

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR IRON & STEEL

What are Occupational Standards (OS)?

- Ø OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- Ø OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

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Introduction

Qualifications Pack – Fitter & Maintenance Water Cooling

SECTOR: Iron & Steel

SUB-SECTOR: Mechanical Maintenance

REFERENCE ID: ISC/Q0820

ALIGNED TO: NCO-2004/NIL

Title of Job: The job is about identifying the problems in water cooling system in terms of source of leakage, pipe choking (due to scale formation), corrosion, etc. and make alternative arrangements for cooling, rectifying the root causes, carrying out checks for fitness.

Personal Attributes: This job requires the individual to work independently as well as in teams. He should be physically fit, not having colour blindness, having analytical skills, problem solving attitude, high concentration levels and willingness to work in a factory environment.



Job Details	Qualifications Pack Code	ISC/Q0820		
	Job Role	Fitter & Maintenance Water Cooling		
	Credits(NSQF)	TBD	Version number	1.0
	Industry	Iron & Steel	Drafted on	08/09/2014
	Sub-sector	Mechanical Maintenance	Last reviewed on	25/03/2015
	Occupation	Fitter	Next review date	1/04/2017
	NSQC Clearance on			

Job Role	Fitter & Maintenance Water Cooling
Role Description	The job holder identifies the problems in water cooling system in terms of source of leakage, pipe choking due to scale formation, corrosion, etc. and make alternative arrangements for cooling, rectifying the root causes, carrying out checks for fitness.
NSQF level	3
Minimum Educational Qualifications	10 th Pass
Maximum Educational Qualifications	ITI Pass
Training (Suggested but not mandatory)	<ul style="list-style-type: none"> Reading and interpreting water circuit drawings Welding, gas cutting and pipe line assembling Working knowledge of tools & tackles 5S and safety practices Working at heights, confined spaces & high temperatures 2 weeks hands on job training (mandatory)
Minimum Job Entry Age	18 years
Experience	<ul style="list-style-type: none"> 2-3 years' experience in the similar function In lieu of minimum qualification the incumbent should have minimum 4 to 5 years' experience as as helper to fitter – water cooling system



Occupational Standards (OS)	<p>Compulsory:</p> <p>ISC/N0814: Understand the assigned job of fitter water cooling system</p> <p>ISC/N0815: Prepare for operation for water cooling system</p> <p>ISC/N0816: Carry out the assigned sequence of operation for water cooling system</p> <p>ISC/N0008: Use basic health and safety practices at the workplace</p> <p>ISC/N0009: Work effectively with others</p> <p>Optional:</p> <p>N/A</p>
Performance Criteria	As described in the relevant NOS units



Definitions

Keywords /Terms	Description
Core Skills/Generic Skills	Core Skills or Generic Skills are a group of skills that are key to learning and working in today's world. These skills are typically needed in any work environment. In the context of the NOS, these include communication related skills that are applicable to most job roles.
Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of NOS.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform to the required standard.
National Occupational Standards (NOS)	NOS are Occupational Standards which apply uniquely in the Indian context
Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
Organisational Context	Organisational Context includes the way the organization is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
Qualifications Pack(QP)	Qualifications Pack comprises the set of NOS, together with the educational, training and other criteria required to perform a job role. A Qualifications Pack is assigned a unique qualification pack code.
Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack.
Scope	Scope is the set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on the quality of performance required.
Sector	Sector is a conglomeration of different business operations having similar businesses and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.



Sub-Sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Sub-functions	Sub-functions are sub-activities essential to fulfil the achieving the objectives of the function.
Technical Knowledge	Technical Knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Unit Code	Unit Code is a unique identifier for a NOS unit, which can be denoted with an 'N'
Unit Title	Unit Title gives a clear overall statement about what the incumbent should be able to do.
Vertical	Vertical may exist within a sub-sector representing different domain areas or the client industries served by the industry.
Keywords /Terms	Description
NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
OEM	Original Equipment Manufacturer
OS	Occupational Standard(s)
QP	Qualifications Pack
5 S	Technique of maintaining orderliness –Japanese terminology
CP	Control Plan
WI	Work Instructions

