



Skills for Employment Investment Program (SEIP)

COMPETENCY STANDARD FOR SHIP MACHINERY INSTALLATION *(SHIPBUILDING SECTOR)*

Finance Division, Ministry of Finance
Government of the People's Republic of Bangladesh

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Copyright

The Competency Standard for Machinery Installation is a document for the development of curricula, teaching and learning materials, and assessment tools. It also serves as the document for providing training consistent with the requirements of industry in order for individuals who graduated through the established standard via competency-based assessment to be suitably qualified for a relevant job.

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List of Abbreviations

General	
BMET	Bureau of Manpower Employment and Training
B-SEP	Bangladesh Skills for Employment and Productivity
BTEB	Bangladesh Technical Education Board
DTE	Directorate of Technical Education
ILO	International Labor Organization
ISC	Industry Skills Council
NPVC	National Pre-Vocation Certificate
NTVQF	National Technical and Vocational Qualifications Framework
PPP	Public Private Partnership
SCDC	Standards and Curriculum Development Committee
SEIP	Skills for Employment Investment Program
TVET	Technical Vocational Education and Training
UoC	Unit of Competency
Occupation Specific	
FPP	Fixed pitch propeller
CCP	Controllable pitch propeller
OHS	Occupational health and safety
PPE	Personal protective equipment
SOP	Standard operating procedure

Introduction

The Skills for Employment Investment Program (SEIP) Project of the Finance Division of the Ministry of Finance has embarked on a project which aims to qualitatively and quantitatively expand the skilling capacity of identified public and private training providers by establishing and operationalising a responsive skill ecosystem and delivery mechanism through a combination of well-defined set of funding triggers and targeted capacity support.

Among the many components of the project, one is to promote a Market Responsive Inclusive Skills Training Delivery programme. Key priority economic growth sectors identified by the government have been targeted by the project to improve current job skills along with up-skilling of the existing workforce to ensure 'required skills to industry standards'. Training providers are encouraged and supported to work with industry to address identified skills and knowledge to enable industry growth and increased employment through the provision of market responsive inclusive skills training programmes. Priority sectors were identified to adopt a demand driven approach to training with effective inputs from Industry Skills Councils (ISC's), employer associations and employers.

This document is developed to improve skills and knowledge in accordance with the job roles, duties and tasks of the occupation and ensure that the required skills and knowledge are aligned to industry requirements.

The document also details the format, sequencing, wording and layout of the Competency Standard for an occupation which is comprised of Units of Competence and its corresponding Elements.

Overview

A **competency standard** is a written specification of the knowledge, skills and attitudes required for the performance of an occupation, trade or job corresponding to the industry standard of performance required in the workplace.

The purpose of a competency standards is to:

- provide a consistent and reliable set of components for training, recognising and assessing people's skills, and may also have optional support materials
- enable industry recognised qualifications to be awarded through direct assessment of workplace competencies
- encourage the development and delivery of flexible training which suits individual and industry requirements
- encourage learning and assessment in a work-related environment which leads to verifiable workplace outcomes

Competency standards are developed by a working group comprised of national and international subject-matter experts, SEIP, BTEB, ISC, and industry experts to identify the competencies required of an occupation in a particular sector.

Competency standards describe the skills, knowledge and attitude needed to perform effectively in the workplace. Competency standards acknowledge that people can achieve technical and vocational competency in many ways by emphasising what the learner can do, not how or where they learned to do it.

With competency standards, training and assessment may be conducted at the workplace or at training institute or any combination of these.

Competency standards consist of several units of competency. A unit of competency describes a distinct work activity that would normally be undertaken by one person in accordance with industry standards.

Units of competency are documented in a standard format that comprises of:

- unit title
- nominal duration
- unit code
- unit descriptor
- elements and performance criteria
- variables and range statement
- curricular content guide
- assessment evidence guide

Together, all the parts of a unit of competency:

- describe a work activity
- guide the assessor to determine whether the candidate is competent or not yet competent

Approval Sheet

Identification and validation of units of competency and elements for this occupation were made by experts within this sector. A series of meetings were held to accurately capture industry and employer needs and expectations and develop the competency framework that would help to enhance the employability of the youth trained. This process started on 13 May 2018 and concluded with a validation workshop with working group on 29 July 2018.

Experts Involved

Industry and subject-matter experts who provided their valuable inputs to develop this competency standard [April – July 2018]:

Name	Organisation	Designation
Engr. Sakhawat Hossain	Western Marine Shipyard Limited	Managing Director/ISC Chairman
Md. Fazle Rashid	Western Marine Shipyard Limited	Director and ISC Member
Md. Arifur Rahman Khan	Western Marine Shipyard Limited	Director and ISC Representative
Capt. Mohd. Habibur Rahman	AEOSIB-SEIP - Implementation Unit	Chief Coordinator
Md Shahadat Hossain Talukder	AEOSIB-SEIP - Implementation Wing	Coordinator - Monitoring and Evaluation
Md. Gias Uddin Ahmed	Highspeed Shipbuilding Limited	General Manager - Shipyard In-Charge
Mr. Niranjana Kumar Podder	Karnafully Shipbuilders Limited	Executive Director
Mr. Mohd. Abul Hasnat	Karnafully Shipbuilders Limited	General Manager
Md. Saifur Rahman	Highspeed Shipbuilding Limited	General Manager
Mr. Syed Monjurul Kibria	BKTTC - Chittagong	Trainer/Assessor
Md. Jashim Uddin	Western Marine Shipyard Limited	Assistant General Manager
Dr. Tozammel Hossain Khan	British Council - SD03	National Subject Matter Consultant - Shipbuilding Sector

Development Workshop

Working group formation and competency standard development workshop participants [held on 19 July 2018]:

Name	Organisation	Designation
Md. Arifur Rahman Khan	Western Marine Shipyard Limited	Director and ISC Member
Md Shahadat Hossain Talukder	AEOSIB-SEIP - Implementation Wing	Coordinator - Monitoring and Evaluation
Md. Gias Uddin Ahmed	Highspeed Shipbuilding Limited	General Manager
Cdr. Kaosar Rashid	Military Institute of Science and Technology - Dhaka	Associate Professor
Md. Jashim Uddin	Western Marine Shipyard Limited	Assistant General Manager
Mr. Lovely Das	Western Marine Shipyard Limited	Trainer/Assessor
Mr. Sayed Manzurul Kibria	BKTTC – Chittagong	Trainer/Assessor
Mr. Rupak Kanti Biswas	BTEB	Quality Assurance Officer
Mr. Syed Nasir Ershad	SEIP	AEPD (Public 1)
Mr. Md. Ahsan Habib	SEIP	TVET Specialist
Mr. Mohiuzzaman	SEIP	Course Specialist
Mr. David King	British Council – SD03	Team Leader
Dr.Tozammel Hossain Khan	British Council – SD03	National Subject Matter Consultant - Shipbuilding Sector

Validation Workshop

Competency standard validation workshop participants [held on 29 July 2018]:

Name	Organisation	Designation
Md. Arifur Rahman Khan	Western Marine Shipyard Limited	Director and ISC Member
Md Shahadat Hossain Talukder	SEIP-AEOSIB Implementation wing	Coordinator - Monitoring and Evaluation
Lovely Das	Western Marine Shipyard Limited	Assistant Engineer (Mech.)
Sayed Manzurul Kibria	BKTTC - Chittagong	Instructor (Mech.)
Mr. Rupak Kanti Biswas	BTEB	Quality Assurance Officer
Syed Nasir Ershad	SEIP	AEPD (Public 1)

Name	Organisation	Designation
Md. Ahsan Habib	SEIP	TVET Specialist
Mr. Mohiuzzaman	SEIP	Course Specialist
Md. Abdur Razzaque	SEIP	Specialist-1 Competency Standard
David King	British Council - SD03	Team Leader
Dr.Tozammel Hossain Khan	British Council - SD03	National Subject Matter Consultant - Shipbuilding Sector

The ensuing sections of this document comprise of a description of the relevant occupation, trade or job with all the key components of a unit of competency, including:

- a chart with an overview of all Units of Competency for the relevant occupation, trade or job including the Unit Codes and the Unit of Competency titles and corresponding Elements
- the Competency Standard that includes the Unit of Competency, Unit Descriptor, Elements and Performance Criteria, Range of Variables, Curricular Content Guide and Assessment Evidence Guide

Committee Workshop

The National competency standards for National Skills Certificate in Ship Machinery Installation **NTVQF Level [INSERT LEVEL]** qualification is a document developed by the Skill for Employment Investment Programme (SEIP), Finance Division, Ministry of Finance. This standard has been developed by an industry expert group under guidance of SEIP. The standard was approved by the SCDC [BTEB to insert date] at NTVQF Cell, BTEB.

