCOMES:**

Upon completion of the module the student trainees must be able to:

LO1. Carry out fire minimization procedures

LO2: Respond to emergencies involving fire

## LO1. CARRY OUT FIRE MINIMIZATION PROCEDURES

### ASSESSMENT CRITERIA:

1. Fire hazards on board vessel are identified and action is taken to eliminate or minimize them.
2. Responsibilities for checking fire prevention equipment and systems are fulfilled and appropriate action is taken to ensure that they are operational.
3. An awareness and understanding of the causes of fire and its minimization is maintained through participation in fire drills and related instructional programs.
4. A state of readiness to respond to fire emergencies is maintained at all times.

### CONTENTS:

- Identification of fire hazard on board the vessel
- Different fire prevention equipment and its operations
- Fire and its minimization
- Exploring fire emergencies on board vessel
- Relevant regulations, code of practice, policies and procedures related to the maintenance of fire detection, fire fighting, life saving and safety equipment and system

### CONDITIONS: The following resources must be provided:

- Solid Materials (wood, textiles, curtains, furniture, plastics)
- Liquid Materials (Patrols, Oils, Lubricants, paints, waxes, alcohol)
- Domestic Main gases (acetylene, LPG, butane or propane)
- Portable Fire Extinguishers (foam, water, CO<sub>2</sub>, dry chemical)
- Fire blankets
- CO<sub>2</sub> fixed system
- Foam installation including semi-portable and fixed system
- Sprinkler system
- Fire pumps (main and emergency fire pump)
- Fire hoses
- Hydrants
- Branches and international shore connection

### METHODOLOGIES:

- Discussion
- Lecture
- Demonstration

### ASSESSMENT METHODS:

- Demonstration with questioning
- Written examination
- Portfolio

## LO2. RESPOND TO EMERGENCIES INVOLVING FIRE

### ASSESSMENT CRITERIA:

1. Emergency situations involving fire are correctly identified in accordance with established nautical practice.
2. Type of fire is identified in accordance with the established classification system for fires.
3. Initial action on becoming aware of fire emergency is in conformity with established practices and procedures.
4. Action taken is timely and appropriate for seriousness of the fire emergency.
5. Action taken on identifying muster signals for a fire emergency is appropriate and complies with established procedures.
6. Appropriate precautions and procedures are implemented when responding to electrical fires.
7. Appropriate precautions and procedures are implemented when responding to uptake and hydrogen fires.
8. Communications are clear and concise at all times and orders are acknowledged in a timely and seamanlike manner.

### CONTENTS:

- Types of Flammable materials and fire hazards
- Identifying emergency situations involving fire
- Types of fire, chemistry of fire their characteristics and equipment needed for their extinguishment
- Identified action undertaken during fire emergencies
- Appropriate actions and precautions while responding to different type of fire
- Application of effective communication in case of fire

### CONDITIONS: The following resources must be provided:

- Solid Materials (wood, textiles, curtains, furniture, plastics)
- Liquid Materials (Patrols, Oils, Lubricants, paints, waxes, alcohol)
- Domestic Main gases (acetylene, LPG, butane or propane)
- Portable Fire Extinguishers (foam, water, CO<sub>2</sub>, dry chemical)
- Fire blankets
- CO<sub>2</sub> fixed system
- Foam installation including semi-portable and fixed system
- Sprinkler system
- Fire pumps (main and emergency fire pump)
- Fire hoses
- Hydrants
- Branches and international shore connection

### METHODOLOGIES:

- Discussion
- Lecture
- Demonstration

### ASSESSMENT METHODS:

- Demonstration and questioning of related underpinning knowledge
- Written examination
- Portfolio

UNIT OF COMPETENCY : **FIGHT AND EXTINGUISH FIRES**

MODULE TITLE : **FIGHTING AND EXTINGUISHING FIRES**

MODULE DESCRIPTOR : This module covers the knowledge, skills and attitudes in fighting and extinguishing fires.

NOMINAL DURATION : 8 hours

**SUMMARY OF LEARNING OUTCOMES:**

Upon completion of the module the student trainees must be able to:

LO1. Operate portable fire fighting equipment

LO2. Carry out fire fighting operations

## LO1. OPERATE PORTABLE FIRE FIGHTING EQUIPMENT

### ASSESSMENT CRITERIA:

1. Types of fires are correctly identified in accordance with accepted fire-fighting practice.
2. Correct portable fire-fighting equipment is selected and used to fight specific classes of fires.
3. Class F fires are correctly extinguished with a fire blanket in accordance with accepted fire-fighting practice.
4. Correct techniques are applied for the use of hose lines to extinguish fires on board a vessel.
5. Where applicable, correct techniques are applied for the setting up of foam making equipment to extinguish B Class fires on board a vessel.

### CONTENTS:

- Identification and standards types and classification of fire
- Different fire fighting practices
- OSHA guidelines regarding fire fighting
- Correct techniques in extinguishing fires on board a vessel
- Different portable firefighting equipment
- Fire pumps, fire hoses and fire sprinkler system

### CONDITIONS: The following resources must be provided:

- Solid Materials (wood, textiles, curtains, furniture, plastics)
- Liquid Materials (Paints, Oils, Lubricants, paints, waxes, alcohol)
- Domestic Main gases (acetylene, LPG, butane or propane)
- Portable Fire Extinguishers (foam, water, CO<sub>2</sub>, dry chemical)
- OSHA guidelines regarding fire fighting
- Fire blankets
- CO<sub>2</sub> fixed system
- Foam installation including semi-portable and fixed system
- Sprinkler system
- Fire pumps (main and emergency fire pump)
- Fire hoses
- Hydrants
- Branches and international shore connection

### METHODOLOGIES:

- Discussion
- Lecture
- Demonstration

### ASSESSMENT METHODS:

- Demonstration with questioning
- Written examination
- Practical performance
- Portfolio

## LO2. CARRY OUT FIRE FIGHTING OPERATIONS

### ASSESSMENT CRITERIA:

1. Fire is extinguished using appropriate procedures, techniques, equipment and fire-fighting agents.
2. Correct portable fire-extinguisher(s) are selected and used for the class of fire involved in a fire emergency.
3. Appropriate safety clothing, appliances and equipment is used and safety precautions and procedures are applied when fighting fires in accordance with regulatory requirements, vessel's procedures and established fire-fighting practice.
4. The timing and sequence of individual actions when fighting fires onboard a vessel are appropriate to the prevailing circumstances and conditions.
5. Search and rescue operations in a smoke filled environment are correctly conducted as a member of a fire-fighting team in accordance with accepted fire-fighting practice.
6. Interior fires are extinguished using appropriate fire-fighting equipment and procedures as a member of a fire-fighting team in accordance with accepted fire-fighting practice.
7. Lifeline signals are correctly used during interior fire-fighting operations.

