Skills for Employment Investment Program (SEIP)

ASSESSMENT TOOL

FOR

SHIP PIPING

(SHIPBUILDING SECTOR)

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

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PART A – THE ASSESSOR

Instructions to Assessor

Assessment is the process of identifying a candidate's skills and knowledge set against the industry established standards in the workplace. It requires the candidate to consistently and over time demonstrate skills, knowledge and attitude that enable confident completion of workplace tasks in a variety of situations.

In judging assessment evidence, the assessor must ensure that the evidence is:

- authentic (the candidate's own work)
- valid (directly related to the current version of the endorsed competency standard)
- reliable (show that the candidate consistently meets the endorsed unit of competency)
- current (reflects the candidate's current capacity to perform the aspect of work covered by the endorsed unit of competency)
- sufficient (covers the full range of elements in the relevant unit of competency)

There are a number of assessment methods that may be employed including but not limited to:

- written examination
- oral questioning
- practical demonstration

A single unit of competency may be assessed or a group of units of competency may be assessed, either in an actual workplace or a simulated workplace environment.

Conducting Assessment

Prior to commencement of assessment, candidates must have the tasks clearly explained to them. Also, the assessor should provide candidates with clear advice and information about the:

- date, time and place for assessment
- structure of assessment
- number of times performance must be demonstrated or observed
- amount or type of assistance candidates can expect
- assessment environment
- resources required for assessment
- performance standards or benchmarks relevant to the qualification

As well as informing the candidate of what they will be required to do during the assessment, the assessor will also need to explain what evidence they will need to provide in response to the various assessment tasks.

If a candidate is required to submit evidence, any explanation must include specific guidance on:

- what to include as evidence
- how to present the evidence
- how to submit the evidence and to whom

Assessing Competence

Competency-based assessment does not award grades, but simply identifies if the candidate has the skills, knowledge and attitudes to undertake the required task to the specified standard.

Therefore, when assessing competency an assessor has two possible results (assessment decisions) that can be awarded:

- Competent (C)
- Not Yet Competent (NYC)

Competent (C)

If the candidate is able to successfully answer and demonstrate what is required to the expected standard of the assessment criteria, they will be deemed as 'Competent'.

The assessor will award 'Competent' if they feel the candidate has the necessary skills, knowledge and attitudes in all assessment tasks for a given package.

Not Yet Competent (NYC)

If the candidate is unable to answer and demonstrate competency to the expected standard, they will be deemed to be 'Not Yet Competent'.

This does not mean the candidate will need to complete all the assessment tasks again. When applying for reassessment, the focus will be on the specific assessment tasks that were not performed to the required standard.

The candidate may be required to:

(a) undertake further training or instruction

(b) undertake the specific assessment task again until they are deemed to be competent

Recording Assessment Information

When all assessment tasks are concluded, the evidence summary sheet should be completed, signed by all parties, and any outstanding activities or issues actioned.

The assessor should ensure that all appropriate forms are completed and signed by all parties.

CHECKLIST FOR ASSESSOR		
Prior to the assessment I have:	**Tick (✓)**	**Remarks**
Ensured the candidate is informed about the venue and schedule of assessment.		
Received current copies of the assessment criteria to be assessed, assessment plan and evidence plan.		
Reviewed the assessment criteria and evidence plan to ensure I clearly understood the instructions and the requirements of the assessment process.		
Identified and accommodated any special needs of the candidate.		
Checked the set-up and resources for the assessment.		
During the assessment I have:		
Introduced myself and confirmed identities of candidates.		
Collected the admission slips.		
Put candidates at ease by being friendly and helpful.		
Checked completed self-assessment guide.		
Explained to candidates the purpose, context and benefits of the assessment.		
Ensured candidates understood the assessment process and the assessment procedure.		
Provided candidates with an overview of the assessment criteria to be used.		
Gave specific and clear instructions to the candidates.		
Observed carefully the specified time limits provided in the assessment package.		
Stayed at the assessment area during the entire duration of the assessment activity.		
Ensured notes are made on unusual conditions or situations during the assessment and include these in the report.		
Did not provide any assistance during the assessment or indicated in any way whether the candidate is or is not performing the activity correctly (intervened only for health and safety reasons).		

Implemented the evidence gathering process and ensured its validity, reliability, fairness and flexibility.		
Collected appropriate evidence and matched relevance to the elements, performance criteria, range of variables and evidence guide in the relevant units of competency.		
Explained the results reporting procedure to the candidate.		
Encouraged candidates to seek clarifications if in doubt about the pre- and post-assessment activity procedures.		
Asked candidates for feedback on the assessment.		
Explained legal, health and safety, and ethical issues, if applicable.		
After the assessment I have:		
Provided feedback on the assessment decision. This includes the following: ▪ clear and constructive feedback on the assessment decision ▪ information on ways of addressing any identified gaps in competency revealed by the assessment ▪ opportunity to discuss the assessment process and outcome ▪ information on reassessment process (if necessary) ▪ information on appeal (if necessary)		
Prepared the necessary assessment reports. This includes the following: ▪ record the assessment decision using the prescribed rating sheet ▪ maintain records of the assessment procedures, evidence collected and assessment decision ▪ endorse assessment decision to BTEB ▪ prepare recommendations for the issuance of certificate		
Thanked candidate for participating in the assessment.		

Assessment Evidence Guide

The purpose of assessment is to confirm that an individual can perform to the standards expected by in the workplace, as expressed in the competency standards.

To attain the certificate of **Ship Piping**, a candidate must demonstrate competent skill and knowledge in all the units of competency listed below. Upon successful completion of all assessment activities, a candidate shall be awarded with a certificate.

CODE	UNIT OF COMPETENCY
Generic Competencies	
SEIP-SBD-SPF-01-G	Use basic mathematical concepts
SEIP-SBD-SPF-02-G	Apply occupational health and safety (OHS) practice in the workplace
SEIP-SBD-SPF-03-G	Carry out workplace interaction
SEIP-SBD-SPF-04-G	Operate in a team environment
Sector-specific Competencies	
SEIP-SBD-SPF-01-S	Work effectively in the shipbuilding sector
SEIP-SBD-SPF-02-S	Use hand and power tools
Occupation-specific Competencies	
SEIP-SBD-SPF-01-O	Identify basic ship piping work
SEIP-SBD-SPF-02-O	Identify pipe and pipe fittings components
SEIP-SBD-SPF-03-O	Perform welding works
SEIP-SBD-SPF-04-O	Perform pipe fabrication works
SEIP-SBD-SPF-05-O	Perform installation of piping system

Assessment Evidence Plan

An assessment evidence plan is a document that assists in establishing what evidence needs to be collected by the assessor to ensure that the candidate meets all the appropriate requirements of the competency standard. It usually contains a record of:

- evidence requirements as set out in the competency standard
- who will collect the evidence?
- time period needed to collect the evidence

Occupation:	Ship Piping					
Unit Name:	Use basic mathematical concepts					
Unit Code:	SEIP-SBD-SPF-01-G					
Assessment Method:	**P**	**O**	**W**			
	Performance *(including demonstration and observation)*	Oral questioning	Written examination *(including short-answer, multiple choice, and true or false questions)*			
Element	**Performance Criteria**			**P**	**O**	**W**
1. Identify calculation requirements in the workplace	**1.1.** Calculation requirements are identified from workplace information.			√		
	1.2. Mathematical problems are constructed from workplace information.			√	√	
2. Select appropriate mathematical methods/concepts for the calculation	**2.1.** Appropriate method is selected to carry out the calculation requirement.			√		√
	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.			√		√

Occupation:	Ship Piping					
Unit Name:	Apply occupational health and safety (OHS) practice at workplace					
Unit Code:	SEIP-SBD-SPF-02-G					
Assessment Method:	**P**	**O**	**W**			
	Performance *(including demonstration and observation)*	Oral questioning	Written examination *(including short-answer, multiple choice, and true or false questions)*			
Element	**Performance Criteria**			**P**	**O**	**W**
1. Identify OHS policies and procedures	**1.1.** OHS policies and safe operating procedures are interpreted.			√		√
	1.2. Safety signs and symbols are identified and followed.			√	√	

	1.3. Response, evacuation procedures and other contingency measures are interpreted correctly.		√	
2. Apply personal health and safety practices	**2.1.** OHS policies and procedures are applied in the workplace including personal protective equipment (PPE).	√		
	2.2. Common health issues are recognised.			√
	2.3. Common safety issues are identified.	√	√	
3. Report hazards and risks	**3.1.** Hazards and risks are identified.	√		
	3.2. Hazards and risks assessment and controls are interpreted.	√		
4. Respond to emergencies	**4.1.** Responded to alarms and warning devices.		√	
	4.2. Emergency response plans and procedures are responded to.			√
	4.3. First aid procedures during emergency situations are identified.		√	

Occupation:	Ship Piping		
Unit Name:	Carry out workplace interaction		
Unit Code:	SEIP-SBD-SPF-03-G		
Assessment Method:	**P**	**O**	**W**
	Performance *(including demonstration and observation)*	Oral questioning	Written examination *(including short-answer, multiple choice, and true or false questions)*

Element	**Performance Criteria**	**P**	**O**	**W**
1. Interpret workplace communication and etiquette	**1.1.** Workplace codes of conduct are interpreted as per organisational guidelines.	√		
	1.2. Appropriate lines of communication are maintained with supervisors and colleagues.	√		
	1.3. Workplace interactions are conducted in a courteous manner to gather and convey information.	√		
	1.4. Workplace procedures and matters are comprehended.			√
2. Read and understand workplace documents	**2.1.** Workplace documents are interpreted correctly.	√		√
	2.2. Visual information/symbols/signage are understood correctly and followed.	√		
	2.3. Specific and relevant information are accessed from appropriate sources.	√		
	2.4. Appropriate medium is used to transfer information and ideas.	√		
	3.1. Team meetings are attended on time.		√	

3. Participate in workplace meetings and discussions	**3.2.** Meeting procedures and etiquette are followed.		√	
	3.3. Active participation is ensured, opinions are expressed and heard.	√		
	3.4. Inputs are provided and interpreted in line with the meeting purpose.		√	
4. Practice professional ethics at work	**4.1.** Responsibilities as a team member are performed.			√
	4.2. Tasks are performed in accordance with workplace procedures.	√		
	4.3. Confidentiality is maintained.	√		
	4.4. Inappropriate and conflicting situations are avoided	√		

Occupation:	Ship Piping		
Unit Name:	Operate in a team environment		
Unit Code:	SEIP-SBD-SPF-04-G		
Assessment Method:	**P**	**O**	**W**
	Performance *(including demonstration and observation)*	Oral questioning	Written examination *(including short-answer, multiple choice, and true or false questions)*

Element	**Performance Criteria**	**P**	**O**	**W**
1. Identify team goals and 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 cooperate with team members	**3.1.** Other teammates' tasks are identified and support provided when requested.		√	
	3.2. The team is encouraged through sharing information 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.	√		

Occupation:	Ship Piping					
Unit Name:	Work effectively in the shipbuilding sector					
Unit Code:	SEIP-SBD-SPF-01-S					
Assessment Method:	**P**	**O**	**W**			
	Performance *(including demonstration and observation)*	Oral questioning	Written examination *(including short-answer, multiple choice, and true or false questions)*			
Element	**Performance Criteria**			**P**	**O**	**W**
1. Understand basics of shipbuilding	**1.1.** Electrical devices, components and equipment of a ship are identified and described.			√	√	
	1.2. Ship construction terminology and GA plan of a ship is interpreted.			√	√	
	1.3. Key areas of a ship are identified from general drawing or model ship.			√		
	1.4. Classification of society and ISO rules are explained.				√	
2. Obtain information about the industry	**2.1.** Sources of information about industry are identified.				√	
	2.2. Industry information is collected from multiple sources.			√		
	2.3. Information is interpreted and applied to day-to-day work activities.			√		
3. Identify key machines installed on a ship	**3.1.** Key machines installed on a ship are identified.			√	√	
	3.2. Identified machines are located on ship.			√		

Occupation:	Ship Piping					
Unit Name:	Use hand and power tools.					
Unit Code:	SEIP-SBD-SPF-02-S					
Assessment Method:	**P**	**O**	**W**			
	Performance *(including demonstration and observation)*	Oral questioning	Written examination *(including short-answer, multiple choice, and true or false questions)*			
Element	**Performance Criteria**			**P**	**O**	**W**

1. Identify and inspect hand and power tools	**1.1.** Appropriate hand and power tools are identified.	√	√	
	1.2. Application of hand and power tools is recognised.	√		
	1.3. Usability of hand and power tools is checked and verified.	√		
2. Use hand tools properly and safely	**2.1.** Appropriate hand tools are selected.	√		
	2.2. Safety precautions are ensured before using hand tools.	√		√
	2.3. Unsafe or faulty tools are identified and marked for repair.	√		
	2.4. Measuring tools are checked and calibrated before use.	√		
	2.5. Use hand tools properly and safely to perform work activity.	√		
3. Operate power tools properly and safely	**3.1.** Appropriate power tools are selected.	√		
	3.2. Power supply outlet and electrical cord are inspected and confirmed safe for use in accordance with established workplace safety requirements.	√		
	3.3. Safety precautions are ensured before using power tools in accordance with manufacturer's operating specification.	√		√
	3.4. Proper sequence of operation is applied using power tools.	√		
	3.5. Unsafe or faulty power tools are identified and marked for repair.	√		
	3.6. Operate power tools properly and safely to perform work activity.	√		
4. Clean and maintain hand tools and power tools	**4.1.** Dust and foreign matters are removed from power tools in accordance to workplace standard.	√		
	4.2. Condition of tools is checked after use and reported.	√		
	4.3. Appropriate lubricant is applied after use and prior to storage.	√		
	4.4. Measuring tools are checked and calibrated after use.	√		
	4.5. Defective hand and power tools are inspected and repaired or replaced.	√		
	4.6. Hand and power tools are stored and secured in accordance with workplace requirements.	√		

Occupation:	Ship Piping
Unit Name:	Identify basic ship piping work

Unit Code:	SEIP-SBD-SPF-01-O					
Assessment Method:	**P**	**O**	**W**			
	Performance *(including demonstration and observation)*	Oral questioning	Written examination *(including short-answer, multiple choice, and true or false questions)*			
Element	**Performance Criteria**			**P**	**O**	**W**
1. Identify key tasks of a ship pipe fitter	**1.1.** Key tasks of a ship pipe fitter are identified.				√	
	1.2. Roles and responsibilities of a pipe fitter are explained.				√	
2. Interpret piping system	**2.1.** Ship piping system is accurately identified and explained.				√	√
	2.2. Components of ship piping system are identified and described.			√	√	√
3. Understand drawings, symbols and specifications	**3.1.** Types of piping drawings are explained as per job requirement.					√
	3.2. Components of spool sheet drawing are identified.			√		
	3.3. Pipe fitting symbols are identified and defined.			√	√	
	3.4. Information contained in specifications of piping work is explained.				√	
4. Identify colour codes and standards	**4.1.** Colour codes are identified and described as per job requirement.			√	√	
	4.2. Colour standard for different systems of ship piping are identified and described.				√	
	4.3. Supplier documentation is identified and described.				√	

Occupation:	Ship Piping					
Unit Name:	Identify pipe and pipe fitting components					
Unit Code:	SEIP-SBD-SPF-02-O					
Assessment Method:	**P**	**O**	**W**			
	Performance *(including demonstration and observation)*	Oral questioning	Written examination *(including short-answer, multiple choice, and true or false questions)*			
Element	**Performance Criteria**			**P**	**O**	**W**
1. Identify different types of pipes	**1.1.** Different types of pipes are identified.			√		√
	1.2. Pipes are selected as per job requirement.			√		
2. Identify different types of valves	**2.1.** Different types of valves are identified.			√	√	√
	2.2. Installing methods of valves are explained.				√	

	2.3. Valves are selected as per job requirement.	√		
3. Identify different types of fittings	**3.1.** Different types of fittings are identified.	√		
	3.2. Connection methods of fittings are explained.		√	
	3.3. Fittings are selected as per job requirement.	√		
4. Identify different types of pumps	**4.1.** Different types of pumps are identified.	√	√	
	4.2. Pump components are identified and their functions are described.	√	√	
	4.3. Pump is selected as per job requirement.	√		
5. Identify different types of supports and fasteners	**5.1.** Different types of hangers, supports, guides and fasteners are identified.	√	√	
	5.2. Pipe supporting and fastening process is explained.		√	
	5.3. Supports and fasteners are selected as per job requirement.	√		

