TRAINING REGULATIONS

RATING FORMING PART OF AN ENGINEERING WATCH NC II (STCW Regulation III/4)

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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TRAINING REGULATIONS FOR

RATING FORMING PART OF AN ENGINEERING WATCH NC II (STCW Regulation III/4)

SECTION1 RATING FORMING PART OF AN ENGINEERING WATCH NC II (STCW Regulation III/4) QUALIFICATION

The **RATING FORMING PART OF AN ENGINEERING WATCH NC II (STCW Regulation III/4)** Qualification consists of competencies that a person must achieve to carry out a watch routine appropriate to the duties of rating forming part of an engine-room watch, maintain the correct boiler water levels and steam pressures (for keeping boiler watch) and, operate emergency equipment and apply emergency procedures at the support level on a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more.

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/4

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
MTM816311	Carry out a watch routine appropriate to the duties of rating forming part of an engine-room watch
MTM816312	Maintain the correct boiler water levels and steam pressures (for keeping boiler watch)
MTM816313	Operate emergency equipment and apply emergency procedures

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

- Rating forming part of an engineering watch

SECTION 2 COMPETENCY STANDARDS

This section gives the details of the contents of the basic, common and core units of competency required of **Rating Forming Part of an Engineering Watch NC II (STCW Regulation III/4).**

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 CO2 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*** is 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 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 : CARRY OUT A WATCH ROUTINE APPROPRIATE TO THE DUTIES OF A RATING FORMING PART OF ENGINE ROOM- WATCH

UNIT CODE : MTM816311

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitude required to carry out a watch routine appropriate to the duties of a rating forming part of engine room watch. This includes handling over and relief of the engineering watch, correct internal communications and the monitoring of the operation of the performance of the main propulsion, auxiliary system and associated controls.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Perform engine room watchkeeping procedures	1.1 ***Machineries and equipment*** are identified and used according to their functions. 1.2 The conduct of handover and relief of the engine room watch is carried out/provided in conformity with accepted principles and vessel's procedures. 1.3 ***Watchkeeping principles and procedures*** are applied in accordance with established marine engineering practice and regulatory requirements. 1.4 A safe engineering watch is achieved based on the accepted bridge and engine room resource management principles and procedures. 1.5 Engine room watch keeping is carried out in accordance with safe working practice. 1.6 Clear and concise communication is acknowledged in a seaman like manner. 1.7 Internal communication and engine room various alarm systems are identified and responded in real and simulated emergency situations in accordance with regulatory requirements and established procedures. 1.8 Emergency communications and ***alarm signals and systems*** are understood and required action implemented is in accordance with emergency procedures and regulatory requirements.
2. Respond to malfunction and emergency situations	2.1 Emergency duties performed are in accordance to shipboard procedures. 2.2 Escape routes from machinery spaces are correctly used in real and simulated emergency situation in accordance with regulatory requirements and established procedures. 2.3 The location of firefighting equipment is identified and the equipment is used according to the manufacturer's instruction. 2.4 *Emergency* and abnormal situations are identified, reported and appropriate action is undertaken in accordance with instructions and regulatory requirements. 2.5 Malfunctions of the main propulsion and auxiliary systems are identified, reported and appropriate action is undertaken in accordance with operating manual instructions. 2.6 Clear and concise communication is acknowledged in a seamanlike manner. 2.7 Engine room emergency is reported immediately and appropriate action is undertaken.
3. Record operating parameters	3.1 Appropriate entries pertaining to the engineering watch are recorded in the engine room book as per standard operating procedures. 3.2 Any deviation from the normal parameters is reported immediately to the engineer on watch.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Machineries and equipment	May include: 1.1 Machineries 1.1.1 Main propulsion plant 1.1.2 Auxiliary machineries 1.1.3 Auxiliary engines 1.2 Equipment 1.2.1 Safety equipment 1.2.2 Workshop equipment 1.2.3 Lifting equipment
2. Watchkeeping principles	May include: 2.1 Maintenance of safe engineering watch 2.2 Avoidance of pollution of the marine environment 2.3 Appropriate assistance must be available to be summoned to the engine room if required by a change in the vessel's operational situation
3. Alarm signals and systems	May include: 3.1 Alarm signals 3.1.1 General alarm 3.1.2 Fire alarm 3.2 Alarm systems 3.2.1 Engine room alarm 3.2.2 Fire extinguishing gas alarm
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 overspeeding of machinery which result in emergency trips