### CONTENTS:

- Appropriate firefighting procedures and techniques
- Different portable fire fighting equipment
- OSHA guidelines regarding fire fighting
- Appropriate fire safety clothing, appliances and equipment on board vessels
- Search and rescue operation in a smoke filled environment
- Different lifeline signals during fire fighting

### CONDITIONS: The following resources must be provided:

- Portable Fire Extinguishers (foam, water, CO2, dry chemical)
- Fire blankets
- CO2 fixed system
- OSHA guidelines regarding fire fighting
- Foam installation including semi-portable and fixed system
- Sprinkler system
- Fire pumps (main and emergency fire pump)
- Fire hoses
- Fire Hydrants

### METHODOLOGIES:

- Discussion
- Lecture
- Demonstration

### ASSESSMENT METHODS:

- Demonstration with questioning
- Written examination
- Practical performance
- Portfolio

Unit of Competency : **TAKE IMMEDIATE ACTION UPON ENCOUNTERING AN ACCIDENT OR OTHER MEDICAL EMERGENCY**

Module Title : **TAKING IMMEDIATE ACTION UPON ENCOUNTERING AN ACCIDENT OR OTHER MEDICAL EMERGENCY**

MODULE DESCRIPTION : This module identifies the competence required in taking immediate action upon encountering an accident or other medical emergency.

NOMINAL DURATION : 24 hours

**SUMMARY OF LEARNING OUTCOMES:**

Upon completion of the module the student trainees must be able to:

- LO1. Determine the need of casualty
- LO2. Administer first-aid to the victim



**LO1. DETERMINE THE NEEDS OF CASUALTY****ASSESSMENT CRITERIA:**

1. Patient condition is determined in accordance with established first aid procedures and the nature of injury or illness is established.
2. Probable cause, nature and extent of injuries is identified and appropriate action is taken to prevent further harm to the victim and to self.
3. The position of the patient is adjusted to optimize personal comfort for the medical condition or injury concerned.
4. Where there are doubts over the seriousness of the injury or illness and how to treat the patient, assistance is sought from senior officers or shore-based medical advisers.

**CONTENTS:**

- Nature of Injury and Types of Illness
- Identification of probable cause, nature and extent of injuries
- Ergonomics and positions of patient for comfort for the medical condition
- Assistance sought from Shore Based Medical Adviser

**CONDITIONS:** The following resources must be provided:

- Vessel's medicine cabinet
- First aid boxes
- Emergency first aid carry bags
- Roller bandages
- Triangular bandages
- Face masks
- Cleaning swabs
- Cleaning materials
- Medicines

**METHODOLOGIES:**

- Discussion
- Lecture
- Demonstration
- Simulation

**ASSESSMENT METHODS:**

- Demonstration with questioning
- Written examination
- Practical performance

## LO2. ADMINISTER FIRST AID TO THE VICTIM

### ASSESSMENT CRITERIA:

1. Appropriate first aid procedures are used to treat the identified injury or illness in accordance with the first-aider's limits of responsibility.
2. Aseptic techniques are applied during any wound dressing.
3. Hygiene measures are used that are appropriate for the degree of illness or injury.
4. Cardio-pulmonary resuscitation techniques are correctly applied where required.
5. Condition of the patient is regularly monitored both visually and through appropriate measures of bodily signs.
6. Health precautions and disease prevention measures are implemented in accordance with regulatory requirements and company procedures.
7. Appropriate action is taken if there are signs of a deterioration in the condition of the patient.
8. Where necessary, assistance is provided in the preparation and transporting of the victim.

### CONTENTS:

- Appropriate first aid procedures
- Techniques for care of wounds
- Types of injuries
- Identified hygiene measures for the degree of illness and injury in the condition of patient
- Signs of deterioration
- Ways of transporting patient
- Correct methods of Expired Air Resuscitation (EAR), External Cardiac Compression (ECC) and Cardio Pulmonary Resuscitation (CPR)

### CONDITIONS: The following resources must be provided:

- Vessel's medicine cabinet
- First aid boxes
- Emergency first aid carry bags
- Roller bandages
- Triangular bandages
- Face masks
- Cleaning swabs
- Cleaning materials
- Medicines

### METHODOLOGIES:

- Discussion
- Lecture
- Demonstration
- Simulation

### ASSESSMENT METHODS:

- Demonstration with questioning
- Written examination
- Practical performance

UNIT OF COMPETENCY : **COMPLY WITH EMERGENCY PROCEDURES**

MODULE TITLE : **COMPLYING WITH EMERGENCY PROCEDURES**

MODULE DESCRIPTOR : This module involves the knowledge, skills and attitudes to take appropriate initial action on becoming aware of an emergency on board vessel and to follow established emergency response procedures.

NOMINAL DURATION : 4 hours

**SUMMARY OF LEARNING OUTCOMES:**

Upon completion of the module the student trainees must be able to:

LO1: Take action on becoming aware of an emergency

LO2. Follow established emergency procedures

LO3. Follow procedures for the use of various life saving appliances

**LO1. TAKE ACTION ON BECOMING AWARE OF AN EMERGENCY****ASSESSMENT CRITERIA:**

1. Emergency situations are recognized and identified.
2. Emergency situations are responded following established vessel's emergency response procedures.
3. Correct action is taken upon discovery of an actual or potential emergency in accordance with established vessel procedures.
4. Information on raising alarm is given as per established vessel's emergency response procedures.