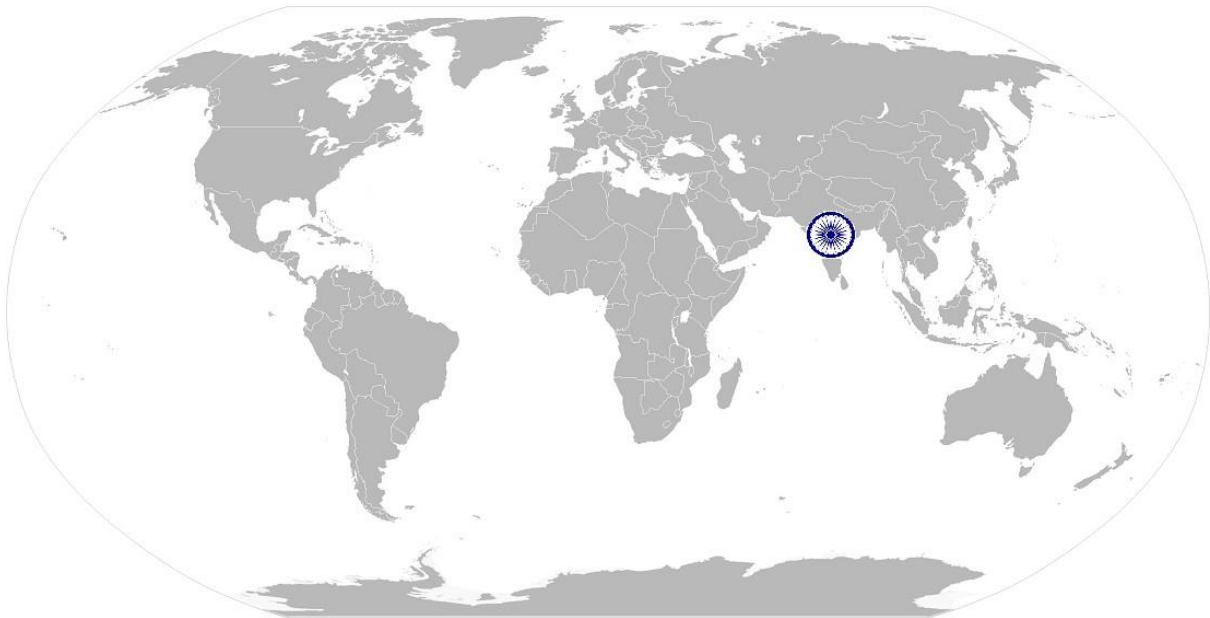
Acronyms



ISC/N0814:

Understand the assigned job of fitter water cooling system

National Occupational Standards



Overview

This unit is about understanding the job requirements of fitter water cooling system in accordance with the checklist and seek any clarifications on the same



ISC/N0814:

Understand the assigned job of fitter water cooling system

National Occupational Standard

Unit Code	ISC/N0814
Unit Title (Task)	Understand the assigned job of fitter water cooling system
Description	This unit is about understanding the requirements of the job of fitter water cooling system after receiving the checklist from the supervisor, seek any clarifications on the requirements of the job and identify the tools and tackles that would be needed to carry out the job
Scope	This unit/task covers the following: <ul style="list-style-type: none"> Understand the assigned job of fitter water cooling system in accordance with the instructions / checklist Understand the pipe line circuit drawings Seek clarifications with respect to the equipment, pipe line circuit drawings Identify the tools and tackles that are required to carry out the assigned job
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Understand the assigned job of fitter water cooling system in accordance with the instructions / checklist	To be competent, the user/individual on the job must be able to: PC1. Interpret the checklist and understand the job requirements PC2. Plan, as appropriate to carry out the job PC3. Identify the source of leakage in water cooling system PC4. Identify part of the pipe line chocking due to scale formation or other reasons PC5. Identify the pipe line damage due to corrosion
Understand the pipe line circuit drawings	To be competent, the user/individual on the job must be able to: PC6. Understand the pipe line circuit drawings PC7. Understand the symbols used in the pipe line circuit drawings PC8. Understand other specifications and identify the sequence of activities required to assemble the pipe line circuit PC9. Read and interpret pipe line circuit drawings to ensure correct layouts and quality of the material (pipes including fittings)
Seek clarifications with respect to the equipment, pipe line circuit drawings	To be competent, the user/individual on the job must be able to: PC10. Identify any clarifications that he/she wants to seek with respect to the given pipe line circuit drawing PC11. Recognize whom to contact for clarifications on the pipe line circuit drawing PC12. Escalate the concern to the supervisor or shift-in-charge, if needed
Identify the tools and tackles that are required to carry out the assigned job	To be competent, the user/individual on the job must be able to: PC13. Identify tools, tackles & equipment required to perform the pipe line job PC14. Ask helper to carry tools and tackles required to the desired work site PC15. Report to stores / supervisor in case of non-availability of tools, tackles, pipes and pipe line fittings etc. or stock-out
Element	Knowledge and Understanding
A. Organisational Context (Knowledge of the Company/ Organisation and	The user/individual on the job needs to know and understand: KA1. Quality and damage checks to be done and importance of the same KA2. Risk and impact of not following defined procedures/work instructions KA3. Escalation matrix for reporting identified issues KA4. Safety procedures as applicable at the work sites



