TRAINING REGULATIONS

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

MARITIME SECTOR

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY
East Service Road, South Superhighway, Taguig City, Metro Manila

Technical Education and Skills Development Act of 1994
(Republic Act No. 7796)

Section 22, "Establishment and Administration of the National Trade Skills Standards" of the RA 7796 known as the TESDA Act mandates TESDA to establish national occupational skill standards. The Authority shall develop and implement a certification and accreditation program in which private industry group and trade associations are accredited to conduct approved trade tests, and the local government units to promote such trade testing activities in their respective areas in accordance with the guidelines to be set by the Authority.

The Training Regulations (TR) serve as basis for the:

1. Competency assessment and certification;
2. Registration and delivery of training programs; and
3. Development of curriculum and assessment instruments.

Each TR has four sections:

Section 1 Definition of Qualification - refers to the group of competencies that describes the different functions of the qualification.

Section 2 Competency Standards - gives the specifications of competencies required for effective work performance.

Section 3 Training Standards - contains information and requirements in designing training program for certain Qualification. It includes curriculum design, training delivery; trainee entry requirements; tools equipment and materials; training facilities; trainer's qualification and institutional assessment.

Section 4 National Assessment and Certification Arrangement - describes the policies governing assessment and certification procedure.

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ABLE SEAFARER ENGINE NC II
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TRAINING REGULATIONS FOR

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

SECTION1 ABLE SEAFARER ENGINE NC II (STCW Regulation III/5) QUALIFICATION

The **ABLE SEAFARER ENGINE NC II (STCW Regulation III/5)** Qualification consists of competencies that a person must achieve to perform marine engineering duties, demonstrate safe usage of electrical equipment and maintaining and repairing at the support level.

This Qualification is packaged from the competency map of the Maritime Sector as shown in Annex A and complies with the requirements of STCW Regulation III/5.

The Units of Competency comprising this Qualification include the following:

Code No.	BASIC COMPETENCIES
500311105	Participate in workplace communication
500311106	Work in a team environment
500311107	Practice career professionalism
500311108	Practice occupational health and safety procedures

Code No.	COMMON COMPETENCIES
MTM834208	Survive at sea in the event of ship abandonment
MTM834209	Minimize the risk of fire and maintain a state of readiness to respond to emergency situations involving fire
MTM834210	Fight and extinguish fires
MTM834211	Take immediate action upon encountering an accident or other medical emergency
MTM834212	Comply with emergency procedures
MTM834213	Take precautions to prevent pollution of the marine environment
MTM834214	Observe safe working practices
MTM834215	Demonstrate security awareness practices

Code No.	CORE COMPETENCIES
MTM816314	Perform marine engineering at the support level
MTM816315	Demonstrate safe usage of electrical equipment at the support level
MTM816316	Perform maintenance and repair at the support level

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

- AB Engine

SECTION 2 COMPETENCY STANDARDS

This section gives the details of the contents of the basic, common and core units of competency required in **ABLE SEAFARER ENGINE NC II (STCW Regulation III/5)**.

BASIC COMPETENCIES

UNIT OF COMPETENCY : PARTICIPATE IN WORKPLACE COMMUNICATION

UNIT CODE : 500311105

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Obtain and convey workplace information	1.1 Specific and relevant information is accessed from ***appropriate sources*** 1.2 Effective questioning , active listening and speaking skills are used to gather and convey information 1.3 Appropriate ***medium*** is used to transfer information and ideas 1.4 Appropriate non- verbal communication is used 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed 1.6 Defined workplace procedures for the location and ***storage*** of information are used 1.7 Personal interaction is carried out clearly and concisely
2. Participate in workplace meetings and discussions	2.1 Team meetings are attended on time 2.2 Own opinions are clearly expressed and those of others are listened to without interruption 2.3 Meeting inputs are consistent with the meeting purpose and established ***protocols*** 2.4 ***Workplace interactions*** are conducted in a courteous manner 2.5 Questions about simple routine workplace procedures and maters concerning working conditions of employment are asked and responded to 2.6 Meetings outcomes are interpreted and implemented
3. Complete relevant work related documents	3.1 Range of ***forms*** relating to conditions of employment are completed accurately and legibly 3.2 Workplace data is recorded on standard workplace forms and documents 3.3 Basic mathematical processes are used for routine calculations 3.4 Errors in recording information on forms/ documents are identified and properly acted upon 3.5 Reporting requirements to supervisor are completed according to organizational guidelines

RANGE OF VARIABLES

VARIABLE	RANGE
1. Appropriate sources	1.1 Team members 1.2 Suppliers 1.3 Trade personnel 1.4 Local government 1.5 Industry bodies
2. Medium	2.1 Memorandum 2.2 Circular 2.3 Notice 2.4 Information discussion 2.5 Follow-up or verbal instructions 2.6 Face to face communication
3. Storage	3.1 Manual filing system 3.2 Computer-based filing system
4. Forms	4.1 Personnel forms, telephone message forms, safety reports
5. Workplace interactions	5.1 Face to face 5.2 Telephone 5.3 Electronic and two way radio 5.4 Written including electronic, memos, instruction and forms, non-verbal including gestures, signals, signs and diagrams
6. Protocols	6.1 Observing meeting 6.2 Compliance with meeting decisions 6.3 Obeying meeting instructions

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Prepared written communication following standard format of the organization 1.2 Accessed information using communication equipment 1.3 Made use of relevant terms as an aid to transfer information effectively 1.4 Conveyed information effectively adopting the formal or informal communication
2. Underpinning Knowledge and Attitudes	2.1 Effective communication 2.2 Different modes of communication 2.3 Written communication 2.4 Organizational policies 2.5 Communication procedures and systems 2.6 Technology relevant to the enterprise and the individual's work responsibilities
3. Underpinning Skills	3.1 Follow simple spoken language 3.2 Perform routine workplace duties following simple written notices 3.3 Participate in workplace meetings and discussions 3.4 Complete work related documents 3.5 Estimate, calculate and record routine workplace measures 3.6 Basic mathematical processes of addition, subtraction, division and multiplication 3.7 Ability to relate to people of social range in the workplace 3.8 Gather and provide information in response to workplace Requirements
4. Resource Implications	4.1 Fax machine 4.2 Telephone 4.3 Writing materials 4.4 Internet
5. Methods of Assessment	5.1 Direct Observation 5.2 Oral interview and written test
6. Context of Assessment	6.1 Competency may be assessed individually in the actual workplace or through accredited institution

UNIT OF COMPETENCY : WORK IN TEAM ENVIRONMENT

UNIT CODE : 500311106

UNIT DESCRIPTOR : This unit covers the skills, knowledge and attitudes to identify role and responsibility as a member of a team.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Describe team role and scope	1.1 The ***role and objective of the team*** is identified from available ***sources of information*** 1.2 Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources
2. Identify own role and responsibility within team	2.1 Individual role and responsibilities within the team environment are identified 2.2 Roles and responsibility of other team members are identified and recognized 2.3 Reporting relationships within team and external to team are identified
3. Work as a team member	3.1 Effective and appropriate forms of communications used and interactions undertaken with team members who contribute to known team activities and objectives 3.2 Effective and appropriate contributions made to complement team activities and objectives, based on individual skills and competencies and ***workplace context*** 3.3 Observed protocols in reporting using standard operating procedures 3.4 Contribute to the development of team work plans based on an understanding of team's role and objectives and individual competencies of the members.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Role and objective of team	1.1 Work activities in a team environment with enterprise or specific sector 1.2 Limited discretion, initiative and judgement maybe demonstrated on the job, either individually or in a team environment
2. Sources of information	2.1 Standard operating and/or other workplace procedures 2.2 Job procedures 2.3 Machine/equipment manufacturer's specifications and instructions 2.4 Organizational or external personnel 2.5 Client/supplier instructions 2.6 Quality standards 2.7 OHS and environmental standards
3. Workplace context	3.1 Work procedures and practices 3.2 Conditions of work environments 3.3 Legislation and industrial agreements 3.4 Standard work practice including the storage, safe handling and disposal of chemicals 3.5 Safety, environmental, housekeeping and quality guidelines

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Operated in a team to complete workplace activity 1.2 Worked effectively with others 1.3 Conveyed information in written or oral form 1.4 Selected and used appropriate workplace language 1.5 Followed designated work plan for the job 1.6 Reported outcomes
2. Underpinning Knowledge and Attitude	2.1 Communication process 2.2 Team structure 2.3 Team roles 2.4 Group planning and decision making
3. Underpinning Skills	3.1 Communicate appropriately, consistent with the culture of the workplace
4. Resource Implications	The following resources **MUST** be provided: 4.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 4.2 Materials relevant to the proposed activity or tasks
5. Methods of Assessment	Competency may be assessed through: 5.1 Observation of the individual member in relation to the work activities of the group 5.2 Observation of simulation and or role play involving the participation of individual member to the attainment of organizational goal 5.3 Case studies and scenarios as a basis for discussion of issues and strategies in teamwork
6. Context for Assessment	6.1 Competency may be assessed in workplace or in a simulated workplace setting 6.2 Assessment shall be observed while task are being undertaken whether individually or in group

UNIT OF COMPETENCY : PRACTICE CAREER PROFESSIONALISM

UNIT CODE : 500311107

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in promoting career growth and advancement.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Integrate personal objectives with organizational goals	1.1 Personal growth and work plans are pursued towards improving the qualifications set for the profession 1.2 Intra- and interpersonal relationships are maintained in the course of managing oneself based on performance ***evaluation*** 1.3 Commitment to the organization and its goal is demonstrated in the performance of duties
2. Set and meet work priorities	2.1 Competing demands are prioritized to achieve personal, team and organizational goals and objectives. 2.2 ***Resources*** are utilized efficiently and effectively to manage work priorities and commitments 2.3 Practices along economic use and maintenance of equipment and facilities are followed as per established procedures
3. Maintain professional growth and development	3.1 ***Trainings and career opportunities*** are identified and availed of based on job requirements 3.2 ***Recognitions*** are -sought/received and demonstrated as proof of career advancement 3.3 ***Licenses and/or certifications*** relevant to job and career are obtained and renewed

RANGE OF VARIABLES

VARIABLE	RANGE
1. Evaluation	1.1 Performance Appraisal 1.2 Psychological Profile 1.3 Aptitude Tests
2. Resources	2.1 Human 2.2 Financial 2.3 Technology 2.3.1 Hardware 2.3.2 Software
3. Trainings and career opportunities	3.1 Participation in training programs 3.1.1 Technical 3.1.2 Supervisory 3.1.3 Managerial 3.1.4 Continuing Education 3.2 Serving as Resource Persons in conferences and workshops
4. Recognitions	4.1 Recommendations 4.2 Citations 4.3 Certificate of Appreciations 4.4 Commendations 4.5 Awards 4.6 Tangible and Intangible Rewards
5. Licenses and/or certifications	5.1 National Certificates 5.2 Certificate of Competency 5.3 Support Level Licenses 5.4 Professional Licenses

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Attained job targets within key result areas (KRAs) 1.2 Maintained intra - and interpersonal relationship in the course of managing oneself based on performance evaluation 1.3 Completed trainings and career opportunities which are based on the requirements of the industries 1.4 Acquired and maintained licenses and/or certifications according to the requirement of the qualification
2. Underpinning Knowledge	2.1 Work values and ethics (Code of Conduct, Code of Ethics, etc.) 2.2 Company policies 2.3 Company-operations, procedures and standards 2.4 Fundamental rights at work including gender sensitivity 2.5 Personal hygiene practices
3. Underpinning Skills	3.1 Appropriate practice of personal hygiene 3.2 Intra and Interpersonal skills 3.3 Communication skills
4. Resource Implications	The following resources **MUST** be provided: 4.1 Workplace or assessment location 4.2 Case studies/scenarios
5. Methods of Assessment	Competency may be assessed through: 5.1 Portfolio Assessment 5.2 Interview 5.3 Simulation/Role-plays 5.4 Observation 5.5 Third Party Reports 5.6 Exams and Tests
6. Context of Assessment	6.1 Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY : **PRACTICE OCCUPATIONAL HEALTH AND SAFETY PROCEDURES**