Occupation:	Ship Piping		
Unit Name:	Perform welding works		
Unit Code:	SEIP-SBD-SPF-03-O		
Assessment Method:	**P**	**O**	**W**
	Performance *(including demonstration and observation)*	Oral questioning	Written examination *(including short-answer, multiple choice, and true or false questions)*

Element	**Performance Criteria**	**P**	**O**	**W**
1. Identify types of welding and welding terminology	**1.1.** Tools and equipment required for welding are identified.	√		
	1.2. Different types of welding are identified and described.	√	√	√
	1.3. Welding terminology is listed and defined.		√	√
2. Identify different types of welding technique	**2.1.** Pipe welding positional techniques are identified and explained.		√	√
	2.2. Arc welding techniques are identified and explained.	√	√	
	2.3. Welding faults and tests are identified and explained.	√		√
3. Perform arc welding	**3.1.** Materials and electrode for arc welding are selected.	√		
	3.2. Tools and equipment for arc welding are selected and set up.	√		

	3.3. Edge prepared and job set-up maintaining proper gap.	√		
	3.4. Arc welding performed following correct welding procedure.	√		
	3.5. Clean work area upon completion of welding.	√		
4. Perform tack welding	**4.1.** Materials and electrode for tack welding are selected.	√		√
	4.2. Tools and equipment for tack welding are selected and set up.	√		
	4.3. Edge prepared and job set-up maintaining proper gap.	√		
	4.4. Tack welding performed following correct welding procedure.	√		
	4.5. Clean work area upon completion of welding.	√		

Occupation:	Ship Piping		
Unit Name:	Perform pipe fabrication works		
Unit Code:	SEIP-SBD-SPF-04-O		
Assessment Method:	**P**	**O**	**W**
	Performance *(including demonstration and observation)*	Oral questioning	Written examination *(including short-answer, multiple choice, and true or false questions)*

Element	**Performance Criteria**	**P**	**O**	**W**
1. Cut, thread and bevel pipes	**1.1.** Materials are identified and selected as per job requirement.	√		
	1.2. Tools and equipment are identified and selected as per job requirement.	√		
	1.3. Cutting techniques are identified and appropriate technique selected as per job requirement.	√	√	
	1.4. Cutting is performed as per specification and job requirement.	√		
	1.5. Threading of pipe, bevelling and grinding is performed as per specification.	√	√	
2. Perform pipe bending with different angle	**2.1.** Pipe bending terms are identified and defined.		√	
	2.2. Pipes are bent with different angle using bending machine.	√	√	
3. Secure supports, hangers and guides	**3.1.** Pipe supporting and fastening process is identified and explained.		√	
	3.2. Pipe support and fastening process is carried out as per job requirement.	√		

4. Clean and test piping	**4.1.** Cleaning and inspection of piping assembly is carried out.	√		
	4.2. Testing methods for piping system and assembly are applied.	√	√	
	4.3. Work area is cleaned upon completion of fabrication.	√		

Occupation:	Ship Piping		
Unit Name:	Perform installation of piping system		
Unit Code:	SEIP-SBD-SPF-05-O		
Assessment Method:	**P**	**O**	**W**
	Performance *(including demonstration and observation)*	Oral questioning	Written examination *(including short-answer, multiple choice, and true or false questions)*

Element	**Performance Criteria**	**P**	**O**	**W**
1. Install fresh water piping system	**1.1.** Drawings, tools and equipment are identified and selected.	√		
	1.2. Pipes are cut within tolerance.	√		√
	1.3. Thread of pipes is cut using threading machine or dice, as required.	√		
	1.4. Different types of fittings are fixed on fresh water piping.	√		
	1.5. Fresh water piping system is installed as per job requirement.	√		
	1.6. Fresh water piping assembly is checked to ensure it is contaminated free.	√		
2. Install sea water piping system	**2.1.** Drawings, tools and equipment are identified and selected.	√		
	2.2. Pipes are cut within tolerance.	√		
	2.3. Thread of pipes is cut using threading machine or dice, as required.	√		
	2.4. Different types of fittings are fixed on sea water piping.	√	√	
	2.5. Sea water piping system is installed as per job requirement.	√		
	2.6. Sea water piping assembly is checked to ensure it is contaminated free.	√	√	
3. Install fuel piping system	**3.1.** Drawings, tools and equipment are identified and selected.	√		
	3.2. Pipes are cut within tolerance.	√		

	3.3. Thread of pipes is cut using threading machine or dice, as required.	√		
	3.4. Pressure testing of piping spool to be carried out.	√		√
	3.5. Pickling and cleaning of piping spools is carried out.	√		
	3.6. Different types of fittings are fixed on fuel piping.	√	√	
	3.7. Fuel piping system is installed as per job requirement.	√		
	3.8. Fuel piping assembly is checked to ensure it is contaminated free.	√	√	
4. Install hydraulic piping system	**4.1.** Components of hydraulic piping system are identified.	√		
	4.2. Drawings, tools, equipment and fittings are identified and selected.	√		
	4.3. Pickling and cleaning of piping spools is carried out.	√		
	4.4. Hydraulic piping system is assembled as per specification.	√		
	4.5. Different types of fittings are fixed on hydraulic piping.	√	√	
	4.6. Hydraulic piping system is installed as per job requirement.	√		
	4.7. Pressure testing of piping spool is carried out.	√	√	
	4.8. Flushing of hydraulic piping is carried out.	√		

PART B – THE CANDIDATE

Instructions to Candidate

To be assessed as competent, you must provide evidence which demonstrates that you can perform to the necessary standard the various elements of these units of competency that comprise of the Certificate in **Ship piping**. Assessment of competency requires you to consistently demonstrate skill, knowledge and aptitude (through a variety of assessment tools such as multiple choice, short-answer questions, oral questioning, workplace observation, and practical demonstration) that enables confident completion of workplace tasks in a variety of situations.

In judging the evidence, your assessor must ensure that the evidence is:

- authentic (your own work)
- valid (directly related to the current version of the units of competency)
- reliable (consistently demonstrates of your knowledge and skill)
- current (shows your current capacity to perform the work)
- sufficient (covers the full range of elements comprised within the units of competency)

Furthermore, the assessment process must:

- provide for valid, reliable, flexible and fair assessment
- provide for judgment to be made on the basis of sufficient evidence
- offer valid, authentic and current evidence
- include workplace requirements

There are two types of assessment:

1. Knowledge Assessment - is designed to enable assessment against the various *elements* contained within the units of competency through a variety of activities such as multiple choice, short-answer questions, oral questioning. It is essentially examining your theoretical knowledge.

   This provides the assessor with substantial evidence of your knowledge and aptitude to perform the work relating to the specific unit of competency, in conjunction with other assessment tools such as workplace observation.

   You should complete the knowledge assessment as directed by the assessor and follow all instructions as and when given. If you are unable to complete the knowledge assessment, please speak to the assessor about alternative assessment solutions.

2. Skill Assessment - is designed to enable assessment against the various *performance criteria* contained within the units of competency through, for example, demonstration of skill in a simulated or actual work environment. In essence, it is an examination of your practical ability.

   This provides the assessor with substantial evidence of your ability to perform the work relating to the specific unit of competency to the standard expected by industry (the benchmark).

   You should complete the skill assessment as directed by the assessor and follow all instructions as and when given, ensuring your own health and safety.

Once you have been assessed as competent against all of the units of competency comprising of the qualification being undertaken, you will be awarded your certificate.

You assessor will discuss in more detail the requirements for assessment for each unit of competency at the appropriate time.

And please do not panic if you are not assessed as competent on any part of your qualification at your first attempt. Your assessor will discuss with you any identified skill and knowledge gaps, work through those with you and assist you as much as possible in attaining competency.

Self-Assessment Guide

Before undertaking any assessment, you should review the list of skills, knowledge and aptitudes relating to the assessment (drawn from the units of competency, its various elements and performance criteria) to determine whether you have current competency in these areas.

If you believe you can demonstrate the skills and knowledge required and can successfully complete the various assessment activities, you should then proceed to discuss your assessment with the assessor and complete Assessment Agreement.

However, should you not believe, for whatever reason, that you are not able to successfully complete the various assessment activities, then speak with the assessor. The assessor will assist you in identifying any skill and knowledge gaps, work through those with you and assist you as much as possible in attaining competency.

Please complete the self-assessment checklist below and discuss with the assessor.

Qualification:	**Ship Piping**
Units of competency:	**Generic units:** Use basic mathematical concepts Apply occupational health and safety (OHS) practice in the workplace Carry out workplace interaction Operate in a team environment **Sector-specific units:** Work effectively in the shipbuilding sector Use hand and power tools **Occupation-specific units:** Identify basic ship piping work Identify pipe and pipe fittings components Perform welding works Perform pipe fabricationn works Perform installation of piping system

Instructions:

- Read each of the questions in the left-hand column of the chart
- Place a tick (√) in the appropriate box opposite each question to indicate your answer

Can I?	YES	NO
▪ Identify calculation requirements from workplace information		
▪ Select appropriate mathematical method to carry out calculation		
▪ Determine system and units of measurement to be followed		
▪ Complete calculations using appropriate methods such as addition, subtraction, multiplication and division		
▪ Apply to workplace calculation systems and units of measurement for the task		

▪ Access and interpret instructions		
▪ Ask questions to clarify understanding or gain more information		
▪ Record information/instruction properly		
▪ Interpret written instructions		
▪ Respond to work signage		
▪ Follow routine written instructions in sequence		
▪ Give feedback to the workplace supervisor		
▪ Use relevant communication methods to transmit instructions		
▪ Use appropriate non-verbal communication		
▪ Identify and follow channels of communication		
▪ Operate communication tools and equipment and identify and report faults		
▪ Convey information using appropriate forms		
▪ Complete all required documentation accurately and on time		
▪ Record workplace data using approved formats or templates		
▪ Pass written information/instruction to appropriate personnel		
▪ Attend meetings regularly and on time following well-disseminated agenda		
▪ Ensure meeting inputs are consistent with meeting purpose and established protocols		
▪ Express opinions without interruption		
▪ Process and implement meeting outputs		
▪ Interpret OHS policies and safe operating procedures		
▪ Identify and use personal protective equipment (PPE)		
▪ Identify and follow safety signs and symbols		
▪ Interpret response, evacuation procedures and other contingency as per standard		
▪ Apply OHS policies and procedures in the workplace		
▪ Recognise common health issues		
▪ Identify and follow common safety issues		
▪ Identify hazards and risks		
▪ Interpret hazards and risks assessment and controls		
▪ Respond to alarms and warning devices		
▪ Follow emergency response plans and procedures as appropriate to the nature of the emergency and according to workplace procedures		
▪ Follow first aid procedures for dealing with accidents, fires and emergencies whenever necessary within scope of responsibilities		
▪ Identify team goals and processes		
▪ Identify roles and responsibilities of team members		

▪ Identify relationships within team and with other work areas		
▪ Used effective interpersonal skills to interact with team members and to contribute to activities and objectives		
▪ Use formal and informal forms of communication effectively to support team achievement		
▪ Respect and value diversity in team functioning		
▪ Understand views and opinions of other team members and reflect accurately		
▪ Use workplace staff regulation correctly to assist communication		
▪ Identify and clarify duties, responsibilities, authorities, objectives and task requirements with team		
▪ Perform task in accordance with organizational and team requirements, specifications and workplace procedures		
▪ Support other members as required to ensure team achieves goals and requirements		
▪ Follow agreed reporting lines using standard operating procedures		
▪ Identify current and potential problems faced by team		
▪ Identify procedures for avoiding and managing problems		
▪ Solve problems effectively and in a manner that supports the team		
▪ Identify and access appropriate manuals		
▪ Check version and date of manual to ensure up-to-date specifications of tools, equipment, materials and procedures		
▪ Identify relevant drawings and specifications		
▪ Identify terms and abbreviations		
▪ Identify signs and symbols		
▪ Interpret drawings and specifications		
▪ Interpret schedules, dimensions and specifications contained in the drawings		
▪ Collect and pack manuals and documents		
▪ Store manuals and documents appropriately to prevent damage, ready access and updating of information where required		
▪ Identify hand tools		
▪ Interpret application of tools to job requirements		
▪ Check and verify usability of tools		
▪ Prepare hand tools and power tools		
▪ Identify sources of power supply for power tools		
▪ Use appropriate hand tools for the job		
▪ Apply proper and safe use and operation of hand tools		
▪ Observe safety precaution when using hand tools		
▪ Identify unsafe or faulty tools and mark for repair		

▪ Inspect power supply outlet and electrical cord and confirm safe for use in accordance with established workplace safety requirements		
▪ Apply proper sequence of operation in using power tools		
▪ Use power tools safely in accordance to manufacturer's operating specification		
▪ Remove dust and foreign matters from power tools in accordance to workplace standard		
▪ Check condition of tools after use		
▪ Apply appropriate lubricant after use and prior to storage		
▪ Check and calibrate measuring tools		
▪ Inspect and correct or replace defective tools, instruments, power tools and accessories		
▪ Comprehend scope, nature and major fields of shipbuilding sector in the industry		
▪ Comprehend profile of shipbuilding sector/industry in relation to Bangladesh employment condition		
▪ Outline trends and technologies relevant to the sector		
▪ Identify and interpret relevant policies and guidelines		
▪ Obtain and clarify instructions as to procedures in achieving quality		
▪ Identify job roles and responsibilities of ship pipe fitter for shipbuilding sector		
▪ Identify employee relationships within the shipbuilding sector		
▪ Identify common goals, objectives and tasks and clarify with appropriate persons		
▪ Determine individual tasks and agree on according to workplace environment		
▪ Identify and clarify workplace requirements		
▪ Interpret workplace practices		
▪ Use problem-solving strategies to address bottlenecks, inconsistencies and other concerns		
▪ Plan own work activities and communicate progress of work to relevant staff		
▪ Complete work activities based on workplace standards		
▪ Identify difficulties and bottlenecks and put forward solutions		
▪ Monitor own work against workplace standards and identify and act on areas for improvement		
▪ Apply effective interpersonal skills to interact with others and to contribute activities and objectives		
▪ Perform assigned tasks in accordance with job requirements, specifications and workplace environment		
▪ Confirm work requirements with colleagues		
▪ Understand basics of ship, shipbuilding and shipyard		

▪ Understand ships are build according to National and International rules such as Class Rule /ISO/IMO/SOLAS/MARPOL etc.		
▪ Understand General Arrangement plan (GA plan)		
▪ Introduce and identify shipbuilding terminology		
▪ Understand and identify different parts of a ship		
▪ Identify different location-wise name of a ship		
▪ Introduce and identify ship machineries		
▪ Understand and Identify key task of a ship pipe fitter		
▪ Introduce with types of ship piping system		
▪ State the name of some important ship pipping system		
▪ Locate piping work to be done in the ship		
▪ Identify different types of pipes used in ship piping work		
▪ Understand and identify piping symbols and colour code		
▪ Read and understood spool sheet drawing		
▪ Draw/sketch layout piping layout according to spool sheet /supplied drawing		
▪ Identify different elements of a spool sheet		
▪ Identify elbow, hangers, supports for ship piping works		
▪ Collect pipes, materials, tools, equipment for cutting, threading and bending pipes as per spool sheet		
▪ Cut, bend, bevel and mark pipes for particular pipe line		
▪ Place and set piping accessories according to drawing on board ship		
▪ Weld/solder or braze pipe as per piping drawing/spool sheet		
▪ Perform pipe bending for fresh water piping system		
▪ Connect pipes, elbow, flange, valves, reducer, nipple as per spool sheet for fresh water piping system		
▪ Inspect/test pipe fitting faults and welding faults for fresh water piping system		
▪ Connect pipes, elbow, flange, valves, reducer, nipple as per spool sheet/drawing for firefighting piping system		
▪ Install/fit pipe line for fresh water, sea water ballast, fuel system etc.		
▪ Read understand spool sheet drawing or fresh water piping system		
▪ Place circuit materials required for the specified circuit placed on the board		
▪ Connect and fit other accessories as per spool sheet /drawing		
▪ Understand and follow safety precautions for piping works		
▪ Wear proper d personal protective equipment (PPE)		
▪ Measure and cut pipe as per spool sheet		