Respectable members of the SCDC:

Ship Machinery Installation - Level [INSERT LEVEL]		

Course Structure

SL	Unit Code and Title		Level	Nominal Duration (Hours)
Generic Competencies				
1	SEIP-SBD-SMI-01-G	Use basic mathematical concepts		20
2	SEIP-SBD-SMI-02-G	Apply occupational health and safety (OHS) practice in the workplace		16
3	SEIP-SBD-SMI-03-G	Carry out workplace interaction		16
4	SEIP-SBD-SMI-04-G	Operate in a team environment		16
Sub-Total				68
Sector-specific Competencies				
1	SEIP-SBD-SMI-01-S	Apply basic knowledge of ship and shipbuilding		16
2	SEIP-SBD-SMI-02-S	Use hand and power tools		16
Sub-Total				32
Occupation-specific Competencies				
1	SEIP-SBD-SMI-01-O	Identify basic machinery installation works		20
2	SEIP-SBD-SMI-02-O	Perform machinery setting and levelling		30
3	SEIP-SBD-SMI-03-O	Install engine and gear box		80
4	SEIP-SBD-SMI-04-O	Install propulsion and steering system		50
5	SEIP-SBD-SMI-05-O	Install electrical machinery		40
6	SEIP-SBD-SMI-06-O	Install deck machinery		40
Sub-Total				260
Total Nominal Learning Hours				360

Competency Chart

Units of Competency	Elements		
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Generic Specific (Basic) Competencies

<p>Use basic mathematical concepts SEIP-SBD-SMI-01-G</p>	<p>Identify calculation requirements in the workplace</p>	<p>Select appropriate mathematical methods/concepts for the calculation</p>	<p>Use tools and instruments to perform calculations</p>
<p>Apply occupational health and safety (OHS) practice in the workplace SEIP-SBD-SMI-02-G</p>	<p>Identify OHS policies and procedures</p>	<p>Apply personal health and safety practices</p>	<p>Report hazards and risks</p>
<p>Carry out workplace interaction SEIP-SBD-SMI-03-G</p>	<p>Interpret workplace communication and etiquette</p>	<p>Read and understand workplace documents</p>	<p>Participate in workplace meetings and discussions</p>
<p>Operate in a team environment SEIP-SBD-SMI-04-G</p>	<p>Identify team goals and work processes</p>	<p>Identify own role and responsibilities within team</p>	<p>Communicate and co-operate with team members</p>
	<p>Practice problem solving within the team</p>		

Sector-specific (Common) Competencies

<p>Apply basic knowledge of ship and shipbuilding SEIP-SBD-SMI-01-S</p>	<p>Understand basics of shipbuilding</p>	<p>Obtain information about the industry</p>	<p>Identify key machines installed on a ship</p>
<p>Use hand and power tools SEIP-SBD-SMI-02-S</p>	<p>Identify and inspect hand and power tools</p>	<p>Use hand tools properly and safely</p>	<p>Operate power tools properly and safely</p>
	<p>Clean and maintain hand and power tools</p>		

Occupation-specific (Core) Competencies

Identify basic machinery installation works SEIP-SBD-SMI-01-O	Determine key machinery installation works	Identify engine and engine components	Identify auxiliary machinery
Perform machinery setting and levelling SEIP-SBD-SMI-02-O	Prepare for work	Prepare for setting and levelling	Carry out setting and levelling
	Clean and maintain tools and equipment		
Install engine and gear box SEIP-SBD-SMI-03-O	Prepare for work	Carry out engine installation	Carry out gear box installation
	Check level and alignment	Clean and maintain tools and equipment	
Install propulsion and steering system SEIP-SBD-SMI-04-O	Prepare for work	Carry out propeller and propeller shaft installation	Carry out rudder and steering system installation
	Check level and alignment	Clean and maintain tools and equipment	
Install electrical machinery SEIP-SBD-SMI-05-O	Prepare for work	Carry out electrical machinery installation	Check level and alignment
	Clean and maintain tools and equipment		

Install deck machinery SEIP-SBD-SMI-06-O	Prepare for work	Carry out deck machinery installation	Check level and alignment
	Clean and maintain tools and equipment		

Units and Elements Table

Generic – Compulsory (4 units of competency required)

Code	Unit of Competency	Elements of Competency	Duration (hours)
SEIP-SBD-SMI-01-G	Use basic mathematical concepts	<ol style="list-style-type: none"> 1. Identify calculation requirements in the workplace. 2. Select appropriate mathematical methods/concepts for the calculation. 3. Use tools and instruments to perform calculations. 	20
SEIP-SBD-SMI-02-G	Apply occupational health and safety (OHS) practice in the workplace	<ol style="list-style-type: none"> 1. Identify OHS policies and procedures. 2. Apply personal health and safety practices. 3. Report hazards and risks. 4. Respond to emergencies. 	16
SEIP-SBD-SMI-03-G	Carry out workplace interaction	<ol style="list-style-type: none"> 1. Interpret workplace communication and etiquette. 2. Read and understand workplace documents. 3. Participate in workplace meetings and discussions. 4. Practice professional ethics at work. 	16
SEIP-SBD-SMI-04-G	Operate in a team environment	<ol style="list-style-type: none"> 1. Identify team goals and work processes. 2. Identify own role and responsibilities within team. 3. Communicate and co-operate with team members. 4. Practice problem solving within the team. 	16
Total Hours			68

Sector-specific – Compulsory (2 units of competency required)

Code	Unit of Competency	Elements of Competency	Duration (hours)
SEIP-SBD-SMI-01-S	Apply basic knowledge of ship and shipbuilding	<ol style="list-style-type: none"> 1. Understand basics of shipbuilding. 2. Obtain information about the industry. 3. Identify key machines installed on a ship. 	16
SEIP-SBD-SMI-02-S	Use hand and power tools	<ol style="list-style-type: none"> 1. Identify and inspect hand and power tools. 2. Use hand tools properly and safety. 3. Operate power tools properly and safely. 4. Clean and maintain hand and power tools. 	16
Total Hours			32

Occupation-specific – Compulsory (6 units of competency required)

Code	Unit of Competency	Elements of Competency	Duration (hours)
SEIP-SBD-SMI-01-O	Identify basic machinery installation works	<ol style="list-style-type: none"> 1. Determine key machinery installation works. 2. Identify engine and engine components. 3. Identify auxiliary machinery. 	20
SEIP-SBD-SMI-02-O	Perform setting and levelling	<ol style="list-style-type: none"> 1. Prepare for work. 2. Prepare for setting and levelling. 3. Carry out setting and levelling. 4. Clean and maintain tools and equipment. 	30
SEIP-SBD-SMI-03-O	Install engine and gear box	<ol style="list-style-type: none"> 1. Prepare for work. 2. Carry out engine installation. 3. Carry out gear box installation. 4. Check level and alignment. 5. Clean and maintain tools and equipment. 	80
SEIP-SBD-SMI-04-O	Install propulsion and steering system	<ol style="list-style-type: none"> 1. Prepare for work. 2. Carry out propeller and propeller shaft installation. 3. Carry out rudder and steering system installation. 4. Check level and alignment. 5. Clean and maintain tools and equipment. 	50
SEIP-SBD-SMI-05-O	Install electrical machinery	<ol style="list-style-type: none"> 1. Prepare for work. 2. Carry out electrical machinery installation. 3. Check level and alignment. 4. Clean and maintain tools and equipment. 	40
SEIP-SBD-SMI-06-O	Install deck machinery	<ol style="list-style-type: none"> 1. Prepare for work. 2. Carry out deck machinery installation. 3. Check level and alignment. 4. Clean and maintain tools and equipment. 	40
Total Hours			260

Generic Competencies

Unit Title:	Use basic mathematical concepts
Unit Code:	SEIP-SBD-SMI-01-G
Nominal Hours:	20 hours
Unit Descriptor:	This unit covers the skills, knowledge and attitudes required to perform computations using basic mathematical concepts in the workplace. It specifically includes identifying general calculation requirements, selecting appropriate mathematical method/concept, and forming and solving mathematical problems in the workplace using appropriate tools and instruments.
Elements of Competency	Performance Criteria (<u>bold and underlined</u> terms are elaborated in the Range of Variables)
1. Identify calculation requirements in the workplace	1.1. <u>Calculation requirements</u> are identified from <u>workplace information</u> . 1.2. Mathematical problems are constructed from workplace information.
2. Select appropriate mathematical methods/concepts for the calculation	2.1. <u>Appropriate method</u> is selected to carry out calculation requirements. 2.2. Constructed mathematical problems are solved with appropriate method.
3. Use tools and instruments to perform calculations	3.1. Tools and instruments required for computation are identified. 3.2. Calculation is performed using appropriate tools and instruments accurately.