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 performed engine room watchkeeping arrangements procedures 1.2 undertook appropriate action in the event of engine malfunction and emergency 1.3 fulfilled engineering watchkeeping responsibilities 1.4 communicated clearly and effectively with others in the course of watchkeeping duties 1.5 recorded operating parameters in the engine room logbook
2. Required Knowledge	2.1 Knowledge of sections of IMO 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 handling over a watch 2.3 Boiler plant systems 2.4 Main engine systems 2.5 Diesel alternator systems 2.6 Turbo alternator system 2.7 Auxiliary systems of the engine 2.8 Terms used in machinery spaces and names of machinery and equipment 2.9 Engine room watchkeeping procedures 2.10 Basic environmental protection procedures 2.11 Engine room alarm systems
3. Required Skills	3.1 Operation and maintaining vessel's main and auxiliary systems including start up, normal running, shut down and emergency situations 3.2 Operating main and auxiliary machinery monitoring devices 3.3 Performing safe working practices for machinery and enclosed spaces 3.4 Isolating main and auxiliary engine safely prior to work commencing 3.5 Working principles of fire prevention, detection and extinguishing 3.6 Using internal communication system 3.7 Recording operating parameters
4. Resource Implications	The following resources should be provided : 4.1 workplace 4.2 tools and equipment appropriate in engine room watchkeeping activities 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 : MAINTAIN THE CORRECT BOILER WATER LEVELS AND STEAM PRESSURES
(For keeping a boiler watch)

UNIT CODE : MTM816312

UNIT DESCRIPTOR : The unit covers the knowledge, skills and attitude required of a rating forming part of an engine-room watch in maintaining the water level and steam pressure of a boiler in a vessel. Vessel may include any commercial vessel up to 750 kW propulsion power.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** *terms* are elaborated in the Range of Variables
1. Maintain boiler water level	1.1 Boiler water level is ***monitored*** and recorded in accordance with established procedures and manufacturer's instruction. 1.2 Any abnormality in the water level is reported immediately to the engineer on watch.
2. Maintain boiler steam pressure	2.1 Boiler steam pressure is monitored and recorded in accordance with established procedures and manufacturer's instruction. 2.2 Any abnormality in the steam pressure is reported immediately to the engineer on watch.
3. Follow safety and hazard control procedures	3.1 Safety, hazard minimization and pollution control procedures and ***regulations*** are followed at all times when monitoring operation of boiler. 3.2 Operational and ***maintenance*** hazards are identified and action is taken to minimize or eliminate risk to personnel, vessel and the environment. 3.3 Where relevant, procedures and precautions necessary for entry into confined spaces on a vessel are correctly followed. 3.4 Action is taken in the event of failure or emergency to isolate and secure the boiler systems and maintain the safety of the vessel and persons involved. 3.5 Vessel's emergency and contingency plans are followed in the event of a failure or emergency involving boiler.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Monitor	Monitoring and maintaining water level and steam pressure of boiler may be conducted: 1.1 by day or night in both normal and emergency situations 1.2 under any permissible conditions of weather 1.3 while underway 1.4 during berthing and unberthing operations 1.5 while anchored or moored 1.6 in dry dock 1.7 when bunkering 1.8 during cargo operations
2. Regulations	May include: 2.1 relevant IMO Conventions and Codes 2.2 relevant international OH&S and pollution control legislation 2.3 relevant international and engineering standards
3. Maintenance	May include: 3.1 Preventative and remedial maintenance and basic repairs of boiler and related equipment and components 3.2 Routine servicing in accordance with established procedures 3.3 Routine visual checks 3.4 Identification of poor performance or faults in the operation of boiler systems 3.5 Identification of faulty equipment or fittings and arranging for repair or replacement 3.6 Assisting contractors in repair operations