ISC/N0814:

Understand the assigned job of fitter water cooling system

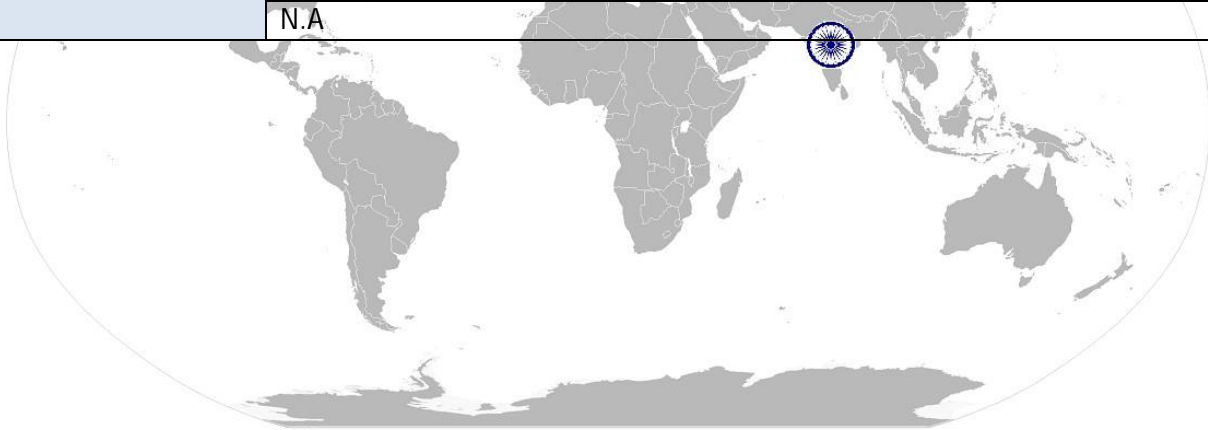
its processes)	
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. Pipe line circuit drawing</p> <p>KB2. Tools & tackles to be used for the pipe line job e.g. different types of pipe wrench, pipe vice etc.</p> <p>KB3. Hard wares e.g. steam jointing, red lead powder, teflon tapes/grease etc.</p> <p>KB4. Gas cutting and welding</p> <p>KB5. Pipe bending as per required profile</p> <p>KB6. Different types of pipe fittings e.g. socket, union, reducer, plug, elbow, T fittings, 4 way fitting, rotary fitting etc.</p> <p>KB7. Pipe line threading as required</p> <p>KB8. Cooling media e.g.- industrial water, soft water</p> <p>KB9. Leakages and their repairing</p> <p>KB10. Pressure testing of hearth cooling staves, bosh plates and tuyere (for blast furnace cooling system)</p> <p>KB11. Implications of not adhering to sequence of activities and operations for pipe line layout as per pipe line circuit drawing</p>
Skills (S) w.r.t. the scope	
Element	Skills
A. Core Skills/ Generic Skills	<p>Writing Skills</p> <p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. Construct simple sentences and express ideas clearly through written communication</p> <p>SA2. Fill up appropriate technical forms, process charts, activity logs in required format of the company</p>
	<p>Reading and Understanding Skills</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA3. Read and interpret Pipe line Circuit Drawing</p> <p>SA4. Understand the sequence of activities</p> <p>SA5. Read and understand manuals, health and safety instructions, memos, reports, job cards etc.</p>
	<p>Oral Communication (Listening and Speaking skills)</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA6. Express statements, opinions or information clearly so that others can hear and understand</p> <p>SA7. Respond appropriately to queries</p> <p>SA8. Communicate with team members and supervisor</p>
B. Professional Skills	<p>Decision Making</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. Make appropriate decisions pertaining to the concerned area of work with respect to intended work objective, span of authority, responsibility, laid down procedure and guidelines</p>
	<p>Plan and Organize</p>