Range of Variables	
Variable	Range (<i>may include but not limited to</i>)
1. Calculation requirements	1.1. Unit 1.2. Area 1.3. Height/ length/ breadth/ thickness 1.4. Diameter 1.5. Weight 1.6. Percentage 1.7. Capacity 1.8. Time 1.9. Temperature 1.10. Material/data usage 1.11. Speed 1.12. Costing

Range of Variables	
Variable	Range (<i>may include but not limited to</i>)
2. Workplace information	2.1. Floor environment 2.2. Design sheet 2.3. Specification sheet 2.4. Working chart/drawing 2.5. Standard operating procedure (SOP) 2.6. Job order
3. Appropriate method	3.1. Addition 3.2. Subtraction 3.3. Division 3.4. Multiplication 3.5. Conversion 3.6. Percentage and ratio calculation 3.7. Simple equation
4. Tools and instruments	4.1. Calculator 4.2. Cell phone 4.3. Computer 4.4. Ruler

Evidence Guide	
The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment must evidence that the candidate: <ol style="list-style-type: none"> 1.1. Identified calculation requirements from workplace information 1.2. Selected appropriate method to carry out the calculation requirements 1.3. Completed calculations using appropriate tools and instruments
2. Underpinning knowledge	<ol style="list-style-type: none"> 2.1. Numerical concepts 2.2. Basic mathematical methods such as addition, subtraction, multiplication, division and percentage 2.3. Mathematical language, symbols and terminology 2.4. Measuring units
3. Underpinning skills	<ol style="list-style-type: none"> 3.1. Constructing simple problems from workplace information 3.2. Solving problems using appropriate method, tools and instruments 3.3. Using appropriate tools and instruments

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

4. Underpinning attitudes	4.1. Prompt in carrying out activities 4.2. Tidy and punctual 4.3. Respectful of peers, subordinates and seniors in the workplace 4.4. Safely use tools and equipment 4.5. Sincere and honest concerning duties
5. Resource implications	The following resources must be provided: 5.1. Workplace (simulated or actual) 5.2. Calculator 5.3. Cell phone 5.4. Computer/laptop/notebook 5.5. Measuring tape 5.6. Ruler 5.7. Projector 5.8. Stationary 5.9. Learning manual
6. Methods of assessment	Methods of assessment may include but is not limited to: 6.1. Written test 6.2. Oral test 6.3. Observation 6.4. Demonstration 6.5. Portfolio
7. Context of assessment	7.1. Competency assessment must be done in a training institute or an actual or simulated workplace after completion of this unit of competency. 7.2. Assessment must be done by a suitably qualified/certified assessor.

Accreditation Requirements

Training Providers must be accredited by Bangladesh Technical Education Board (BTEB), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any NTVQF qualification. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by BTEB.

Unit Title:	Apply occupational health and safety (OHS) practice in the workplace
Unit Code:	SEIP-SBD-SMI-02-G
Nominal Hours:	16 hours
Unit Descriptor:	This unit covers the skills, knowledge and attitudes required to apply occupational health and safety (OHS) practice in the workplace. It specifically includes identifying OHS policies and procedures, applying personal health and safety practices, reporting hazards and risks, and responding to emergencies.
Elements of Competency	Performance Criteria (<u>bold and underlined</u> terms are elaborated in the Range of Variables)
1. Identify OHS policies and procedures	<p>1.1. <u>OHS policies</u> and safe operating procedures are interpreted.</p> <p>1.2. Safety signs and symbols are identified and followed.</p> <p>1.3. Response, evacuation procedures and other contingency measures are interpreted correctly.</p>
2. Apply personal health and safety practices	<p>2.1. OHS policies and procedures are applied in the workplace including <u>personal protective equipment (PPE)</u>.</p> <p>2.2. Common health issues are recognised.</p> <p>2.3. Common safety issues are identified.</p>
3. Report hazards and risks	<p>3.1. Hazards and risks are identified.</p> <p>3.2. Hazards and risks assessment and controls are interpreted .</p>
4. Respond to emergencies	<p>4.1. Responded to alarms and warning devices.</p> <p>4.2. <u>Emergency response plans and procedures</u> are responded to.</p> <p>4.3. <u>First aid procedures</u> during emergency situations are identified.</p>

Range of Variables	
Variable	Range (<i>may include but not limited to</i>)
1. OHS policies	<p>1.1. Organisational OHS polices</p> <p>1.2. International OHS requirements</p> <p>1.3. Fire safety rules and regulations</p>
2. Emergency response plans and procedures	<p>2.1. Firefighting procedures</p> <p>2.2. Earthquake response procedures</p> <p>2.3. Emergency response procedures</p> <p>2.4. Medical and first aid</p>

Range of Variables	
Variable	Range (may include but not limited to)
3. First aid procedure	3.1. Washing of open wound 3.2. Washing chemically infected area 3.3. Applying bandage 3.4. Taking appropriate medicine
4. Personal protective equipment	4.1. Safety glasses 4.2. Ear plugs 4.3. Gloves 4.4. Apron 4.5. Helmet 4.6. Mask 4.7. Safety shoes

Evidence Guide	
The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment must evidence that the candidate: <ol style="list-style-type: none"> 1.1. Identified OHS policies and procedures 1.2. Applied personal health and safety practices (including PPE) 1.3. Reported hazards and risks 1.4. Responded to emergencies
2. Underpinning knowledge	<ol style="list-style-type: none"> 2.1. Workplace OHS policies and procedures 2.2. Work safety procedures 2.3. Emergency response procedures: <ol style="list-style-type: none"> 2.3.1. Fire fighting 2.3.2. Earthquake response 2.3.3. Accident response 2.4. Types of hazards (biological, chemical and physical) and their effects 2.5. OHS awareness 2.6. Personal protective equipment (PPE)
3. Underpinning skills	<ol style="list-style-type: none"> 3.1. Identifying OHS policies and procedures 3.2. Applying personal health and safety practices 3.3. Reporting hazards and risks 3.4. Responding to emergencies

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

4. Underpinning attitudes	4.1. Committed to occupational health and safety practices 4.2. Communicates well with peers, subordinates and seniors in workplace 4.3. Prompt in carrying out activities 4.4. Tidy and punctual 4.5. Sincere and honest concerning duties 4.6. Responsible during emergencies
5. Resource implications	The following resources must be provided: 5.1. Workplace (simulated or actual) 5.2. Personal protective equipment (PPE) 5.3. Firefighting equipment 5.4. Emergency response manual 5.5. First aid kits 5.6. Projector 5.7. Stationary 5.8. Learning manual
6. Methods of assessment	Methods of assessment may include but is not limited to: 6.1. Written test 6.2. Oral test 6.3. Observation 6.4. Demonstration 6.5. Portfolio
7. Context of assessment	7.1. Competency assessment must be done in a training institute or an actual or simulated workplace after completion of this unit of competency. 7.2. Assessment must be done by a suitably qualified/certified assessor.

Accreditation Requirements

Training Providers must be accredited by Bangladesh Technical Education Board (BTEB), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any NTVQF qualification. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by BTEB.