UNIT CODE : **500311108**

UNIT DESCRIPTOR : This unit covers the outcomes required to comply with regulatory and organizational requirements for occupational health and safety.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Identify hazards and risks	1.1 ***Safety regulations*** and workplace safety and hazard control practices and procedures are clarified and explained based on organization procedures 1.2 ***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 1.3 ***Contingency measures*** during workplace accidents, fire and other emergencies are recognized and established in accordance with organization procedures
2. Evaluate hazards and risks	2.1 Terms of maximum tolerable limits which when exceeded will result in harm or damage are identified based on threshold limit values (TLV) 2.2 Effects of the hazards are determined 2.3 OHS issues and/or concerns and identified safety hazards are reported to designated personnel in accordance with workplace requirements and relevant workplace OHS legislation
3. Control hazards and risks	3.1 Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace are consistently followed 3.2 Procedures for dealing with workplace accidents, fire and emergencies are followed in accordance with organization OHS policies 3.3 ***Personal protective equipment (PPE)*** is correctly used in accordance with organization OHS procedures and practices 3.4 Appropriate assistance is provided in the event of a workplace emergency in accordance with established organization protocol
4. Maintain OHS awareness	4.1 ***Emergency-related drills and trainings*** are participated in as per established organization guidelines and procedures 4.2 ***OHS personal records*** are completed and updated in accordance with workplace requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. Safety regulations	May include but are not limited to: 1.1 Clean Air Act 1.2 Building code 1.3 National Electrical and Fire Safety Codes 1.4 Waste management statutes and rules 1.5 Philippine Occupational Safety and Health Standards 1.6 DOLE regulations on safety legal requirements 1.7 ECC regulations
2. Hazards/Risks	May include but are not limited to: 2.1 Physical hazards – impact, illumination, pressure, noise, vibration, temperature, radiation 2.2 Biological hazards- bacteria, viruses, plants, parasites, mites, molds, fungi, insects 2.3 Chemical hazards – dusts, fibers, mists, fumes, smoke, gasses, vapors 2.4 Ergonomics • Psychological factors – over exertion/ excessive force, awkward/static positions, fatigue, direct pressure, varying metabolic cycles • Physiological factors – monotony, personal relationship, work out cycle
3. Contingency measures	May include but are not limited to: 3.1 Evacuation 3.2 Isolation 3.3 Decontamination 3.4 (Calling designed) emergency personnel
4. PPE	May include but are not limited to: 4.1 Mask 4.2 Gloves 4.3 Goggles 4.4 Hair Net/cap/bonnet 4.5 Face mask/shield 4.6 Ear muffs 4.7 Apron/Gown/coverall/jump suit 4.8 Anti-static suits
5. Emergency-related drills and training	5.1 Fire drill 5.2 Earthquake drill 5.3 Basic life support/CPR 5.4 First aid 5.5 Spillage control 5.6 Decontamination of chemical and toxic 5.7 Disaster preparedness/management
6. OHS personal records	6.1 Medical/Health records 6.2 Incident reports 6.3 Accident reports 6.4 OHS-related training completed

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Explained clearly established workplace safety and hazard control practices and procedures 1.2 Identified hazards/risks in the workplace and its corresponding indicators in accordance with company procedures 1.3 Recognized contingency measures during workplace accidents, fire and other emergencies 1.4 Identified terms of maximum tolerable limits based on threshold limit value- TLV. 1.5 Followed Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace 1.6 Used Personal Protective Equipment (PPE) in accordance with company OHS procedures and practices 1.7 Completed and updated OHS personal records in accordance with workplace requirements
2. Underpinning Knowledge and Attitude	2.1 OHS procedures and practices and regulations 2.2 PPE types and uses 2.3 Personal hygiene practices 2.4 Hazards/risks identification and control 2.5 Threshold Limit Value -TLV 2.6 OHS indicators 2.7 Organization safety and health protocol 2.8 Safety consciousness 2.9 Health consciousness
3. Underpinning Skills	3.1 Practice of personal hygiene 3.2 Hazards/risks identification and control skills 3.3 Interpersonal skills 3.4 Communication skills
4. Resource Implications	The following resources must be provided: 4.1 Workplace or assessment location 4.2 OHS personal records 4.3 PPE 4.4 Health records
5. Methods of Assessment	Competency may be assessed through: 5.1 Portfolio Assessment 5.2 Interview 5.3 Case Study/Situation
6. Context for Assessment	6.1 Competency may be assessed in the work place or in a simulated work place setting

COMMON COMPETENCIES

UNIT OF COMPETENCY : SURVIVE AT SEA IN THE EVENT OF SHIP ABANDONMENT

UNIT CODE : MTM834208

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in surviving at sea in the event of ship abandonment.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Respond to the indicated emergency	1.1 Muster signal is identified and appropriate action to respond to the ***identified emergency*** is taken based on established procedures. 1.2 Timing and sequence of individual actions are practiced based on prevailing circumstances and conditions and potential ***dangers and threats to survival*** are minimized. 1.3 ***Life-saving appliances*** are used in accordance with standards operating procedures. 1.4 Recommended swimming techniques are practiced with or without wearing a lifejacket.
2. Board a survival craft	2.1 ***Survival craft*** is boarded and dangers to other survivors are avoided based on recommended method. 2.2 Initial actions after leaving the ship are taken to minimize threats to survival. 2.3 Survival craft equipment and location devices, including radio equipment, are operated based on established procedures and manufacturer's instruction.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Identified emergency	May include: 1.1 Collision 1.2 Fire 1.3 Foundering 1.4 Person falling overboard (man overboard)
2. Dangers and threats to survival	May include: 2.1 Cold water shock 2.2 Hypothermia 2.3 Psychological response to disaster 2.4 Loss of will to live 2.5 Sea sickness 2.6 Dehydration 2.7 Injuries 2.8 Starvation
3. Life-saving appliances	May include: 3.1 Life jackets 3.2 Life buoys 3.3 Hard hats 3.4 Immersion suits and other thermal protective aid 3.5 Rocket line throwing appliances 3.6 Pyrotechnic distress signals 3.7 GMDSS survival craft VHF radios 3.8 Satellite emergency position indicating radio beacons EPIRBs 3.9 SARTs 3.10 Whistles
4. Survival Craft	May include: 4.1 Free fall life boats 4.2 Davit launched life boats 4.3 Life rafts

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate : 1.1 responded to indicated emergency 1.2 boarded survival craft
2. Required Knowledge	2.1 Types of emergency situations and actions to be taken when- 2.1.1 called to survival craft stations 2.1.2 required to abandon ship 2.1.3 in the water 2.1.4 aboard a survival craft 2.1.5 a person falls overboard (man overboard) 2.2 Types, uses and location of life-saving appliances 2.3 Survival craft equipment and how to operate them 2.4 Value of training and drills 2.5 Types and uses of personal protective clothing and equipment
3. Required Skills	3.1 Donning lifejacket 3.2 Donning and using an immersion suit 3.3 Jumping from a height into the water 3.4 Righting an inverted life raft while wearing a lifejacket 3.5 Keeping afloat without a lifejacket 3.6 Taking initial action on boarding survival craft 3.7 Streaming a drogue or sea-anchor 3.8 Operating survival craft equipment 3.9 Operating location devices including radio equipment
4. Resource Implications	The following resources should be provided: 4.1 work place with recommended facilities 4.2 tools and equipment appropriate to the activity 4.3 materials relevant to the proposed activity and tasks
5. Methods of Assessment	Competency in this unit must be assessed through: 5.1 Demonstration and questioning of related underpinning knowledge 5.2 Written examination 5.3 Portfolio
6. Context of Assessment	6.1 Competency may be assessed in workplace or in a simulated workplace setting

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

UNIT CODE : MTM 834209

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in performing fire-prevention and firefighting activities

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Carry out fire minimization procedures	1.1 Fire hazards on board vessel are identified and action is taken to eliminate or minimize them. 1.2 Responsibilities for checking fire prevention equipment and systems are fulfilled and appropriate action is taken to ensure that they are operational. 1.3 An awareness and understanding of the causes of ***fire and its minimization*** is maintained through participation in fire drills and related instructional programs. 1.4 A state of readiness to respond to ***fire emergencies*** is maintained at all times.
2. Respond to emergencies involving fire	2.1 Emergency situations involving fire are correctly identified in accordance with established nautical practice. 2.2 ***Type of fire*** is identified in accordance with the established classification system for fires. 2.3 Initial action on becoming aware of fire emergency is in conformity with established practices and procedures. 2.4 Action taken is timely and appropriate for seriousness of the fire emergency. 2.5 Action taken on identifying muster signals for a fire emergency is appropriate and complies with established procedures. 2.6 Appropriate precautions and procedures are implemented when responding to electrical fires. 2.7 Appropriate precautions and procedures are implemented when responding to uptake and hydrogen fires. 2.8 Communications are clear and concise at all times and orders are acknowledged in a timely and seamanlike manner.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Fire and its minimization	Fire hazard minimization procedures may include: 1.1. Housekeeping in work areas 1.2. Following of fire safety procedures 1.3. Checking and maintaining shipboard fire prevention systems 1.4. Identification and elimination or minimization of fire hazards 1.5. Precautions when using and storing flammable materials 1.6. Precautions that need to be taken when responding to an electrical fire 1.7. Precautions that need to be taken when responding to uptake and hydrogen fires 1.8. Precautions when using naked flames or welding equipment
2. Fire emergencies	Fire emergencies on board vessel may occur: 2.1. By day or night in both normal and emergency situations 2.2. Under any possible conditions of weather and loading 2.3. While underway 2.4. During berthing and un-berthing operations 2.5. While anchoring or mooring 2.6. While in port 2.7. While moored or at anchor
3. Type of fire	Standard types of fires may include: 3.1 Class A 3.2 Class B 3.3 Class C 3.4 Class F

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate : 1.1 implemented fire prevention and minimization measures and procedures on board vessel 1.2 recognized fire hazards onboard vessel and take appropriate action to eliminate or minimize them 1.3 assessed the operational capability of fire-detection and fire- fighting equipment and systems and initiate any required maintenance or replenishment action 1.4 responded to emergency situations involving fire 1.5 implemented OHS principles and policies when carrying out fire prevention and fire–fighting duties 1.6 communicate effectively with others as required during fire prevention activities and fire emergencies
2. Required Knowledge	2.1 Relevant maritime regulations concerning minimization of the risk of fire on board vessel 2.2 The chemistry of fire and its relationship to materials typically carried on vessels 2.3 Principles underlying the spread of fire and its extinguishment, including the elements of fire and explosion (the fire triangle) 2.4 Types and sources of ignition 2.5 Flammable materials and fire hazards 2.6 Factors that influence the spread of fire 2.7 The importance of constant vigilance in fire prevention and minimization 2.8 The different classes of fire, their characteristics and strategies and equipment needed for their extinguishment 2.9 A basic understanding of the types of fire-detection, fire-fighting equipment and systems used on board vessels, their features, principles of operation and the procedures for their use and maintenance 2.10 Relevant regulations and policies related to the maintenance of fire equipment and systems 2.11 Precautions and procedures that must be followed when responding to electrical fires 2.12 Precautions and procedures that must be followed when responding to uptake and hydrogen fires 2.13 Maritime communication techniques applicable to fire prevention and fire-minimization activities on board vessel 2.14 Problems that can occur with shipboard fire-detection and fire hazards on board a vessel and appropriate action that should be taken 2.15 Sources of information on shipboard fire prevention and minimization