**CONTENTS:**

- Identification and recognition of emergency situation
- Knowledge of relevant maritime regulations particular in times of emergency
- Navigational emergencies for vessels and appropriate action and solutions
- Indications of various types of emergency situations and the action to be followed when various types of actual or potential emergency situations are identified
- Emergency alarm signals and systems in use of vessels and procedures to be followed when an emergency alarm is raised

**CONDITIONS:** The following resources must be provided:

- IMO STCW Codes and Convention
- Relevant domestic and international OH&S legislation (Manual)
- Survival equipment
- Life jackets
- Exposure and immersion suits
- Survival crafts
- Contingency plans (samples)

**METHODOLOGIES:**

- Discussion
- Lecture
- Demonstration
- Simulation

**ASSESSMENT METHODS:**

- Demonstration with questioning
- Written examination
- Practical performance

## LO2. FOLLOW ESTABLISHED EMERGENCY PROCEDURES

### ASSESSMENT CRITERIA:

1. Vessel's contingency plans for emergency response are known and are implemented in real and simulated emergency situations.
2. Escape routes, internal and external communications and alarm systems are used in real and simulated emergency situations in accordance with regulatory requirements and established procedures.
3. Emergency communications and alarm signals and systems are recognized and required actions are applied in accordance with emergency procedures and regulatory requirements.
4. Planned damage control procedures for dealing with damage to the vessel and its hull are implemented in accordance with company procedures and regulatory requirements.

### CONTENTS:

- Escape routes and internal and external communications systems and alarm on board a vessel
- General principles of damage and control and the manner in which watertight integrity of hull is maintained on a vessel, including the importance of preparation, control and repair
- Ways of controlling damage during a flooding emergency, including the use of various shipboard items that can be used for damage control purposes such as mattresses, canvass and clothing
- Maritime communication techniques used during navigational emergencies

### CONDITIONS: The following resources must be provided:

- IMO STCW Codes and Convention
- Relevant domestic and international OH&S legislation (Manual)
- Survival equipment
- Life jackets
- Exposure and immersion suits
- Survival crafts
- Contingency plans (samples)

### METHODOLOGIES:

- Discussion
- Lecture
- Demonstration
- Simulation

### ASSESSMENT METHODS:

- Demonstration with questioning
- Written examination
- Practical performance

### **LO3. FOLLOW PROCEDURES FOR THE USE OF VARIOUS LIFE SAVING EQUIPMENT**

#### **ASSESSMENT CRITERIA:**

1. Participation in life saving drills confirms readiness to carry out life saving procedures and the use of life saving equipment.
2. Survival equipment are used in the event of emergencies.
3. Procedures for the use of various shipboard life saving appliances are followed in accordance with regulatory requirements, manufacturer's instruction and company procedures.

#### **CONTENTS:**

- Taking initial action during real and simulated emergency situation
- Identification of life saving equipment
- Implementing emergency during a real and simulated emergency situations
- Identifying and evaluating problems that may occur during a shipboard emergency and determining appropriate courses of action
- Applying safety and life saving precautions and procedures during emergency situations during on board a vessel
- Participating in drills aimed at preparing shipboard personnel to implement

#### **CONDITIONS:** The following resources must be provided:

- IMO STCW Codes and Convention
- Relevant domestic and international OH&S legislation (Manual)
- Survival equipment
- Life jackets
- Exposure and immersion suits
- Survival crafts
- Contingency plans (samples)

#### **METHODOLOGIES:**

- Discussion
- Lecture
- Demonstration
- Simulation

#### **ASSESSMENT METHODS:**

- Demonstration with questioning
- Written examination
- Practical performance

UNIT OF COMPETENCY : **TAKE PRECAUTIONS TO PREVENT POLLUTION OF THE MARINE ENVIRONMENT**

MODULE TITLE : **TAKING PRECAUTIONS TO PREVENT POLLUTION OF THE MARINE ENVIRONMENT**

MODULE DESCRIPTION : This module identifies the competence required to prevent pollution of the marine environment. It involves the development of awareness to preserve and protect marine environment.

NOMINAL DURATION : 4 hours

**SUMMARY OF LEARNING OUTCOMES:**

Upon completion of the module the student trainees must be able to:

- LO1. Practice compliance with legislative requirements for protection of the marine environment
- LO2. Practice anti-pollution procedures

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## **LO1. PRACTICE COMPLIANCE WITH LEGISLATIVE REQUIREMENTS FOR PROTECTION OF THE MARINE ENVIRONMENT**

### ASSESSMENT CRITERIA:

1. Relevant regulations and procedures for the protection of the marine environment are identified.
2. Appropriate action is taken in day-to-day work to ensure compliance with relevant regulations and procedures for the protection of the marine environment as required.
3. Appropriate action is taken where incidences of non-compliance or potential non-compliance are identified in accordance with regulations and procedures.
4. Any breach of regulations and procedures concerning protection of the marine environment is reported as required within the limits of the crew's responsibility.

### CONTENTS:

- Observing marine environment protection checklist
- Knowledge of the different procedures for the protection of the marine environment
- Safety, environmental and hazard control precautions and procedures relevant to MARPOL regulations
- Checking of equipment in compliance with anti-pollution procedures

### CONDITIONS: The following resources must be provided:

- Incineration option for shipboard generated garbage
- All kinds of victual, domestic and operational wastes excluding fresh fish and parts thereof
- Guidelines to include Garbage for which there is a total prohibition on discharge into the sea
- All plastic including but not limited to synthetic ropes, synthetic fishing nets, garbage plastic bags
- Reporting system (sample contents)

### METHODOLOGIES:

- Discussion
- Lecture
- Demonstration
- Simulation

### ASSESSMENT METHODS:

- Demonstration with questioning
- Written examination
- Practical performance



## LO2. PRACTICE ANTI-POLLUTION PROCEDURES

### ASSESSMENT CRITERIA:

1. Anti-pollution procedures applicable to vessel operations are followed in accordance with regulations and procedures.
2. Appropriate preventive measures are undertaken to prevent pollution of the marine environment in accordance with regulations and procedures.
3. Inputs are provided in the preparation of reports and other documentation related to the protection of marine environment in accordance with regulations and procedures.