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 maintained the water level and steam pressure of a boiler on a vessel 1.2 followed safety and hazard control procedures 1.3 communicated effectively with others when monitoring and maintaining the water level and steam pressure of a boiler in a vessel
2. Required Knowledge	2.1 Knowledge of relevant maritime regulations 2.2 Relevant OH&S and pollution control legislation and codes of practice 2.3 Statutory requirements for the operation and maintenance of boiler in a vessel 2.4 Types of boiler used on vessels up to 750 kW propulsion power, including their principle features and operating characteristics 2.5 Basic construction of boilers, including fittings that complies with safety and statutory requirements 2.6 Basic principles of operation and safety of boilers and feed systems, steam engines and turbines, including the care of boilers and their fittings and basic feed water systems, testing and treatment 2.7 Procedures for the operation and routine maintenance boiler on vessels 2.8 Basic properties of steam 2.9 Procedures for the use of gauges and meters to monitor and measure performance 2.10 The causes, effects of, and methods of detection of boiler water contamination 2.11 Hazard control precautions and procedures relevant to the operation and routine maintenance of boiler 2.12 Typical problems related to the operation and maintenance of boiler systems on vessels and appropriate diagnostic action and related solutions 2.13 Precautions that must be taken to minimize danger of fire or explosion.
3. Required Skills	3.1 Communication skills 3.2 Observing safety precautions 3.3 Using personal protective equipment
4. Resource Implications	The following resources should be provided : 4.1 appropriately illuminated and ventilated workplace/area 4.2 tools and equipment appropriate in the operating and maintaining the water level and steam pressure of a boiler 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 with oral questioning 5.2 Portfolio (e.g. approved in-service and training ship experiences, etc.) 5.3 Written examination
6. Context of Assessment	6.1 Competency may be assessed in simulated workplace setting or accredited assessment center

UNIT OF COMPETENCY : OPERATE EMERGENCY EQUIPMENT AND APPLY EMERGENCY PROCEDURES

UNIT CODE : MTM816313

UNIT DESCRIPTOR : This unit involves the knowledge, skills and attitude to apply emergency procedure and operate emergency related to the engine-room watchkeeping.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range Statement
1. Respond to emergencies	1.1 ***Emergencies*** are correctly recognized and identified. 1.2 Response to an emergency situation is established following the vessel's emergency response procedures. 1.3 Initial action is undertaken on discovery of an actual or potential emergency in accordance with established vessel 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/external communication and alarm systems are correctly 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.
3. Follow procedures for the operation of emergency equipment	3.1 Location of emergency equipment is identified. 3.2 Location of the posted operating procedures for the specific ***emergency equipment*** is identified. 3.3 Procedures for the use of various emergency equipment are followed in accordance with regulatory requirements, manufacturer's instruction and company procedures.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Emergencies	May include: 1.1 Collision with another vessel 1.2 Explosion on board vessel 1.3 Impairment of integrity of hull and ingress of water 1.4 Loss of steering control 1.5 Loss of motive power 1.6 Foundering 1.7 Grounding 1.8 Beaching a vessel 1.9 Person overboard 1.10 Rescue and evacuation of injured personnel 1.11 Oil pollution 1.12 Piracy/armed robbery/stowaways
2. Contingency plans	May include: 2.1 Contingency plan in controlling fire or explosion emergency 2.2 Use of appropriate firefighting equipment and techniques such as various types of fire extinguishers, fire blankets, fire hoses and nozzles and foam applicators 2.3 Activation of fixed fire fighting sprinklers and systems 2.4 Removal of fuel or heat source 2.5 Boundary cooling techniques 2.6 Contingency Plan in controlling flooding emergency 2.7 Use of softwood wedges and plugs to reduce water ingress 2.8 Erection and application of vertical shoring 2.9 Construction and fitting of a leak-stopping mat 2.10 Temporary repair of a ruptured pressurized pipe 2.11 Operation of a portable salvage pump 2.12 SOPEP and its equipment
3. Emergency equipment in the engine room watchkeeping	May include: 3.1 Emergency generator 3.2 Emergency fire pump 3.3 Emergency bilge suction 3.4 Emergency steering 3.5 Emergency compressor 3.6 Quick closing valves 3.7 General service pump (Diesel driven) 3.8 Fire dampers