3. Required Skills	3.1 Implementing of fire prevention and minimization measures and procedures 3.2 Identifying and evaluating fire hazards and taking appropriate courses of action 3.3 Responding to simulated and real emergency situations involving fire 3.4 Assessing the operational capability of fire-detection equipment and systems and taking any required maintenance or replenishment action
4. Resource Implications	The following resources should be provided: 4.1 work place with recommended facilities 4.2 tools and equipment appropriate to the activity 4.3 materials relevant to the proposed activity and tasks
5. Methods of Assessment	Competency in this unit must be assessed through: 5.1 Demonstration and questioning of related underpinning knowledge 5.2 Written examination 5.3 Portfolio
6. Context of Assessment	6.1 Competency may be assessed in workplace or in a simulated workplace setting

UNIT OF COMPETENCY : FIGHT AND EXTINGUISH FIRES

UNIT CODE : MTM834210

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in fighting and extinguishing fires

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Operate portable fire-fighting equipment	1.1 ***Type of fires*** is correctly identified in accordance with accepted fire-fighting practice. 1.2 Correct portable ***fire-fighting equipment*** is selected and used to fight specific classes of fires. 1.3 Class F fires are correctly extinguished with a fire blanket in accordance with accepted fire-fighting practice. 1.4 Correct techniques are applied for the use of hose lines to extinguish ***fires on board a vessel***. 1.5 Where applicable, correct techniques are applied for the setting up of foam making equipment to extinguish B Class fires on board a vessel.
2. Carry out fire-fighting operations	2.1 Fire is extinguished using appropriate procedures, techniques, equipment and fire-fighting agents. 2.2 Correct portable fire-extinguisher(s) are selected and used for the class of fire involved in a fire emergency. 2.3 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. 2.4 The timing and sequence of individual actions when fighting fires onboard a vessel are appropriate to the prevailing circumstances and conditions. 2.5 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. 2.6 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. 2.7 Lifeline signals are correctly used during interior fire-fighting operations.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Type of fire	Standard types of fires may include: 1.1 Class A 1.2 Class B 1.3 Class C 1.4 Class F
2. Fire-fighting equipment	Fire-fighting equipment, appliances and systems may include: 2.1 Portable fire extinguishers including foam, water, CO_2, dry chemical and wet foam 2.2 Fire blankets 2.3 CO_2 fixed systems 2.4 Foam installations including semi-portable and fixed systems 2.5 Sprinkler systems 2.6 Fire pumps (main and emergency fire pump) 2.7 Fire hoses, hydrants, branches and international shore connection
3. Fire on board a vessel	Fire emergencies on board vessel may occur: 3.1 By day or night in both normal and emergency situations 3.2 Under any possible conditions of weather and loading 3.3 While underway 3.4 During berthing and un-berthing operations 3.5 While anchoring or mooring 3.6 While in port 3.7 While moored or at anchor
4. Safety clothing, appliances and equipment	Safety clothing and equipment may include: 4.1 Fire-resistant clothing 4.2 Self-contained breathing apparatus (SCBA) 4.3 Masks 4.4 Eye and ear protection 4.5 Gloves 4.6 Boots

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate : 1.1 participated in simulated on-boar d fire-fighting activities 1.2 participated in search and rescue and fire-fighting teams 1.3 applied OHS principles and policies when carrying out fire-fighting duties 1.4 communicated effectively with others as required during fire emergencies
2. Required Knowledge	2.1 Knowledge of relevant maritime regulations 2.2 The chemistry of fire and its relationship to materials typically carried on vessels 2.3 Principles underlying the spread of fire and how it is extinguished 2.4 The different types of fire, their characteristics and strategies and equipment needed to extinguish them 2.5 Principles and procedures for the use of self-contained breathing apparatus (SCBA) when fighting fires 2.6 Fire-fighting clothing, outfits and personal safety equipment used when fighting a fire onboard a vessel 2.7 Types fire-fighting appliances, equipment and systems used on board vessels, their features, principles of operation and the procedures for their use and maintenance 2.8 Fixed fire prevention and extinguishing installations used on vessels and their principles of operation 2.9 Fire-fighting techniques, agents and precautions applicable to different types of fire on board a vessel 2.10 Maritime communication techniques applicable to fire-fighting activities onboard a vessel 2.11 Typical problems that can occur with shipboard fire-fighting equipment and operations and appropriate remedial action and solutions 2.12 Sources of information on shipboard fire prevention and extinguishment
3. Required Skills	3.1 Applying fire prevention measures and procedures 3.2 Identifying fire fighting problems and determining appropriate courses of action 3.3 Participating as a member of an interior search and rescue and fire-fighting team on board a vessel 3.4 Determining the operational capability of fire-fighting appliances, equipment and systems
4. Resource Implications	The following resources should be provided: 4.1 work place with recommended facilities 4.2 tools and equipment appropriate to the activity 4.3 materials relevant to the proposed activity and tasks
5. Methods of Assessment	Competency in this unit must be assessed through: 5.1 Demonstration and questioning of related underpinning knowledge 5.2 Written examination 5.3 Portfolio
6. Context of Assessment	6.1 Competency may be assessed in workplace or in a simulated workplace setting

UNIT OF COMPETENCY : TAKE IMMEDIATE ACTION UPON ENCOUNTERING AN ACCIDENT OR OTHER MEDICAL EMERGENCY

UNIT CODE : MTM 834211

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in taking immediate action upon encountering an accident or other medical emergency.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Determine the need of casualty	1.1 ***Patient*** condition is determined in accordance with established first aid procedures and the nature of injury or illness is established. 1.2 Probable cause, nature and extent of ***injuries*** are identified and appropriate action is taken to prevent further harm to the victim and to self. 1.3 The position of the patient is adjusted to optimize personal comfort for the medical condition or injury concerned. 1.4 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.
2. Administer first-aid to the victim	2.1. Appropriate first aid procedures are used to treat the identified injury or illness in accordance with the first-aider's limits of responsibility. 2.2. Aseptic techniques are applied during any wound dressing. 2.3. Hygiene measures are used that are appropriate for the degree of illness or injury. 2.4. Cardio-pulmonary resuscitation techniques are correctly applied where required. 2.5. Condition of the patient is regularly monitored both visually and through appropriate measures of bodily signs. 2.6. Health precautions and disease prevention measures are implemented in accordance with regulatory requirements and company procedures. 2.7. Appropriate action is taken if there are signs of a deterioration in the condition of the patient. 2.8. Where necessary, assistance is provided in the preparation and transporting of the victim.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Patient	May include patient having: 1.1 Heart attack 1.2 Stroke 1.3 Asthma attack 1.4 Diabetes 1.5 Epilepsy seizures
2. Injuries	Injuries on board a vessel may include: 2.1 External bleeding 2.2 An amputation 2.3 A foreign body in the eye 2.4 A penetrating chest wound 2.5 A nose bleed 2.6 Internal bleeding 2.7 Fractures, sprains, strains and dislocations 2.8 Electric shock 2.9 Asphyxia

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate : 1.1. identified and prioritized the need for medical first aid in life-threatening medical emergencies 1.2. administered first aid on board a vessel 1.3. communicated effectively with others during medical emergencies and health care
2. Required Knowledge	2.1 Relevant sections of maritime regulations 2.2 Emergencies, injuries and medical problems that may occur on board a vessel and appropriate action, treatments and solutions 2.3 Relevant OH&S and health legislation and policies 2.4 Duties and responsibilities of the designated first aid officer on board a vessel 2.5 First aid procedures 2.6 Shipboard procedures for: 2.6.1. conducting an initial patient first aid assessment 2.6.2. managing injuries 2.6.3. managing medical emergencies 2.6.4. carrying out resuscitation techniques 2.7 Techniques for care of wounds 2.8 Ways in which disease can spread on board a vessel and ways of preventing the spread 2.9 Legal issues related to the administration of drugs and medicines on board a vessel 2.10 Knowledge of body structures and functions relevant to possible injury, illnesses and disease that may be encountered on board a vessel 2.11 Maritime communication techniques related to health care and receiving radio medical advice from shore-based advisers 2.12 Marine publications containing information on first aid and medical treatment on board a vessel
3. Required Skills	3.1. Providing first-aid on board a vessel 3.2. Identifying and problems and emergencies and taking appropriate courses of action 3.3. Applying aseptic and other precautionary techniques when carrying out first-aid procedures on board a vessel
4. Resource Implications	The following resources should be provided: 4.1. work place with recommended facilities 4.2. tools and equipment appropriate to the activity 4.3. materials relevant to the proposed activity and tasks
5. Methods of Assessment	Competency in this unit must be assessed through: 5.1. Demonstration and questioning of related underpinning knowledge 5.2. Written examination 5.3. Portfolio
6. Context of Assessment	6.1 Competency may be assessed in workplace or in a simulated workplace setting

UNIT OF COMPETENCY : COMPLY WITH EMERGENCY PROCEDURES

UNIT CODE : MTM834212

UNIT DESCRIPTOR : This unit deals with the knowledge and skills required to take appropriate initial action on becoming aware of an emergency on board a commercial vessel in conformance with the established emergency response procedures.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** items are elaborated in the Range of Variables
1. Take action on becoming aware of an emergency	1.1 ***Emergency situations*** are recognized and identified. 1.2 Responses to an emergency situation followed the established vessel's emergency response procedures. 1.3 Correct actions are taken on discovery of an actual or ***potential emergencies/emergency situation*** in accordance with established vessel's emergency response procedures. 1.4 Information given on raising alarm is prompt, accurate, complete and clear.
2. Follow established emergency procedures	2.1 Vessel's contingency plans for emergency response are known and are implemented in real and simulated emergency situations. 2.2 Escape routes and internal and external communications and alarm systems are used in real and simulated emergency situations in accordance with ***regulatory requirements*** and established procedures. 2.3 Emergency communications and alarm signals and systems are understood and required action implemented in accordance with emergency procedures and regulatory requirements. 2.4 Planned damage control procedures for dealing with damage to the vessel and its hull are implemented in accordance with company procedures and regulatory requirements.
3. Follow procedures for the use of various life-saving equipment	3.1 Participation in life saving drills confirms readiness to correctly carry out life-saving procedures and use ***life-saving equipment***. 3.2 Procedures for the use of various shipboard life-saving appliances are followed in accordance with regulatory requirements, manufacturer's instructions and company procedures.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Emergency situations	May include: 1.1 Collision with another vessel 1.2 Explosion on board vessel 1.3 Fire on board vessel 1.4 Impairment of integrity of hull and ingress of water 1.5 Loss of steering control 1.6 Lost of motive power 1.7 Foundering 1.8 Grounding 1.9 Beaching a Vessel 1.10 Person overboard 1.11 Rescue and evacuation of injured personnel
2. Potential emergencies	May occur: 2.1 By day or night 2.2 Under any possible conditions of weather and loading 2.3 While underway 2.4 During berthing and unberthing operations 2.5 While anchoring or mooring 2.6 When bunkering 2.7 During cargo handling operations
3. Regulatory requirements	May include: 3.1 SOLAS convention 3.2 IMO STCW Codes and Convention 3.3 Relevant domestic and international OH&S legislation
4. Life-saving equipment	May include: 4.1 Life jackets 4.2 Exposure and immersion suits 4.3 Survival craft