### CONTENTS:

- Practice Anti-Pollution Procedures
- Identification of preventive measure to prevent pollution for marine environment
- Different regulations applicable to environmental and hazard control precautions and procedures relevant to MARPOL , IMO STCW regulations

### CONDITIONS: The following resources must be provided:

- Incineration option for shipboard generated garbage
- All kinds of victual, domestic and operational wastes excluding fresh fish and parts thereof
- Guidelines to include Garbage for which there is a total prohibition on discharge into the sea
- All plastic including but not limited to synthetic ropes, synthetic fishing nets, garbage plastic bags
- Reporting system (sample contents)

### METHODOLOGIES:

- Discussion
- Lecture
- Demonstration
- Simulation

### ASSESSMENT METHODS:

- Demonstration with questioning
- Written examination
- Practical performance

UNIT OF COMPETENCY : **OBSERVE SAFE WORKING PRACTICES**

MODULE TITLE : **OBSERVING SAFE WORKING PRACTICES**

MODULE DESCRIPTION : This module deals with the knowledge and skills required to follow and apply established maritime safe working practices and procedures and hazard control strategies.

NOMINAL DURATION : 4 hours

**SUMMARY OF LEARNING OUTCOMES:**

Upon completion of the module the student trainees must be able to:

- LO1. Identify and follow workplace procedures for hazard identification and risk control
- LO2. Contribute to arrangements for the management of occupational health and safety
- LO3. Take necessary actions to control fatigue
- LO4. Complete occupational health and safety records

## **LO1. IDENTIFY AND FOLLOW WORKPLACE PROCEDURES FOR HAZARD IDENTIFICATION AND RISK CONTROL**

### **ASSESSMENT CRITERIA:**

1. Occupational Health and Safety regulations for controlling risks onboard a vessel are followed.
2. Workplace instruction and procedures dealing with shipboard accidents, fire and emergencies are known and followed.
3. Hazards in the workplace are identified and reported to appropriate personnel in accordance with established shipboard safety practices and procedures.
4. Safety procedures and precautions for entry into a pump room, fuel tanks or other confined spaces on a vessel are followed.
5. Personal protection clothing and equipment is used in accordance with established shipboard safety practices and procedures.
6. Appropriate assistance is provided in the event of a shipboard emergency to secure the vessel and its machinery and equipment and to maintain the safety of the vessel and persons involved.
7. Established emergency and contingency plans are followed in the event of a shipboard emergency.

### **CONTENTS:**

- Different Safety Regulations and Vessels Safety and Hazard Control Practices
- Identification of Hazards in the Workplace
- Workplace procedures dealing with shipboard accidents
- Relevant precautionary measures necessary for entry into pump room, fuel tanks, and other confined spaces
- PPE's in the workplace
- Identification of appropriate assistance provided in the event of shipboard emergencies

### **CONDITIONS:** The following resources must be provided:

- Workplace evacuation plan
- Personal protective equipment (PPE)
- Learning guides
- Hand-outs
  - Organizational safety and health protocol
  - OHS indicators
  - Hazards/risk identification and control guidelines
- CD's, DVD's, Computer Presentations

### **METHODOLOGIES:**

- Discussion
- Lecture
- Demonstration
- Simulation

### **ASSESSMENT METHODS:**

- Demonstration with questioning
- Written examination
- Practical performance

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## **LO2. CONTRIBUTE TO ARRANGEMENTS FOR THE MANAGEMENT OF OCCUPATIONAL HEALTH AND SAFETY**

### **ASSESSMENT CRITERIA:**

1. Occupational Health and Safety issues are raised with designated personnel in accordance with meeting procedures.
2. Contributions to occupational health and safety management are made in accordance with workplace procedures.

### **CONTENTS:**

- Identification of different OH&S Regulations and Vessels Safety and Hazard Control Practices
- Legal bases and legislation pertaining OH&S management
- Identification of participative arrangements for OH&S
- OH&S acts regulations and code of practice

### **CONDITIONS:** The following resources must be provided:

- Workplace evacuation plan
- Personal protective equipment (PPE)
- Learning guides
- Hand-outs
  - Organizational safety and health protocol
  - OHS indicators
  - Hazards/risk identification and control guidelines
- CD's, DVD's, Computer Presentations

### **METHODOLOGIES:**

- Discussion
- Lecture
- Demonstration
- Simulation

### **ASSESSMENT METHODS:**

- Demonstration with questioning
- Written examination
- Practical performance

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**LO3. TAKE NECESSARY ACTIONS TO CONTROL FATIGUE****ASSESSMENT CRITERIA:**

1. Fatigue symptoms are recognized and identified.
2. Fatigue management practices are observed at all times.
3. Reports related to incidence of fatigue are communicated to appropriate authority in accordance with established company procedures.

**CONTENTS:**

- Identification and recognition of Fatigue symptoms
- Different corrective action and control pertaining fatigue
- Fatigue management
- Preparation of reports related to incidence of fatigue

**CONDITIONS:** The following resources must be provided:

- Workplace OHS procedures and procedures
- Learning modules on Fatigue Controls
- Hand-outs
  - Organizational safety and health protocol
  - OHS indicators
  - Hazards/risk identification and control guidelines
- CD's, DVD's, Computer Presentations

**METHODOLOGIES:**

- Discussion
- Lecture
- Demonstration
- Simulation

**ASSESSMENT METHODS:**

- Demonstration with questioning
- Written examination
- Practical performance

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**LO4. COMPLETE OCCUPATIONAL HEALTH AND SAFETY RECORDS****ASSESSMENT CRITERIA:**

1. Occupational health and safety records for self are completed in accordance with workplace requirements.
2. Legal requirements for the maintenance of records of occupational injury and diseases are followed.

**CONTENTS:**

- Operational Occupational health and safety records for personnel on board
- Legal requirements and legislation for maintenance of OH&S records
- ISM Code Safety Management System Procedures

**CONDITIONS:** The students/trainees must be provided with the following

- Workplace OHS procedures and procedures
- Learning modules on OH&S
- Hand-outs
  - Organizational safety and health protocol
  - OHS indicators
  - Hazards/risk identification and control guidelines
- CD's, DVD's, Computer Presentations

**METHODOLOGIES:**

- Interactive lecture
- Simulation
- Symposium
- Film viewing
- Group dynamics

**ASSESSMENT METHODS:**

- Demonstration
- Interview
- Written examination
- Portfolio assessment

UNIT OF COMPETENCY : **DEMONSTRATE SECURITY AWARENESS PRACTICES**

MODULE TITLE : **DEMONSTRATING SECURITY AWARENESS PRACTICES**

MODULE DESCRIPTION : This module covers the knowledge, skills and attitudes in demonstrating security awareness practices.