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate : 1.1 undertook appropriate action in the event of discovering a shipboard emergency 1.2 followed vessel's contingency plans for emergency response 1.3 followed procedures for the use of various emergency equipment in the engine room watchkeeping 1.4 identified typical problems that may occur during a shipboard emergency and take appropriate action 1.5 communicated clearly and effectively with others during shipboard emergencies
2. Required Knowledge	2.1 Relevant maritime regulations dealing with emergency equipment and procedures 2.2 Navigational emergencies for vessels and appropriate action and solutions 2.3 Indications of various types of emergency situations and the action to be followed when various types of actual or potential emergency situations are identified 2.4 Emergency alarm signals and systems in use on vessels and procedures to be followed when an emergency alarm is raised 2.5 Escape routes and internal and external communications systems and alarms on board a vessel 2.6 General principles of damage and control and the manner in which watertight integrity of hull is maintained on a vessel, including the importance of preparation, control and repair 2.7 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 2.8 Maritime communication techniques used during navigational emergencies
3. Required Skills	3.1 Taking initial action during real and simulated emergency situation 3.2 Implementing emergency during a real and simulated emergency situations 3.3 Identifying and evaluating problems that may occur during an engine room emergency and determining appropriate course of action
4. Resource Implications	The following resources should be provided: 4.1 work place location 4.2 tools and equipment required to respond to emergencies in engine room watchkeeping 4.3 material 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 a 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 **RATING FORMING PART OF AN ENGINEERING WATCH NC II (STCW Regulation III/4).**

3.1 CURRICULUM DESIGN

Course Title: **RATING FORMING PART OF AN ENGINEERING WATCH NC II (STCW Regulation III/4)**

Suggested Nominal Training Duration: **18 Hours (Basic Competencies)**
60 Hours (Common Competencies)*
30 Hours (Core Competencies)
(Plus 2 months approved period of seagoing service)

Course Description:

This course is designed to equip individual with operational skills, knowledge and attitudes of Ratings Forming Part of an Engineering Watch in accordance with STCW Codes and Regulations. It covers core competencies such as perform functions of a rating forming part of an engine room watch, maintaining the water level and steam pressure (For keeping boiler watch), operating emergency equipment, and applying emergency procedures.

This course is also designed to enhance the basic and common knowledge, skills and attitudes of an individual in the field of engine seafaring.

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	• Interviews/ questioning • Observation
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.	• Group discussion • Interaction	• Interviews/ questioning • Demonstrati on • Observation
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.	• Group discussion • Interaction	• Demonstrati on • 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	• Group discussion • Interaction	• Demonstrati on • Observation • Interviews/ questioning

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 Basic Safety Training (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. Carry out a watch routine appropriate to the duties of rating forming part of an engine-room watch	1.1 Perform engine room watch keeping procedures 1.2 Respond to malfunction and emergency situations 1.3 Record operating parameters	• Lecture • Demonstrations • Discussions • Hands-on/ Simulation	• Observation • Practical demonstration and oral examination • Written test
2. Maintain the correct boiler water levels and steam pressures (For keeping a boiler watch)	2.1 Maintain boiler water level 2.2 Maintain boiler steam pressure 2.3 Follow safety and hazard control procedures	• Lecture • Demonstrations • Discussions • Hands-on/ Simulation	• Observation • Practical demonstration and oral examination • Written test
3. Operate emergency equipment and apply emergency procedures	3.1 Respond to emergencies 3.2 Follow established emergency procedures 3.3 Follow procedures for the operation of emergency equipment	• Lecture • Demonstrations • Discussions • Hands-on/ 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 program 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
- 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.