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 undertook appropriate action in the event of emergency situations 1.2 followed established procedures and regulatory requirements during emergency responses' procedures 1.3 followed procedures for the use of various life-saving equipment 1.4 participated in drills in preparation for the implementation of emergency responses 1.5 communicated effectively with others during emergency responses' procedures
2. Required Knowledge	2.1 Types of emergencies 2.2 Shipboard contingency plans 2.3 Knowledge of relevant maritime regulations 2.4 Relevant OH&S legislation and policies 2.5 Navigational emergencies for vessels and appropriate action and solutions 2.6 Indications of various types of emergency situations and the action to be followed when various types of actual or potential emergency situations are identified 2.7 Emergency alarm signals and systems in use on vessels and procedures to be followed when an emergency alarm is raised 2.8 Escape routes and internal and external communications systems and alarms on board a vessel 2.9 General principles of damage control and the manner in which watertight integrity of hull is maintained on a vessel, including the importance of preparation, control and repair 2.10 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, canvas and clothing 2.11 Maritime communication techniques used during navigational emergencies of actual or potential emergency situations are identified 2.12 Emergency alarm signals and systems in use on vessels and procedures to be followed when an emergency alarm is raised 2.13 Escape routes and internal and external communications systems and alarms on board a vessel 2.14 General principles of damage control and the manner in which watertight integrity of hull is maintained on a vessel, including the importance of preparation, control and repair 2.15 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, canvas and clothing

3. Required Skills	3.1 Applying navigational emergencies for vessels and appropriate action and solutions 3.2 Applying appropriate action in various types of actual or potential emergency situations 3.3 Using emergency alarm signals and systems 3.4 Using various shipboard items to be used for damage control purposes such as mattresses, canvas and clothing 3.5 Using personal safety equipment
4. Resource Implications	The following resources should be provided: 4.1 simulated workplace environment 4.2 workplace standards, procedures, policies, guidelines 4.3 tools and equipment relevant to work activities
5. Methods of Assessment	Competency in this unit may be assessed through: 5.1 Observation/simulated practical demonstration in responding to emergency situations onboard a commercial vessel, and/or 5.2 Simulation/role plays to test the candidate's knowledge and skills in complying with emergency procedures
6. Context of Assessment	6.1 Competency may be assessed in workplace or in a simulated workplace setting

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

UNIT CODE : MTM834213

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in taking precautions towards protection of the marine environment.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Practice compliance with legislative requirements for protection of the marine environment	1.1. Relevant regulations and procedures for the ***protection of the marine environment*** are identified. 1.2. 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. 1.3. Appropriate action is taken where incidences of non-compliance or potential non-compliance are identified in accordance with regulations and procedures. 1.4. Any breach of regulations and procedures concerning protection of the marine environment is rectified and/or reported as required within the limits of the crew's/ officer's responsibility.
2. Practice anti-pollution procedures	2.1. ***Anti-pollution procedures*** applicable to vessel operations are followed in the course of day-to-day work. 2.2. Appropriate ***preventive measures*** are undertaken to prevent pollution of the marine environment in accordance with regulations and procedures. 2.3. Inputs are provided in the preparation of reports and other documentation related to the protection of marine environment in accordance with ***regulations*** and procedures.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Protection of the marine environment	Protection of the marine environment may be observed: 1.1. By day or night in both normal and emergency situations 1.2. Under any possible conditions of sea and weather 1.3. While underway 1.4. During berthing and unberthing operations 1.5. While anchoring or mooring 1.6. While moored or at anchor 1.7. During loading and unloading operations 1.8. During maintenance operations
2. Anti-pollution procedures	Anti-pollution procedures include checking of items and equipment such as: 2.1. Pumps 2.2. Valves 2.3. Emission control equipment 2.4. Water management equipment including: cooling water, ballast water and bilge systems 2.5. Waste storage and recycling equipment 2.6. Ballast management equipment
3. Preventive measures	Preventative measures to protect the marine environment may include: 3.1. Prevention of spillages of cargo 3.2. Prevention of spillage s of fuel and oil 3.3. Control of polluting emissions of gas and smoke 3.4. Effective management of waste, pollution and recycling processes 3.5. Effective management of ballast operations 3.6. Shipboard housekeeping 3.7. Pollution control instructions
4. Regulations	Applicable regulations includes: 4.1. MARPOL Convention 4.2. IMO STCW Code and Convention related to the protection of marine environment 4.3. Relevant international and/or local legislation related to the protection of the marine environment

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate : 1.1. practiced compliance with legislative requirements for protection of the marine environment 1.2. practiced preventative and remedial anti-pollution procedures as per relevant regulations and procedures 1.3. identified typical pollution control problems and take appropriate action 1.4. communicate effectively with others concerning measures to protect the marine environment
2. Required Knowledge	2.1. Relevant legislation, codes of practice, policies and procedures to protect the marine environment 2.2. Impact of shipping on the marine environment and the effects of operational or accidental pollution on it 2.3. Basic environmental protection procedures 2.4. Pollution control problems and related measures to protect the marine environment 2.5. Complexity and diversity of the marine environment 2.6. Requirements under local and/or international legislation and conventions for reporting incidents related to breaches of the statutory codes and measures for the protection of the marine environment
3. Required Skills	3.1. Completing activities aimed at compliance with relevant regulatory requirements for protection of the marine environment 3.2. Identifying and evaluating problems related to compliance with relevant regulations for environmental protection and determining an appropriate courses of action 3.3. Following anti-pollution procedures
4. Resource Implications	The following resources should be provided: 4.1. work place with recommended facilities 4.2. tools and equipment appropriate to the activity 4.3. materials relevant to the proposed activity and tasks
5. Methods of Assessment	Competency in this unit must be assessed through: 5.1. Demonstration and questioning of related underpinning knowledge 5.2. Written examination 5.3. Portfolio
6. Context of Assessment	6.1 Competency may be assessed in workplace or in a simulated workplace setting

UNIT OF COMPETENCY : OBSERVE SAFE WORKING PRACTICES

UNIT CODE : MTM834214

UNIT DESCRIPTOR : This unit deals with the knowledge and skills required to observe established maritime safe working practices.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** items are elaborated in the Range of Variables
1. Identify and follow workplace procedures for hazard identification and risk control	1.1 Safety regulations and established vessel's safety and hazard control practices and procedures are obtained, interpreted and applied to day-to-day work activities. 1.2 Workplace procedures for Occupational Health and Safety and related work instructions for controlling risks onboard a vessel are followed. 1.3 Workplace procedures for dealing with shipboard accidents, fire and ***emergencies*** are known and followed. 1.4 ***Hazards in the workplace*** are identified and appropriate action is taken to report them and to minimize or eliminate risk to personnel, vessel and the environment. 1.5 Where relevant, procedures and precautions necessary for entry into a pump room, fuel tanks or other confined spaces on a vessel are followed. 1.6 Personal protection clothing and equipment is used in accordance with established shipboard safety practices and procedures. 1.7 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. 1.8 Established emergency and contingency plans are followed in the event of a shipboard emergency.
2. Contribute to arrangements for the management of occupational health and safety	2.1 Occupational Health and Safety issues and identified safety hazards are raised with designated personnel in accordance with workplace procedures and relevant occupational health and safety legislation. 2.2 Contributions to occupational health and safety management in the workplace are made within workplace procedures and provisions of relevant legislation. 2.3 Occupational health and safety issues are raised with designated personnel in accordance with workplace procedures and relevant occupational health and safety legislation. 2.4 Contribute to ***participative arrangements*** for occupational health and safety management in the workplace within vessel's procedures and scope of responsibilities and competencies.
3. Take necessary actions to control fatigue	3.1 Fatigue symptoms are recognized and identified. 3.2 Corrective actions are taken on discovery of fatigue in accordance with established company procedures. 3.3 Fatigue management practices are observed at all times. 3.4 Reports related to incidence of fatigue are communicated to appropriate authority in accordance with established company procedures.
4. Complete occupational health and safety records	4.1 Occupational health and safety records for self are completed in accordance with workplace requirements. 4.2 Legal requirements for the maintenance of records of occupational injury and diseases are followed.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Emergencies	May include: 1.1 Loss of propulsion 1.2 Loss of electrical power 1.3 Loss of steerage 1.4 Flooding of vessel 1.5 Fire or explosion 1.6 Loss of refrigeration 1.7 Loss of water making ability 1.8 Fuel oil, lubrication oil, steam and gas leaks 1.9 Overheating and over speed of machinery, governors, emergency trips
2. Hazards in the workplace	May include: 2.1 Moving heavy loads in an unsafe work environment 2.2 Unsecure machinery, components or repair equipment 2.3 Slippery deck 2.4 Welding equipment 2.5 Sharp tools and implements 2.6 Power tools 2.7 Moving and rotating machinery 2.8 Flammable liquids, vapors and fuel 2.9 Using equipment beyond safe working limits 2.10 Poor housekeeping procedures 2.11 Electrical wiring and systems 2.12 Hot pipes and valves (steam, fuel oil, lubricating oil) 2.13 Cold pipes and valves (refrigeration and liquefied gas cargoes) 2.14 Working at heights 2.15 Exposed electrical circuits 2.16 Toxic gases and substances 2.17 Chemicals and other harmful substances 2.18 Damaged cargo and containers
3. Participative arrangements	May include: 3.1 Formal and informal meetings which include occupational health and safety 3.2 Occupational health and safety committees 3.3 Other committees, for example, consultative, planning and purchasing 3.4 Health and safety representatives 3.5 Suggestions, requests, reports and concerns put forward by vessel's crew to senior officers

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidences that the candidate: 1.1 identified and followed workplace procedures for hazard identification and risk control 1.2 contributed to arrangements for the management of OHS onboard a vessel 1.3 understood and taken necessary actions to control fatigue 1.4 completed OHS records as required 1.5 communicated effectively with others on workplace safety matters
2. Required Knowledge	2.1 Knowledge of relevant maritime and OHS regulations 2.2 ISM Code Safety Management System procedures (where applicable) 2.3 The provisions of OHS Acts, regulations and codes of practice relevant to the workplace, including the rights and responsibilities of the workplace parties under OHS Acts, regulations and codes of practice; 2.4 The ways in which OHS is managed in the workplace, and activities required under OHS legislation, for example: 2.4.1 policies 2.4.2 procedures 2.4.3 plant and equipment maintenance 2.4.4 hazard identification 2.4.5 risk assessment and control 2.4.6 OHS instruction 2.4.7 training and provision of OHS information 2.5 Hazards that exist in the workplace 2.6 The preferred order of ways to control risks (known as the hierarchy of control); 2.7 Workplace OHS procedures relevant to the work being undertaken, including procedures for: 2.7.1 recognizing and reporting on hazards, for example, work area inspections 2.7.2 work operations to control risks, for example, permit to work systems and isolation procedures 2.7.3 responding to accidents, fires and emergencies 2.7.4 raising OHS issues 2.7.5 employee participation in OHS management, for example, consultative or OHS committees and 2.7.6 joint employer/employee inspections 2.8 The meaning of OHS symbols found on signs and labels in the workplace 2.9 Designated personnel responsible for OHS onboard a vessel 2.10 Effects of sleep, schedules, and the circadian rhythm on fatigue 2.11 Effects of physical stressors on seafarers 2.12 Effects of environmental stressors in and outside the ship and their impact 2.13 Effects of schedule changes on seafarer fatigue

3. Required Skills	3.1 Applying OHS in the workplace, and activities required under OHS legislation, 3.2 Applying order of ways to control risks (known as the hierarchy of control) 3.3 Designating personnel responsible for OHS onboard a vessel 3.4 Communication skills
4. Resource Implications	The following resources should be provided: 4.1 simulated workplace environment 4.2 workplace standards, procedures, policies, guidelines 4.3 tools and equipment relevant to work activities
5. Methods of Assessment	Competency in this unit may be assessed through: 5.1 Observation/simulated practical demonstration in the application of safe working practices and safety hazard control onboard a vessel 5.2 Simulation/role plays to test the candidate's knowledge and skills in the application of safe working practices and hazard control and safety hazard control on a commercial/or training vessel
6. Context of Assessment	6.1 Assessment may be conducted in the workplace or in simulated work environment