NOMINAL DURATION : 4 hours

**SUMMARY OF LEARNING OUTCOMES:**

Upon completion of the module the student trainees must be able to:

- LO1. Contribute to the enhancement of maritime security through heightened awareness
- LO2. Recognize security threats
- LO3. Maintaining security awareness and vigilance

## **LO1. CONTRIBUTE TO THE ENHANCEMENT OF MARITIME SECURITY THROUGH HEIGHTENED AWARENESS**

### **ASSESSMENT CRITERIA:**

1. Requirements relating to enhanced maritime security are identified.
2. All critical factors relevant to the security and safety of a maritime workplace are monitored continuously during work operations.
3. Relevant information concerning the security and safety of a maritime workplace is recognized and interpreted and timely action is taken in accordance with workplace procedures.
4. Changes to work environment and related risks are monitored and managed to ensure a safe outcome to workplace operations.
5. A security-related contingency plan of action is studied and interpreted and where necessary appropriate action is taken.
6. Reports on matters related to vessel security are prepared and submitted to designated personnel in accordance with the ship security plan and company and maritime regulatory requirements.

### **CONTENTS:**

- Requirements relating to maritime security
- Critical factors affecting maritime security
- Safety in the maritime workplace
- Changes in work environment
- Monitoring risk to ensure safe outcomes in the workplace
- Maritime contingency plan
- Report generations procedures according to ship security plan

### **CONDITIONS:** The following resources must be provided:

- Computer with printer
- Paper and pens
- LCD projector
- Learning guides
- Hand-outs
  - Maritime security procedures/manuals
- CD's, DVD's, maritime workplace security

### **METHODOLOGIES:**

- Discussion
- Lecture
- Demonstration
- Simulation

### **ASSESSMENT METHODS:**

- Demonstration with questioning
- Written examination
- Practical performance



## LO2. RECOGNIZE SECURITY THREATS

### ASSESSMENT CRITERIA:

1. Factors that may adversely affect the security and safety of a maritime workplace are identified.
2. Risks to vessel or port security and safety are recognized and reported to relevant security personnel and appropriate action is taken to control the risk in accordance with workplace procedures and security requirements.
3. Persons posing potential security risks are recognized and reported to relevant security personnel and appropriate action is taken to control the risk in accordance with workplace procedures and security requirements.
4. All relevant indications of a security situation are recognized and alerted relevant personnel in accordance with workplace procedures and regulatory requirements.

### CONTENTS:

- Identifying factors affecting security and safety in maritime workplace
- Recognition of risks to vessel
- Person posing potential security risks
- Identification of relevant security personnel on a ship vessel
- Relevant security personnel
- Potential security risks and its control
- Relevant security situation according to workplace procedures and regulatory requirements

### CONDITIONS: The following resources must be provided:

- Computer with printer
- Paper and pens
- LCD projector
- Learning guides
- Hand-outs
  - Maritime security procedures/manuals
- CD's, DVD's, maritime workplace security situations

### METHODOLOGIES:

- Discussion
- Lecture
- Demonstration
- Simulation

### ASSESSMENT METHODS:

- Demonstration with questioning
- Written examination
- Practical performance

### LO3. MAINTAINING SECURITY AWARENESS AND VIGILANCE

#### ASSESSMENT CRITERIA:

1. Security instruction programs are participated in as per company and regulatory requirements.
2. Requirements and processes for security awareness and vigilance are identified.
3. Security and emergency drills are participated in accordance with the ship security plan and company and maritime regulatory requirements.
4. Inputs to improve/enhance security training programs and drills are provided, where necessary.

#### CONTENTS:

- Security instruction program
- Requirements and processes for security awareness
- Types of Security emergency drill
- Security plans and maritime regulatory requirements
- Inputs to enhanced security training program

#### CONDITIONS: The following resources must be provided:

- Computer with printer
- Paper and pens
- LCD projector
- Learning guides
- Hand-outs
  - Security Awareness and Vigilance Programs/Manual
- CD's, DVD's, maritime workplace security situations

#### METHODOLOGIES:

- Discussion
- Lecture
- Demonstration
- Simulation

#### ASSESSMENT METHODS:

- Demonstration with questioning
- Written examination
- Practical performance

# **MODULES OF INSTRUCTION**

## **CORE COMPETENCIES**

**ABLE SEAFARER ENGINE NC II (STCW REGULATION III/5)**

- UNIT OF COMPETENCY : **PERFORM MARINE ENGINEERING AT THE SUPPORT LEVEL**
- MODULE TITLE : **PERFORMING MARINE ENGINEERING AT THE SUPPORT LEVEL**
- MODULE DESCRIPTOR : This module covers the knowledge, skills and attitude required to communicate, monitor and control a safe engine room watch. This includes understanding the operations of main propulsion, auxiliary systems, equipment and machineries.
- NOMINAL DURATION : 30 hours

#### SUMMARY OF LEARNING OUTCOMES:

Upon completion of the module the student trainees must be able to:

- LO1. Contribute to a safe engineering watch
- LO2. Contribute to the monitoring and controlling of an engine room watch
- LO3. Contribute to fuelling and oil transfer operations
- LO4. Contribute to bilge and ballast operations
- LO5. Contribute to the operation of equipment and machinery

## LO1. CONTRIBUTE TO A SAFE ENGINEERING WATCH

### ASSESSMENT CRITERIA:

1. The conduct, handover and relief of the engineering watch is carried out in conformity with accepted principles and vessel's procedures.
2. Watchkeeping principles and procedures are followed in accordance with established marine engineering practice and regulatory requirements.
3. A safe engineering watch is achieved based on the accepted bridge and engine room resource management principles and procedures.
4. Fatigue management strategies are correctly applied in accordance with STCW codes.
5. Communications with the officer of the watch are clear and concise.
6. Orders from the officer on watch are understood and accurately executed.