▪ Cut and set collected conduits		
▪ Set up hangers and other accessories for particular pipping system		
▪ Able to follow proper procedure to secure hangers and accessories		
▪ Detect any faults during set up hangers and accessories		
▪ Follow proper colour codes for particular piping system		
▪ Perform testing for pipe leakage in particular piping system		
▪ Perform set up insert in the bulkhead to pass the pipping system		
▪ Perform flat/straight positional pipe fitting on deck		
▪ Perform set up vertical positional piping system		
▪ Perform pipe fitting along the ship internal side shell		
▪ Perform set up overhead positional piping system		
▪ Perform identify different types of valves		
▪ Perform set up valves with particular pipe lines		
▪ Perform identify strainer and perform tack weld for strainer		
▪ Perform set up strainer with pipe lines		
▪ Perform set up pump for pipe lines		
▪ Perform set up hydraulic piping system		
▪ Perform set up fire protection piping system in the ship		
▪ Identify key tasks of ship pipe fitter		
▪ Interpret piping system		
▪ Understand drawings, symbols and specifications		
▪ Identify colour codes and standards		
▪ Identify different types of pipes		
▪ Identify different types of valves		
▪ Identify different types of fittings		
▪ Identify different types of pumps		
▪ Identify different types of supports and fasteners		
▪ Identify types of welding and welding terminology		
▪ Identify different types of welding technique		
▪ Perform arc welding		
▪ Perform tack welding		
▪ Cut, thread and bevel pipes		
▪ Perform bend pipe with different angle		
▪ Perform 1 cut, 2 cut, 3 cut for manual pipe bending		

▪ Secure supports, hangers and guides		
▪ Clean and test piping		
▪ Install fresh water piping system		
▪ Install sea water piping system		
▪ Install fuel oil piping system		
▪ Install hydraulic pipping system		
▪ Clean service parts of the pipes by using specified cleaning agent and tools in accordance with manufacturer's specification		
▪ Perform pipe fabrication works for piping		
▪ Able to mark and store and assemble pipes for different system maintaining colour codes		
▪ Conduct hydraulic test and note down results in accordance with specification		
▪ Clean tools and equipment as per standard		
▪ Prepare cleaning tools and equipment for cleaning		
▪ Dispose waste materials		
▪ Store tools and equipment as per standard		
▪ Report to supervisor		
I agree to undertake assessment in the knowledge that the information gathered will only be used for educational and professional development purposes, and can only be accessed by concerned assessment personnel and my manager/supervisor.		
Candidate's signature:		**Date:**

PART C – THE ASSESSMENT

Assessment Agreement – Ship Piping

The purpose of assessment is to confirm that you can perform to the standards expected in the workplace of an occupation, as expressed in the competency standards (after completion of self-assessment and in agreement with assessor).

To help achieve this, an assessment agreement is required to navigate both you and the assessor through the assessment process.

The assessment agreement is designed to provide a clear understanding of what and how you will be assessed and to nominate the tools that may be used to collect the assessment evidence.

You, the assessor and/or workplace supervisor should agree on the assessment requirements, dates and deadlines.

Therefore, to attain the Certificate of **Ship Piping** you must demonstrate competence in the following units, as established in the assessment agreement:

CODE	UNIT OF COMPETENCY
Generic Competencies	
SEIP-SBD-SPF-01-G	Use basic mathematical concepts
SEIP-SBD-SPF-02-G	Apply occupational health and safety (OHS) practice in the workplace
SEIP-SBD-SPF-03-G	Carry out workplace interaction
SEIP-SBD-SPF-04-G	Operate in a team environment
Sector-specific Competencies	
SEIP-SBD-SPF-01-S	Work effectively in the shipbuilding sector
SEIP-SBD-SPF-02-S	Use hand and power tools
Occupation-specific Competencies	
SEIP-SBD-SPF-01-O	Identify basic ship piping work
SEIP-SBD-SPF-02-O	Identify pipe and pipe fittings components
SEIP-SBD-SPF-03-O	Perform welding works
SEIP-SBD-SPF-04-O	Perform pipe fabrication works
SEIP-SBD-SPF-05-O	Perform installation of piping system

After successful completion of learning and assessment, you shall be awarded with a certificate.

Assessment Agreement	
Occupation:	Certificate in Ship Piping
Assessment Centre:	
Candidate Name:	
Assessor Name:	
Unit of Competency	
Generic Competencies	
SEIP-SBD-SPF-01-G	Use basic mathematical concepts
SEIP-SBD-SPF-02-G	Apply occupational health and safety (OHS) practice in the workplace
SEIP-SBD-SPF-03-G	Carry out workplace interaction
SEIP-SBD-SPF-04-G	Operate in a team environment
Sector-specific Competencies	
SEIP-SBD-SPF-01-S	Work effectively in the shipbuilding sector
SEIP-SBD-SPF-02-S	Use hand and power tools
Occupation-specific Competencies	
SEIP-SBD-SPF-01-O	Identify basic ship piping work
SEIP-SBD-SPF-02-O	Identify pipe and pipe fittings components
SEIP-SBD-SPF-03-O	Perform welding works
SEIP-SBD-SPF-04-O	Perform pipe fabrication works
SEIP-SBD-SPF-05-O	Perform installation of piping system

Resources Required for Assessment

Candidates must have access to the following:

- copies of activities, questions, projects nominated by the assessor
- relevant organisational policies, protocols and procedural documents (if required)
- devices or tools to record answers
- appropriate actual or simulated workplace
- all necessary tools and equipment used in performance of the work-based task
- any other resources normally used in the workplace

Assessment Instructions

Candidates should respond to the formative and summative assessments either verbally or in writing as agreed with the assessor. Written responses can be recorded in the spaces provided (if more space is required attach additional pages) or submitted in a word-processed document.

If candidates answer verbally, the assessor should record their answers in detail.

Candidates should also undertake observable tasks that provide evidence of performance. The assessor must provide instruction to candidates on what is expected during observation, and arrange a suitable time and location for demonstration of these skills.

Candidates must fully understand what they are required to do to complete these assessment tasks successfully, then sign the declaration.

Performance Standards
To receive a **satisfactory** result for the assessments, candidates must complete all activities, questions, projects, and tasks nominated by the assessor, to the required standard. Completion of all tasks for a unit of competency, to a satisfactory level, will contribute to an assessment of competence for that specific individual unit (or units if holistic assessment approach is taken). Successful completion of all the units of competency that comprise of the qualification Ship Piping, will result in the candidate being issued with the relevant, nationally recognised certificate. Assessors must clearly explain the required performance standards.
Declaration
I declare that: ▪ the assessment requirements have been clearly explained to me ▪ all the work completed towards assessment will be my own ▪ cheating and plagiarism are unacceptable

Candidate Signature:		**Date:**	
Assessor Signature:		**Date:**	

PART D – ASSESSMENT TOOLS

Specific Instructions to Assessor

Please read carefully and prepare as necessary:

1. The assessor shall (practical demonstration assessment activities):
    - provide the candidate with the necessary tools, equipment, machinery and materials for completion of one (1) set of the following practical demonstration activities:
        - **Set A:**
            - Perform simple spool fabrication and assembly for pipes
            - Perform assembly of galvanized steel pipe for fresh water
        - **Set B:**
            - Perform simple spool fabrication and assembly for pipes
            - Perform assembly of galvanized steel pipe for sea water
        - **Set C:**
            - Perform simple spool fabrication and assembly for pipes
            - Perform assembly of galvanized steel pipe for firefighting
    - provide the candidate with the copy of the specific instruction to candidate
    - allow practical demonstration to be performed within six (6) hours including preparation of the materials
    - ensure that the candidate **FULLY** understands the instructions before proceeding to the performance of the assessment activity
    - allow fifteen (15) minutes for the candidate to familiarise themselves with the resources to be used during the practical demonstrations
    - ensure that the candidate is wearing appropriate personal protective equipment (PPE) before allowing them to proceed with the assessment activity
2. Assessment shall be based on the performance criteria in each of the units of competency. The evidence gathering method shall be comprised of:

    (a) Written Test (1 hour) – **knowledge evidence**

    (b) Practical Demonstration (6 hours) – **performance evidence**

    The practical demonstration activities will be divided into two (2) tasks (contained in one set):

    (i) Practical Demonstration 1 (3 hours)

    (ii) Practical Demonstration 2 (3 hours)
3. Final assessment is your responsibility as the accredit/certified assessor.
4. At the conclusion of each assessment activity, you will provide feedback to the candidate of the assessment result. The feedback will indicate whether the candidate is:

    ❑ **COMPETENT**

    ❑ **NOT YET COMPETENT**

5. The list of tools, equipment, machinery and materials to be provided for completion of the practical demonstration assessment activities can be found at:

   - Set A – Practical Demonstration 1 page 41
   - Set A – Practical Demonstration 2: page 48
   - Set B – Practical Demonstration 1: page 53
   - Set B – Practical Demonstration 2: page 59
   - Set C – Practical Demonstration 1: page 65
   - Set C – Practical Demonstration 2: page 72

Specific Instructions to Candidate

You should respond to the assessment either in writing or verbally as agreed with the assessor. Written responses can be recorded in the spaces provided; if more space is required attach additional pages or submit a word-processed document.

If you answer verbally, the assessor should record your answers in detail. Please check your recorded answers carefully and thoroughly to ensure that they are accurate.

You may also be undertaking observable activities (i.e. practical demonstration) that provide evidence of performance. The assessor must provide you with clear instructions on what is expected during this type of assessment, and arrange a suitable time and location for demonstration of these skills.

To receive a satisfactory result for the assessments, you must complete all of the assessment activities; including questions, projects and tasks nominated by the assessor, to the required standard.

This assessment is based upon the units of competency in Ship Piping. Using the performance criteria as a benchmark, evidence will be gathered through:

1. Written Test (1 hour) – a variety of multiple-choice, true of false and short answer theory questions to support your competence with regard to the required knowledge (**knowledge evidence**).

2. Practical Demonstration (6 hours) – observable tasks outlined in the elements and performance criteria of the units of competency, completed to support a judgement of satisfactory performance to the required standard (**performance evidence**).

   There will be one (1) set of practical demonstration activities to complete. The assessor will direct you as to which 'set' you will be required to complete out of the following:

   - **Set A:**
     - Perform simple spool fabrication and assembly for pipes (3 hours)
     - Perform assembly of galvanized steel pipe for fresh water (3 hours)
   - **Set B:**
     - Perform simple spool fabrication and assembly for pipes (3 hours)
     - Perform assembly of galvanized steel pipe for sea water (3 hours)
   - **Set C:**
     - Perform simple spool fabrication and assembly for pipes (3 hours)
     - Perform assembly of galvanized steel pipe for firefighting (3 hours)

3. The assessor will provide all necessary tools, equipment, machinery and materials required to complete each assessment activity.

4. These assessments cover all units of competency for Ship Piping.

5. The assessor will provide you with feedback of your performance after completion of each assessment activity. This feedback shall indicate whether you are:

   ❑ **COMPETENT**

   ❑ **NOT YET COMPETENT**

6. Complete of all assessment activities, to a satisfactory level, will contribute to a final assessment of competence.

Written Test

WRITTEN TEST - INSTRUCTIONS	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in Ship Piping
Unit of Competency	
Generic Competencies	
SEIP-SBD-SPF-01-G	Use basic mathematical concepts
SEIP-SBD-SPF-02-G	Apply occupational health and safety (OHS) practice in the workplace
SEIP-SBD-SPF-03-G	Carry out workplace interaction
SEIP-SBD-SPF-04-G	Operate in a team environment
Sector-specific Competencies	
SEIP-SBD-SPF-01-S	Work effectively in the shipbuilding sector
SEIP-SBD-SPF-02-S	Use hand and power tools
Occupation-specific Competencies	
SEIP-SBD-SPF-01-O	Identify basic ship piping work
SEIP-SBD-SPF-02-O	Identify pipe and pipe fittings components
SEIP-SBD-SPF-03-O	Perform welding works
SEIP-SBD-SPF-04-O	Perform pipe fabrication works
SEIP-SBD-SPF-05-O	Perform installation of piping system
Assessment Centre:	
Date of Assessment:	
Time of Assessment:	
Instructions:	
Read and understand the directions carefully: ▪ this written examination is based on the performance criteria from all the units of competency in Elec in Ship Piping ▪ this assessment activity will be used to measure your underpinning knowledge ▪ write your answers on the paper provided ▪ answer all the questions as best as possible ▪ you have 1 (one) hour to complete this test	

WRITTEN TEST		
Multiple Choice		
This is a **multiple-choice** of test. Choose the appropriate answer and circle the letter that corresponds with your answer.		
1.	Which is the 50 % of 250?	a. 50 b. 75 c. 125 d. 150
2.	The diameter of a pipe is 100 mm. What is the circumference in millimeters?	a. 214 b. 314 c. 324 d. 224
3.	Ways to build relationships within a team may include?	a. Discuss team member work styles b. Define “team personality” c. Discuss individual goals, hopes, concerns d. All of the above
4.	What does a visual workplace improve?	a. Communication b. Facility operation c. Both a and b d. None of the above
5.	When discussing reporting relationships, what important organisational principle of reporting needs to be taken into consideration?	a. Chain of command b. Chain reaction c. Designation list d. None of the above
6.	What potentially hazardous situation which, if not avoided, may result in minor or moderate injury?	a. Danger b. Caution c. Warning d. Emergency
7.	Which is not a measuring tool?	a. Ammeter b. Grinders c. Multi meter d. Megger
8.	What is the Bow?	a. Forward side of the ship b. After side of the sip

		c. Right side of the ship d. Left side of the sip
9.	What is the colour code for a fresh water pipe line?	a. Green b. Blue c. Yellow d. Brown
10.	What is the most common type of steel pipe used on a ship?	a. Stainless b. Mild c. Carbon d. Cast
11.	What type of welding is commonly perform by a ship pipe fitter?	a. Fillet b. Butt c. Tack d. Lap
12.	Which one is a cutting technique?	a. Undercut b. Template c. Porosity d. Slag inclusion
True or False Quiz		
Tick (√) the box corresponding to the correct answer.		
13.	Right side of the ship is called star board.	True ☐ False ☐
14.	A reducer is not used in pipe fitting works.	True ☐ False ☐
Fill in the Missing Blanks		
Write the word or group of words needed to complete the following sentences.		
15.	_____ is used to catch a person to avoid from falling while working at height.	
16.	A simple hand tool which is used to measure thickness or diameter of a pipe is known as a _____.	
Short Answer		
Write a short answer in the space provided (not to exceed more than approximately sixty (60) words).		
17.	Why is a piping system necessary?	

18.	What is a spool sheet?	
19.	Why is tack welding used in ship piping?	
20.	What actions will you take in case two of your co-workers were engaged in a conflict at work?	