Unit Title:	Carry out workplace interaction
Unit Code:	SEIP-SBD-SMI-03-G
Nominal Hours:	16 hours
Unit Descriptor:	This unit covers the skills, knowledge and attitudes required to carry out workplace interaction. It specifically includes workplace communication, etiquette, understanding workplace documents, workplace meetings and discussions, and professional ethics at work.
Elements of Competency	Performance Criteria (<u>bold and underlined</u> terms are elaborated in the Range of Variables)
1. Interpret workplace communication and etiquette	<p>1.1. Workplace codes of conduct are interpreted as per organisational guidelines.</p> <p>1.2. Appropriate lines of communication are maintained with supervisors and colleagues.</p> <p>1.3. Workplace interactions are conducted in a <u>courteous manner</u> to gather and convey information.</p> <p>1.4. <u>Workplace procedures and matters</u> are comprehended.</p>
2. Read and understand workplace documents	<p>2.1. Workplace documents are interpreted correctly.</p> <p>2.2. Visual information/symbols/signage are understood correctly and followed.</p> <p>2.3. Specific and relevant information are accessed from <u>appropriate sources</u>.</p> <p>2.4. Appropriate medium is used to transfer information and ideas.</p>
3. Participate in workplace meetings and discussions	<p>3.1. Team meetings are attended on time.</p> <p>3.2. Meeting procedures and etiquette are followed.</p> <p>3.3. Active participation is ensured, opinions are expressed and heard.</p> <p>3.4. Inputs are provided and interpreted in line with the meeting purpose.</p>
4. Practice professional ethics at work	<p>4.1. Responsibilities as a team member are performed.</p> <p>4.2. Tasks are performed in accordance with workplace procedures.</p> <p>4.3. Confidentiality is maintained.</p> <p>4.4. Inappropriate and conflicting situations are avoided.</p>

Range of Variables	
Variable	Range (may include but not limited to)
1. Courteous manner	1.1. Effective questioning 1.2. Active listening 1.3. Speaking skills 1.4. Writing skill 1.5. Email etiquette
2. Workplace procedures and matters	2.1. Notes 2.2. Arranging a meeting 2.3. Agenda 2.4. Simple reports such as progress and incident reports 2.5. Job sheets 2.6. Operational manuals 2.7. Brochures and promotional material 2.8. Visual and graphic materials 2.9. Standards 2.10. OHS information 2.11. Signs
3. Appropriate sources	3.1. Human Resources (HR) Department 3.2. Managers 3.3. Supervisors 3.4. Management Information System (MIS)

Evidence Guide	
The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment must evidence that the candidate: <ol style="list-style-type: none"> 1.1. Interpreted workplace communication and etiquette 1.2. Interpreted workplace instructions and symbols 1.3. Performed active participation in workplace meetings
2. Underpinning knowledge	<ol style="list-style-type: none"> 2.1. Workplace communication and etiquette 2.2. Workplace documents, signs and symbols 2.3. Meeting procedure and etiquette 2.4. Professional ethics
3. Underpinning skills	<ol style="list-style-type: none"> 3.1. Demonstrating workplace communication and etiquette 3.2. Interpreting workplace instructions and symbols 3.3. Demonstrating active participation on workplace meeting 3.4. Applying professional ethics at work

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

4. Underpinning attitudes

- 4.1. Prompt in carrying out activities
- 4.2. Tidy and punctual
- 4.3. Respectful of peers, subordinates and seniors in the workplace
- 4.4. Concerned about the work environment
- 4.5. Sincere and honest concerning duties

5. Resource implications

The following resources must be provided:

- 5.1. Workplace (simulated or actual)
- 5.2. Workplace procedures
- 5.3. Standard operating procedure
- 5.4. Workplace documents, signs and symbols
- 5.5. Codes of conduct
- 5.6. Projector
- 5.7. Stationary
- 5.8. Learning manual

6. Methods of assessment

Methods of assessment may include but is not limited to:

- 6.1. Written test
- 6.2. Oral test
- 6.3. Observation
- 6.4. Demonstration
- 6.5. Portfolio

7. Context of assessment

- 7.1 Competency assessment must be done in a training institute or an actual or simulated workplace after completion of this unit of competency.
- 7.2 Assessment must be done by a suitably qualified/certified assessor.

Accreditation Requirements

Training Providers must be accredited by Bangladesh Technical Education Board (BTEB), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any NTVQF qualification. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by BTEB.

Unit Title:	Operate in a team environment
Unit Code:	SEIP-SBD-SMI-04-G
Nominal Hours:	16 hours
Unit Descriptor:	This unit covers the skills, knowledge and attitudes required to operate in a team environment. It specifically includes team goals and work processes, roles and responsibilities, team communication and problem solving within the team.
Elements of Competency	Performance Criteria (<u>bold and underlined</u> terms are elaborated in the Range of Variables)
1. Identify team goals and work processes	1.1. Roles and objectives of the team are identified and interpreted. 1.2. Roles and responsibilities of team members are identified and interpreted.
2. Identify own role and responsibilities within team	2.1. Personal role and responsibilities are identified within the team environment. 2.2. Reporting relationships are interpreted within team and external to team.
3. Communicate and co-operate with team members	3.1. Other teammates' tasks are identified, and support provided when requested. 3.2. The team is encouraged through <u>sharing information</u> or expertise, working together to solve problems, and putting team success first. 3.3. Views and opinions of other team members are interpreted and respected.
4. Practice problem solving within the team	4.1. Problems faced at the individual and team level are identified and showed insight into the root-causes of the problems. 4.2. A range of solutions and courses of action are identified together with benefits, costs, and risks associated with each. 4.3. The good ideas of others to help develop solutions are recognised and advice sought from those who have solved similar problems. 4.4. It is looked beyond the obvious and not stopped at the first answers.

Range of Variables	
Variable	Range (<i>may include but not limited to</i>)
1. Sharing information	1.1. Agenda 1.2. Minutes 1.3. progress and incident reports 1.4. Operational manuals 1.5. Visual and graphic materials 1.6. Emails and SMS 1.7. Phone directory 1.8. Policy, procedure and standards 1.9. OHS information

Evidence Guide	
The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment must evidence that the candidate: 1.1. Identified own role and responsibilities within team 1.2. Communicated and co-operated with team members 1.3. Demonstrated problem solving within the team
2. Underpinning knowledge	2.1. Team goals and work processes 2.2. Roles and responsibilities 2.3. Finding problems and solving them
3. Underpinning skills	3.1. Identifying own role and responsibilities within team 3.2. Communicating and co-operating with team members 3.3. Demonstrating problem solving within the team
4. Underpinning attitudes	4.1. Active on teamwork 4.2. Prompt in carrying out activities 4.3. Tidy and punctual 4.4. Respectful of peers, subordinates and seniors in the workplace 4.5. Sincere and honest concerning duties
5. Resource implications	The following resources must be provided: 5.1. Workplace (simulated or actual) 5.2. Projector 5.3. Stationary 5.4. Learning manual

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

6. Methods of assessment

Methods of assessment may include but is not limited to:

- 6.1. Written test
- 6.2. Oral test
- 6.3. Observation
- 6.4. Demonstration
- 6.5. Portfolio

7. Context of assessment

- 7.1 Competency assessment must be done in a training institute or an actual or simulated workplace after completion of this unit of competency.
- 7.2 Assessment must be done by a suitably qualified/certified assessor.

Accreditation Requirements

Training Providers must be accredited by Bangladesh Technical Education Board (BTEB), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any NTVQF qualification. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by BTEB.

Sector-specific Competencies

Unit Title:	Apply basic knowledge of ship and shipbuilding
Unit Code:	SEIP-SBD-SMI-01-S
Nominal Hours:	16 hours
Unit Descriptor:	This unit covers the skills, knowledge and attitudes required to apply basic knowledge of ship and shipbuilding. It specifically includes understanding the basics of shipbuilding, obtaining information about the industry, and identifying key machines installed on a ship.
Elements of Competency	Performance Criteria (<u>bold and underlined</u> terms are elaborated in the Range of Variables)
1. Understand basics of shipbuilding	<p>1.1. Ship construction terminology and GA plan is interpreted.</p> <p>1.2. <u>Key areas of ship</u> are identified from general drawing or model ship.</p> <p>1.3. Electrical devices, components and equipment are identified and described.</p> <p>1.4. Classification of society and ISO rules are explained.</p>
2. Obtain information about the industry	<p>2.1. Sources of information about industry are identified.</p> <p>2.2. Industry information is collected from multiple sources.</p> <p>2.3. Information is interpreted and applied to day-to-day work activities.</p>
3. Identify key machines installed on a ship	<p>3.1. <u>Key machines</u> installed on a ship are identified.</p> <p>3.2. Identified machines are located on a ship.</p>

Range of Variables	
Variable	Range (<i>may include but not limited to</i>)
1. Key areas of ship	<p>1.1. Bridge</p> <p>1.2. Main hull</p> <p>1.3. Engine room</p> <p>1.4. Cargo holds</p> <p>1.5. Deep Tank</p> <p>1.6. Double Bottom (DB) tank</p> <p>1.7. Bulbous bow</p> <p>1.8. Forecastle</p> <p>1.9. Poop</p> <p>1.10. Weather deck</p> <p>1.11. Tween deck</p> <p>1.12. Bulkhead</p> <p>1.13. Collision bulkhead</p>