- Must be 18 years old and above
- Must have completed 10 years Basic Education
- 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 RATING FORMING PART OF AN ENGINEERING WATCH NC II (STCW Regulation III/4)

Recommended list of tools, equipment and materials for a ***batch of 24 trainees*** for **RATING FORMING PART OF AN ENGINEERING WATCH.**

TOOLS		EQUIPMENT		MATERIALS	
QTY	**Description**	**QTY**	**Description**	**QTY**	**Description**
25 pcs.	• Spanner wrench	1 unit	• *Operational marine diesel engine, minimum of three (3) -cylinder	25 pairs	• PPE (Gloves, goggles, ear muff, air mask, cover all/boiler suit, hard hat)
5 pcs.	• Vice grip				
5 pcs.	• Pliers (assorted sizes)	1 unit	• *Air compressor		
2 sets	• Adjustable wrench (assorted sizes)	1 set	• *Oil Separator (open and complete for demo – non-operational)	10 kls	• Rags (paper/cotton)
1 set	• Wrench, combination open/box (assorted sizes)			1 kit	• First aid kit
		2 pc. @ type	• *Thermometer, mercury (various ranges)	2 pails	• Cleaning solvent
1 set	• Wrench, socket (assorted sizes)	2 pcs.	• Pressostat	1 sack	• Saw dust
2 sets @ type/ size	• Flat cold chisel	2 pcs.	• Thermostat	1 sack	• Powder Detergent Soap
		1 assy	• *Centrifugal pump (non-operational)		
2 pcs	• Hacksaw	1 pc	• *Freshwater tank (1 m^3)		
1 set	• Ballpeen hammer (3 sizes)	1 assy	• *Duplex oil filter	Training Materials/ Reference books:	
5 sets	• Screw drivers (Philips & negative, size 5 mm to 15 mm)	1 assy	• *Duplex fuel filter		• Read's Marine Engineering Series Vol. 12
2 pcs.	• Sounding tape	1 unit.	• *Marine boiler		• Manuals
2 sets	• Pressure Gauges(SI, English)	1 cu.m.	• *Fuel-oil tank overhead or engine supply		• Catalogs/ Brochures
10 pcs	• Wire brush				• Modules/LEs
5 pcs.	• Mop				• CDs/Video tapes
4 pcs.	• Shovel				
2 pcs	• Trash bin				
5 pcs.	• Broomstick				
5 pcs.	• Dust pan				

NOTE: *The use of simulator (description is listed 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

Based on a class size of 24 students/trainees

SPACE REQUIREMENT	SIZE IN METERS	AREA IN SQ. METERS	TOTAL AREA IN SQ. METERS
Workshop/Laboratory area • Trainee working space (Engine Room/ Equipment Area • Trainee Working Space (Marine Boiler room)			156 (50 m^2 minimum) (50 m^2 minimum)
Lecture Room	4.00 x 7.00	28.00	28.00
Learning Resource Center	4.00 x 5.00	20.00	20.00
Wash/Comfort room		10	10
Storage/Tool room		20	20
Circulation Area			60
Total Area			294

Circulation area = 30% of workshop area + lecture room + LRC

3.6 TRAINER'S QUALIFICATIONS FOR MARITIME SECTOR

RATING FORMING PART OF AN ENGINEERING WATCH NC II (STCW Regulation III/4)

TRAINER QUALIFICATION

- Must be licensed Officer-In-Charge of an Engineering Watch and at least with twelve (12) months seagoing service in that position
- Must be proficient in English communication
- Must be a holder of National TVET Trainer Certificate (NTTC) I – Rating Forming Part of an Engineering Watch NC II (STCW Regulation III/4)

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 units 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 endorsed 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 in all the units of competency contained in the maritime program and with equivalent sea service experience on a seagoing ship of 750 kW propulsion power or more, before applying for assessment and certification for Certificate of Proficiency (COP).