ISC/N0814:

Understand the assigned job of fitter water cooling system

	The user/individual on the job needs to know and understand: SB2. Plan and organize their own work schedule, work area, tools, equipment and materials to maintain decorum and for improved productivity
	Customer Centricity
	N.A
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB3. Think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s) SB4. Identify immediate or temporary solutions to resolve delays SB5. Identify sources of support that can be availed of for problem solving for various kind of problems SB6. Seek appropriate assistance from other sources to resolve problems SB7. Report problems that you cannot resolve to appropriate authority
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB8. Identify cause and effect relations in their area of work SB9. Use cause and effect relations to anticipate potential problems and their solution
	Critical Thinking
	N.A

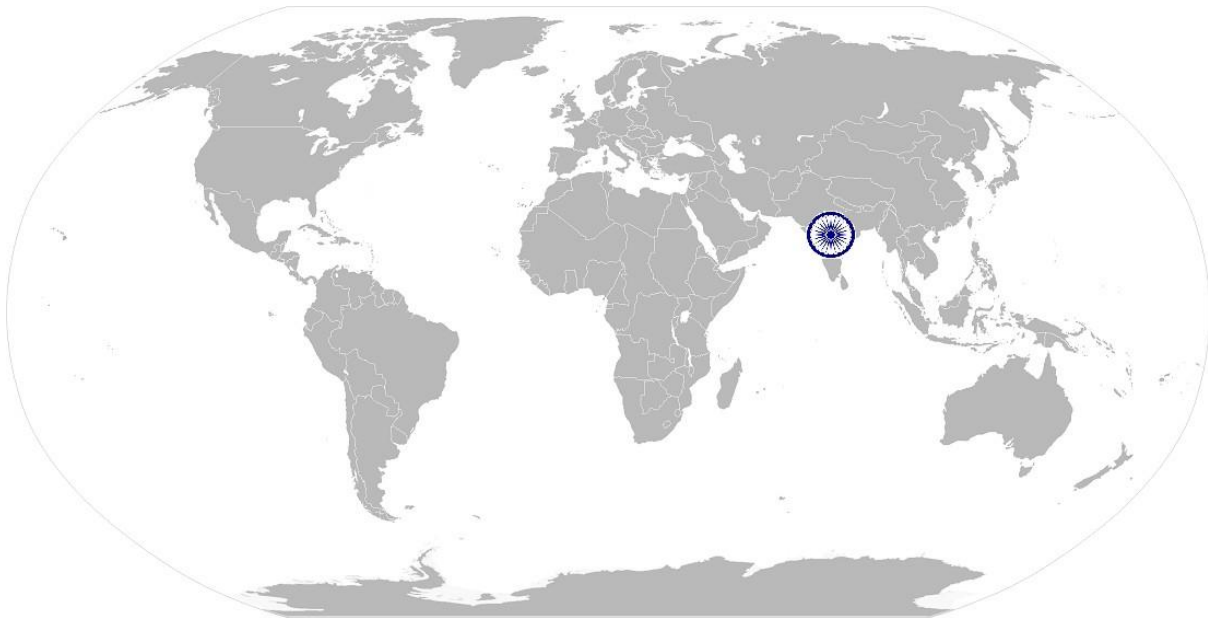




ISC/N0814: Understand the assigned job of fitter water cooling system

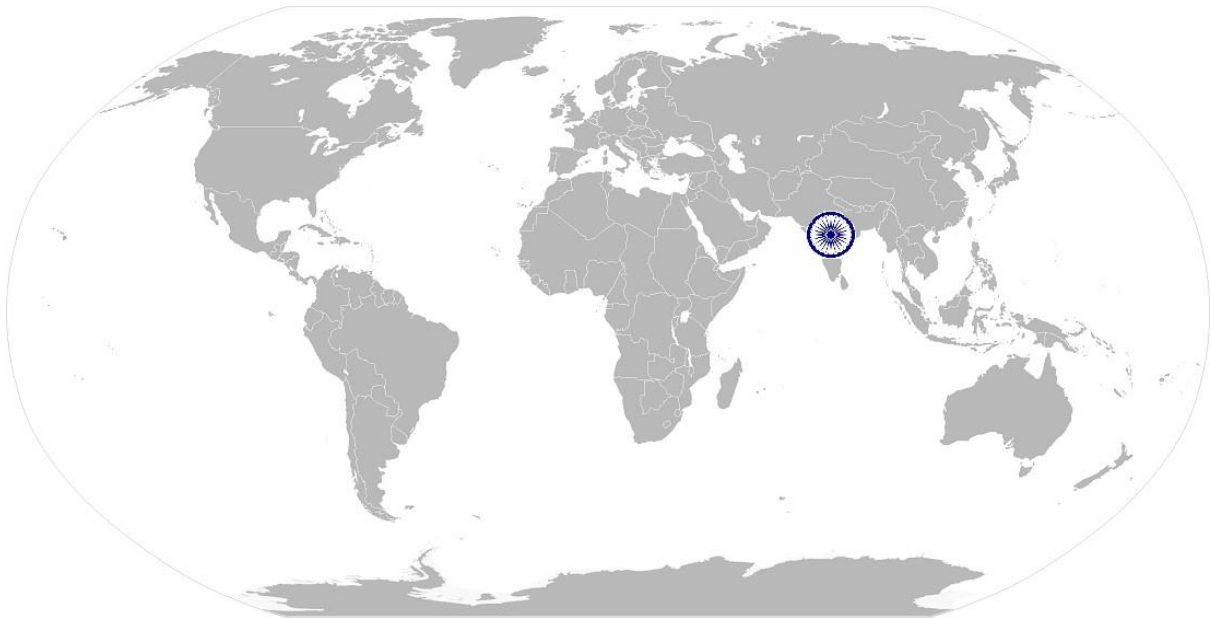
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NOS Code	ISC/N0814		
Credits(NSQF)	TBD	Version number	1.0
Industry	Iron and Steel	Drafted on	08/09/2014
Industry Sub-sector	Mechanical Maintenance	Last reviewed on	25/03/2015
Occupation	Fitter	Next review date	1/04/2017





National Occupational Standards



Overview

This unit is about inspecting the pipe line circuit for scheduled maintenance or defects and preparing the tools, tackles and pipe line fittings for carrying out the assigned pipe line circuit job.



ISC/N0815:

Prepare for operation for water cooling system

Unit Code	ISC/N0815
Unit Title (Task)	Prepare for operation for water cooling system
Description	This unit is about inspecting the pipe line circuit for scheduled maintenance or defects and preparing the tools, tackles and pipe line fittings for carrying out the assigned pipe line circuit job.
Scope	This unit/task covers the following: <ul style="list-style-type: none"> Reach the site and inspect the pipe line circuit drawing for scheduled maintenance or defects and identify cause of problem Prepare tools, tackles, hard wares, pipes, pipe line fittings and equipments required for assigned pipe line job