Feedback to candidate:

Assessment decision for this assessment activity:

☐ **Competent** ☐ **Not Yet Competent**

Candidate Signature:		**Date:**	
Assessor Signature:		**Date:**	

Written Test - Answers

Answers are highlighted in **bold** and ***italics*****.**

Multiple Choice		
1.	Which is the 50 % of 250?	a. 50 b. 75 ***c. 125*** d. 150
2.	The diameter of a pipe is 100 mm. What is the circumference in millimeters?	a. 214 ***b. 314*** c. 324 d. 224
3.	Ways to build relationships within a team may include?	a. Discuss team member work styles b. Define "team personality" c. Discuss individual goals, hopes, concerns ***d. All of the above***
4.	What does a visual workplace improve?	a. Communication b. Facility operation ***c. Both a and b*** d. None of the above
5.	When discussing reporting relationships, what important organisational principle of reporting needs to be taken into consideration?	***a. Chain of command*** b. Chain reaction c. Designation list d. None of the above
6.	What potentially hazardous situation which, if not avoided, may result in minor or moderate injury?	a. Danger ***b. Caution*** c. Warning d. Emergency
7.	Which is not a measuring tool?	a. Ammeter ***b. Grinders*** c. Multi meter d. Megger
8.	What is the Bow?	***a. Forward side of the ship*** b. After side of the ship c. Right side of the ship

		d. Left side of the ship
9.	What is the colour code for a fresh water pipe line?	a. Green ***b. Blue*** c. Yellow d. Brown
10.	What is the most common type of steel pipe used on a ship?	a. Stainless steel ***b. Mild steel*** c. Carbon steel d. Cast steel
11.	What type of welding is commonly perform by a ship pipe fitter?	a. Fillet b. Butt ***c. Tack*** d. Lap
12.	Which one is a cutting technique?	a. Undercut ***b. Template*** c. Porosity d. Slag inclusion
True or False Quiz		
13.	Right side of the ship is called star board.	***True*** √ False ☐
14.	A reducer is not used in pipe fitting works.	True ☐ ***False*** √
Fill in the Missing Blanks		
15.	***Safety belt/harness*** is used to catch a person to avoid from falling while working at height.	
16.	A simple hand tool which is used to measure thickness or diameter of a pipe is known as a **measuring tape**.	
Short Answer		
17.	Why is a piping system necessary?	***It is used for providing shipboard drainage, ballast, fire protection, fresh water supply, sewage disposal, heat and steam supply, ventilation and air conditioning, refrigeration, and compressed air.***
18.	What is a spool sheet?	***A pipe spool is an assembly of pipe, flanges and fittings that is defined as part of a particular piping system.*** ***Pipe spools are assembled in the pipe shop in order to minimize the amount of pipe fitting and welding required during subsequent construction stages (on-unit, on-block, on-board).***

19.	Why is tack welding used in ship piping?	***Tack welding is the temporary welding operation on items before the final welding operations take place.*** ***Tack welding is a major part of welding which are used as a temporary means to hold the components in the proper location, alignment, and distance apart, while welding.***
20.	What actions will you take in case two of your co-workers were engaged in a conflict at work?	***Make a written report and submit the same to your line manager.***

Set A: Practical Demonstration 1

PRACTICAL DEMONSTRATION 1	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in Ship Piping
Task:	Perform simple spool fabrication and assembly for pipes
Assessment Centre:	
Date of Assessment:	
Time of Assessment:	

Instructions:

Read and understand the directions carefully:

- this practical demonstration is based on the performance criteria from all or some of the units of competency in Ship Piping
- this assessment activity will be used to measure your underpinning skills
- you will have fifteen (15) minutes to familiarise yourself with the resources to be used
- you have three (3) hours to complete this demonstration

Procedure:

- observe and follow all health and safety (OHS) requirements at all times
- read the specification information provided
- collect all materials needed to complete the task
- perform the task within the given time

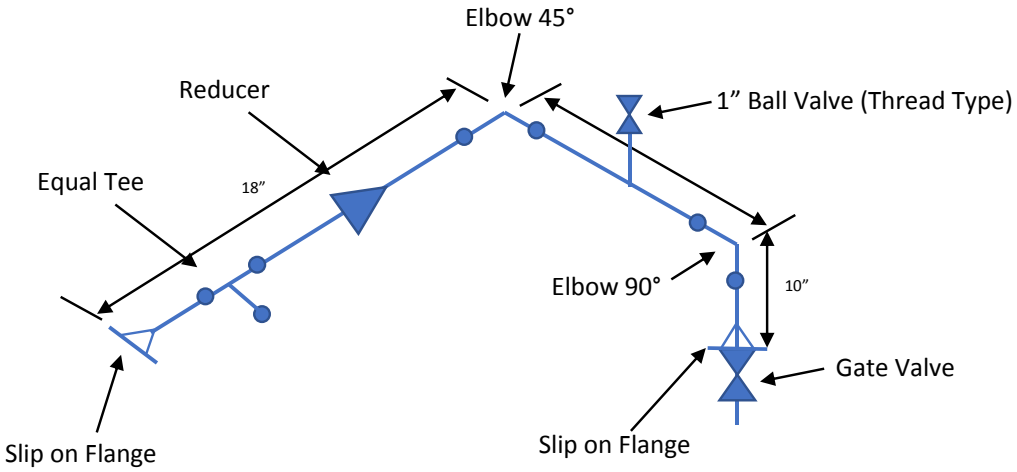
Job Specification Information:

1. Identify, read and interpret job specifications, drawings and other workplace documents.
2. Identify and collect required tools, equipment, machinery and materials required for task.
3. Inspect worksite for hazards and implement appropriate controls (if necessary).
4. Identify and collect appropriate PPE.
5. Inspect and check tools, equipment, machinery and materials as per job specification.
6. Identify relevant components of piping system.
7. Measure and calculate pipe diameter, thickness and length.
8. Prepare work pieces according to technical diagram or drawing.
9. Perform cutting, threading, bevelling and bending as required.
10. Mark pipes according to technical diagram or drawing.
11. Perform joining of pipes with elbows, valves and other accessories.
12. Carry out welding of pipes using appropriate technique.
13. Assemble and fix all fittings, accessories and supports.
14. Perform leak test as required.
15. Clean, maintain and store tools, equipment and machinery.
16. Clean work area and dispose of waste materials

Drawing, Plan, Diagram or Sketch:

The drawing below is the actual installation requirement for task. During the installation process, you are to ensure:

- Proper use of tools and fabrication technique
- Measurements conducted according to drawing/layout
- Levelling and straightness
- Use proper elbows/bending angle
- No burrs and sharp edges
- Stability of all assembled components



Specification:

Pipe Size (Schedule 40) – 3"(Ø 88.9 X 4.5) & 2" (Ø 60.3 X 4)

Elbow - 90° (1.5 D, 3 cut)

Flange – Thickness 16 mm, No of hole 8, Hole dia 18 mm

Reducer – 3" X 2"

Tee – 3" X 2" X 3"

Figure 1: Drawing for simple pipe spool fabrication works.

Resources Required:

Tools:	Cutting sets Grinding machine Centre punch Level bar Ball hammer Spirit level Soft stone Measuring tape Files Power brush Steel brush Adjustable wrench Tip cleaners Contour marker Plumb bob Spark lighter

	Steel Ruler Try square
Equipment:	Welding set
Machinery:	N/A
Materials:	As mentioned in the job specification above
PPE:	Apron Mask Safety helmet Safety goggles Gloves (long) Safety shoes

Set A: Practical Demonstration 1 – Observation Checklist

PRACTICAL DEMONSTRATION 1 – OBSERVATION CHECKLIST	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in Ship Piping
Task:	Perform simple spool fabrication and assembly for pipes
Assessment Centre:	
Date of Assessment:	
Instructions:	The tasks listed on the observation checklist of the practical demonstration will provide performance evidence of the candidate. Performance can be observed in an actual workplace or in a simulated working environment. If performance of particular tasks cannot be observed, you may ask the candidate to explain a procedure or enter into a discussion on the subject. The assessment activity (practical demonstration) should: ▪ fit industry requirements in which the assessment will be conducted ▪ adhere, where possible, to reasonable adjustment practices ▪ ensure that suitable performance benchmarks are applied and explained to the candidate

OBSERVATION RECORD		
Performance Criteria	Place a ✓ to show if evidence has been demonstrated competently	
	Yes	**No**
Identified and interpreted relevant policies, guidelines and workplace documents.	☐	☐
Identified and interpreted relevant drawings and specifications.	☐	☐
Collected information about industry from multiple sources (as required).	☐	☐
Interpreted and applied information to day-to-day work activities.	☐	☐
Applied OSH policies and procedures in the workplace.	☐	☐
Identified hazards and risks.	☐	☐
Implemented controls for identified hazards and risks.	☐	☐
Identified and used personal protective equipment (PPE).	☐	☐
Identified and followed safety signs and symbols.	☐	☐
Identified tools, equipment and machinery required for installation.	☐	☐
Inspected and checked tools, equipment and machinery as per standard operating procedure.	☐	☐

Calculated quantity of materials required as per job specification.	☐	☐
Inspected and checked the materials as per job specification.	☐	☐
Performed measurements and calculations as per job specifications.	☐	☐
Identified key areas of a ship from model or drawing.	☐	☐
Identified and located key machines installed on a ship.	☐	☐
Identified and described components of ship piping system.	☐	☐
Identified and explained ship piping system.	☐	☐
Identified components of spool sheet drawing.	☐	☐
Identified and described colour codes as per job requirement.	☐	☐
Identified and selected different types of pipe.	☐	☐
Identified and selected different types of valve.	☐	☐
Identified and selected different types of fittings.	☐	☐
Identified different types of pumps, their components and function.	☐	☐
Identified and selected different types of hangers, supports, guides and fasteners.	☐	☐
Identified and described different types of welding.	☐	☐
Identified and described different types of welding techniques.	☐	☐
Prepared edge and maintained proper gap.	☐	☐
Performed welding following correct welding procedure.	☐	☐
Identified and explained welding faults and tests.	☐	☐
Identified cutting techniques and selected appropriate technique as per job requirement.	☐	☐
Performed cutting as per specification and job requirement.	☐	☐
Performed threading of pipe, bevelling and grinding is as per specification.	☐	☐
Bent pipes with different angle using bending machine.	☐	☐
Identified pipe supporting and fastening process.	☐	☐
Carried out pipe support and fastening process is as per job requirement.	☐	☐
Carried out cleaning and inspection of piping assembly.	☐	☐
Applied testing methods for piping system and assembly.	☐	☐
Cut pipes within tolerance.	☐	☐
Threaded pipes using threading machine or dice (as required).	☐	☐
Carried out pressure testing of piping spool.	☐	☐
Carried out pickling and cleaning of piping spools.	☐	☐
Fixed different types of fittings as per drawings.	☐	☐
Installed/assembled piping system as per job requirement.	☐	☐

Checked assembly to ensure it is contaminated free.	☐	☐
Monitored own work against workplace standards and identified and acted upon areas for improvement.	☐	☐
Completed work activities based on workplace standards.	☐	☐
Tools and equipment are cleaned, maintained and stored.	☐	☐
Defective or faulty tools and equipment are detected and reported according to standard operating procedure.	☐	☐
Workplace is cleaned and waste material disposed of.	☐	☐
Appropriate lines of communication are maintained with supervisors and colleagues.	☐	☐
Workplace interactions are conducted in courteous manner to gather and convey information.	☐	☐
Used appropriate medium to transfer information and ideas.	☐	☐
Responsibilities as a team member are performed.	☐	☐
Tasks are performed in accordance with workplace procedures.	☐	☐
Other teammates' tasks are identified and provided support.	☐	☐
Active participation is ensured, opinions are expressed and heard.	☐	☐
Inputs are provided and interpreted in line with the meeting purpose.	☐	☐
Problems faced at the individual and team level are identified and showed insight into the root-causes of the problems.	☐	☐
Looked beyond the obvious and did not stop at the first answers.	☐	☐
Confidentiality is maintained.	☐	☐
Inappropriate and conflicting situations are avoided.	☐	☐
The team is encouraged through sharing information or expertise, working together to solve problems, and putting team success first.	☐	☐
Feedback to candidate:		
Assessment decision for this assessment activity: ☐ **Competent** ☐ **Not Yet Competent**		

Candidate Signature:		**Date:**	
Assessor Signature:		**Date:**	

Set A: Practical Demonstration 2

PRACTICAL DEMONSTRATION 2	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in Ship Piping
Task:	Perform assembly of galvanised steel pipe for fresh water and leakage test
Assessment Centre:	
Date of Assessment:	
Time of Assessment:	

Instructions:

Read and understand the directions carefully:

- this practical demonstration is based on the performance criteria from all or some of the units of competency in Ship Piping
- this assessment activity will be used to measure your underpinning skills
- you will have fifteen (15) minutes to familiarise yourself with the resources to be used
- you have three (3) hours to complete this demonstration

Procedure:

- observe and follow all health and safety (OHS) requirements at all times
- read the specification information provided
- collect all materials needed to complete the task
- perform the task within the given time

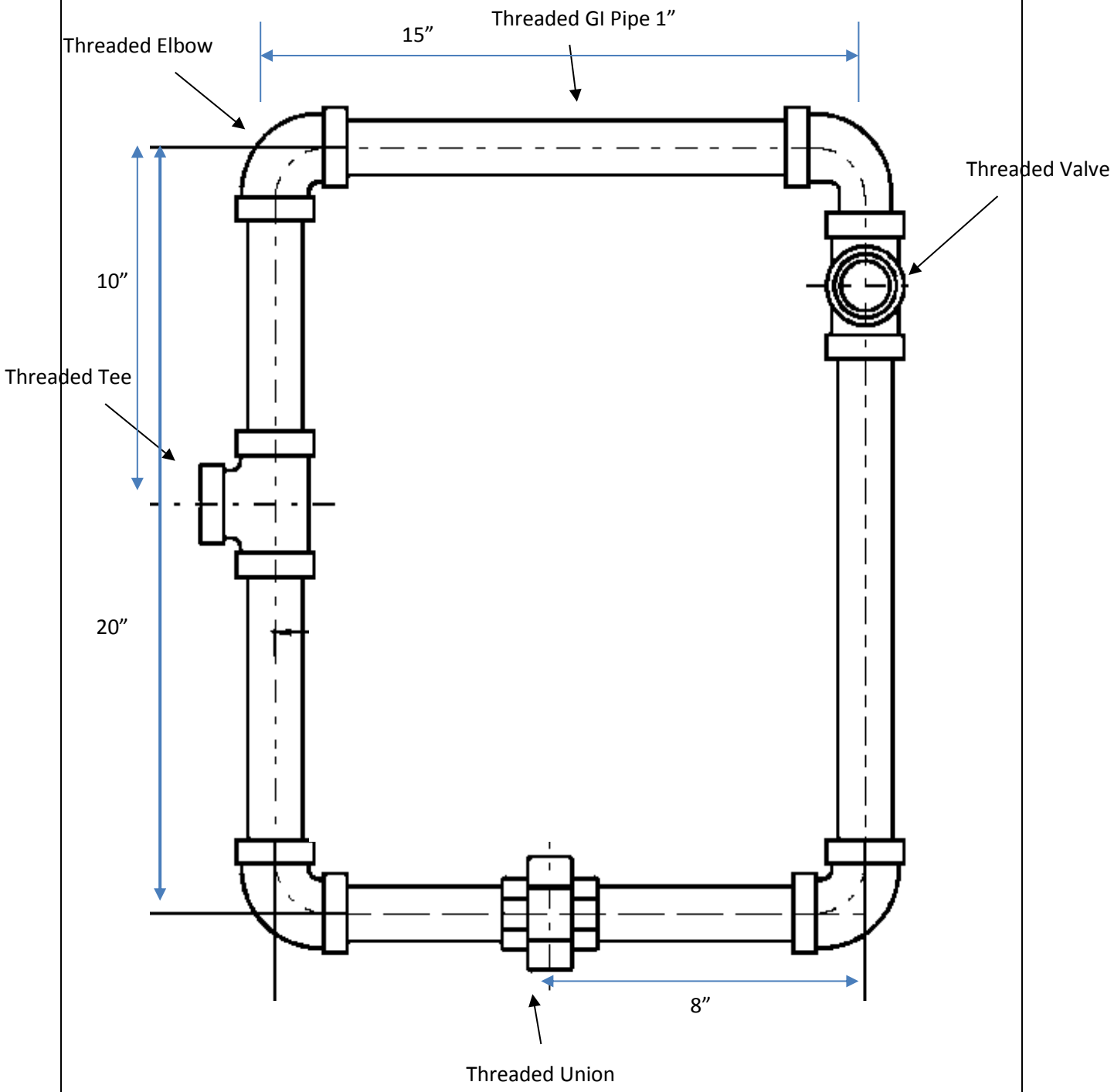
Job Specification Information:

1. Identify, read and interpret job specifications, drawings and other workplace documents.
2. Identify and collect required tools, equipment, machinery and materials for task.
3. Inspect worksite for hazards and implement appropriate controls (if necessary).
4. Identify and collect appropriate PPE.
5. Inspect and check tools, equipment, machinery and materials as per job specification.
6. Measure and calculate pipe diameter, thickness and length.
7. Prepare work pieces according to technical diagram or drawing.
8. Perform cutting, threading, bevelling and bending as required.
9. Mark pipes according to technical diagram or drawing.
10. Perform joining of pipes with elbows, valves and other accessories.
11. Carry out welding of pipes using appropriate technique.
12. Assemble and fix all fittings, accessories and supports.
13. Install fresh water piping system.
14. Check piping assembly and ensure it is contaminated free.
15. Perform leak test as required.
16. Clean, maintain and store tools, equipment and machinery.
17. Clean work area and dispose of waste materials.