Range of Variables	
Variable	Range (may include but not limited to)
2. Key machines	2.1. Marine engine 2.2. Panel board 2.3. Generator 2.4. Transformer 2.5. Air compressor 2.6. Life boat engine 2.7. Heat exchanger 2.8. Motor 2.9. Radar 2.10. Echo sounder 2.11. Gyro-compass 2.12. Magnetic compass 2.13. Steam boiler 2.14. Pumps 2.15. Winch and windlass 2.16. Crane 2.17. Propeller unit 2.18. Air conditioner 2.19. Refrigeration plant 2.20. Purifier/centrifuged 2.21. Laundry unit

Evidence Guide	
The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment must evidence that the candidate: <ol style="list-style-type: none"> 1.1. Identified key areas of a ship 1.2. Interpreted terminology and plans 1.3. Sourced information about industry and shipbuilding 1.4. Identified and located key machinery
2. Underpinning knowledge	<ol style="list-style-type: none"> 2.1. Electrical devices, components and equipment 2.2. Key areas of a ship 2.3. Key ship machinery 2.4. Shipbuilding terminology
3. Underpinning skills	<ol style="list-style-type: none"> 3.1. Identifying key areas of a ship 3.2. Interpreting terminology and plans 3.3. Identifying and locating key machinery

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

4. Underpinning attitudes	4.1. Tidy and punctual 4.2. Prompt in carrying out activities 4.3. Sincere and honest concerning duties 4.4. Active on teamwork 4.5. Eager to learn
5. Resource implications	The following resources must be provided: 5.1. Workplace (simulated or actual) 5.2. Sketches 5.3. Drawings 5.4. Layouts 5.5. Plans 5.6. Machinery and equipment 5.7. Projector 5.8. Stationary 5.9. Learning manual
6. Methods of assessment	Methods of assessment may include but is not limited to: 6.1. Written test 6.2. Oral test 6.3. Observation 6.4. Demonstration 6.5. Portfolio
7. Context of assessment	7.1. Competency assessment must be done in a training institute or an actual or simulated workplace after completion of this unit of competency. 7.2. Assessment must be done by a suitably qualified/certified assessor.

Accreditation Requirements

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Unit Title:	Use hand and power tools
Unit Code:	SEIP-SBD-SMI-02-S
Nominal Hours:	16 hours
Unit Descriptor:	This unit covers the skills, knowledge and attitudes required to use hand and power tools in the workplace. It specifically includes identifying and inspecting hand and power tools for usability, using and operating tools properly and safely, and cleaning and maintaining hand and power tools after use.
Elements of Competency	Performance Criteria (<u>bold and underlined</u> terms are elaborated in the Range of Variables)
1. Identify and inspect hand and power tools	<p>1.1. Appropriate hand and power tools are identified.</p> <p>1.2. Application of hand and power tools is recognised.</p> <p>1.3. Usability of hand and power tools is checked and verified.</p>
2. Use hand tools properly and safely	<p>2.1. Appropriate <u>hand tools</u> are selected.</p> <p>2.2. Safety precautions are ensured before using hand tools.</p> <p>2.3. Unsafe or faulty hand tools are identified and marked for repair.</p> <p>2.4. <u>Measuring tools</u> are checked and calibrated before use.</p> <p>2.5. Use hand tools properly and safely to perform work activity.</p>
3. Operate power tools properly and safely	<p>3.1. Appropriate <u>power tools</u> are selected.</p> <p>3.2. Power supply outlet and electrical cord are inspected and confirmed safe for use in accordance with established workplace safety requirements.</p> <p>3.3. Safety precautions are ensured before using power tools in accordance with manufacturer's operating specification.</p> <p>3.4. Proper sequence of operation applied for using power tools.</p> <p>3.5. Unsafe or faulty power tools are identified and marked for repair.</p> <p>3.6. Operate power tools properly and safely to perform work activity.</p>
4. Clean and maintain hand and power tools	<p>4.1. Dust and foreign matters removed from hand and power tools in accordance to workplace standards.</p> <p>4.2. Condition of hand and power tools is checked after use and reported.</p> <p>4.3. Appropriate lubricant is applied after use and prior to storage.</p> <p>4.4. Measuring tools are checked and calibrated after use.</p> <p>4.5. Defective hand and power tools are inspected and repaired or replaced.</p> <p>4.6. Hand and power tools are stored and secured in accordance with workplace requirements.</p>

Range of Variables	
Variable	Range <i>(may include but not limited to)</i>
1. Hand tools	1.1. Hammer 1.2. Bench vice 1.3. Files 1.4. Punches 1.5. Chisels 1.6. Wrenches 1.7. Pliers 1.8. Scriber 1.9. Screwdrivers 1.10. Hacksaw 1.11. Socket spanners 1.12. Spanners 1.13. Vice grip 1.14. Wire cutters 1.15. Drill 1.16. Grinder 1.17. Clamps 1.18. Jacks
2. Power tools	2.1. Drills 2.2. Grinders 2.3. Cutting 2.4. Saws 2.5. Soldering iron 2.6. Welding machines
3. Measuring tools	3.1. Meters 3.2. Gauges 3.3. Testers 3.4. Megger 3.5. Measuring tape 3.6. Hose level 3.7. Water level 3.8. Calliper 3.9. Micrometres 3.10. Steel rule 3.11. Protractor 3.12. Tri-square

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

1. Critical aspects of competency	Assessment must evidence that the candidate: 1.1. Identified and selected appropriate hand and power tools for work to be performed 1.2. Identified and used measuring and testing tools appropriate to work activity 1.3. Followed safety precautions when using hand and power tools 1.4. Operated power tools safely and pursuant to manufacturer's operating specification 1.5. Performed cleaning and maintenance of hand and power tools after use and prior to storing
2. Underpinning knowledge	2.1. Information on types of hand and power tools, their functions and use 2.2. Procedures for safely using hand and power tools.
3. Underpinning skills	3.1. Identifying hand and power tools, and measuring tools 3.2. Following safety precautions when using hand, power tools and measuring tools 3.3. Operating power tools correctly and safely in accordance to manufacturer's operating specification 3.4. Cleaning and maintaining hand and power tools after use 3.5. Applying appropriate lubricant on hand and power tools after using and prior to storing
4. Underpinning attitudes	4.1. Tidy and punctual 4.2. Prompt in carrying out activities 4.3. Sincere and honest concerning duties 4.4. Active on teamwork 4.5. Eager to learn 4.6. Concerned for proper use of tools 4.7. Concerned about the work environment 4.8. Committed to occupational health and safety practices
5. Resource implications	The following resources must be provided: 5.1. Workplace (simulated or actual) 5.2. Personal protective equipment (PPE) 5.3. Hand tools 5.4. Power tools 5.5. Measuring tools 5.6. Projector 5.7. Stationary 5.8. Learning manual

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

6. Methods of assessment

Methods of assessment may include but is not limited to:

- 6.1. Written test
- 6.2. Oral test
- 6.3. Observation
- 6.4. Demonstration
- 6.5. Portfolio

7. Context of assessment

- 7.1. Competency assessment must be done in a training institute or an actual or simulated workplace after completion of this unit of competency.
- 7.2. Assessment must be done by a suitably qualified/certified assessor.