### CONTENTS:

- Watchkeeping principles and procedures
- Fatigue management strategies
- Propulsion and Steerage
- Understanding orders from officers
- Engine room resource management principles and procedures in the ff:
  - a. Main engine systems
  - b. Diesel alternator systems
  - c. Turbo alternator system
  - d. Auxiliary systems of the engine

### CONDITIONS: The following resources must be provided:

- Tools and equipment appropriate in monitoring and controlling an engine room watch
  - a. Computer with accessories
  - b. LCD Projector
- Engine room simulated environment
- Materials relevant to the activity and tasks
  - a. Logbook
  - b. Paper and pens

### METHODOLOGIES:

- Discussion
- Lecture
- Demonstration
- Simulation

### ASSESSMENT METHODS:

- Demonstration with questioning
- Written examination
- Practical performance

## LO2. CONTRIBUTE TO THE MONITORING AND CONTROLLING OF AN ENGINE-ROOM WATCH

### ASSESSMENT CRITERIA:

1. The frequency and extent of monitoring of main propulsion and auxiliary machinery is carried out in conformity with accepted principles and procedures.
2. Appropriate entries pertaining to the engineering watch are recorded in the engine room book as per standard operating procedures.
3. Any deviation from the normal parameters is reported immediately to the engineer on watch.
4. Malfunctions of the main propulsion and auxiliary machineries and its parameters are identified, and reported immediately to the duty engineer.
5. Unsafe conditions or potential hazards are promptly recognized, reported and rectified before work continues.
6. Engine room emergency is reported immediately and appropriate action is undertaken.

### CONTENTS:

- Principles and procedures carried out in conformity main propulsion and auxiliary machinery
- Understanding of main propulsion and auxiliary machinery
- Recording procedures of entries pertaining engineering watch
- Recognition of unsafe conditions or potential hazards
- Different engine room emergency situations and appropriate actions

### CONDITIONS: The following resources must be provided:

- Tools and equipment appropriate in monitoring and controlling an engine room watch
  - a. Computer with accessories
  - b. LCD Projector
- Engine room simulated environment
- Materials relevant to the activity and tasks
  - a. Logbook
  - b. Paper and pens

### METHODOLOGIES:

- Discussion
- Lecture
- Demonstration
- Simulation

### ASSESSMENT METHODS:

- Demonstration with questioning
- Written examination
- Practical performance

### LO3. CONTRIBUTE TO FUELLING AND OIL TRANSFER OPERATIONS

#### ASSESSMENT CRITERIA:

1. Fuel system and oil transfer operations are carried out in accordance with established safety practices and equipment operating instructions.
2. Dangerous, hazardous and harmful liquid is handled in compliance with established safety practices.
3. The performance of machinery and equipment used in fuel system and oil transfer operations are monitored in accordance with vessel's survey requirements and manufacturer's instructions.
4. Communications made within the operator's area of responsibility are consistently successful.
5. Housekeeping is observed at all times in engine room.

#### CONTENTS:

- Fuel system and oil transfer operations procedures
- Handling of dangerous/hazardous/harmful liquids
- Machinery and equipment used in fuel system and oil transfer
- Types of communication made within operators areas of responsibility
- Housekeeping procedures involving fuel and oil transfer
- Connecting and disconnecting fuel and oil hoses

#### CONDITIONS:

The following resources must be provided:

- Tools and equipment
  - a. Computer with accessories
  - b. LCD Projector
- Engine room simulated environment
- Materials relevant to the activity and tasks
  - a. Logbook
  - b. Paper and pens
  - c. Fuel
  - d. Engine oil
  - e. Housekeeping materials

#### METHODOLOGIES:

- Discussion
- Lecture
- Demonstration
- Simulation

#### ASSESSMENT METHODS:

- Demonstration with questioning
- Written examination
- Practical performance

## LO4. CONTRIBUTE TO BILGE AND BALLAST OPERATIONS

### ASSESSMENT CRITERIA:

1. Bilge and ballast operations and maintenance are carried out in accordance with established safety standards and regulatory requirements, to avoid pollution of the marine environment.
2. Any operational problems encountered in the use of equipment and machinery on the vessel are reported and/or rectified in accordance with standard procedures.
3. Records of performance of machinery and equipment used in bilge and ballast operations are maintained in accordance with established procedures.
4. Communications made within the operators area of responsibility are consistently successful.
5. Housekeeping is observed at all times in engine room.

### CONTENTS:

- Bilge and ballast operations and maintenance
- Safety standards and regulatory practices
- Different machinery and equipment used in bilge and ballast operations
- Records of performance of machinery and equipment
- Types of communication made within the operators
- Waste management and pollution control procedures as per MARPOL
- Reporting of tank levels

### CONDITIONS:

The following resources must be provided:

- Tools and equipment
  - a. Computer with accessories
  - b. LCD Projector
- Ship/vessel
- Materials relevant to the activity and tasks
  - a. Logbook
  - b. Paper and pens
  - c. Fuel
  - d. Engine oil
  - e. Housekeeping materials

### METHODOLOGIES:

- Discussion
- Lecture
- Demonstration
- Simulation

### ASSESSMENT METHODS:

- Demonstration with questioning
- Written examination
- Practical performance



**LO5. CONTRIBUTE TO THE OPERATION OF EQUIPMENT AND MACHINERY****ASSESSMENT CRITERIA:**

1. Pre-operational checks of equipment and machinery and associated systems are carried out in accordance with safety requirements and shipboard practices.
2. Operation of equipment and machinery is performed in accordance with manufacturer's specifications and instructions and safety requirements.
3. Any operational problems encountered in the use of equipment and machinery on the vessel are reported and/or rectified in accordance with standard procedures.
4. Post-operational checks of equipment and machinery and associated systems are carried out in accordance with safety requirements and shipboard practices.
5. Communications made within the operator's area of responsibility are consistently successful.
6. Housekeeping is observed at all times in engine room.