   2.1 **Every candidate for certification shall:**

      2.1.1. Be not less than 18 years of age
      2.1.2. Those who have:

         2.1.2.1 Completed TESDA-registered program on Rating Forming Part Of An Engineering Watch (RFPEW) inclusive of an approved seagoing service of not less than two (2) months where candidate has performed watchkeeping duties under the supervision of the master or officer-in-charge of an engineering watch or a qualified rating on board a merchant vessel of 750 kW propulsion power or more; OR

         2.1.2.2 Graduate of Bachelor of Science in Marine Engineering (BSMarE) or undergraduate who completed watchkeeping subjects with an approved sea going service of not less than six (6) months on board seagoing vessel of 750 kW propulsion power or more, evidenced by a certificate from the manning agency/shipping company with an attestation that the candidate performed engineering watchkeeping functions and involved in the performance of duties carried out under the direct supervision of the master, the officer-in-charge of the engineering watch or a qualified rating.

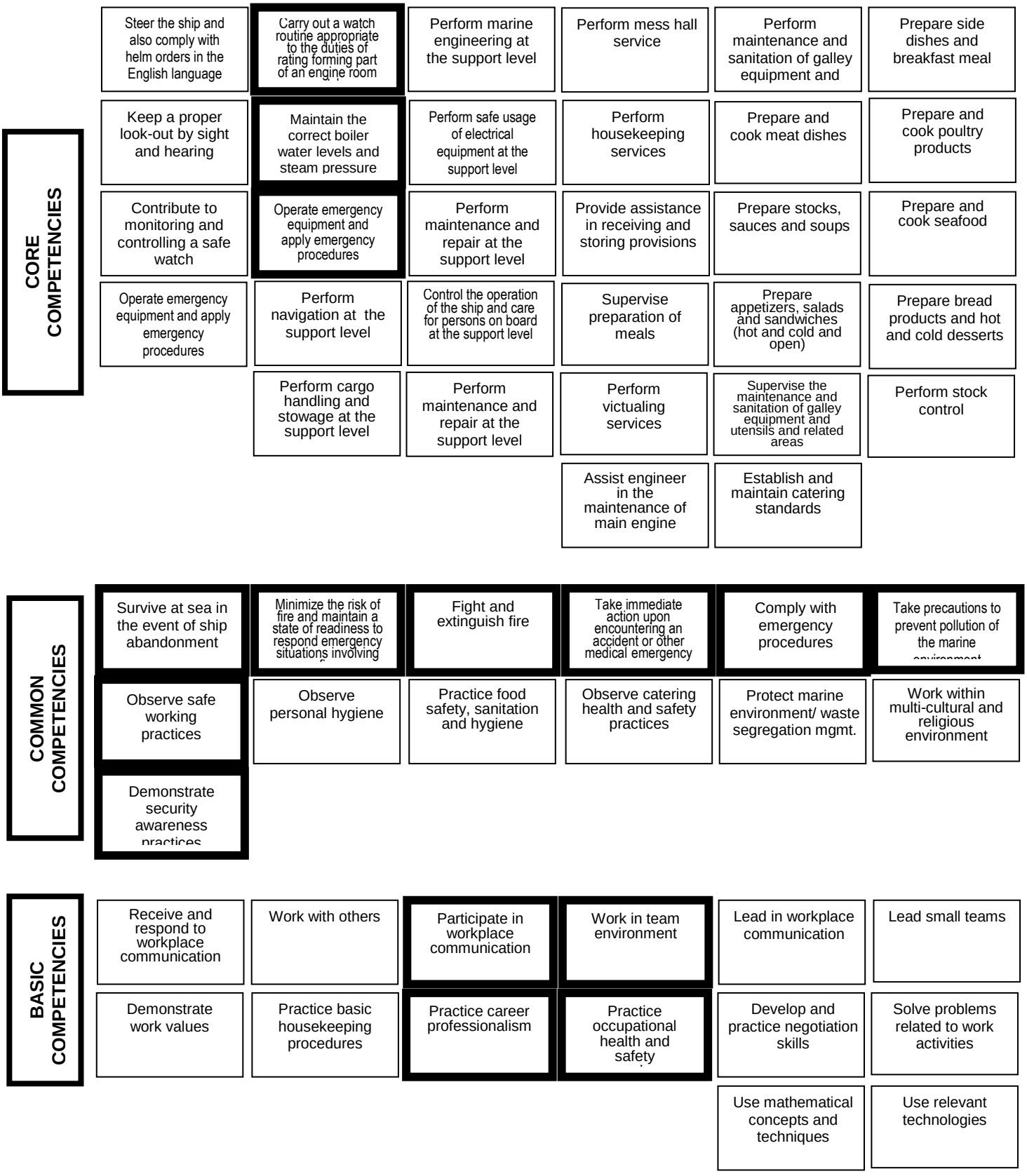
      2.1.3 Meet the standard of competence specified in this Training Regulations.