Accreditation Requirements

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Occupation-specific Competencies

Unit Title:	Identify basic machinery installation works
Unit Code:	SEIP-SBD-SMI-01-O
Nominal Hours:	20 hours
Unit Descriptor:	This unit covers the skills, knowledge and attitudes required to identify basic machinery installation works. It specifically includes determining key machinery installation works and, identifying types of engine, engine components and auxiliary machinery.
Elements of Competency	Performance Criteria (<u>bold and underlined</u> terms are elaborated in the Range of Variables)
1. Determine key machinery installation works	<p>1.1. <u>Key machinery</u> for installation is identified and located.</p> <p>1.2. Key machinery <u>installation works</u> are identified and described.</p> <p>1.3. Machinery installation plans and drawings are interpreted.</p> <p>1.4. Roles and responsibilities of a machinery installer are identified and explained.</p>
2. Identify engine and engine components	<p>2.1. <u>Types of engine</u> are identified.</p> <p>2.2. <u>Components of engine</u> are identified.</p> <p>2.3. Functions of different types of engine are described.</p>
3. Identify auxiliary machinery	<p>3.1. <u>Types of auxiliary machines</u> are identified.</p> <p>3.2. Functions of various auxiliary machinery are described.</p>

Range of Variables	
Variable	Range (<i>may include but not limited to</i>)
1. Key machinery	<p>1.1. Main engine</p> <p>1.2. Gear box</p> <p>1.3. Propeller shaft and propeller</p> <p>1.4. Steering gear and rudder</p> <p>1.5. Electrical machinery</p> <p>1.6. Deck machinery</p> <p>1.7. Bow thruster</p> <p>1.8. Fin stabiliser</p>
2. Installation works	<p>2.1. Main engine</p> <p>2.2. Gear box system</p> <p>2.3. Propulsion system</p> <p>2.4. Electrical system</p> <p>2.5. Steering system</p>

Range of Variables	
Variable	Range <i>(may include but not limited to)</i>
3. Types of engine	3.1. Internal combustion engine 3.2. External combustion engine 3.3. Turbine engine
4. Components of engine	4.1. Cylinder block 4.2. Cylinder 4.3. Cylinder head 4.4. Rocker arms 4.5. Push rod 4.6. Piston 4.7. Combustion chamber 4.8. Inlet manifold 4.9. Exhaust manifold 4.10. Injector 4.11. Connecting rod 4.12. Crank shaft 4.13. Cam shaft 4.14. Piston rings 4.15. Gaugeon pins 4.16. Fly wheel
5. Types of auxiliary machinery	5.1. Generator 5.2. Pump 5.3. Purifier 5.4. Boiler 5.5. Cooler 5.6. Heaters 5.7. Air compressors 5.8. Heat exchangers 5.9. Distillation equipment 5.10. Oil-water separators 5.11. Sewage treatment plants and incinerators

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

1. Critical aspects of competency	Assessment must evidence that the candidate: 1.1. Identified key machinery 1.2. Identified key machinery installation works 1.3. Identified types of engine and their components 1.4. Described functions of engine 1.5. Identify types of auxiliary machinery 1.6. Described functions of auxiliary machinery
2. Underpinning knowledge	2.1. Key machinery 2.2. Key machinery installation works 2.3. Marine engines and components 2.4. Auxiliary machinery
3. Underpinning skills	3.1. Identifying key marine machinery and equipment 3.2. Identifying main types of engine 3.3. Identify components of engine 3.4. Describing function of engine components 3.5. Identifying auxiliary machinery 3.6. Describing function of auxiliary machinery
4. Underpinning attitudes	4.1. Tidy and punctual 4.2. Prompt in carrying out activities 4.3. Sincere and honest concerning duties 4.4. Eager to learn 4.5. Committed to occupational health and safety practices
5. Resource implications	The following resources must be provided: 5.1. Workplace (simulated or actual) 5.2. Personal protective equipment (PPE) 5.3. Plans, drawings and specifications 5.4. Engines 5.5. Auxiliary machinery 5.6. Projector 5.7. Stationary 5.8. Learning manual
6. Methods of assessment	Methods of assessment may include but is not limited to: 6.1. Written test 6.2. Oral test 6.3. Observation 6.4. Demonstration 6.5. Portfolio

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

7. Context of assessment

7.1 Competency assessment must be done in a training institute or an actual or simulated workplace after completion of this unit of competency.

7.2 Assessment must be done by a suitably qualified/certified assessor.

Accreditation Requirements

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Unit Title:	Perform machinery setting and levelling
Unit Code:	SEIP-SBD-SMI-02-O
Nominal Hours:	30 hours
Unit Descriptor:	This unit covers the skills, knowledge and attitudes required to perform machinery setting and levelling works. It specifically includes preparing for work, preparing for setting and levelling, carrying out setting and levelling, and cleaning and maintaining tools and equipment.
Elements of Competency	Performance Criteria (<u>bold and underlined</u> terms are elaborated in the Range of Variables)
1. Prepare for work	<p>1.1. Nature and scope of work is identified and clarified.</p> <p>1.2. Job specification is identified including manufacturer's specifications and instructions for installation of machinery.</p> <p>1.3. <u>Levelling tools</u> and <u>lifting equipment</u> are identified and selected as per job requirement.</p> <p>1.4. Appropriate <u>tools and equipment</u> are selected and set-up to operate lifting equipment.</p>
2. Prepare for setting and levelling	<p>2.1. <u>Machinery and components</u> are checked</p> <p>2.2. Inspection of machinery and components is carried out as per job specification and standard operating procedure.</p>
3. Carry out setting and levelling	<p>3.1. Appropriate engineering principles and techniques are identified and selected.</p> <p>3.2. Levelling and alignment calculations are performed.</p> <p>3.3. Lifting equipment is levelled using appropriate technique.</p> <p>3.4. Tools and equipment are used to lift and hold machinery for installation.</p> <p>3.5. Levelling and alignment is carried out as per standard operating procedure.</p>
4. Clean and maintain tools and equipment	<p>4.1. Machinery and components are cleaned as per standard operating procedure.</p> <p>4.2. Waste materials are disposed of.</p> <p>4.3. Tools and equipment are stored as per workplace guidelines.</p>

Range of Variables	
Variable	Range <i>(may include but not limited to)</i>
1. Levelling tools	<ul style="list-style-type: none"> 1.1. Precision levels 1.2. Spirit levels 1.3. Line levels 1.4. Optical levels 1.5. Electronic levels 1.6. Laser levels 1.7. Master levels 1.8. Dial indicators 1.9. Special type dial indicator 1.10. Fixtures 1.11. Magnetic bases 1.12. Feeler gauges 1.13. Bench centres 1.14. Plumb line 1.15. Folding wedges
2. Lifting equipment	<ul style="list-style-type: none"> 2.1. Hydraulic jack 2.2. Pneumatic jack 2.3. Lifting device 2.4. Crane 2.5. Chain hoist 2.6. Block

Range of Variables	
Variable	Range <i>(may include but not limited to)</i>
3. Tools and equipment	<ul style="list-style-type: none"> 3.1. Adjustable wrench 3.2. Open ended spanner 3.3. Slogging spanner 3.4. Ring slopping spanner 3.5. T- box spanner 3.6. Analog torque wrench 3.7. Square drive wrench 3.8. Vice grip 3.9. Side cutting pliers 3.10. Combination pliers 3.11. Straight hand snip 3.12. Ball-peen hammer 3.13. Sledge hammer 3.14. Hack saw 3.15. Jaw gear puller 3.16. Matric tape measure 3.17. Screw driver 3.18. Bolt cutter 3.19. Allen key set 3.20. Table vice 3.21. Electric drill
4. Machinery and components	<ul style="list-style-type: none"> 4.1. Main engine 4.2. Boiler 4.3. Refrigeration 4.4. Electrical equipment 4.5. Auxiliary engines 4.6. Air compressors 4.7. Oil-water separator 4.8. Pumps 4.9. Propulsion system

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

1. Critical aspects of competency	Assessment must evidence that the candidate: 1.1. Identified and selected levelling tools and lifting equipment 1.2. Set-up tools and equipment to operate lifting equipment 1.3. Checked and inspected machinery and components 1.4. Carried out levelling and alignment calculations 1.5. Performed levelling and alignment as per job specification
2. Underpinning knowledge	2.1. Levelling tools and lifting equipment 2.2. Machinery and components 2.3. Engineering principles and practices 2.4. Levelling and alignment techniques 2.5. Maintenance procedures
3. Underpinning skills	3.1. Identifying and selecting levelling tools and lifting equipment 3.2. Setting-up tools and equipment to operate lifting device 3.3. Checking and inspecting machinery components 3.4. Carrying out levelling and alignment calculations 3.5. Performing levelling and alignment (including realignment)
4. Underpinning attitudes	4.1. Tidy and punctual 4.2. Prompt in carrying out activities 4.3. Sincere and honest concerning duties 4.4. Active on teamwork 4.5. Eager to learn 4.6. Concerned for proper use of tools 4.7. Concerned about the work environment 4.8. Committed to occupational health and safety practices
5. Resource implications	The following resources must be provided: 5.1. Workplace (simulated or actual) 5.2. Personal protective equipment (PPE) 5.3. Tools and equipment 5.4. Levelling tools 5.5. Lifting equipment 5.6. Machinery 5.7. Job specifications 5.8. Standard operating procedure 5.9. Projector 5.10. Stationary 5.11. Learning manual

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

6. Methods of assessment

Methods of assessment may include but is not limited to:

- 6.1.** Written test
- 6.2.** Oral test
- 6.3.** Observation
- 6.4.** Demonstration
- 6.5.** Portfolio

7. Context of assessment

- 7.1.** Competency assessment must be done in a training institute or an actual or simulated workplace after completion of this unit of competency.
- 7.2.** Assessment must be done by a suitably qualified/certified assessor.