**CONTENTS:**

- Pre operational check-up of equipment and machinery associated system
- Safe operation of equipment and machineries
- Identification of equipment and machinery operational problem
- Post-operational check-ups of machinery and equipment
- Housekeeping procedures involving equipment and machinery
- Valves and pumps, hatches and watertight doors
- Ports and related equipment
- Anti pollution equipment

**CONDITIONS:** The following resources must be provided:

- Tools and equipment
  - a. Computer with accessories
  - b. LCD Projector
- Engine room simulated environment
- Materials relevant to the activity and tasks
  - a. Logbook / checklist
  - b. Paper and pens
  - c. Fuel
  - d. Engine oil
  - e. Housekeeping materials

**METHODOLOGIES:**

- Discussion
- Lecture
- Demonstration
- Simulation

**ASSESSMENT METHODS:**

- Demonstration with questioning
- Written examination
- Practical performance

UNIT OF COMPETENCY : **PERFORM SAFE USAGE OF ELECTRICAL EQUIPMENT AT THE SUPPORT LEVEL**

MODULE TITLE : **PERFORMING SAFE USAGE OF ELECTRICAL EQUIPMENT AT THE SUPPORT LEVEL**

MODULE DESCRIPTION : This module involves the knowledge, skills and attitude required to operate shipboard electrical equipment on a vessel.

NOMINAL DURATION : 14 hours

**SUMMARY OF LEARNING OUTCOMES:**

Upon completion of the module the student trainees must be able to:

- LO1. Operate electrical equipment
- LO2. Follow safety hazard control procedures

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## LO1. OPERATE ELECTRICAL EQUIPMENT

### ASSESSMENT CRITERIA:

1. Shipboard Electrical equipment and its power supply are identified according to their functions.
2. Shipboard electrical equipment is operated in accordance with established procedures and manufacturer's instructions.
3. Initial immediate corrective action is performed on electrical problems and faults and reported to relevant personnel.

### CONTENTS:

- Types of shipboard electrical equipment and power supply
- Operational hazards of electrical equipment
- Limits of performance of shipboard electrical equipment as per manufacturers instructions and specification.
- Monitoring shipboard electrical equipment
- Diagnostic techniques in identifying electrical equipment faults
- Records and documentation of electrical equipment performance

### CONDITIONS:

The following resources must be provided:

- Tools and equipment
  - a. Computer with accessories
  - b. LCD Projector
- Ship/vessel
- Materials relevant to the activity and tasks
  - a. Logbook
  - b. Paper and pens
  - c. Housekeeping materials
  - d. Electrical handtools

### METHODOLOGIES:

- Discussion
- Lecture
- Demonstration
- Simulation

### ASSESSMENT METHODS:

- Demonstration with questioning
- Written examination
- Practical performance

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## LO2. FOLLOW SAFETY HAZARD CONTROL PROCEDURES

### ASSESSMENT CRITERIA:

1. Safety, hazard minimization and pollution control procedures and national and international regulations are followed at all times during the operation of electrical machinery and electrical equipment.
2. Operational hazards are identified and unsafe equipment are reported to concerned personnel in accordance with company policies and procedures.
3. Isolation and emergency procedures are carried out and immediately reported to relevant personnel in the event of any electrical equipment failure.
4. Shipboard emergency and contingency plans followed in the event of a electrical equipment failure or emergency.
5. Housekeeping is observed at all times in engine room.

### CONTENTS:

- Safety, hazard minimization and pollution control
- Operational hazards
- Different emergency situation on board
- Action done in case of electrical equipment failure and emergencies
- Shipboard contingency and emergency plans

### CONDITIONS: The following resources must be provided:

- Tools and equipment
  - a. Computer with accessories
  - b. LCD Projector
- Ship/vessel
- Materials relevant to the activity and tasks
  - a. Logbook
  - b. Paper and pens
  - c. Housekeeping materials

### METHODOLOGIES:

- Discussion
- Lecture
- Demonstration
- Simulation

### ASSESSMENT METHODS:

- Demonstration with questioning
- Written examination
- Practical performance

UNIT OF COMPETENCY : **PERFORM MAINTENANCE AND REPAIR AT THE SUPPORT LEVEL**

MODULE TITLE : **PERFORMING MAINTENANCE AND REPAIR AT THE SUPPORT LEVEL**

MODULE DESCRIPTION : This module involves the knowledge, skills and attitude required in the routine maintenance and repair procedures of the shipboard equipment and machinery.

NOMINAL DURATION : 24 hours

**SUMMARY OF LEARNING OUTCOMES:**

Upon completion of the module the student trainees must be able to:

- LO1. Contribute in routine planned maintenance of equipment and machinery
- LO2. Contribute in repairs of equipment and machinery
- LO3. Carry out stores operations

## LO1. CONTRIBUTE IN ROUTINE PLANNED MAINTENANCE OF EQUIPMENT AND MACHINERY

### ASSESSMENT CRITERIA:

1. Cleaning materials and equipment are identified and selected in preparation for routine maintenance.
2. Maintenance arrangements for equipment and machinery on the vessel are carried out in accordance with technical, safety and procedural specifications.
3. Operational problems or faults with the vessel's equipment and machinery are identified and reported to the relevant personnel.
4. Routine lubrication and other preventive maintenance of equipment and machinery is carried out in accordance with manufacturer's instructions.
5. Preventive and remedial maintenance carried out on equipment and machinery spaces are communicated to the engine officer for record keeping.

### CONTENTS:

- Types of machinery to carry out planned routine maintenance
- Preventive and remedial Maintenance arrangement for equipment and machinery
- Operational problems of machinery and equipment
- Operating restrictions with vessels equipment and machinery
- Lubricating and other preventive maintenance of equipment and machinery
- Fault identification of equipment and machinery
- Records and documentation of preventive maintenance

CONDITIONS: The following resources must be provided:

#### Tools and accessories:

- Spanner wrench
- Screw drivers (Philips, & negative, size 5mm to 15mm)
- Vice grip
- Pliers (assorted sizes)
- Adjustable wrench (assorted)
- Torque wrenches
- Hammer ball pen
- Punchers
- Chisel Cold
- Files Snips
- Hacksaws
- Nibblers
- Drill Bits
- Taps
- Portable and Pedestal grinders
- Jigsaws
- Sheers
- Power Nibblers
- Gauges
- Sounding tape
- Tools for removing packing