Drawing, Plan, Diagram or Sketch:

Specifications:

1. GI threaded pipe 1” – 6 pieces (both sides threaded)
2. Threaded elbow 1” – 4 pieces
3. Union joint 1” – 1 piece
4. Threaded tee 1” – 1 piece
5. Threaded ball valve 1” – 1 piece



Resources Required:	
Tools:	Cutting sets Grinding machine Centre punch Level bar Ball hammer Spirit level Soft stone Measuring tape Files Power brush Steel brush Adjustable wrench Tip cleaner Contour marker Plumb bob Spark lighter
Equipment:	Welding set
Machinery:	N/A
Materials:	Metal pipes Fittings Flange Bolts and nuts Gaskets Valves
PPE:	Apron Mask Safety helmet Safety goggles Gloves (long) Safety shoes

Set A: Practical Demonstration 2 – Observation Checklist

PRACTICAL DEMONSTRATION 2 – OBSERVATION CHECKLIST	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in Ship Piping
Task:	Perform assembly of galvanised steel pipe for fresh water and leakage test
Assessment Centre:	
Date of Assessment:	
Instructions:	The tasks listed on the observation checklist of the practical demonstration will provide performance evidence of the candidate. Performance can be observed in an actual workplace or in a simulated working environment. If performance of particular tasks cannot be observed, you may ask the candidate to explain a procedure or enter into a discussion on the subject. The assessment activity (practical demonstration) should: ▪ fit industry requirements in which the assessment will be conducted ▪ adhere, where possible, to reasonable adjustment practices ▪ ensure that suitable performance benchmarks are applied and explained to the candidate

OBSERVATION RECORD		
Performance Criteria	Place a ✓ to show if evidence has been demonstrated competently	
	Yes	**No**
Identified and interpreted relevant policies, guidelines and workplace documents.	☐	☐
Identified and interpreted relevant drawings and specifications.	☐	☐
Collected information about industry from multiple sources (as required).	☐	☐
Interpreted and applied information to day-to-day work activities.	☐	☐
Applied OSH policies and procedures in the workplace.	☐	☐
Identified hazards and risks.	☐	☐
Implemented controls for identified hazards and risks.	☐	☐
Identified and used personal protective equipment (PPE).	☐	☐
Identified and followed safety signs and symbols.	☐	☐
Identified tools, equipment and machinery required for installation.	☐	☐
Inspected and checked tools, equipment and machinery as per standard operating procedure.	☐	☐

Calculated quantity of materials required as per job specification.	☐	☐
Inspected and checked the materials as per job specification.	☐	☐
Performed measurements and calculations as per job specifications.	☐	☐
Identified key areas of a ship from model or drawing.	☐	☐
Identified and located key machines installed on a ship.	☐	☐
Identified and described components of ship piping system.	☐	☐
Identified and explained ship piping system.	☐	☐
Identified components of spool sheet drawing.	☐	☐
Identified and described colour codes as per job requirement.	☐	☐
Identified and selected different types of pipe.	☐	☐
Identified and selected different types of valve.	☐	☐
Identified and selected different types of fittings.	☐	☐
Identified different types of pumps, their components and function.	☐	☐
Identified and selected different types of hangers, supports, guides and fasteners.	☐	☐
Identified and described different types of welding.	☐	☐
Identified and described different types of welding techniques.	☐	☐
Prepared edge and maintained proper gap.	☐	☐
Performed welding following correct welding procedure.	☐	☐
Identified and explained welding faults and tests.	☐	☐
Identified cutting techniques and selected appropriate technique as per job requirement.	☐	☐
Performed cutting as per specification and job requirement.	☐	☐
Performed threading of pipe, bevelling and grinding as per job specification.	☐	☐
Bent pipes with different angle using bending machine.	☐	☐
Identified pipe supporting and fastening process.	☐	☐
Carried out pipe support and fastening process is as per job requirement.	☐	☐
Carried out cleaning and inspection of piping assembly.	☐	☐
Applied testing methods for piping system and assembly.	☐	☐
Cut pipes within tolerance.	☐	☐
Threaded pipes using threading machine or dice (as required).	☐	☐
Carried out pressure testing of piping spool.	☐	☐
Carried out pickling and cleaning of piping spools.	☐	☐
Fixed different types of fittings as per drawings.	☐	☐
Installed fresh water piping system as per job requirement.	☐	☐
Checked assembly to ensure it is contaminated free.	☐	☐

Monitored own work against workplace standards and identified and acted upon areas for improvement.	☐	☐
Completed work activities based on workplace standards.	☐	☐
Tools and equipment are cleaned, maintained and stored.	☐	☐
Defective or faulty tools and equipment are detected and reported according to standard operating procedure.	☐	☐
Workplace is cleaned and waste material disposed of.	☐	☐
Appropriate lines of communication are maintained with supervisors and colleagues.	☐	☐
Workplace interactions are conducted in courteous manner to gather and convey information.	☐	☐
Used appropriate medium to transfer information and ideas.	☐	☐
Responsibilities as a team member are performed.	☐	☐
Tasks are performed in accordance with workplace procedures.	☐	☐
Other teammates' tasks are identified and provided support.	☐	☐
Active participation is ensured, opinions are expressed and heard.	☐	☐
Inputs are provided and interpreted in line with the meeting purpose.	☐	☐
Problems faced at the individual and team level are identified and showed insight into the root-causes of the problems.	☐	☐
Looked beyond the obvious and did not stop at the first answers.	☐	☐
Confidentiality is maintained.	☐	☐
Inappropriate and conflicting situations are avoided.	☐	☐
The team is encouraged through sharing information or expertise, working together to solve problems, and putting team success first.	☐	☐

Feedback to candidate:

Assessment decision for this assessment activity:

☐ **Competent** ☐ **Not Yet Competent**

Candidate Signature:		**Date:**	
Assessor Signature:		**Date:**	

Set B: Practical Demonstration 1

PRACTICAL DEMONSTRATION 1	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in Ship Piping
Task:	Perform simple spool fabrication and assembly for pipes
Assessment Centre:	
Date of Assessment:	
Time of Assessment:	

Instructions:

Read and understand the directions carefully:

- this practical demonstration is based on the performance criteria from all or some of the units of competency in Ship Piping
- this assessment activity will be used to measure your underpinning skills
- you will have fifteen (15) minutes to familiarise yourself with the resources to be used
- you have three (3) hours to complete this demonstration

Procedure:

- observe and follow all health and safety (OHS) requirements at all times
- read the specification information provided
- collect all materials needed to complete the task
- perform the task within the given time

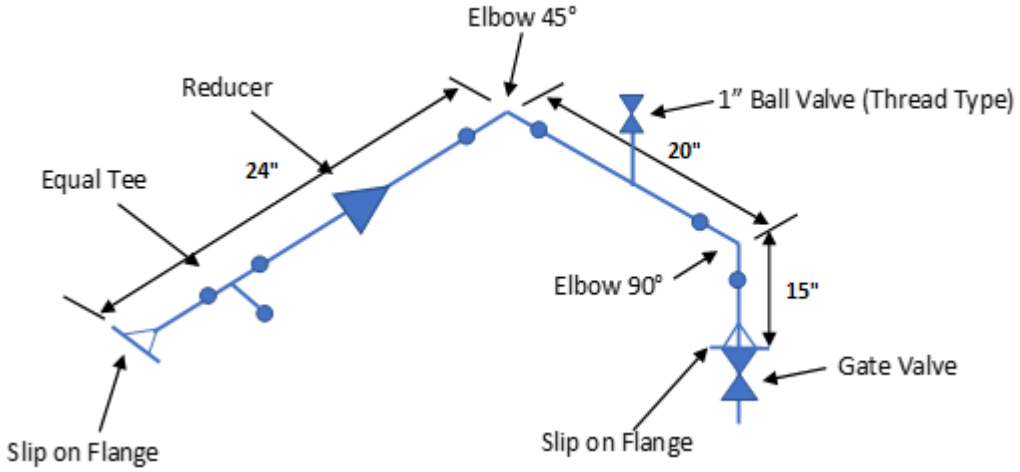
Job Specification Information:

1. Identify, read and interpret job specifications, drawings and other workplace documents.
2. Identify and collect required tools, equipment, machinery and materials required for task.
3. Inspect worksite for hazards and implement appropriate controls (if necessary).
4. Identify and collect appropriate PPE.
5. Inspect and check tools, equipment, machinery and materials as per job specification.
6. Identify relevant components of piping system.
7. Measure and calculate pipe diameter, thickness and length.
8. Prepare work pieces according to technical diagram or drawing.
9. Perform cutting, threading and bevelling as required.
10. Mark pipes according to technical diagram or drawing.
11. Perform joining of pipes with elbows, valves and other accessories.
12. Carry out welding of pipes using appropriate technique.
13. Assemble and fix all fittings, accessories and supports.
14. Perform leak test as required.
15. Clean, maintain and store tools, equipment and machinery.
16. Clean work area and dispose of waste materials

Drawing, Plan, Diagram or Sketch:

The drawing below is the actual installation requirement for task. During the installation process, you are to ensure:

- Proper use of tools and fabrication technique
- Measurements conducted according to drawing/layout
- Levelling and straightness
- Use proper elbows/bending angle
- No burrs and sharp edges
- Stability of all assembled components



Specification:

Pipe Size (Schedule 40) – 3"(Ø 88.9 X 4.5) & 2" (Ø 60.3 X 4)

Elbow - 90° (1.5 D, 3 cut)

Flange – Thickness 16 mm, No of hole 8, Hole dia 18 mm

Reducer – 3" X 2"

Tee – 3" X 2" X 3"

Figure 1: Simple pipe spool fabrication works.

Note:

Figure 2 shows an example of a pipe spool with relatively simple configuration. It shows that the pipe spool can at least be fabricated by two different sequences from the same raw materials. Fabrication sequence1 requires three operations to produce the final product while the second sequence only needs two.

Resources Required:	
Tools:	Cutting sets Grinding machine Centre punch Level bar Ball hammer Spirit level Soft stone Measuring tape Files

	Power brush Steel brush Adjustable wrench Tip cleaners Contour marker Plumb bob Spark lighter Steel Ruler Try square
Equipment:	Welding set
Machinery:	N/A
Materials:	As mentioned in the job specification above
PPE:	Apron Mask Safety helmet Safety goggles Gloves (long) Safety shoes

Set B: Practical Demonstration 1 – Observation Checklist

PRACTICAL DEMONSTRATION 1 – OBSERVATION CHECKLIST	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in Ship Piping
Task:	Perform simple spool fabrication and assembly for pipes
Assessment Centre:	
Date of Assessment:	
Instructions:	The tasks listed on the observation checklist of the practical demonstration will provide performance evidence of the candidate. Performance can be observed in an actual workplace or in a simulated working environment. If performance of particular tasks cannot be observed, you may ask the candidate to explain a procedure or enter into a discussion on the subject. The assessment activity (practical demonstration) should: ▪ fit industry requirements in which the assessment will be conducted ▪ adhere, where possible, to reasonable adjustment practices ▪ ensure that suitable performance benchmarks are applied and explained to the candidate

OBSERVATION RECORD		
Performance Criteria	Place a ✓ to show if evidence has been demonstrated competently	
	Yes	**No**
Identified and interpreted relevant policies, guidelines and workplace documents.	☐	☐
Identified and interpreted relevant drawings and specifications.	☐	☐
Collected information about industry from multiple sources (as required).	☐	☐
Interpreted and applied information to day-to-day work activities.	☐	☐
Applied OSH policies and procedures in the workplace.	☐	☐
Identified hazards and risks.	☐	☐
Implemented controls for identified hazards and risks.	☐	☐
Identified and used personal protective equipment (PPE).	☐	☐
Identified and followed safety signs and symbols.	☐	☐
Identified tools, equipment and machinery required for installation.	☐	☐
Inspected and checked tools, equipment and machinery as per standard operating procedure.	☐	☐

Calculated quantity of materials required as per job specification.	☐	☐
Inspected and checked the materials as per job specification.	☐	☐
Performed measurements and calculations as per job specifications.	☐	☐
Identified key areas of a ship from model or drawing.	☐	☐
Identified and located key machines installed on a ship.	☐	☐
Identified and described components of ship piping system.	☐	☐
Identified and explained ship piping system.	☐	☐
Identified components of spool sheet drawing.	☐	☐
Identified and described colour codes as per job requirement.	☐	☐
Identified and selected different types of pipe.	☐	☐
Identified and selected different types of valve.	☐	☐
Identified and selected different types of fittings.	☐	☐
Identified different types of pumps, their components and function.	☐	☐
Identified and selected different types of hangers, supports, guides and fasteners.	☐	☐
Identified and described different types of welding.	☐	☐
Identified and described different types of welding techniques.	☐	☐
Prepared edge and maintained proper gap.	☐	☐
Performed welding following correct welding procedure.	☐	☐
Identified and explained welding faults and tests.	☐	☐
Identified cutting techniques and selected appropriate technique as per job requirement.	☐	☐
Performed cutting as per specification and job requirement.	☐	☐
Performed threading of pipe, bevelling and grinding is as per specification.	☐	☐
Bent pipes with different angle using bending machine.	☐	☐
Identified pipe supporting and fastening process.	☐	☐
Carried out pipe support and fastening process is as per job requirement.	☐	☐
Carried out cleaning and inspection of piping assembly.	☐	☐
Applied testing methods for piping system and assembly.	☐	☐
Cut pipes within tolerance.	☐	☐
Threaded pipes using threading machine or dice (as required).	☐	☐
Carried out pressure testing of piping spool.	☐	☐
Carried out pickling and cleaning of piping spools.	☐	☐
Fixed different types of fittings as per drawings.	☐	☐
Installed/assembled piping system as per job requirement.	☐	☐

Checked assembly to ensure it is contaminated free.	☐	☐
Monitored own work against workplace standards and identified and acted upon areas for improvement.	☐	☐
Completed work activities based on workplace standards.	☐	☐
Tools and equipment are cleaned, maintained and stored.	☐	☐
Defective or faulty tools and equipment are detected and reported according to standard operating procedure.	☐	☐
Workplace is cleaned and waste material disposed of.	☐	☐
Appropriate lines of communication are maintained with supervisors and colleagues.	☐	☐
Workplace interactions are conducted in courteous manner to gather and convey information.	☐	☐
Used appropriate medium to transfer information and ideas.	☐	☐
Responsibilities as a team member are performed.	☐	☐
Tasks are performed in accordance with workplace procedures.	☐	☐
Other teammates' tasks are identified and provided support.	☐	☐
Active participation is ensured, opinions are expressed and heard.	☐	☐
Inputs are provided and interpreted in line with the meeting purpose.	☐	☐
Problems faced at the individual and team level are identified and showed insight into the root-causes of the problems.	☐	☐
Looked beyond the obvious and did not stop at the first answers.	☐	☐
Confidentiality is maintained.	☐	☐
Inappropriate and conflicting situations are avoided.	☐	☐
The team is encouraged through sharing information or expertise, working together to solve problems, and putting team success first.	☐	☐
Feedback to candidate:		
Assessment decision for this assessment activity: ☐ **Competent** ☐ **Not Yet Competent**		

Candidate Signature:		**Date:**	
Assessor Signature:		**Date:**	

Set B: Practical Demonstration 2

PRACTICAL DEMONSTRATION 2	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in Ship Piping
Task:	Perform assembly of galvanised steel pipe for sea water and leakage test
Assessment Centre:	
Date of Assessment:	
Time of Assessment:	

Instructions:

Read and understand the directions carefully:

- this practical demonstration is based on the performance criteria from all or some of the units of competency in Ship Piping
- this assessment activity will be used to measure your underpinning skills
- you will have fifteen (15) minutes to familiarise yourself with the resources to be used
- you have three (3) hours to complete this demonstration

Procedure:

- observe and follow all health and safety (OHS) requirements at all times
- read the specification information provided
- collect all materials needed to complete the task
- perform the task within the given time