UNIT OF COMPETENCY : DEMONSTRATE SECURITY AWARENESS PRACTICES

UNIT CODE : MTM 834215

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in demonstrating security awareness practices.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Contribute to the enhancement of maritime security through heightened awareness	1.1. Requirements relating to enhanced maritime security are identified. 1.2. All critical factors relevant to the security and safety of a maritime workplace are monitored continuously during work operations. 1.3. 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. 1.4. Changes to work environment and related risks are monitored and managed to ensure a safe outcome to workplace operations. 1.5. A security-related contingency plan of action is studied and interpreted and where necessary appropriate action is taken. 1.6. 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.
2. Recognize security threats	2.1. Factors that may adversely affect the security and safety of a maritime workplace are identified. 2.2. 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. 2.3. ***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. 2.4. All relevant indications of a ***security situation*** are recognized and appropriate action is taken to alert relevant personnel and/or take appropriate action in accordance with workplace procedures and regulatory requirements.
3. Understand the need for and maintaining security awareness and vigilance	3.1. Security instruction programs are participated in as per company and regulatory requirements. 3.2. Requirements and processes for security awareness and vigilance are identified. 3.3. ***Security and emergency drills*** are participated in accordance with the ship security plan and company and maritime regulatory requirements. 3.4. Inputs to improve/enhance security training programs and drills are provided, where necessary.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Maritime workplace	Workplace may include: 1.1. Vessels 1.2. Port facilities
2. Relevant security personnel	May include: 2.1. Ship security officer 2.2. Port security officer 2.3. Company security officer 2.4. Master or skipper of the vessel 2.5. Other personnel on vessel (in terms of their security awareness, preparedness and vigilance)
3. Persons posing potential security risks	May include: 3.1. Unknown persons photographing vessels or facilities 3.2. Unknown persons attempting to gain access to vessels or facilities 3.3. Unknown persons loitering in the vicinity of vessels or port facilities 3.4. Unknown persons telephoning to ascertain security, personnel or standard operating procedures on a vessel or at a port facility 3.5. Vehicles or small vessels with personnel in them loitering and perhaps taking photographs or drawing diagrams of vessels or facilities 3.6. General aviation aircraft operating in proximity of vessels or facilities 3.7. Unauthorized vendors attempting to sell merchandise 3.8. Persons carrying suspicious parcels which could be bombs 3.9. Unknown persons acting suspiciously 3.10. Unknown persons seeking information from vessel personnel or their families about vessels or port facilities via either face-to-face discussion or email 3.11. Unauthorized workers attempting to gain access to a vessel or port facilities to repair, replace, service or install equipment
4. Security situation	May include: 4.1. Piracy/hijacking 4.2. Armed robbery 4.3. Bomb threat 4.4. Unidentified objects/explosives on vessel 4.5. Damage to or destruction of port facility 4.6. Damage to or destruction of vessel 4.7. Piracy and other depredations 4.8. Stowaways
5. Security and emergency drills	Security and emergency drills may relate to incidents such as: 5.1. Damage to or destruction of the vessel or port facility (e.g. by explosive devices, arson, sabotage or vandalism) 5.2. Hijacking or seizure of a vessel or of persons on board 5.3. Tampering with cargo or essential vessel equipment or systems or vessel's stores 5.4. Unauthorized access to or use of the vessel (including presence of stowaways) 5.5. Smuggling of weapons or equipment (including weapons of mass destruction) 5.6. Use of the vessel to carry persons intending to cause a security incident (or their equipment) 5.7. Use of the vessel itself as a weapon or as a means to cause damage or destruction 5.8. Attacks from seaward while at berth or at anchor 5.9. Attacks while at sea

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate : 1.1. contributed to the enhancement of maritime security through heightened awareness 1.2. recognized security threats 1.3. understood the need for and methods of maintaining security awareness and vigilance
2. Required Knowledge	2.1. IMO ISPS Code applicable to vessels and ports 2.2. Procedures for maintaining security awareness 2.3. Relevant security and safety regulations, rules, policies and procedures 2.4. Relevant security personnel on a vessel or at a port facility 2.5. Communication procedures and protocols on matters related to vessel and port security 2.6. Security and safety problems that may be identified when maintaining and managing situation awareness and action that can be taken to overcome them 2.7. Security and safety hazards and risks that may be identified in the maritime workplace and ways of controlling those hazards and associated risks
3. Required Skills	3.1. Applying the above knowledge to the management of situation awareness during workplace operations 3.2. Reading and interpreting instructions, procedures and other information relevant to the maintenance of vessel and port security 3.3. Working as a team with others on matters relevant to the maintenance of vessel and port security 3.4. Selecting and using appropriate communications equipment 3.5. Taking appropriate initiatives related to vessel and port security within limits of role and responsibility 3.6. Interpreting and applying security and safety practices and regulations 3.7. Communicating with others on matters related to vessel and port security 3.8. Modifying activities dependent on differing workplace contingencies, risk situations and environments 3.9. Identifying and solving problems associated with the maintenance of vessel and port security and to report security issues and take appropriate action based on available information 3.10. Monitoring and anticipating security problems and risks and taking appropriate action
4. Resource Implications	The following resources should be provided: 4.1. work place with recommended facilities 4.2. tools and equipment appropriate to the activity 4.3. materials relevant to the proposed activity and tasks
5. Methods of Assessment	Competency in this unit must be assessed through: 5.1 Demonstration and questioning of related underpinning knowledge 5.2 Written examination 5.3 Portfolio
6. Context of Assessment	6.1 Competency may be assessed in workplace or in a simulated workplace setting

CORE COMPETENCIES

UNIT OF COMPETENCY : PERFORM MARINE ENGINEERING AT THE SUPPORT LEVEL

UNIT CODE : MTM816314

UNIT DESCRIPTOR : This unit 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.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Contribute to a safe engineering watch	1.1 The conduct, handover and relief of the engineering watch is carried out in conformity with accepted principles and vessel's procedures. 1.2 ***Watchkeeping principles and procedures*** are followed in accordance with established marine. engineering practice and regulatory requirements 1.3 A safe engineering watch is achieved based on the accepted bridge and engine room resource management principles and procedures. 1.4 ***Fatigue management strategies*** are correctly applied in accordance with STCW codes. 1.5 Communications with the officer of the watch are clear and concise. 1.6 Orders from the officer on watch are understood and accurately executed.
2. Contribute to the monitoring and controlling of an engine-room watch	2.1 The frequency and extent of monitoring of main propulsion and auxiliary machinery is carried out in conformity with accepted principles and procedures. 2.2 Appropriate entries pertaining to the engineering watch are recorded in the engine room book as per standard operating procedures. 2.3 Any deviation from the normal parameters is reported immediately to the engineer on watch. 2.4 Malfunctions of the main propulsion and auxiliary machineries and its parameters are identified, and reported immediately to the duty engineer. 2.5 ***Unsafe conditions or potential hazards*** are promptly recognized, reported and rectified before work continues. 2.6 Engine room ***emergency*** is reported immediately and appropriate action is undertaken.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
3. Contribute to fuelling and oil transfer operations	3.1 ***Fuel system and oil transfer operations*** are carried out in accordance with established safety practices and equipment operating instructions. 3.2 Dangerous, hazardous and harmful liquid is handled in compliance with established safety practices. 3.3 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. 3.4 ***Communications*** made within the operators' area of responsibility are consistently successful. 3.5 Housekeeping is observed at all times in engine room.
4. Contribute to bilge and ballast operations	4.1 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. 4.2 Any operational problems encountered in the use of equipment and machinery on the vessel are reported and/or rectified in accordance with standard procedures. 4.3 Records of performance of ***machinery and equipment used in bilge and ballast*** operations are maintained in accordance with established procedures. 4.4 Communications made within the operators' area of responsibility are consistently successful. 4.5 Housekeeping is observed at all times in engine room.
5. Contribute to the operation of equipment and machinery	5.1 Pre-operational checks of ***equipment and machinery and associated systems*** are carried out in accordance with safety requirements and shipboard practices. 5.2 Operation of equipment and machinery is performed in accordance with manufacturer's specifications and instructions and safety requirements. 5.3 Any ***operational problems*** encountered in the use of equipment and machinery on the vessel are reported and/or rectified in accordance with standard procedures. 5.4 Post-operational checks of equipment and machinery and associated systems are carried out in accordance with safety requirements and shipboard practices. 5.5 Communications made within the operators' area of responsibility are consistently successful. 5.6 Housekeeping is observed at all times in engine room.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Watchkeeping principles and procedures	May include: 1.1 Maintenance of safe engineering watch 1.2 Avoidance of pollution of the marine environment 1.3 Appropriate assistance must be available to be summoned to the engine room if required by a change in the vessel's operational situation
2. Fatigue management strategies	May include: 2.1 Recognition of symptoms of fatigue 2.2 Arranging to take a break when symptoms of fatigue are identified 2.3 Maintenance of personal fitness and health and appropriate dietary habits 2.4 Avoidance of excessive consumption of alcohol prior to watchkeeping duties
3. Unsafe conditions or potential hazards	May include: 3.1 Unsafe conditions 3.1.1 System leakages 3.1.2 Excessive pressure 3.1.3 Excessive temperature 3.1.4 Excessive vibration 3.2 Potential hazards 3.2.1 Electrical hazards 3.2.2 Uninsulated high temperature lines 3.2.3 Unsecure movable equipment and tools 3.2.4 Open engine room plating
4. Emergencies	May include: 4.1 Loss of propulsion or / and steerage 4.2 Flooding of engine room 4.3 Fire or explosion in engine room 4.4 Breakdown and failure of refrigeration system 4.5 Malfunction of fresh water generator 4.6 Fuel oil, lubrication oil, steam and gas leaks 4.7 Breakdown of generating set 4.8 Pump failure 4.9 Overheating and over speeding of machinery which result in emergency trips
5. Fuel system and oil transfer operations	May include: 5.1 Prepare for fuelling and transfer operations 5.2 Procedures for connecting and disconnecting fuelling and transfer hoses 5.3 Procedures relating to incidents that may arise during fuelling and transferring operations 5.4 Secure from fuelling and transfer operations 5.5 Ability to correctly measure and report tank levels

VARIABLE	RANGE
6. Machinery and equipment used in fuel system and oil transfer	Types of machinery and equipment may include: 6.1 Pumps and pumping systems 6.2 Auxiliary systems and controls, including 6.2.1 Fuel and oil 6.2.2 Waste management and pollution control systems as per the MARPOL Convention 6.2.3 Cargo pumps, tank washing machines and associated systems
7. Safety standards and regulatory requirements	May include: 7.1 Company standard 7.2 MARPOL Regulations, 7.3 National Regulations 7.4 Code of safe working practices
8. Bilge and ballast operations	Bilge and ballast operations may be carried out: 8.1 By day or night in both normal and emergency situations 8.2 Under any permissible conditions of weather while underway 8.3 When bunkering 8.4 During cargo operations
9. Machinery and equipment used in bilge and ballast operations	Types of machinery may include:: 9.1 Pumps and pumping systems 9.2 Auxiliary systems and controls, including 9.2.1 Bilge and ballast system, oily water separator 9.2.2 Waste management and pollution control systems as per the MARPOL Convention 9.2.3 Cargo pumps, tank washing machines and associated systems
10. Communication	May include but are not limited to: 10.1 Portable VHF Radio 10.2 Hand signals 10.3. Established means of communication
11. Equipment, machinery and associated systems	Equipment, machinery and associated system may include but are not limited to: 11.1 Valves and pumps 11.2 Hoists and lifting equipment 11.3 Hatches, watertight doors, ports and related equipment 11.4 Anti-pollution equipment
12. Operational problems	May include: 12.1 No power 12.2 No suction 12.3 Un able to deliver set pressure 12.4 Faulty limit switch 12.5 Block water tight doors