#### Equipment:

- Pressure gauges, various types
- Vacuum gauge
- Thermometer, mercury (various ranges)
- Pressostat
- Thermostat
- Valves- globe, gate, butterfly, safety, etc.
- Thermometer, mercury (various ranges)
- Marine diesel engine (operational, complete with temperature and pressure monitoring devices)
- Air starting system (compressor, air tank and piping to engine)
- Refrigerating unit (open and complete for demo)
- Oil purifier (open and complete for demo)

**Learning Materials**

- Reference books
- Manuals
- Catalogs
- Brochures
- Modules
- CD/Video tapes
- Computers
- Printers

**Supplies and Materials:**

- Gloves
- Goggles
- Ear muff
- Coverall/boiler suits
- Air musk
- Hacksaws blades
- Rags (paper/cloth)
- Paint (primer)
- Thinner
- Paint brush
- Wire brush
- Chipping hammer
- First aid kits
- Mop
- Cleaning solvent
- Powder detergents
- Saw dust
- Trash bin
- Water finder
- Gate valve (pipe diameter 200mm)
- Buckets
- Broom sticks
- Dust pan
- Shovel

**METHODOLOGIES:**

- Discussion
- Lecture
- Demonstration
- Simulation

**ASSESSMENT METHODS:**

- Demonstration with questioning
- Written examination
- Practical performance

## LO2. CONTRIBUTE IN REPAIRS OF EQUIPMENT AND MACHINERY

### ASSESSMENT CRITERIA:

1. Correct shut down of malfunctioning/faulty machinery or equipment and disassembly procedure is carried out with the supervision of an engineering officer..
2. Damaged or faulty components are repaired / replaced with the supervision of an engineering officer.
3. Repaired machinery is re-assembled and tested in accordance with manufacturer's instructions and the supervision of engineering officer.
4. Performance of repaired machinery and associated safety devices, control systems and alarms is tested in accordance with manufacturer's instructions and in consultation with relevant personnel.
5. Replaced damage parts and consumable are disposed in accordance with the International regulations.
6. Housekeeping is observed at all times in engine room.

### CONTENTS:

- Procedures in shutting down faulty/ malfunction machinery
- Dismantling machinery in accordance with manufacturers standards
- Diagnostic techniques in identifying malfunction and damage machinery
- Repaired machinery testing procedures
- Replacing damages parts and disposal according to international regulations
- Types of vessel machinery and equipment

CONDITIONS: The following resources must be provided:

#### Tools and accessories:

- Spanner wrench
- Screw drivers (Philips, & negative, size 5mm to 15mm)
- Vice grip
- Pliers (assorted sizes)
- Adjustable wrench (assorted)
- Torque wrenches
- Hammer ball pen
- Punchers
- Chisel Cold
- Files Snips
- Hacksaws
- Nibblers
- Drill Bits
- Taps
- Portable and Pedestal grinders
- Jigsaws
- Sheers
- Power Nibblers
- Gauges
- Sounding tape
- Tools for removing packing

#### Equipment:

- Pressure gauges, various types
- Vacuum gauge
- Thermometer, mercury (various ranges)
- Pressostat
- Thermostat
- Valves- globe, gate, butterfly, safety, etc.
- Thermometer, mercury (various ranges)
- Marine diesel engine (operational, complete with temperature and pressure monitoring devices)
- Air starting system (compressor, air tank and piping to engine)
- Refrigerating unit (open and complete for demo)
- Oil purifier (open and complete for demo)



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### Learning Materials

- Reference books
- Manuals
- Catalogs
- Brochures
- Modules
- CD/Video tapes
- Computers
- Printers

### Supplies and Materials:

- Gloves
- Goggles
- Ear muff
- Coverall/boiler suits
- Air musk
- Hacksaws blades
- Rags (paper/cloth)
- Paint (primer)
- Thinner
- Paint brush
- Wire brush
- Chipping hammer
- First aid kits
- Mop
- Cleaning solvent
- Powder detergents
- Saw dust
- Trash bin
- Water finder
- Gate valve (pipe diameter 200mm)
- Buckets
- Broom sticks
- Dust pan
- Shovel

### METHODOLOGIES:

- Discussion
- Lecture
- Demonstration
- Simulation

### ASSESSMENT METHODS:

- Demonstration with questioning
- Written examination
- Practical performance

### LO3. CARRY OUT STORES OPERATIONS

#### ASSESSMENT CRITERIA:

1. Performance of stowage of dangerous/ hazardous / harmful stores complied with established safety practices.
2. Safe handling of stores is undertaken following established standard procedures.
3. Securing of stores is performed, when necessary or in the event of unforeseen circumstances.
4. Communications are made within the operator's area of responsibility.

#### CONTENTS:

- Stowage of dangerous/hazardous/ harmful stores
- Safe handling of stores
- Securing of stores
- Communications within operators

#### CONDITIONS: The following resources must be provided:

- Tools and equipment
  - a. Computer with accessories
  - b. LCD Projector
- Ship/vessel
- Materials relevant to the activity and tasks
  - a. Logbook
  - b. Paper and pens
  - c. Housekeeping materials
- Materials relevant to the activity and tasks

#### METHODOLOGIES:

- Discussion
- Lecture
- Demonstration
- Simulation

#### ASSESSMENT METHODS:

- Demonstration with questioning
- Written examination
- Practical performance

## **What is Competency-Based Curriculum (CBC)?**

- ❑ A competency-based curriculum is a framework or guide for the subsequent detailed development of competencies, associated methodologies, training and assessment resources.
- ❑ The CBC specifies the outcomes which are consistent with the requirements of the workplace as agreed through the industry or community consultations.
- ❑ CBC can be developed immediately when competency standards exist.
- ❑ When competency standards do not exist, curriculum developers need to clearly define the learning outcomes to be attained. The standard of performance required must be appropriate to industry and occupational needs through the industry/enterprise or specified client group consultations.

*These materials are available in both printed and electronic copies.*

*For more information please contact:*

**Technical Education and Skills Development Authority (TESDA)**

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*or visit our website: [www.tesda.gov.ph](http://www.tesda.gov.ph) or the TESDA Regional or Provincial Office nearest you.*