3. Candidates for a COP on RFPEW shall be required to undergo assessment using the assessment methodologies identified in the unit of competency.

4. Conduct of assessment and issuance of certificates shall follow the procedure manuals and implementing guidelines developed for the assessment and certification of RFPEW 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 RFPEW 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.	**Boat Falls**	the rope over in one or more blocks as a hoisting rig or tackle, the permanently secured end of which is called the standing part, it's working end the hauling part.
6.	**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.
7.	**Condenser**	a heat transfer device that reduces a thermodynamic fluid from its vapor phase to its liquid phase.
8.	**Crankcase**	the housing from a crankshaft of an engine
9.	**Cylinder head**	the cap that serves to close the end of the piston chamber or reciprocating engine, pump or compressor
10.	**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
11.	**Engine Room**	space in which a vessel's main propulsion and auxiliary engines
12.	**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.
13.	**Heat exchanger**	any device that transfer heat from one fluid to another or to the environment.
14.	**Jacob's Ladder**	a handy rope-sided ladder having wood rungs which are set between strands of, and seized to the rope used for passage to or from an over side stage, boat boom

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

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THE TECHNICAL AND INDUSTRY EXPERT PANEL

DECK DEPARTMENT	
CAPT. RODOLFO A. ASPILLAGA Technical Consultant MARINA-STCW Office 6th Floor Parkview Plaza, 984 Taft Ave. cor. T. M. Kalaw, Ermta, Manila	**CAPT. EDWIN M. ITABLE** Vice-President Master and Mates Association of the Philippines (MMAP) Rm. 503/504, 5th Floor, CTC Commercial Bldg. Pedro Gil cor. Taft Ave., Malate, Manila
The PARTICIPANTS in the Validation of these Training Regulations	
CAPT. JONATHAN V. TABINO UFS	**CAPT. FERNANDO J. ALANO** FAME
CAPT. SIMEON E. FLORES PHILSAFE/MMAP	**CAPT. PEDRO U. BERIÑA, JR.** NEWSIM
CAPT. FIDEL V. OJERA PHILCAMSAT	**CAPT. VICTOR DEL PRADO** FAME-FILSCAPT
CAPT. DANNY S TAMPUS UFS	

ENGINEERING DEPARTMENT	
C/E DIOSDADO G. RAMOS General Manager Monsoon Maritime Services Phils., Inc. Unit 103, G/F Marbella Manila Bldg. 2071 Roxas Blvd., Malate, Manila	**C/E FERDINAND R. PASCUA** Member, Board of Marine Engineer Officers Professional Regulation Commission (PRC) P. Paredes St. cor. Morayta St. Sampaloc, Manila
C/E JANVIER PATRICK ROSETE Training Manager for STCW AJ Center for Excellence 2/F Delgado Bldg., 637 Bonifacio Drive South Harbor, Port Area, Manila	
The PARTICIPANTS in the Validation of these Training Regulations	
C/E ANTONINO R. GASCON PROTECT MARINE	**C/E SOLIMAN V. DILAG** EXACT

Members of the TESDA Board
The MANAGEMENT and STAFF of the TESDA Secretariat
TESDA EXCOM
QSO