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate : 1.1 contribute to a safe engineering watch 1.2 contribute to the monitoring and controlling of an engine-room watch 1.3 contribute to fuelling and oil transfer operations 1.4 contribute to bilge and ballast operations 1.5 contribute to the operation of equipment and machinery 1.6 ensured adherence to national and international regulations, IMO Conventions and Codes 1.7 communicated effectively with others in the course of watchkeeping duties 1.8 maintained watchkeeping records
2. Required Knowledge	2.1 Knowledge on pertinent sections of STCW Code on Safe Engineering Watch 2.2 Duties and responsibilities of an engine rating forming part of the engineering watch on both manned and UMS vessels with respect to safety of personnel and vessel, when taking over, keeping and handover a watch 2.3 Main engine and its associated systems 2.4 Diesel alternator systems 2.5 Turbo alternator system 2.6 Terms used in machinery spaces and names of machinery and equipment 2.7 Procedures for the relief, maintenance and handover of a watch 2.8 Information required to maintain a safe watch 2.9 Function of main propulsion and auxiliary machinery 2.10 Function of fuel system and oil transfer operations 2.11 Function of the bilge and ballast systems 2.12 MARPOL Regulations
3. Required Skills	3.1 Operating and maintaining vessel's main and auxiliary systems including start up, normal running, shut down and emergency situations 3.2 Operating and maintaining fuel system and oil transfer operations 3.3 Operating and maintaining bilge and ballast system 3.4 Operating main and auxiliary machinery monitoring devices 3.5 Performing safe working practices for machinery and enclosed spaces 3.6 Isolating main and auxiliary engine safely prior to work commencing 3.7 Working principles of fire prevention, detection and fire fighting 3.8 Using and operating anti-pollution equipment 3.9 Communication skills 3.10 Maintaining records
4. Resource Implications	The following resources should be provided : 4.1 workplace 4.2 tools and equipment appropriate in maintaining watchkeeping activities, fuel, oil transfer, bilge and ballast operations, or simulator 4.3 materials relevant to the activity and tasks
5. Methods of Assessment	Competency in this unit must be assessed through : 5.1 Practical demonstration and questioning of related underpinning knowledge 5.2 Written examination 5.3 Portfolio (e.g. approved in-service and training ship experiences, etc.)
6. Context of Assessment	6.1 Competency may be assessed in simulated workplace setting or accredited assessment center

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

UNIT CODE : MTM816315

UNIT DESCRIPTOR : This unit involves the skills and knowledge required in the safe use of electrical equipment on board ship.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Operate electrical equipment	1.1. ***Shipboard Electrical equipment*** and its ***power supply*** are identified according to their functions. 1.2. Shipboard electrical equipmen***t*** is ***operated*** in accordance with established procedures and manufacturer's instructions. 1.3. Initial immediate corrective action is performed on electrical problems and faults and reported to relevant personnel.
2. Follow safety and hazard control procedures	2.1 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. 2.2 ***Operational hazards*** are Identified and unsafe equipment are reported to concerned personnel in accordance with company policies and procedures. 2.3 Isolation and emergency procedures are carried out and immediately reported to relevant personnel n the event of any electrical equipment failure. 2.4 ***Shipboard emergency*** and ***contingency plans*** followed in the event of a electrical equipment failure or emergency. 2.5 Housekeeping is observed at all times in engine room.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Shipboard electrical equipment	May include: 1.1 Fixed 1.2 Portable 1.3 Hand-held
2. Power supply	May include: 2.1 Voltages 2.2 Current 2.3 Frequency
3. Operated	Operation of shipboard electrical machinery equipment may be carried out: 3.1 By day or night in both normal and emergency situations 3.2 Under any permissible conditions of weather 3.3 While underway 3.4 During berthing and unberthing operations 3.5 While anchored or moored 3.6 In dry dock 3.7 When bunkering 3.8 During cargo operations
4. Operational hazards	May include: 4.1 Moving and rotating electrical equipment 4.2 Using equipment beyond safe working limits 4.3 Poor housekeeping procedures 4.4 Non-compliance with safe working procedures 4.5 Hot pipes and valves (steam, fuel oil, lubricating oil) 4.6 Cold pipes and valves (refrigeration and liquefied gas cargoes) 4.7 Working at heights 4.8 Dangerous atmosphere 4.9 Overspeed of electrical machinery, emergency trips 4.10 Noxious and dangerous cargoes 4.11 Electric shock
5. Shipboard emergency	May include: 5.1 Loss of electrical power 5.2 Short circuits and open-circuits in distribution systems 5.3 Loss of electronic / electrical control of systems 5.4 Flooding of engine room 5.5 Fire or explosion 5.6 Failure of emergency alarm and control systems 5.7 Loss of refrigeration 5.8 Overloading of electrical systems 5.9 Electric shock 5.10 Founding/grounding of vessel
6. Contingency plans	May include 6.1 Manual operations of electrical equipment 6.2 Alternative operations without the use of main electrical system

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate 1.1 operated shipboard electrical equipment against specifications on a vessel 1.2 identified malfunctioning and faulty electrical equipment and components and initiate appropriate action for recommendation for repair or replacement 1.3 exercised all required safety, environmental and hazard control precautions and procedures when the operating shipboard electrical equipment 1.4 identified electrical equipment operational problems and hazards and took appropriate action 1.5 communicated effectively with others during operation of electrical equipment including effective use of internal communication systems 1.6 ensured adherence to national and international regulations, IMO Conventions and Codes
2. Required Knowledge	2.1 Knowledge of national and international regulations, IMO Conventions and Codes 2.2 Marine Orders applicable to the operation of shipboard electrical equipment on vessels 2.3 Relevant OH&S legislation, policies and procedures 2.4 Established engineering practice for the operation of marine electrical equipment 2.5 Operational characteristics and performance specifications for the different types of shipboard electrical equipment usually found on a vessel 2.6 The nature and causes of typical shipboard electrical equipment operational problems and the appropriate preventative and remedial action to be taken in each case 2.7 Control circuits used onboard a vessel and their associated operational electrical equipment 2.8 Principles and procedures for electrical measurement, including the use of multimeters 2.9 Principles of marine electrical practice relevant to detection, identification of faults 2.10 Knowledge and ability to read and interpret Material Safety Data Sheets 2.11 Knowledge and ability to read and interpret vessel and electrical equipment specifications and operational manuals 2.12 Maintenance hazards and hazard identification and prevention strategies 2.13 Maritime communication techniques needed when operating electrical equipment 2.14 Safety, environmental and hazard control precautions and procedures relevant to the operation of shipboard electrical equipment 2.15 Safe procedures for the use of hand and power tools and maintenance of equipment

3. Required Skills	3.1 Operating shipboard electrical machinery equipment 3.2 Assessing operational performance of shipboard electrical equipment 3.3 Identifying operational problems with shipboard electrical equipment and taking remedial action 3.4 Taking action to minimize any damage and safety risk that could be caused by electrical equipment malfunctions 3.5 Applying safety precautions relevant to the operation of shipboard electrical equipment 3.6 Basic Computer operation
4. Resource Implications	The following resources should be provided : 4.1 workplace 4.2 tools and equipment appropriate in the operation of shipboard electrical equipment 4.3 materials relevant to the proposed activity and tasks
5. Methods of Assessment	Competency in this unit must be assessed through: 5.1 Practical demonstration and questioning of related underpinning knowledge 5.2 Written Examination 5.3 Portfolio (e.g. approved in-service and training ship experiences, etc.)
6. Context of Assessment	6.1 Competency may be assessed in simulated workplace setting or accredited assessment center

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

UNIT CODE : MTM816316

UNIT DESCRIPTOR : This unit involves the skills and knowledge required in the routine maintenance and repair procedures of the shipboard equipment and machinery.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Contribute in routine planned maintenance of equipment and machinery	1.1 ***Cleaning materials and equipment*** are identified and selected in preparation for routine maintenance. 1.2 ***Maintenance*** arrangements for equipment and machinery on the vessel are carried out in accordance with technical, safety and procedural specifications. 1.3 Operational problems or faults with the vessel's equipment and machinery are identified and reported to the relevant personnel. 1.4 Routine lubrication and other preventive maintenance of equipment and machinery are carried out in accordance with manufacturer's instructions. 1.5 Preventive and remedial maintenance carried out on equipment and machinery spaces are communicated to the engine officer for record keeping.
2. Contribute in repairs of equipment and machinery	2.1 Correct shut down of malfunctioning/faulty machinery or equipment and disassembly procedure are carried out with the supervision of an engineering officer. 2.2 Damaged or faulty components are repaired / replaced with the supervision of an engineering officer. 2.3 Repaired machinery is re-assembled and ***tested*** in accordance with manufacturer's instructions and the supervision of engineering officer. 2.4 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. 2.5 Replaced damage parts and consumable are disposed in accordance with the International regulations. 2.6 Housekeeping is observed at all times in engine room.
3. Carry out stores operations	3.1 Performance of stowage of dangerous, hazardous and harmful stores complied with established safety practices. 3.2 Safe handling of stores is undertaken following established standard procedures. 3.3 Securing of stores is performed, when necessary or in the event of unforeseen circumstances. 3.4 Communications made within the operator's area of responsibility are consistently successful.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Cleaning materials and equipment	May include: 1.1 Materials 1.1.1 Detergents 1.1.2 Cleaning Rags 1.1.3 Mops 1.1.4 Chemicals 1.1.5 Degreaser 1.1.6 Metal Polish 1.1.7 Wire brush 1.1.8 Paint brush 1.1.9 Oil pan 1.2 Equipment 1.2.1 Spray equipment 1.2.2 Vacuum cleaner 1.2.3 Polisher 1.2.4 Grinder 1.2.5 Jet chisel 1.2.6 Greaser
2. Maintenance	May include: 2.1 Maintenance 2.1.1 Planned maintenance systems 2.1.2 Operational checks 2.1.3 Recording 2.1.4 Reporting 2.1.5 Isolation 2.1.6 Cleanliness 2.1.7 Use of correct tools, parts, and lubricants 2.1.8 Worksite preparation 2.2 Maintenance tools and equipment 2.2.1 Hand and power tools 2.2.2 Greasing and lubrication tools 2.2.3 Protective clothing and equipment such as: 2.2.4 Eye and ear protection 2.2.5 Safety boots and helmet 2.2.6 Dust and fume masks
3. Tested	May include: 3.1 Meters and gauges, oxygen meter and gas detectors 3.2 Computer displays of performance parameters 3.3 Hand tools, such as spanners, wrenches, screwdrivers, hacksaws, etc. 3.4 Greasing and lubrication tools 3.5 Electric power tools, such as grinders, lathes, drills, etc. 3.6 Pneumatic power tools, such as grinders, sanders, drills, etc. 3.7 Welding equipment 3.8 Block and tackle and portable and manual lifting equipment and hydraulic jacks 3.9 Material safety data sheets 3.10 Protective clothing and equipment such as: 3.10.1 Eye and ear protection 3.10.2 Safety boots and helmet 3.10.3 Dust and fume masks 3.10.4 Boiler suit/overall