Accreditation Requirements

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Unit Title:	Install engine and gear box
Unit Code:	SEIP-SBD-SMI-03-O
Nominal Hours:	80 hours
Unit Descriptor:	This unit covers the skills, knowledge and attitudes required to install engine and gear box. It specifically includes preparing for work, carrying out engine and gear box installation and, cleaning and maintaining tools and equipment.
Elements of Competency	Performance Criteria (<u>bold and underlined</u> terms are elaborated in the Range of Variables)
1. Prepare for work	<p>1.1. Nature and scope of work is identified and clarified.</p> <p>1.2. Job specification is identified including manufacturer's specifications and instructions for installation of machinery.</p> <p>1.3. Drawings, tools and equipment are identified and selected.</p>
2. Carry out engine installation	<p>2.1. <u>Engine and ancillary equipment</u> is prepared for sequential installation.</p> <p>2.2. Engine and ancillary equipment is checked for conformance with manufacturer's specifications.</p> <p>2.3. Engine and ancillary equipment is installed as per manufacturer's specifications.</p> <p>2.4. Adjustments are performed as per standard operating procedure, if required.</p>
3. Carry out gear box installation	<p>3.1. Appropriate gear box is selected and fixed as per job specification.</p> <p>3.2. Gear box is tested and checked for conformance with manufacturer's specifications.</p> <p>3.3. Gear box is installed as per manufacturer's specifications.</p> <p>3.4. Adjustments are performed as per standard operating procedure, if required.</p>
4. Check level and alignment	<p>4.1. Level and alignment is checked against manufacturer's specification.</p> <p>4.2. Adjustments and realignment are performed, if necessary.</p>
5. Clean and maintain tools and equipment	<p>5.1. Tools and equipment are cleaned as per standard operating procedure.</p> <p>5.2. Waste materials are disposed of.</p> <p>5.3. Tools and equipment are stored as per workplace guidelines.</p>

Range of Variables	
Variable	Range <i>(may include but not limited to)</i>
1. Engine and ancillary equipment (including engine components)	1.1. Engine 1.2. Electric components 1.3. Hydraulic components 1.4. Pneumatic components 1.5. Mechanical components 1.6. Steering systems (hydraulic, cable, wire) 1.7. Fuel systems (heavy oil, diesel)

Evidence Guide	
The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment must evidence that the candidate: <ol style="list-style-type: none"> 1.1. Prepared for work 1.2. Installed engine and ancillary equipment 1.3. Installed and fixed gear box 1.4. Checked engine, ancillary equipment and gear box 1.5. Checked level and alignment 1.6. Adjusted level and performed realignment
2. Underpinning knowledge	<ol style="list-style-type: none"> 2.1. Tools and equipment 2.2. Types of engine and engine components 2.3. Ancillary equipment 2.4. Types of gear box 2.5. Levelling and alignment techniques 2.6. Maintenance procedures
3. Underpinning skills	<ol style="list-style-type: none"> 3.1. Installing engine and ancillary equipment as per manufacturer's specification 3.2. Installing gear box as per manufacturer's specification 3.3. Checking and testing engine, ancillary equipment and gear box 3.4. Checking level and alignment and making any necessary adjustments

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

4. Underpinning attitudes	<ul style="list-style-type: none">4.1. Tidy and punctual4.2. Prompt in carrying out activities4.3. Sincere and honest concerning duties4.4. Active on teamwork4.5. Eager to learn4.6. Concerned for proper use of tools4.7. Concerned about the work environment4.8. Committed to occupational health and safety practices
5. Resource implications	The following resources must be provided: <ul style="list-style-type: none">5.1. Workplace (simulated or actual)5.2. Personal protective equipment (PPE)5.3. Tools and equipment5.4. Engine5.5. Ancillary equipment5.6. Gear box5.7. Manufacturer's specifications5.8. Job specification5.9. Standard operating procedure5.10. Projector5.11. Stationary5.12. Learning manual
6. Methods of assessment	Methods of assessment may include but is not limited to: <ul style="list-style-type: none">6.1. Written test6.2. Oral test6.3. Observation6.4. Demonstration6.5. Portfolio
7. Context of assessment	<ul style="list-style-type: none">7.1. Competency assessment must be done in a training institute or an actual or simulated workplace after completion of this unit of competency.7.2. Assessment must be done by a suitably qualified/certified assessor.

Accreditation Requirements

Training Providers must be accredited by Bangladesh Technical Education Board (BTEB), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any NTVQF qualification. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by BTEB.

Unit Title:	Install propulsion and steering system
Unit Code:	SEIP-SBD-SMI-04-O
Nominal Hours:	50 hours
Unit Descriptor:	This unit covers the skills, knowledge and attitudes required to install propulsion and steering system. It specifically includes preparing for work, carrying out propeller and propeller shaft installation, carrying out rudder and steering gear installation, checking level and alignment, and cleaning and maintaining tools and equipment.
Elements of Competency	Performance Criteria (<u>bold and underlined</u> terms are elaborated in the Range of Variables)
1. Prepare for work	<p>1.1. Nature and scope of work is identified and clarified.</p> <p>1.2. Job specification is identified including manufacturer's specifications and instructions for installation of machinery.</p> <p>1.1. Drawings, tools and equipment are identified and selected.</p>
2. Carry out propeller and propeller shaft installation	<p>2.1. Propeller and propeller shaft is prepared for sequential installation.</p> <p>2.2. Propeller and propeller shaft is checked for conformance with manufacturer's specifications.</p> <p>2.3. Propeller and propeller shaft is installed and fixed as per manufacturer's specifications.</p> <p>2.4. Adjustments are performed as per standard operating procedure, if required.</p>
3. Carry out rudder and steering gear installation	<p>3.1. Rudder and <u>steering gear</u> is prepared for sequential installation.</p> <p>3.2. Rudder and steering gear is checked for conformance with manufacturer's specifications.</p> <p>3.3. Rudder and steering gear is installed and fixed as per manufacturer's specifications.</p> <p>3.4. Adjustments are performed as per standard operating procedure, if required.</p>
4. Check level and alignment	<p>4.1. Level and alignment is checked against manufacturer's specification.</p> <p>4.2. Adjustments and realignment are performed, if necessary.</p>
5. Clean and maintain tools and equipment	<p>5.1. Tools and equipment are cleaned as per standard operating procedure.</p> <p>5.2. Waste materials are disposed of.</p> <p>5.3. Tools and equipment are stored as per workplace guidelines.</p>

Range of Variables	
Variable	Range (may include but not limited to)
1. Steering gear	1.1. Telemotor: 1.1.1. Hydraulic 1.1.2. Electrical 1.2. Ram 1.3. Vane

Evidence Guide	
The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment must evidence that the candidate: 1.1. Prepared for work 1.2. Installed propeller and propeller shaft 1.3. Installed and fixed rudder and steering gear 1.4. Checked propeller, rudder and steering gear 1.5. Checked level and alignment 1.6. Adjusted level and performed realignment
2. Underpinning knowledge	2.1. Tools and equipment 2.2. Types of propeller and propeller shaft 2.3. Types of rudder and steering gear 2.4. Levelling and alignment techniques 2.5. Maintenance procedures
3. Underpinning skills	3.1. Installing propeller and propeller shaft as per manufacturer's specification 3.2. Installing and fix rudder and steering gear as per manufacturer's specification 3.3. Checking and testing propeller and propeller shaft 3.4. Checking and testing rudder and steering gear 3.5. Checking level and alignment and making any necessary adjustments
4. Underpinning attitudes	4.1. Tidy and punctual 4.2. Prompt in carrying out activities 4.3. Sincere and honest concerning duties 4.4. Active on teamwork 4.5. Eager to learn 4.6. Concerned for proper use of tools 4.7. Concerned about the work environment 4.8. Committed to occupational health and safety practices

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

5. Resource implications	The following resources must be provided: 5.1. Workplace (simulated or actual) 5.2. Personal protective equipment (PPE) 5.3. Tools and equipment 5.4. Propeller shaft 5.5. Propeller 5.6. Rudder 5.7. Steering gear 5.8. Manufacturer's specifications 5.9. Job specification 5.10. Standard operating procedure 5.11. Projector 5.12. Stationary 5.13. Learning manual
6. Methods of assessment	Methods of assessment may include but is not limited to: 6.1. Written test 6.2. Oral test 6.3. Observation 6.4. Demonstration 6.5. Portfolio
7. Context of assessment	7.1. Competency assessment must be done in a training institute or an actual or simulated workplace after completion of this unit of competency. 7.2. Assessment must be done by a suitably qualified/certified assessor.