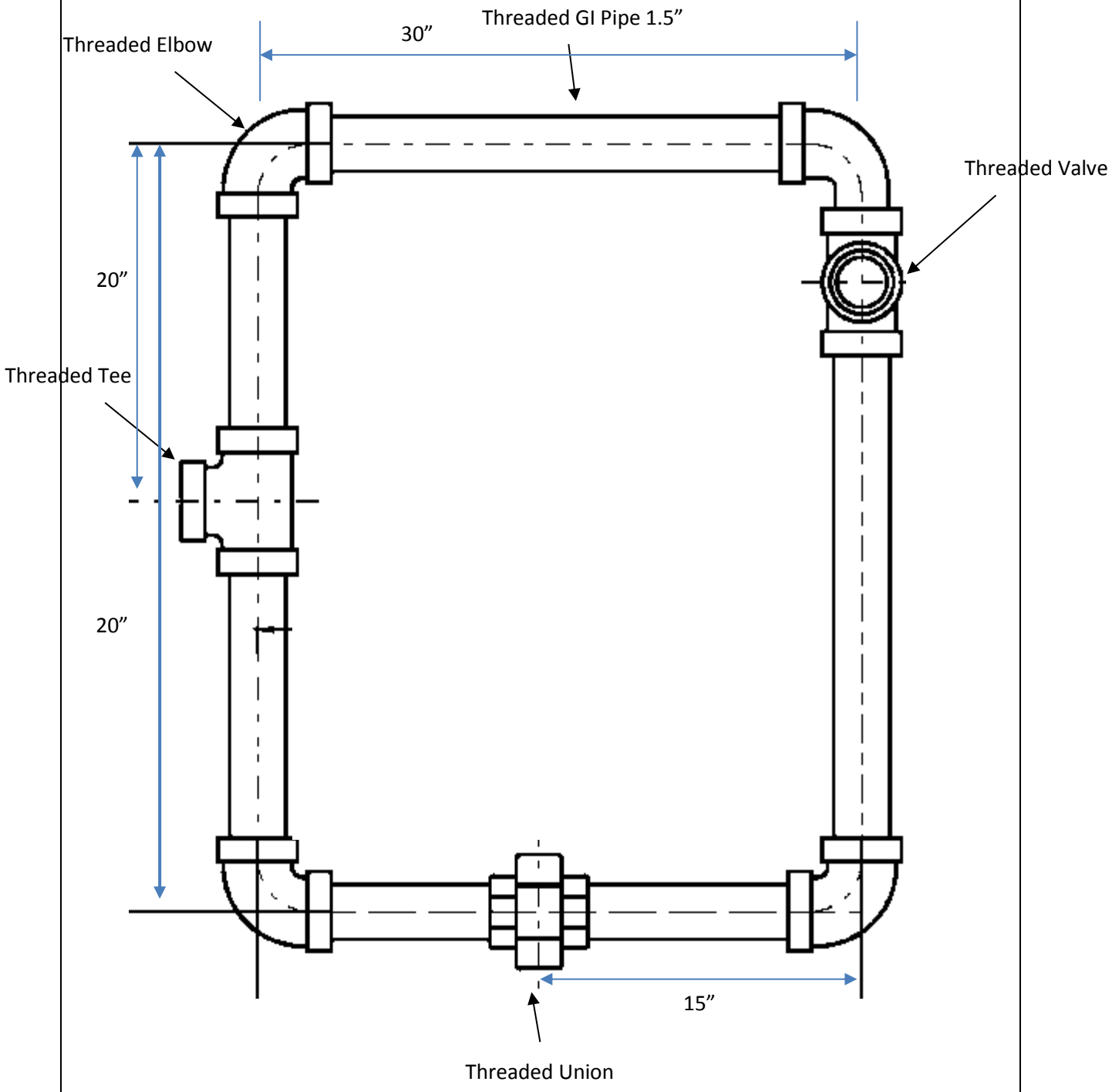
Job Specification Information:

1. Identify, read and interpret job specifications, drawings and other workplace documents.
2. Identify and collect required tools, equipment, machinery and materials for task.
3. Inspect worksite for hazards and implement appropriate controls (if necessary).
4. Identify and collect appropriate PPE.
5. Inspect and check tools, equipment, machinery and materials as per job specification.
6. Measure and calculate pipe diameter, thickness and length.
7. Prepare work pieces according to technical diagram or drawing.
8. Perform cutting, threading, bevelling and bending as required.
9. Mark pipes according to technical diagram or drawing.
10. Perform joining of pipes with elbows, valves and other accessories.
11. Carry out welding of pipes using appropriate technique.
12. Assemble and fix all fittings, accessories and supports.
13. Install sea water piping system.
14. Check piping assembly and ensure it is contaminated free.
15. Perform leak test as required.
16. Clean, maintain and store tools, equipment and machinery.
17. Clean work area and dispose of waste materials.

Drawing, Plan, Diagram or Sketch:

The drawing below is the actual installation requirement for task. During the installation process, you are to ensure:

- Proper use of tools and fabrication technique
- Measurements conducted according to drawing
- Levelling and straightness
- Correct bending angle and offsetting without crumple and kinks
- No burrs and sharp edges
- Compliance with ISO/IMO/Class Rules



Resources Required:	
Tools:	Cutting sets Grinding machine Centre punch

	Level bar Ball hammer Spirit level Soft stone Measuring tape Files Power brush Steel brush Adjustable wrench Tip cleaner Contour marker Plumb bob Spark lighter
Equipment:	Welding set
Machinery:	N/A
Materials:	Metal pipes Fittings Flange Bolts and nuts Gaskets Valves
PPE:	Apron Mask Safety helmet Safety goggles Gloves (long) Safety shoes

Set B: Practical Demonstration 2 – Observation Checklist

PRACTICAL DEMONSTRATION 2 – OBSERVATION CHECKLIST	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in Ship Piping
Task:	Perform assembly of galvanised steel pipe for sea water and leakage test
Assessment Centre:	
Date of Assessment:	
Instructions:	The tasks listed on the observation checklist of the practical demonstration will provide performance evidence of the candidate. Performance can be observed in an actual workplace or in a simulated working environment. If performance of particular tasks cannot be observed, you may ask the candidate to explain a procedure or enter into a discussion on the subject. The assessment activity (practical demonstration) should: ▪ fit industry requirements in which the assessment will be conducted ▪ adhere, where possible, to reasonable adjustment practices ▪ ensure that suitable performance benchmarks are applied and explained to the candidate

OBSERVATION RECORD		
Performance Criteria	Place a ✓ to show if evidence has been demonstrated competently	
	Yes	**No**
Identified and interpreted relevant policies, guidelines and workplace documents.	☐	☐
Identified and interpreted relevant drawings and specifications.	☐	☐
Collected information about industry from multiple sources (as required).	☐	☐
Interpreted and applied information to day-to-day work activities.	☐	☐
Applied OSH policies and procedures in the workplace.	☐	☐
Identified hazards and risks.	☐	☐
Implemented controls for identified hazards and risks.	☐	☐
Identified and used personal protective equipment (PPE).	☐	☐
Identified and followed safety signs and symbols.	☐	☐
Identified tools, equipment and machinery required for installation.	☐	☐
Inspected and checked tools, equipment and machinery as per standard operating procedure.	☐	☐

Calculated quantity of materials required as per job specification.	☐	☐
Inspected and checked the materials as per job specification.	☐	☐
Performed measurements and calculations as per job specifications.	☐	☐
Identified key areas of a ship from model or drawing.	☐	☐
Identified and located key machines installed on a ship.	☐	☐
Identified and described components of ship piping system.	☐	☐
Identified and explained ship piping system.	☐	☐
Identified components of spool sheet drawing.	☐	☐
Identified and described colour codes as per job requirement.	☐	☐
Identified and selected different types of pipe.	☐	☐
Identified and selected different types of valve.	☐	☐
Identified and selected different types of fittings.	☐	☐
Identified different types of pumps, their components and function.	☐	☐
Identified and selected different types of hangers, supports, guides and fasteners.	☐	☐
Identified and described different types of welding.	☐	☐
Identified and described different types of welding techniques.	☐	☐
Prepared edge and maintained proper gap.	☐	☐
Performed welding following correct welding procedure.	☐	☐
Identified and explained welding faults and tests.	☐	☐
Identified cutting techniques and selected appropriate technique as per job requirement.	☐	☐
Performed cutting as per specification and job requirement.	☐	☐
Performed threading of pipe, bevelling and grinding is as per specification.	☐	☐
Bent pipes with different angle using bending machine.	☐	☐
Identified pipe supporting and fastening process.	☐	☐
Carried out pipe support and fastening process is as per job requirement.	☐	☐
Carried out cleaning and inspection of piping assembly.	☐	☐
Applied testing methods for piping system and assembly.	☐	☐
Cut pipes within tolerance.	☐	☐
Threaded pipes using threading machine or dice (as required).	☐	☐
Carried out pressure testing of piping spool.	☐	☐
Carried out pickling and cleaning of piping spools.	☐	☐
Fixed different types of fittings as per drawings.	☐	☐
Installed sea water piping system as per job requirement.	☐	☐

Checked assembly to ensure it is contaminated free.	☐	☐
Monitored own work against workplace standards and identified and acted upon areas for improvement.	☐	☐
Completed work activities based on workplace standards.	☐	☐
Tools and equipment are cleaned, maintained and stored.	☐	☐
Defective or faulty tools and equipment are detected and reported according to standard operating procedure.	☐	☐
Workplace is cleaned and waste material disposed of.	☐	☐
Appropriate lines of communication are maintained with supervisors and colleagues.	☐	☐
Workplace interactions are conducted in courteous manner to gather and convey information.	☐	☐
Used appropriate medium to transfer information and ideas.	☐	☐
Responsibilities as a team member are performed.	☐	☐
Tasks are performed in accordance with workplace procedures.	☐	☐
Other teammates' tasks are identified and provided support.	☐	☐
Active participation is ensured, opinions are expressed and heard.	☐	☐
Inputs are provided and interpreted in line with the meeting purpose.	☐	☐
Problems faced at the individual and team level are identified and showed insight into the root-causes of the problems.	☐	☐
Looked beyond the obvious and did not stop at the first answers.	☐	☐
Confidentiality is maintained.	☐	☐
Inappropriate and conflicting situations are avoided.	☐	☐
The team is encouraged through sharing information or expertise, working together to solve problems, and putting team success first.	☐	☐
Feedback to candidate:		
Assessment decision for this assessment activity: ☐ **Competent** ☐ **Not Yet Competent**		

Candidate Signature:		**Date:**	
Assessor Signature:		**Date:**	

Set C: Practical Demonstration 1

PRACTICAL DEMONSTRATION -1	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in Ship Piping
Task:	Perform simple spool fabrication and assembly for pipes
Assessment Centre:	
Date of Assessment:	
Time of Assessment:	

Instructions:

Read and understand the directions carefully:

- this practical demonstration is based on the performance criteria from all or some of the units of competency in Ship Piping
- this assessment activity will be used to measure your underpinning skills
- you will have fifteen (15) minutes to familiarise yourself with the resources to be used
- you have three (3) hours to complete this demonstration

Procedure:

- observe and follow all health and safety (OHS) requirements at all times
- read the specification information provided
- collect all materials needed to complete the task
- perform the task within the given time

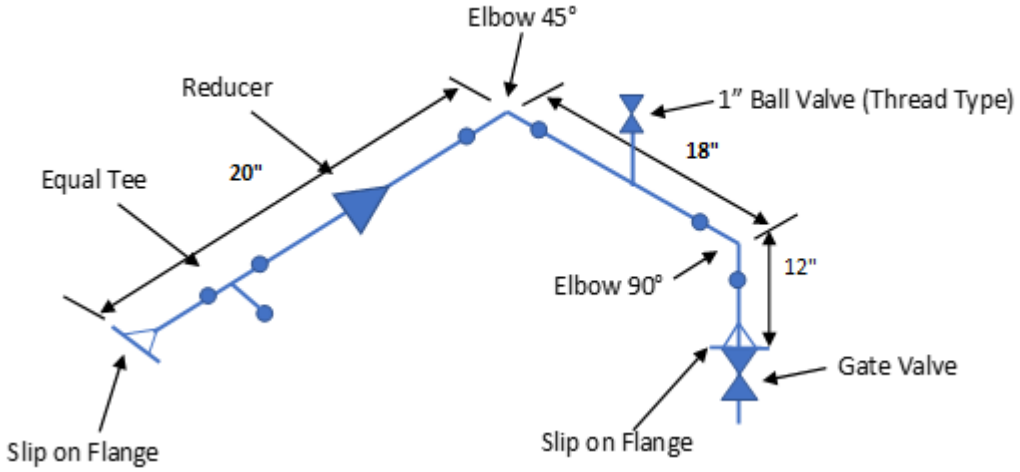
Job Specification Information:

1. Identify, read and interpret job specifications, drawings and other workplace documents.
2. Identify and collect required tools, equipment, machinery and materials required for task.
3. Inspect worksite for hazards and implement appropriate controls (if necessary).
4. Identify and collect appropriate PPE.
5. Inspect and check tools, equipment, machinery and materials as per job specification.
6. Identify relevant components of piping system.
7. Measure and calculate pipe diameter, thickness and length.
8. Prepare work pieces according to technical diagram or drawing.
9. Perform cutting, threading and bevelling as required.
10. Mark pipes according to technical diagram or drawing.
11. Perform joining of pipes with elbows, valves and other accessories.
12. Carry out welding of pipes using appropriate technique.
13. Assemble and fix all fittings, accessories and supports.
14. Perform leak test as required.
15. Clean, maintain and store tools, equipment and machinery.
16. Clean work area and dispose of waste materials

Drawing, Plan, Diagram or Sketch:

The drawing below is the actual installation requirement for task. During the installation process, you are to ensure:

- Proper use of tools and fabrication technique
- Measurements conducted according to drawing/layout
- Levelling and straightness
- Use proper elbows/bending angle
- No burrs and sharp edges
- Stability of all assembled components



Specification:

Pipe Size (Schedule 40) – 3"(Ø 88.9 X 4.5) & 2" (Ø 60.3 X 4)

Elbow - 90° (1.5 D, 3 cut)

Flange – Thickness 16 mm, No of hole 8, Hole dia 18 mm

Reducer – 3" X 2"

Tee – 3" X 2" X 3"

Figure 1: Simple pipe spool fabrication works.

Note:

Figure 2 shows an example of a pipe spool with relatively simple configuration. It shows that the pipe spool can at least be fabricated by two different sequences from the same raw materials. Fabrication sequence1 requires three operations to produce the final product while the second sequence only needs two.