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 used and carried out planned routine maintenance of equipment and machinery 1.2 identified typical problems related to the equipment and machinery operation and maintenance and undertook appropriate action in conjunction with other vessel personnel 1.3 ensured the exercise of all required safety, environmental and hazard control precautions and procedures during equipment and machinery operation and maintenance 1.4 carried out stores operations 1.5 communicated effectively with others during the operation and maintenance of equipment and machinery
2. Required Knowledge	2.1 Sections of the relevant maritime regulations 2.2 Relevant OH&S and pollution control legislation and codes of practice 2.3 Principle design and safety features and component parts of equipment and machinery 2.4 Procedures for operating and carrying out planned maintenance of equipment and machinery 2.5 Procedures for isolating defective equipment and machinery or components 2.6 Repair and/or replacement procedures for equipment and machinery and components 2.7 Principles and procedures of machinery lubrication as they relate to equipment and machinery on a vessel, including: 2.7.1 Application of grease 2.7.2 Changing of gearbox lubricating oil 2.7.3 Lubrication of a steel wire rope is demonstrated 2.7.4 The applications and use of "denso" tape are identified 2.7.5 The changing of lubricating and hydraulic oil 2.8 Procedures for the replacement of flexible hoses in equipment and machinery 2.9 Procedures for using hand and power tools for typical maintenance operations on equipment and machinery 2.10 Maintenance and repair hazards and problems and appropriate preventative and remedial action and solutions 2.11 Safety, environmental and hazard control precautions and procedures relevant to the operation and maintenance of equipment and machinery 2.12 Safe procedures for handling heavy machinery and component parts during maintenance of equipment and machinery 2.13 Knowledge and ability to read and interpret Material Safety Data Sheets 2.14 Knowledge and ability to read and interpret operational manuals and specifications. 2.15 Maritime communication techniques needed during the use and maintenance of equipment and machinery on a vessel 2.16 Maintenance records that must be maintained on a commercial vessel 2.17 Procedures for stowage and securing of stores

3. Required Skills	3.1 Using and carrying out planned routine maintenance of equipment and machinery 3.2 Identifying the operational and maintenance problems and determining appropriate courses of action 3.3 Ensuring the application of safety precautions relevant to use and maintenance of equipment and machinery 3.4 Applying environmental protection procedures when carrying out maintenance operations 3.5 Handling of dangerous, hazardous and harmful stores 3.6 Action taken promptly to report and/or rectify defective or malfunctioning equipment and machinery, and components in accordance with manufacturer's instructions and established procedures 3.7 Work is completed systematically with required attention to detail
4. Resource Implications	The following resources must be provided : 4.1 workplace 4.2 tools and equipment appropriate in equipment and machinery operation 4.3 materials relevant to the activity and tasks
5. Methods of Assessment	Competency in this unit must be assessed through : 5.1 Practical demonstration and questioning of related underpinning knowledge 5.2 Written examination 5.3 Portfolio (e.g. approved in-service and training ship experiences, etc.)
6. Context of Assessment	6.1 Competency may be assessed in simulated workplace setting or accredited assessment center

SECTION 3 TRAINING STANDARDS

These guidelines are set to provide the Technical and Vocational Education and Training (TVET) providers with information and other important requirements to consider when designing training programs for **ABLE SEAFARER ENGINE NC II (STCW Regulation III/5).**

3.1 CURRICULUM DESIGN

Course Title: **ABLE SEAFARER ENGINE NC II (STCW Regulation III/5)**

Suggested Nominal Training Duration: **18** Hours (Basic Competencies)
60 Hours (Common Competencies)
68 Hours (Core Competencies)

Course Description:

This course is designed to equip individual with basic and common operational skills, knowledge and attitudes of **ABLE SEAFARER ENGINE NC II (STCW Regulation III/5).**

To obtain this, all units prescribed for this qualification must be achieved.

BASIC COMPETENCIES

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Participate in workplace communication	1.1 Obtain and convey workplace information. 1.2 Complete relevant work related documents. 1.3 Participate in workplace meeting and discussion.	Group discussion Interaction	• Demonstration • Observation • Interviews/ questioning
2. Work in a team environment	2.1 Describe and identify team role and responsibility in a team. 2.2 Describe work as a team member.	Discussion Interaction	• Demonstration • Observation • Interviews/ questioning
3. Practice career professionalism	3.1 Integrate personal objectives with organizational goals. 3.2 Set and meet work priorities. 3.3 Maintain professional growth and development.	Discussion Interaction	• Demonstration • Observation • Interviews/ questioning
4. Practice occupational health and safety	4.1 Evaluate hazard and risks 4.2 Control hazards and risks 4.3 Maintain occupational health and safety awareness	Discussion Plant tour Symposium	• Observation • Interview

COMMON COMPETENCIES

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Survive at sea in the event of ship abandonment	1.1 Respond to the indicated emergency 1.2 Board a survival craft	• Discussion • Lecture • Demonstration • Simulation	• Written • Questioning • Observation • Practical performance
2. Minimize the risk of fire and maintain a state of readiness to respond to emergency situations involving fire	2.1 Carry out fire minimization procedures 2.2 Respond to emergencies involving fire	• Discussion • Lecture • Demonstration • Simulation	• Observation • Demonstration • Practical performance
3. Fight and extinguish fires	3.1 Operate portable fire-fighting equipment 3.2 Carry out fire-fighting operations	• Discussion • Lecture • Demonstration • Simulation	• Observation • Demonstration • Practical performance
4. Take immediate action upon encountering an accident or other medical emergency	4.1 Determine the need of casualty 4.2 Administer first-aid to the victim	• Discussion • Lecture • Demonstration • Simulation	• Observation • Demonstration • Practical performance
5. Comply with emergency procedures	5.1 Take action on becoming aware of an emergency 5.2 Follow established emergency procedures 5.3 Follow procedures for the use of various life-saving equipment	• Discussion • Lecture • Demonstration • Simulation	• Observation • Demonstration • Practical performance

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
6. Take precautions to prevent pollution of the marine environment	6.1 Practice compliance with legislative requirements for protection of the marine environment 6.2 Practice anti-pollution procedures	• Discussion • Lecture • Demonstration • Simulation	• Observation • Demonstration • Practical performance
7. Observe safe working practices	7.1 Identify and follow workplace procedures for hazard identification and risk control 7.2 Contribute to arrangements for the management of occupational health and safety 7.3 Understand and take necessary actions to control fatigue 7.4 Complete occupational health and safety records	• Discussion • Lecture • Demonstration • Simulation	• Observation • Demonstration • Practical performance
8. Demonstrate security awareness practices	8.1 Contribute to the enhancement of maritime security through heightened awareness 8.2 Recognize security threats 8.3 Understand the need for and maintaining security awareness and vigilance	• Discussion • Lecture • Demonstration • Simulation	• Observation • Demonstration • Practical performance

NOTE: *Trainee-applicant who already possesses the relevant certificate of training and/or certificate of competency on BST and Security Awareness Training shall not be required to undergo training or certification on Common Competencies

CORE COMPETENCIES

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Perform marine engineering at the support level	1.1 Contribute to a safe engineering watch 1.2 Contribute to the monitoring and controlling of an engine-room watch 1.3 Contribute to fuelling and oil transfer operations 1.4 Contribute to bilge and ballast operations 1.5 Contribute to the operation of equipment and machinery	• Demonstration • Discussion • Shipboard visitation (educational tours) • Simulation	• Observation • Practical Demonstration and Oral Examination • Written Test
2. Perform safe usage of electrical equipment at the support level	2.1 Operate electrical equipment 2.2 Follow safety and hazard control procedures	• Demonstration • Discussion • Shipboard visitation (educational tours) • Simulation	• Observation • Practical Demonstration and Oral Examination • Written Test
3. Perform maintenance and repair at the support level	3.1 Contribute in routine planned maintenance of equipment and machinery 3.2 Contribute in repairs of equipment and machinery 3.3 Carry out stores operations	• Demonstration • Discussion • Shipboard visitation (educational tours) • Simulation	• Observation • Practical Demonstration and Oral Examination • Written Test

3.2 TRAINING DELIVERY

The delivery of training should adhere to the design of the curriculum. Delivery should be guided by the 10 basic principles of competency-based TVET.

- The training is based on curriculum developed from the competency standards;
- Learning is modular in its structure;
- Training delivery is learner-centered and should accommodate individualized and self-paced learning strategies;
- Training is based on work that must be performed;
- Training materials are directly related to the competency standards and the curriculum modules;
- Assessment is based in the collection of evidence of the performance of work to the industry required standard;
- Training is based both on and off the job components
- Allows for recognition of prior learning (RPL) or current competencies
- Training allows for multiple entry and exit; and
- Approved training programs are Nationally Accredited

The competency-based TVET system recognizes various types of delivery modes, both on and off-the-job as long as the learning is driven by the competency standards specified by the industry. The following training modalities may be adopted when designing training programs:

- The dualized mode of training delivery is preferred and recommended. Thus programs would contain both in-school and in-industry training or fieldwork components. Details can be referred to the Dual Training System (DTS) Implementing Rules and Regulations.
- Modular/self-paced learning is a competency-based training modality wherein the trainee is allowed to progress at his own pace. The trainer facilitates the training delivery
- Peer teaching/mentoring is a training modality wherein fast learners are given the opportunity to assist the slow learners.
- Supervised industry training or on-the-job training is an approach in training designed to enhance the knowledge and skills of the trainee through actual experience in the workplace to acquire specific competencies prescribed in the training regulations.
- Distance learning is a formal education process in which majority of the instruction occurs when the students and instructor are not in the same place. Distance learning may employ correspondence study, or audio, video or computer technologies.
- Project-Based Instruction is an authentic instructional model or strategy in which students plan, implement and evaluate projects that have real world applications.

3.3 TRAINEE ENTRY REQUIREMENTS

This section specifies the qualifications 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 an Engineering Watch II (STCW Regulation III/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. 2013-0006

3.4 LIST OF TOOLS, EQUIPMENT AND MATERIALS FOR ABLE SEAFARER ENGINE NC II (STCW Regulation III/5)

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)

TOOLS		EQUIPMENT		MATERIALS	
QTY	**Description**	**QTY**	**Description**	**QTY**	**Description**
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)
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 m^3)	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	**Training Materials / Reference Books**	
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 potencial hazard in engine room
		1 unit	• Bunker sampling equipment		
				1 pc.	• Video related to emergencies in engine room
		2 pcs	• Removable stopper for the swing valve	1 pc.	• Video related to bunkering

TOOLS		EQUIPMENT		MATERIALS	
QTY	Description	QTY	Description	QTY	Description
		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 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

SIMULATOR/S	
QTY	Description
1 set	**ENGINE ROOM SIMULATORS (ERS) EQUIPMENT** 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: — main engine including turbocharger system — 2 auxiliary diesel generators — lubrication oil separator — steering gear system — fire pump — shaft generator — cooling water system including freshwater generation system — turbo generator — fuel oil Bunkering system — fuel oil Settling and Service systems — 2 heavy fuel oil separators — 1 diesel oil separator — steam generation plant including exhaust and oil-fired boilers — 2 starting air compressors — diesel oil and heavy fuel oil supply to main and auxiliary engines — main engine operation from engine room, engine control room and bridge — turbocharger system — air ventilation system for engine and control room — bilge water system including oily water treatment systems — stern tube system — deck machinery applicable to the ship model — ballast system — Sewage treatment system. ***Medium and High Speed Engines*** 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:

	— one or more main engines — main SW system — 2 auxiliary engines — fuel oil tanks — fuel oil separator — lubrication oil separator — main engine(s), including: — fresh water system — lubrication system — turbocharger system — ME SW system. — reduction gear system — controllable propeller pitch where applicable — steam generation system as applicable — freshwater generator — bilge wells and bilge separation system — 2 air compressors — steering gear system — fire pump — electrical power plant — deck machinery applicable to the ship model — ballast system — sewage treatment system ***Steam Propulsion*** 3. The simulation model should reflect main steam related subsystems of an actual ship: — HFO supply system — DO supply system — boil-off gas supply system if LNG ship is simulated — 1 ½ boiler system or twin boiler systems each including: — local and remote control systems — safety systems — burner management system — burner system, incl. minimum 3 burners — air/flue gas system — heating surfaces — water/ steam system. — main turbine, including: — local and remote control systems — safety systems — throttle control — draining and heating system — gland sealing system. — main reduction gear system including: — lubrication system incl. purifier — governor sensor system. — condenser and condensate feed systems — SW circ system — aux SW system — vacuum pumps — condenser condensate level control. — atmospheric drain system — atmospheric drain tank — drain pumps — level control. — feed water pre-heaters (one or more)

	— de-aerator system — boiler feed water pumps — back pressure steam system and auxiliary — ballast system — deck machinery applicable to the ship model. ***Electric Propulsion Motors (Diesel and/or Gas)*** 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: — propulsion electric motor(s) — 2 or more high voltage generators — 2 or more prime movers (diesel engines or gas-turbines) — cooling water system including freshwater generation system — fuel oil Bunkering system — fuel oil Settling and Service systems — fuel oil separator system — lubrication oil separator system — steam generation plant as applicable — starting air and service air system — main engine operation from engine room, engine control room and bridge — bilge water system including oily water treatment systems. — ballast system — stern tube system — steering gear system — deck machinery applicable to the ship model -- fire pump

REMARKS:

Above tools, equipment and materials are applicable for the training delivery of the CORE COMPETENCIES.