Accreditation Requirements

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Unit Title:	Install electrical machinery
Unit Code:	SEIP-SBD-SMI-05-O
Nominal Hours:	40 hours
Unit Descriptor:	This unit covers the skills, knowledge and attitudes required to install electrical machinery and equipment. It specifically includes preparing for work, carrying electrical machinery installation, checking level and alignment, and cleaning and maintaining tools and equipment.
Elements of Competency	Performance Criteria (<u>bold and underlined</u> terms are elaborated in the Range of Variables)
1. Prepare for work	<p>1.1. Nature and scope of work is identified and clarified.</p> <p>1.2. Job specification is identified including manufacturer's specifications and instructions for installation of machinery.</p> <p>1.3. Drawings, tools and equipment are identified and selected.</p>
2. Carry out electrical machinery installation	<p>2.1. <u>Electrical machinery</u> is prepared for sequential installation.</p> <p>2.2. Electrical machinery is checked for conformance with manufacturer's specifications.</p> <p>2.3. Electrical machinery is installed as per manufacturer's specifications.</p> <p>2.4. Pre-start checks are carried out and machinery started to ensure correct operation.</p> <p>2.5. Adjustments are performed as per standard operating procedure, if required.</p>
3. Check level and alignment	<p>3.1. Level and alignment is checked against manufacturer's specification.</p> <p>3.2. Adjustments and realignment are performed, if necessary.</p>
4. Clean and maintain tools and equipment	<p>4.1. Tools and equipment are cleaned as per standard operating procedure.</p> <p>4.2. Waste materials are disposed of.</p> <p>4.3. Tools and equipment are stored as per workplace guidelines.</p>

Range of Variables	
Variable	Range (<i>may include but not limited to</i>)
1. Electrical machinery	<p>1.1. Generator</p> <p>1.2. Transformer</p> <p>1.3. Motor</p>

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

1. Critical aspects of competency	Assessment must evidence that the candidate: 1.1. Prepared for work 1.2. Installed electrical machinery 1.3. Conducted pre-start checks 1.4. Checked level and alignment 1.5. Adjusted level and performed realignment
2. Underpinning knowledge	2.1. Tools and equipment 2.2. Electrical machinery 2.3. Installation methods 2.4. Levelling and alignment techniques 2.5. Maintenance procedures
3. Underpinning skills	3.1. Installing electrical machinery 3.2. Checking and testing electrical machinery 3.3. Conducting pre-start checks (performing adjustments as necessary) 3.4. Checking level and alignment and making any necessary adjustments
4. Underpinning attitudes	4.1. Tidy and punctual 4.2. Prompt in carrying out activities 4.3. Sincere and honest concerning duties 4.4. Active on teamwork 4.5. Eager to learn 4.6. Concerned for proper use of tools 4.7. Concerned about the work environment 4.8. Committed to occupational health and safety practices
5. Resource implications	The following resources must be provided: 5.1. Workplace (simulated or actual) 5.2. Personal protective equipment (PPE) 5.3. Tools and equipment 5.4. Electrical machinery 5.5. Manufacturer's specifications 5.6. Job specification 5.7. Standard operating procedure 5.8. Projector 5.9. Stationary 5.10. Learning manual

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

6. Methods of assessment

Methods of assessment may include but is not limited to:

- 6.1. Written test
- 6.2. Oral test
- 6.3. Observation
- 6.4. Demonstration
- 6.5. Portfolio

7. Context of assessment

- 7.1. Competency assessment must be done in a training institute or an actual or simulated workplace after completion of this unit of competency.
- 7.2. Assessment must be done by a suitably qualified/certified assessor.

Accreditation Requirements

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Unit Title:	Install deck machinery
Unit Code:	SEIP-SBD-SMI-06-O
Nominal Hours:	40 hours
Unit Descriptor:	This unit covers the skills, knowledge and attitudes required to install deck machinery. It specifically includes installing preparing for work, carrying out deck machinery installation, checking level and alignment, and cleaning and maintain tools and equipment.
Elements of Competency	Performance Criteria (<u>bold and underlined</u> terms are elaborated in the Range of Variables)
1. Prepare for work	<p>1.1. Nature and scope of work is identified and clarified.</p> <p>1.2. Job specification is identified including manufacturer's specifications and instructions for installation of machinery.</p> <p>1.3. Drawings, tools and <u>equipment</u> are identified and selected.</p>
2. Carry out deck machinery installation	<p>2.1. <u>Deck machinery</u> is prepared for sequential installation.</p> <p>2.2. Deck machinery is checked for conformance with manufacturer's specifications.</p> <p>2.3. Deck machinery is installed as per manufacturer's specifications.</p> <p>2.4. Pre-start checks are carried out and machinery started to ensure correct operation.</p> <p>2.5. Adjustments are performed as per standard operating procedure, if required.</p>
3. Check level and alignment	<p>3.1. Level and alignment is checked against manufacturer's specification.</p> <p>3.2. Adjustments and realignment are performed, if necessary.</p>
4. Clean and maintain tools and equipment	<p>4.1. Tools and equipment are cleaned as per standard operating procedure.</p> <p>4.2. Waste materials are disposed of.</p> <p>4.3. Tools and equipment are stored as per workplace guidelines.</p>

Range of Variables	
Variable	Range (<i>may include but not limited to</i>)
1. Equipment	<p>1.1. Mooring equipment</p> <p>1.2. Anchoring equipment</p> <p>1.3. Cargo handling equipment and hatch covers</p> <p>1.4. Lifeboats and life rafts</p> <p>1.5. Firefighting equipment</p>

Range of Variables	
Variable	Range <i>(may include but not limited to)</i>
2. Deck machinery	2.1. Winches 2.2. Windlass 2.3. Crane 2.4. Davit 2.5. Safeguards and protective devices for winches

Evidence Guide	
The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment must evidence that the candidate: <ol style="list-style-type: none"> 1.1. Prepared for work 1.2. Installed deck machinery 1.3. Conducted pre-start checks 1.4. Checked level and alignment 1.5. Adjusted level and performed realignment
2. Underpinning knowledge	<ol style="list-style-type: none"> 2.1. Tools and equipment 2.2. Deck machinery 2.3. Installation methods 2.4. Levelling and alignment techniques 2.5. Maintenance procedures
3. Underpinning skills	<ol style="list-style-type: none"> 3.1. Installing deck machinery 3.2. Checking and testing deck machinery 3.3. Conducting pre-start checks (performing adjustments as necessary) 3.4. Checking level and alignment and making any necessary adjustments
4. Underpinning attitudes	<ol style="list-style-type: none"> 4.1. Tidy and punctual 4.2. Prompt in carrying out activities 4.3. Sincere and honest concerning duties 4.4. Active on teamwork 4.5. Eager to learn 4.6. Concerned for proper use of tools 4.7. Concerned about the work environment 4.8. Committed to occupational health and safety practices

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

5. Resource implications

The following resources must be provided:

- 5.1. Workplace (simulated or actual)
- 5.2. Personal protective equipment (PPE)
- 5.3. Tools and equipment
- 5.4. Deck machinery
- 5.5. Manufacturer's specifications
- 5.6. Job specification
- 5.7. Standard operating procedure
- 5.8. Projector
- 5.9. Stationary
- 5.10. Learning manual

6. Methods of assessment

Methods of assessment may include but is not limited to:

- 6.1. Written test
- 6.2. Oral test
- 6.3. Observation
- 6.4. Demonstration
- 6.5. Portfolio

7. Context of assessment

- 7.1. Competency assessment must be done in a training institute or an actual or simulated workplace after completion of this unit of competency.
- 7.2. Assessment must be done by a suitably qualified/certified assessor.

Accreditation Requirements

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