Resources Required:	
Tools:	Cutting sets Grinding machine Centre punch Level bar Ball hammer Spirit level Soft stone Measuring tape Files Power brush

	Steel brush Adjustable wrench Tip cleaners Contour marker Plumb bob Spark lighter Steel Ruler Try square
Equipment:	Welding set
Machinery:	N/A
Materials:	As mentioned in the job specification above
PPE:	Apron Mask Safety helmet Safety goggles Gloves (long) Safety shoes

Set C: Practical Demonstration 1 – Observation Checklist

PRACTICAL DEMONSTRATION 1 – OBSERVATION CHECKLIST	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in Ship Piping
Task:	Perform simple spool fabrication and assembly for pipes
Assessment Centre:	
Date of Assessment:	
Instructions:	The tasks listed on the observation checklist of the practical demonstration will provide performance evidence of the candidate. Performance can be observed in an actual workplace or in a simulated working environment. If performance of particular tasks cannot be observed, you may ask the candidate to explain a procedure or enter into a discussion on the subject. The assessment activity (practical demonstration) should: ▪ fit industry requirements in which the assessment will be conducted ▪ adhere, where possible, to reasonable adjustment practices ▪ ensure that suitable performance benchmarks are applied and explained to the candidate

OBSERVATION RECORD		
Performance Criteria	Place a ✓ to show if evidence has been demonstrated competently	
	Yes	**No**
Identified and interpreted relevant policies, guidelines and workplace documents.	☐	☐
Identified and interpreted relevant drawings and specifications.	☐	☐
Collected information about industry from multiple sources (as required).	☐	☐
Interpreted and applied information to day-to-day work activities.	☐	☐
Applied OSH policies and procedures in the workplace.	☐	☐
Identified hazards and risks.	☐	☐
Implemented controls for identified hazards and risks.	☐	☐
Identified and used personal protective equipment (PPE).	☐	☐
Identified and followed safety signs and symbols.	☐	☐
Identified tools, equipment and machinery required for installation.	☐	☐
Inspected and checked tools, equipment and machinery as per standard operating procedure.	☐	☐

Calculated quantity of materials required as per job specification.	☐	☐
Inspected and checked the materials as per job specification.	☐	☐
Performed measurements and calculations as per job specifications.	☐	☐
Identified key areas of a ship from model or drawing.	☐	☐
Identified and located key machines installed on a ship.	☐	☐
Identified and described components of ship piping system.	☐	☐
Identified and explained ship piping system.	☐	☐
Identified components of spool sheet drawing.	☐	☐
Identified and described colour codes as per job requirement.	☐	☐
Identified and selected different types of pipe.	☐	☐
Identified and selected different types of valve.	☐	☐
Identified and selected different types of fittings.	☐	☐
Identified different types of pumps, their components and function.	☐	☐
Identified and selected different types of hangers, supports, guides and fasteners.	☐	☐
Identified and described different types of welding.	☐	☐
Identified and described different types of welding techniques.	☐	☐
Prepared edge and maintained proper gap.	☐	☐
Performed welding following correct welding procedure.	☐	☐
Identified and explained welding faults and tests.	☐	☐
Identified cutting techniques and selected appropriate technique as per job requirement.	☐	☐
Performed cutting as per specification and job requirement.	☐	☐
Performed threading of pipe, bevelling and grinding is as per specification.	☐	☐
Bent pipes with different angle using bending machine.	☐	☐
Identified pipe supporting and fastening process.	☐	☐
Carried out pipe support and fastening process is as per job requirement.	☐	☐
Carried out cleaning and inspection of piping assembly.	☐	☐
Applied testing methods for piping system and assembly.	☐	☐
Cut pipes within tolerance.	☐	☐
Threaded pipes using threading machine or dice (as required).	☐	☐
Carried out pressure testing of piping spool.	☐	☐
Carried out pickling and cleaning of piping spools.	☐	☐
Fixed different types of fittings as per drawings.	☐	☐
Installed/assembled piping system as per job requirement.	☐	☐

Checked assembly to ensure it is contaminated free.	☐	☐
Monitored own work against workplace standards and identified and acted upon areas for improvement.	☐	☐
Completed work activities based on workplace standards.	☐	☐
Tools and equipment are cleaned, maintained and stored.	☐	☐
Defective or faulty tools and equipment are detected and reported according to standard operating procedure.	☐	☐
Workplace is cleaned and waste material disposed of.	☐	☐
Appropriate lines of communication are maintained with supervisors and colleagues.	☐	☐
Workplace interactions are conducted in courteous manner to gather and convey information.	☐	☐
Used appropriate medium to transfer information and ideas.	☐	☐
Responsibilities as a team member are performed.	☐	☐
Tasks are performed in accordance with workplace procedures.	☐	☐
Other teammates' tasks are identified and provided support.	☐	☐
Active participation is ensured, opinions are expressed and heard.	☐	☐
Inputs are provided and interpreted in line with the meeting purpose.	☐	☐
Problems faced at the individual and team level are identified and showed insight into the root-causes of the problems.	☐	☐
Looked beyond the obvious and did not stop at the first answers.	☐	☐
Confidentiality is maintained.	☐	☐
Inappropriate and conflicting situations are avoided.	☐	☐
The team is encouraged through sharing information or expertise, working together to solve problems, and putting team success first.	☐	☐
Feedback to candidate:		
Assessment decision for this assessment activity: ☐ **Competent** ☐ **Not Yet Competent**		

Candidate Signature:		**Date:**	
Assessor Signature:		**Date:**	

Set C: Practical Demonstration 2

PRACTICAL DEMONSTRATION 2	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in Ship Piping
Task:	Perform assembly of galvanised steel pipe for firefighting and leakage test
Assessment Centre:	
Date of Assessment:	
Time of Assessment:	

Instructions:

Read and understand the directions carefully:

- this practical demonstration is based on the performance criteria from all or some of the units of competency in Ship Piping
- this assessment activity will be used to measure your underpinning skills
- you will have fifteen (15) minutes to familiarise yourself with the resources to be used
- you have three (3) hours to complete this demonstration

Procedure:

- observe and follow all health and safety (OHS) requirements at all times
- read the specification information provided
- collect all materials needed to complete the task
- perform the task within the given time

Specification Information:

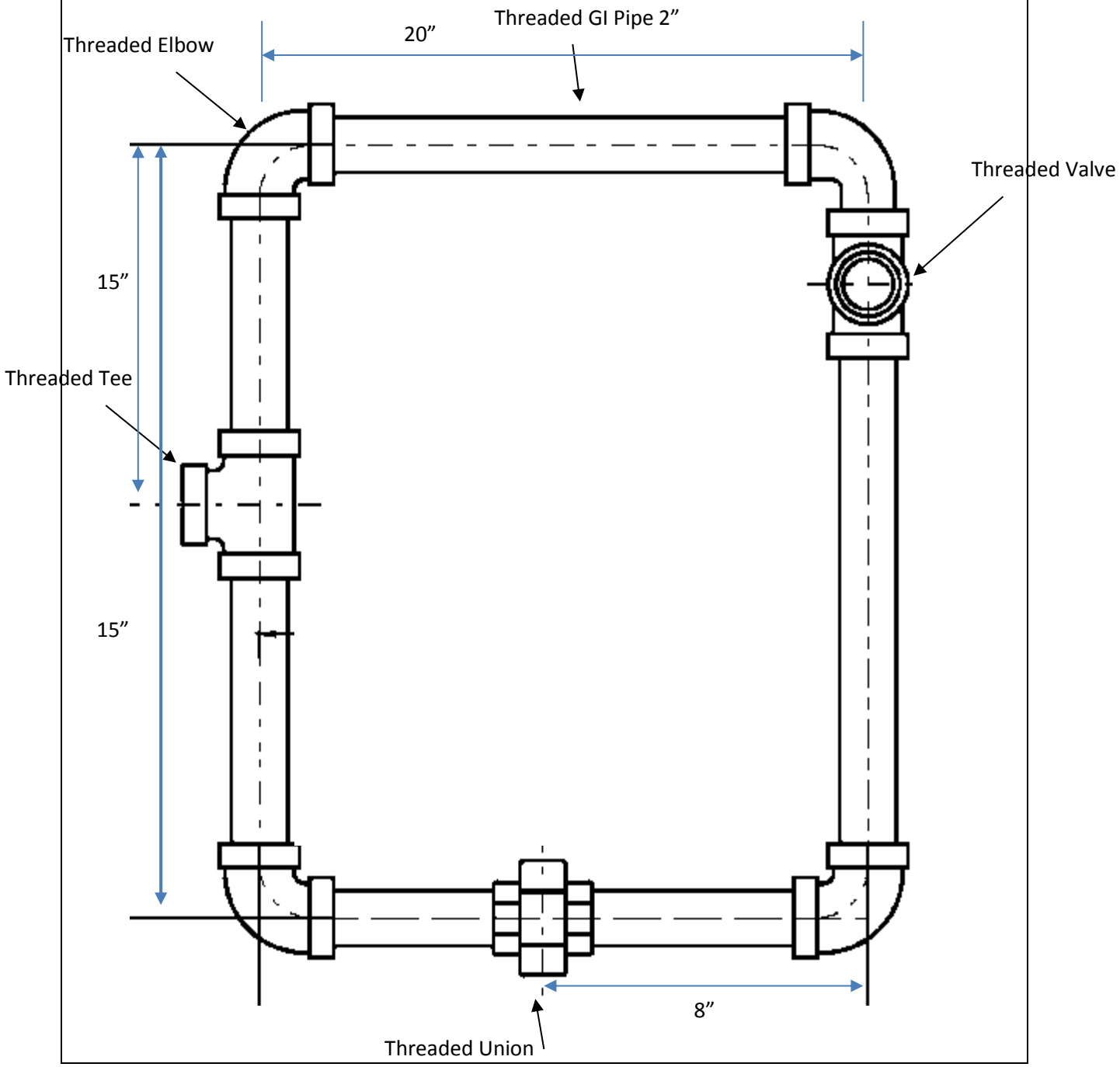
1. Identify, read and interpret job specifications, drawings and other workplace documents.
2. Identify and collect required tools, equipment, machinery and materials for task.
3. Inspect worksite for hazards and implement appropriate controls (if necessary).
4. Identify and collect appropriate PPE.
5. Inspect and check tools, equipment, machinery and materials as per job specification.
6. Measure and calculate length of nipple.
7. Prepare work pieces according to technical diagram or drawing.
8. Perform cutting, threading, bevelling and bending as required.
9. Mark pipes according to technical diagram or drawing.
10. Carry out pressure testing of piping spool.
11. Perform pickling and cleaning of piping spools.
12. Perform joining of pipes with elbows, valves and other accessories.
13. Carry out welding of pipes using appropriate technique.
14. Assemble and fix all fittings, accessories and supports.
15. Identified and selected controlling devices.
16. Install firefighting piping system.
17. Check piping assembly and ensure it is contaminated free.
18. Perform leak test as required (including further pressure test).
19. Clean, maintain and store tools, equipment and machinery.

20. Clean work area and dispose of waste materials.

Drawing, Plan, Diagram or Sketch:

The drawing below is the actual installation requirement for task. During the installation process, you are to ensure:

- Proper use of tools and wiring technique
- Compliance in ISO/Class Rule
- Correct connection for Elbow
- Correct connection for controlling device (valve)
- Check loose connection/leakage
- Proper splicing and termination
- Proper fixing and tightness of all accessories
- Safety and integrity for pipe assembling/installation



Resources Required:	
Tools:	Cutting sets Grinding machine Centre punch Level bar Ball hammer Spirit level Soft stone Measuring tape Files Power brush Steel brush Adjustable wrench Tip cleaner Contour marker Plumb bob Spark lighter
Equipment:	Welding set
Machinery:	N/A
Materials:	Metal pipes Fittings Flange Bolts and nuts Gaskets Valves
PPE:	Apron Mask Safety helmet Safety goggles Gloves (long) Safety shoes

Set C: Practical Demonstration 2 – Observation Checklist

PRACTICAL DEMONSTRATION 2 – OBSERVATION CHECKLIST	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in Ship Piping
Task:	Perform assembly of galvanised steel pipe for firefighting and leakage test
Assessment Centre:	
Date of Assessment:	
Instructions:	The tasks listed on the observation checklist of the practical demonstration will provide performance evidence of the candidate. Performance can be observed in an actual workplace or in a simulated working environment. If performance of particular tasks cannot be observed, you may ask the candidate to explain a procedure or enter into a discussion on the subject. The assessment activity (practical demonstration) should: ▪ fit industry requirements in which the assessment will be conducted ▪ adhere, where possible, to reasonable adjustment practices ▪ ensure that suitable performance benchmarks are applied and explained to the candidate

OBSERVATION RECORD		
Performance Criteria	Place a ✓ to show if evidence has been demonstrated competently	
	Yes	**No**
Identified and interpreted relevant policies, guidelines and workplace documents.	☐	☐
Identified and interpreted relevant drawings and specifications.	☐	☐
Collected information about industry from multiple sources (as required).	☐	☐
Interpreted and applied information to day-to-day work activities.	☐	☐
Applied OSH policies and procedures in the workplace.	☐	☐
Identified hazards and risks.	☐	☐
Implemented controls for identified hazards and risks.	☐	☐
Identified and used personal protective equipment (PPE).	☐	☐
Identified and followed safety signs and symbols.	☐	☐
Identified tools, equipment and machinery required for installation.	☐	☐
Inspected and checked tools, equipment and machinery as per standard operating procedure.	☐	☐

Calculated quantity of materials required as per job specification.	☐	☐
Inspected and checked the materials as per job specification.	☐	☐
Performed measurements and calculations as per job specifications.	☐	☐
Identified key areas of a ship from model or drawing.	☐	☐
Identified and located key machines installed on a ship.	☐	☐
Identified and described components of ship piping system.	☐	☐
Identified and explained ship piping system.	☐	☐
Identified components of spool sheet drawing.	☐	☐
Identified and described colour codes as per job requirement.	☐	☐
Identified and selected different types of pipe.	☐	☐
Identified and selected different types of valve.	☐	☐
Identified and selected different types of fittings.	☐	☐
Identified different types of pumps, their components and function.	☐	☐
Identified and selected different types of hangers, supports, guides and fasteners.	☐	☐
Identified and described different types of welding.	☐	☐
Identified and described different types of welding techniques.	☐	☐
Prepared edge and maintained proper gap.	☐	☐
Performed welding following correct welding procedure.	☐	☐
Identified and explained welding faults and tests.	☐	☐
Identified cutting techniques and selected appropriate technique as per job requirement.	☐	☐
Performed cutting as per specification and job requirement.	☐	☐
Performed threading of pipe, bevelling and grinding is as per specification.	☐	☐
Bent pipes with different angle using bending machine.	☐	☐
Identified pipe supporting and fastening process.	☐	☐
Carried out pipe support and fastening process is as per job requirement.	☐	☐
Carried out cleaning and inspection of piping assembly.	☐	☐
Applied testing methods for piping system and assembly.	☐	☐
Cut pipes within tolerance.	☐	☐
Threaded pipes using threading machine or dice (as required).	☐	☐
Carried out pressure testing of piping spool.	☐	☐
Carried out pickling and cleaning of piping spools.	☐	☐
Fixed different types of fittings as per drawings.	☐	☐

Disconnected mains before inspection and testing in accordance with standard procedure.	☐	☐
Checked leakages such as loose or connection in elbow valves and other connections.	☐	☐
Tested piping system installation for detecting faults.	☐	☐
Identified and selected controlling and protective devices.	☐	☐
Installed controlling and protective devices according to the layout plan.	☐	☐
Controlling and protective devices are set and connected to the piping works.	☐	☐
Installed piping system as per job requirement.	☐	☐
Checked assembly to ensure it is contaminated free.	☐	☐
Monitored own work against workplace standards and identified and acted upon areas for improvement.	☐	☐
Completed work activities based on workplace standards.	☐	☐
Tools and equipment are cleaned, maintained and stored.	☐	☐
Defective or faulty tools and equipment are detected and reported according to standard operating procedure.	☐	☐
Workplace is cleaned and waste material disposed of.	☐	☐
Appropriate lines of communication are maintained with supervisors and colleagues.	☐	☐
Workplace interactions are conducted in courteous manner to gather and convey information.	☐	☐
Used appropriate medium to transfer information and ideas.	☐	☐
Responsibilities as a team member are performed.	☐	☐
Tasks are performed in accordance with workplace procedures.	☐	☐
Other teammates' tasks are identified and provided support.	☐	☐
Active participation is ensured, opinions are expressed and heard.	☐	☐
Inputs are provided and interpreted in line with the meeting purpose.	☐	☐
Problems faced at the individual and team level are identified and showed insight into the root-causes of the problems.	☐	☐
Looked beyond the obvious and did not stop at the first answers.	☐	☐
Confidentiality is maintained.	☐	☐
Inappropriate and conflicting situations are avoided.	☐	☐
The team is encouraged through sharing information or expertise, working together to solve problems, and putting team success first.	☐	☐
Feedback to candidate:		

Assessment decision for this assessment activity: ☐ **Competent** ☐ **Not Yet Competent**			
Candidate Signature:		**Date:**	
Assessor Signature:		**Date:**	

Oral Questions (Optional)