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.

3.5 TRAINING FACILITIES
ABLE SEAFARER ENGINE NC II (STCW Regulation III/5)

Based on a class size of 24 students/trainees

SPACE REQUIREMENT	SIZE IN METERS	AREA IN SQ. METERS	TOTAL AREA IN SQ. METERS
• Lecture Room (Job/ Site/ School		42.00	42.00
• Trainee Working Space	1.50 x 1.50 / trainee	2.2.5 per trainee	54.00
• Lecture Resource Center	4.00 x 5.00	20.00	20.00
• Administration / Faculty			30.00
Total Workshop Area			146.00

REMARKS:

1. The training facilities 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.

3.6 TRAINER'S QUALIFICATIONS FOR MARITIME SECTOR

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

TRAINER QUALIFICATION

- Must be a licensed Officer-In-Charge of an Engineering Watch and at least with twelve (12) months seagoing service in the position
- Must be proficient in English communication
- Must be a holder of National TVET Trainer Certificate (NTTC) I – Able Seafarer Engine NC II (STCW Regulation III/5)

REMARKS:

Above trainer's qualifications are applicable for the delivery of the CORE COMPETENCIES.

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.

3.7 INSTITUTIONAL ASSESSMENT

Institutional assessment is undertaken by trainees to determine their achievement of units of competency. A certificate of achievement is issued for each unit of competency.

SECTION 4 NATIONAL ASSESSSMENT AND CERTIFICATION ARRANGEMENTS

Assessment of an individual's competence leads to the issuance of a Certificate of Proficiency (COP) in the relevant unit of competency.

A Certificate of Proficiency (COP) is issued when a candidate has demonstrated competence in all the units of competency that comprise the relevant promulgated qualification.

1. Candidate wanting to be certified will have to be assessed in accordance with the requirements identified in the evidence guide of the relevant unit/s of competency. As a rule, the unit/s of competency shall be the benchmark for all assessment under the Training Regulations for Maritime Sector.

2. Candidate must have completed the prescribed course of instruction or acquired all the units of competency contained in this Training Regulation and with equivalent sea service experience. The following are qualified to apply for assessment and certification:

   - Holder of Certificate of Proficiency (COP) for Rating Forming Part of an Engineering Watch NC II (STCW Regulation III/4 ; and
   - Has completed TESDA-registered training program for ABLE SEAFARER ENGINE inclusive of an approved sea going service in the engine department of not less than twelve (12) months on board seagoing vessel of 750 kW propulsion power or more, supported by an accomplished Training Record Book as prescribed by the TESDA/MARINA; OR

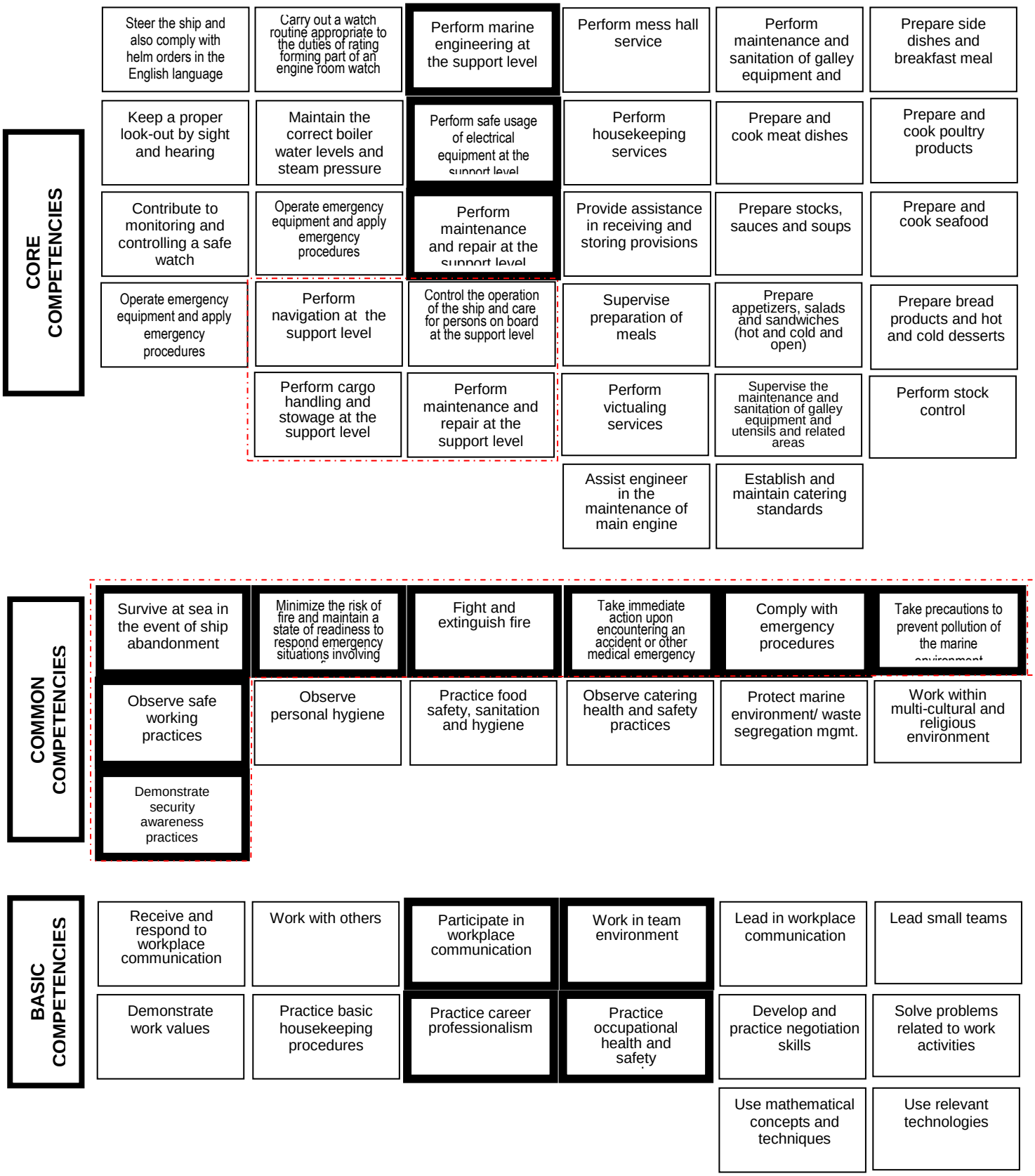
     Minimum eighteen (18) months sea going service in the engine department and qualified as a rating forming part of a engine watch on board seagoing vessel of 750 kW propulsion power or more, evidenced by a certificate from the manning agency/shipping company which must be reflected in the Seafarers' Identification and Record Book (SIRB) and in addition, a duly accomplished Training Record Book as prescribed by the TESDA/MARINA.

3. Candidates for a COP shall be required to undergo assessment using the methods identified in the units of competency.

4. Conduct of assessment and issuance of certificates shall follow the procedures manuals and implementing guidelines developed for the assessment and certification of Able Seafarer Engine as institutionalized by and between TESDA and MARINA through a Memorandum of Agreement (MOA).

5. Candidates who are found to be competent under the qualification for Able Seafarer Engine as contained in Section 1 shall be awarded with the corresponding Certificate of Proficiency (COP).

COMPETENCY MAP
For Maritime Sector



DEFINITION OF TERMS

1.	**Auxiliary machinery**	is a diesel engine that acts as prime mover from a ship generator. The other machineries found inside the engine room other than the auxiliary engine and main engine.
2.	**Ballasting/ Deballasting**	transferring, taking in or discharging water ballast. It is usually arranged to work the bilges, fire system, or sanitary circulation as required.
3.	**Bilge**	the lowest part of hull next to the keelson
4.	**Blueprints**	a contact print, with white line on blue background of a drawing; made on linen or a ferro-prusiate paper and developed in water or special solution.
5.	**Bunkering**	the process of loading, storage of solid or liquid fuel oil in containers, tanks from which the fuel can be continuously or intermittently withdrawn the ship fuel oil storage tank.
6.	**Condenser**	a heat transfer device that reduces a thermodynamic fluid from its vapor phase to its liquid phase. .
7.	**Crankcase**	the housing of a crankshaft of an engine
8.	**Cylinder head**	the cap that serves to close the end of the piston chamber or reciprocating engine, pump or compressor
9.	**Economizer**	a force flow, once-throw, conviction-heat –transfer tube bank in which boiler feed water is raised to boiling temperature to produce steam by using the heat generated from internal combustion
10.	**Engine Room**	space in which a vessel's main propulsion and auxiliary engines
11.	**Governor**	a device, especially one acquitted by centrifugal force of whirling weight oppose by gravity or by spring used to provide automatic control of speed or power of a prime mover.
12.	**Heat exchanger**	any device that transfer heat from one fluid to another or to the environment.
13.	**Lashing**	a fastening made by a piece of cordage, chain, or wire in securing a movable object or uniting two or more parts or objects together.

14.	**Liferaft**	a passenger ship equipment covering deficiency if any, in lifeboat capacity for all persons on board.
15.	**Major maintenance**	any maintenance job, which requires the shut down of the equipment to be maintained and requires big or large resources
16.	**Man over board**	alarm cry when a person falls into the water.
17.	**Manipulate**	to work, operate, or when a person falls into the water.
18.	**Minor maintenance**	any maintenance job, which can be performed by a single person with ease and few resources.
19.	**Monitor**	to watch, to check on or regulate the performance of a machine.
20.	**Motorman**	is a rating forming part of an engineering watch and provides support in all engineering tasks in tanker ships.
21.	**Nozzle**	a tube like device, usually streamlined, accelerating and directing fluid, whose pressure decreases as it leaves the nozzle.
22.	**Oiler**	Is a rating forming part of an engineering watch and provides support in all engineering tasks in ships except tanker
23.	**Parameter**	is a quantity, which is constant in a given set of conditions, but may be different under other condition.
24.	**Preventive maintenance**	to feed furnish internal combustion engine or may be different under other condition.
25.	**Sea chest**	a pipe between s hip’s side and a valve in the hull from draining water.
26.	**Sounding**	measurement used to ascertain the depth of liquid by a lead line sounder and pathometers.
27.	**Tank sounding**	the level of the liquid inside the tank.
28.	**Valve**	a gate or a variable orifice that is used to regulate the flow of liquid sludge a precipitate/residue from oil.
29.	**Wash Paint**	the process of cleaning, washing and drying inside the engine rooms.

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