ORAL QUESTIONS - INSTRUCTIONS	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in Ship Piping
Unit of Competency	
Generic Competencies	
SEIP-SBD-SPF-01-G	Use basic mathematical concepts
SEIP-SBD-SPF-02-G	Apply occupational health and safety (OHS) practice in the workplace
SEIP-SBD-SPF-03-G	Carry out workplace interaction
SEIP-SBD-SPF-04-G	Operate in a team environment
Sector-specific Competencies	
SEIP-SBD-SPF-01-S	Work effectively in the shipbuilding sector
SEIP-SBD-SPF-02-S	Use hand and power tools
Occupation-specific Competencies	
SEIP-SBD-SPF-01-O	Identify basic ship piping work
SEIP-SBD-SPF-02-O	Identify pipe and pipe fittings components
SEIP-SBD-SPF-03-O	Perform welding works
SEIP-SBD-SPF-04-O	Perform pipe fabricationn works
SEIP-SBD-SPF-05-O	Perform installation of piping system
Assessment Centre:	
Date of Assessment:	
Time of Assessment:	
Instructions:	
Read and understand the directions carefully: ▪ these oral questions are based on the performance criteria from all the units of competency in Ship Piping ▪ oral questions are designed to enable additional assessment of your underpinning knowledge ▪ you should present your responses as directed by the assessor ▪ answer all the questions asked by the assessor as best as possible	

ORAL QUESTIONS			
Question		Place a ✓in the appropriate box to show if evidence has been demonstrated competently	
		Yes	**No**
1.	What is the percentage of female workers if there are 8 male workers and 2 female workers in a team?	☐	☐
2.	What will you do if there was a leak in the piping works?	☐	☐
3.	What are your duties and responsibilities as a ship pipe fitter?	☐	☐
4.	Identify the following symbol: 	☐	☐
5.	What is the pre-fabrication of a spool sheet?	☐	☐
6.	Why is a bilge and ballast system necessary?	☐	☐
7.	What is the purpose of pipe cutting and threading?	☐	☐
8.	What types of valve are used in piping works?	☐	☐
9.	What is the function of a safety valves?	☐	☐
10.	What is a pump and its uses?	☐	☐
11.	What types hangers, supports, guides, fasteners are used in piping?	☐	☐
12.	What is the difference between fillet and butt welding?	☐	☐
13.	What types of positional welding are used in piping?	☐	☐
14.	What types of fittings are used for pipe installation?	☐	☐
15.	What is 1 cut, 2 cut and 3 cut for pipe bending?	☐	☐
16.	What is a pipe spool and why it is so important in piping works?	☐	☐
17.	What is the difference between elbow and bending?	☐	☐
18.	What are shop fabrication works?	☐	☐
19.	Why is pipe assembling necessary?	☐	☐
20.	What types of installation works are done on a ship?	☐	☐
Feedback to candidate:			
Assessment decision for this assessment activity: ☐ **Competent** ☐ **Not Yet Competent**			
Candidate Signature:		**Date:**	
Assessor Signature:		**Date:**	

Oral Questioning Guideline

General Guidelines For Effective Questioning
▪ Keep questions short and focused on one key concept
▪ Ensure that questions are structured
▪ Test the questions to check that they are not ambiguous
▪ Use `open-ended questions such as `what if...?' and `why...?' questions, rather than closed questions
▪ Keep questions clear and straight forward and ask one at a time
▪ Use words that the candidate is able to understand
▪ Look at the candidate when asking questions
▪ Check to ensure that the candidate fully understands the questions
▪ Ask the candidate to clarify or re-phrase their answer if the assessor does not understand the initial response
▪ Confirm the candidate's response by repeating the answer back in his/her own words
▪ Encourage a conversational approach with the candidate when appropriate, to put him or her at ease
▪ Use questions or statements as prompts for keeping focused on the purpose of the questions and the kind of evidence being collected
▪ Use language at a suitable level for the candidate
▪ Listen carefully to the answers for opportunities to find unexpected evidence
▪ Follow up responses with further questions, if useful, to draw out more evidence or to make links between knowledge areas
▪ Compile a list of acceptable responses to ensure reliability of assessments

Oral Questions (Optional) - Answers

Answers are highlighted in **bold** and *italics*.

ORAL QUESTIONS		
Question		**Answer**
1.	What is the percentage of female workers if there are 8 male workers and 2 female workers in a team?	***20%***
2.	What will you do if there was a leak in the piping works?	***May include but are not limited to:*** ***1. Dismantle pipe from joint(s) , check threads, replace tape and set up joint properly.*** ***2. Perform test again.***
3.	What are your duties and responsibilities as a ship pipe fitter?	***May include but are not limited to:*** • ***Pipe cutting, threading, lay out, assemble, install, and maintain piping systems according to colour code. Set up pipe supports, and related hydraulic and pneumatic equipment for steam, hot water, heating, cooling, lubricating, sprinkling, and industrial production and processing systems.***
4.	Identify the following symbol: 	***Upper symbol represents the globe valve, lower symbol represents the gate valve.***
5.	What is the pre-fabrication of a spool sheet?	***Pipe spools are fabricated from a number of raw pipes and pipe fittings (e.g. elbows, flanges, tees, etc.) in fabrication shops. Raw pipes are cut to the required sizes and moved with pipe fittings to a fitting table, where some of the components are fitted together (i.e. temporarily connected).***
6.	Why is a bilge and ballast system necessary?	***The bilge system is used to remove small quantities of fluid/ debris that have leaked or condensed into a dry space. Mud boxes and strum boxes (line filters) are fitted at the ends and in bilge lines to stop debris being sucked into pipes.*** ***Ballast is extra weight usually sea water needed to maintain ship stability. Ballast system of pipping used to load or unload ballast as necessary. The number of pumps and their capacity depend upon the size, type and service of the vessel.***
7.	What is the purpose of pipe cutting and threading?	***Cutting of pipe is used to cut the pipe in particular measurement by hacksaw/pipe cutter or by gas cutting as per drawing.*** ***Threading is used for creating a screw thread to make pipe joints as per***

		job requirements. There may be external or internal threading.
8.	What types of valve are used in piping works?	***There are many types of valves used in pipe fittings, such as: globe valve, gate valve, non-return valve, butterfly, relief, ball valve safety valves.***
9.	What is the function of a safety valves?	***Safety valves are a specialized type of pressure valve. A leak tight, lower cost, single emergency use option would be a rupture disk.***
10.	What is a pump and its uses?	***A pump is a device that moves fluids (liquids or gases) by mechanical action. A marine pump is an important auxiliary equipment in marine industry and ship building industry. These marine pumps can be serviced for cooling, circulating, bilge, ballast, general service (G/S) etc.***
11.	What types hangers, supports, guides, fasteners are used in piping?	***Hangers/supports/guides: pipe, clevis, ring, roller, saddles and stanchions, roller support, thrust blocks, pipe clams and guides*** ***Fasteners: hanger bolts, beam clamps, concrete fasteners, metal fasteners etc.***
12.	What is the difference between fillet and butt welding?	***Fillet welded joints such as tee, lap and corner joints are the most common connection in welded fabrication maintaining perpendicular. In total they probably account for around 70 to 80% of all joints made by arc welding. No edge preparation is needed and assemblies in piping systems are simpler.*** ***Butt welds are welds where two pieces of metal to be joined are in the same plane. These types of welds require only some kind of preparation and are used with thin sheet metals that can be welded with a single pass*** ***A butt joint is the most universally used method of joining pipe to itself, fittings, flanges, valves, and other equipment.***
13.	What types of positional welding are used in piping?	***Pipe welding frequently requires in different position such as: flat, horizontal, vertical, overhead and rolled /wrap around position (for different angles).***
14.	What types of fittings are used for pipe installation?	***A lot of fittings are used in ship piping, such as: elbow, union, nipple. reducer, tees, cross cap, plug, Y-fitting.***
15.	What is 1 cut, 2 cut and 3 cut for pipe bending?	***It's the process of bending pipe manually. Process includes cutting pipes 30, 45 and 90-degrees angles and forming bend by welding.***

16.	What is a pipe spool and why it is so important in piping works?	***The prefabricated components of a piping system are called pipe spools. They include the pipes, flanges and fittings, and they are mounted during the fabrication before they are delivered to the construction are. They are delivered pre-mounted so to make them easier to assemble using hoists, gauges, and other tools for assembly. Pipe spools connect long pipes with flanges at the tips so that they can be bolted to another pipe with matching flange.***
17.	What is the difference between elbow and bending?	***1. Elbow is a standard fitting, but bends are custom fabricated. Bends are generally made or fabricated as per the requirement; however, elbows are pre-fabricated and standard.*** ***2. The major difference is the radius of curvature. Elbows generally have radius of curvature between one to twice the diameter of the pipe. Bends have a radius of curvature more than twice the diameter.*** ***3. Elbows have industrial standards and have limitations to size, bend radius and angle. The angles are usually 45 deg or 90 degrees. All other offsets are classified as pipe bends.***
18.	What are shop fabrication works?	***Shop fabrication is, generally speaking, any pipe, fittings and components that are assembled by welding into spool assemblies at the fabricator's facility. The spools are then labelled with an identifier and transported to the job site for installation.***
19.	Why is pipe assembling necessary?	***Pipe assembling is necessary to split or join a number of pipes together, and for other purposes. A broad variety of standardized pipe fittings are available; they are generally broken down into either a tee, an elbow, a branch, a reducer/enlarger, or a wye. Valves control fluid flow and regulate pressure.***
20.	What types of installation works are done on a ship?	***The installation of pipe systems follows its fabrication and is very frequently a part of it. The installation of pipe can be accomplished in the following two primary ways, or combinations thereof:*** ***1. Field fabricate and install*** ***2. Shop fabricate and field erected***

Assessment Evidence Summary Sheet

EVIDENCE SUMMARY SHEET			
Candidate Name:			
Assessor Name:			
Qualification:	Certificate in Ship Piping		
Assessment Centre:			
Date(s) of Assessment:			
The performance of the candidate in the following unit or units of competency and the methods engaged to assess performance are as follows:			
Unit of Competency	**Assessment Method**	**Competent**	**Not Yet Competent**
All units of competency comprising of the qualification	Written Test	☐	☐
	Practical Demonstration 1 (Set ….)	☐	☐
	Practical Demonstration 2 (Set ….)	☐	☐
	Oral Questioning (optional)	☐	☐
Note: Issuance of a certificate will only be given to a candidate who has successfully been assessed as competent for **ALL** units of competency.			
Recommendation			
❑ Issuance of Statement of Achievement (*indicate title of SOA, if full Certificate is not met)*	❑ Submission of additional documents Specify:	❑ Reassessment Specify:	
Did the candidate overall performance meet the required evidence/standard?		☐ Yes ☐ No	
Overall Evaluation:	❑ **Competent** ❑ **Not Yet Competent**		
General Comments:			
Candidate Signature:		Date:	
Assessor Signature:		Date:	
Institution Manager Signature:		Date:	

CANDIDATES COPY

(Please presents this form when you claim your Certificate)

ASSESSMENT RESULTS SUMMARY			
Qualification:	Certificate in Ship Piping		
Name of Candidate:		**Date:**	
Name at Assessment Centre:		**Date:**	
Assessment Results:	❑ **Competent** ❑ **Not Yet Competent**		
Recommendation:	❑ Issuance of SOA *(indicate title of SOA, if full certificate is not met)*		
	❑ Submission of additional documents – specify:		
	❑ Reassessment - specify:		
Assessed by: (name and signature)		**Date:**	
Attested by: (name and signature):		**Date**	

Assessment Validation Map

This identifies how the assessment tools in this resource may assess:

- elements and performance criteria
- critical aspects of assessment
- skills and knowledge
- employability skills

Unit of Competency:	SEIP-SBD-SPF-01-G – Use basic mathematical concepts		
Element	**Assessment Method**		
	Written	**Practical**	**Oral**
1. Identify calculation requirements in the workplace.	1, 2	A1, A2, B1, B2, C1, C2	1
2. Select appropriate mathematical methods /concepts for the calculation.	1, 2	A1, A2, B1, B2, C1, C2	1
3. Use tools and instruments to perform calculations.	1, 2	A1, A2, B1, B2, C1, C2	1
Unit of Competency:	SEIP-SBD-SPF-02-G – Apply occupational health and safety (OHS) practice in the workplace		
Element	**Assessment Method**		
	Written	**Practical**	**Oral**
1. Identify OHS policies and procedures.	15	A1, A2, B1, B2, C1, C2	
2. Apply personal health and safety practices.	6	A1, A2, B1, B2, C1, C2	
3. Report hazards and risks.		A1, A2, B1, B2, C1, C2	
4. Respond to emergencies.			2
Unit of Competency:	SEIP-SBD-SPF-03-G – Carry out workplace interaction		
Element	**Assessment Method**		
	Written	**Practical**	**Oral**

1. Interpret workplace communication and etiquette.	4	A1, A2, B1, B2, C1, C2	
2. Read and understand workplace documents.	10	A1, A2, B1, B2, C1, C2	
3. Participate in workplace meetings and discussions.		A1, A2, B1, B2, C1, C2	
4. Practice professional ethics at work.		A1, A2, B1, B2, C1, C2	

Unit of Competency:	SEIP-SBD-SPF-04-G – Operate in a team environment

Element	**Assessment Method**		
	Written	**Practical**	**Oral**
1. Identify team goals and work processes.	3	A1, A2, B1, B2, C1, C2	
2. Identify own role and responsibilities within team.		A1, A2, B1, B2, C1, C2	
3. Communicate and co-operate with team members.	5	A1, A2, B1, B2, C1, C2	
4. Practice problem solving within the team.	20	A1, A2, B1, B2, C1, C2	

Unit of Competency:	SEIP-SBD-SPF-01-S – Work effectively in the shipbuilding sector

Element	**Assessment Method**		
	Written	**Practical**	**Oral**
1. Understand basics of shipbuilding.	8, 13	A1, A2, B1, B2, C1, C2	6, 20
2. Obtain information about the industry.		A1, A2, B1, B2, C1, C2	18
3. Identify key machines installed on a ship.		A1, A2, B1, B2, C1, C2	

Unit of Competency:	SEIP-SBD-SPF-02-S – Use hand and power tools

Element	Assessment Method		
	Written	Practical	Oral
1. Identify and Inspect hand tools and power tools.	7, 16	A1, A2, B1, C1, C2	
2. Use hand tools properly and safety.		A1, A2, B1, C1, C2	
3. Operate power tools properly and safely.		A1, A2, B1, C1, C2	
4. Clean and maintain hand and power tools.		A1, A2, B1, C1, C2	

Unit of Competency:	SEIP-SBD-SPF-01-O – Identify basic ship piping work

Element	Assessment Method		
	Written	Practical	Oral
1. Identify key tasks of a ship pipe fitter.			3, 19
2. Interpret piping system.	17	A1, A2, B1, B2, C1, C2	16
3. Understand drawings, symbols and specifications.	14	A1, A2, B1, B2, C1, C2	4
4. Identify colour codes and standards.	9	A1, A2, B1, B2, C1, C2	

Unit of Competency:	SEIP-SBD-SPF-02-O – Identify pipe and pipe fittings components

Element	Assessment Evidence Method		
	Written	Practical	Oral
1. Identify the different types of pipes.	10	A1, A2, B1, B2, C1, C2	17
2. Identify different types of valves.		A1, A2, B1, B2, C1, C2	8, 9

3. Identify different types of fittings.	13	A1, A2, B1, B2, C1, C2	15
4. Identify different types of pumps.		A1, A2, B1, B2, C1, C2	10
5. Identify different types of supports and fasteners.		A1, A2, B1, B2, C1, C2	11

Unit of Competency:	SEIP-SBD-SPF-03-O – Perform welding works

Element	**Assessment Method**		
	Written	**Practical**	**Oral**
1. Identify types of welding and welding terminology.	11	A1, B1, C1	
2. Identify different types of welding technique.	12	A1, B1, C1	12, 13
3. Perform arc welding.		A1, B1, C1	
4. Perform tack welding.	19	A1, B1, C1	

Unit of Competency:	SEIP-SBD-SPF-04-O – Perform pipe fabricationn works

Element	**Assessment Method**		
	Written	**Practical**	**Oral**
1. Cut, thread and bevel pipes.		A2, B2, C2	7
2. Perform bend pipe with different angle.		A2, B2, C2	
3. Secure supports, hangers and guides.		A2, B2, C2	
4. Clean and test piping.		A2, B2, C2	2

Unit of Competency:	SEIP-SBD-SPF-05-O – Perform installation of piping system

Element	**Assessment Method**		
	Written	**Practical**	**Oral**
1. Install fresh water piping system.		A1, A2	
2. Install sea water piping system.		B1, B2	

3. Install fuel piping system.	18	A1, A2, B1, B2, C1, C2	5
4. Install hydraulic piping system.		A1, A2, B1, B2, C1, C2	