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Reach the site and inspect the pipe line circuit drawing for scheduled maintenance or defects and identify cause of problem	To be competent, the user/individual on the job must be able to: PC1. Reach the site with desired tools, tackles, hard wares, pipes, pipe line fittings and equipments PC2. Identify the root cause of the problem, if any PC3. Identify the source of leakage in water cooling system PC4. Identify part of the pipe line choking due to scale formation PC5. Identify the pipe line damage due to corrosion PC6. Identify the temperate rise of the discharged water
Prepare tools, tackles, hard wares, pipes, pipe line fittings and equipments required for assigned pipe line job	To be competent, the user/individual on the job must be able to: PC7. Prepare the list of tools, tackles, hard wares, pipes, pipe line fittings and equipments required for completion of the assigned pipe line job and ensure availability at the work site PC8. Ensure that tools, tackles, hard wares, pipes, pipe line fittings match the desired specifications of the given job PC9. Ensure tools, tackles, hard wares, pipes, pipe line fittings and equipment required for assembly are free from physical damage and ready for operation PC10. Report damaged / defective pipes, pipe fittings and equipment as per the escalation matrix
Element	Knowledge and Understanding
A. Organisational Context (Knowledge of the Company/ Organisation and its processes)	The user/individual on the job needs to know and understand: KA1. Quality and damage checks to be done and importance of the same KA2. Risk and impact of not following defined procedures/work instructions KA3. Escalation matrix for reporting identified issues KA4. Safety procedures as applicable at the work sites
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. Pipe line circuit drawing KB2. Tools & tackles to be used for the pipe line job e.g. different types of pipe wrench, pipe vice etc. KB3. Hard wares e.g. steam jointing, red lead powder, teflon tapes/grease etc.



ISC/N0815:

Prepare for operation for water cooling system

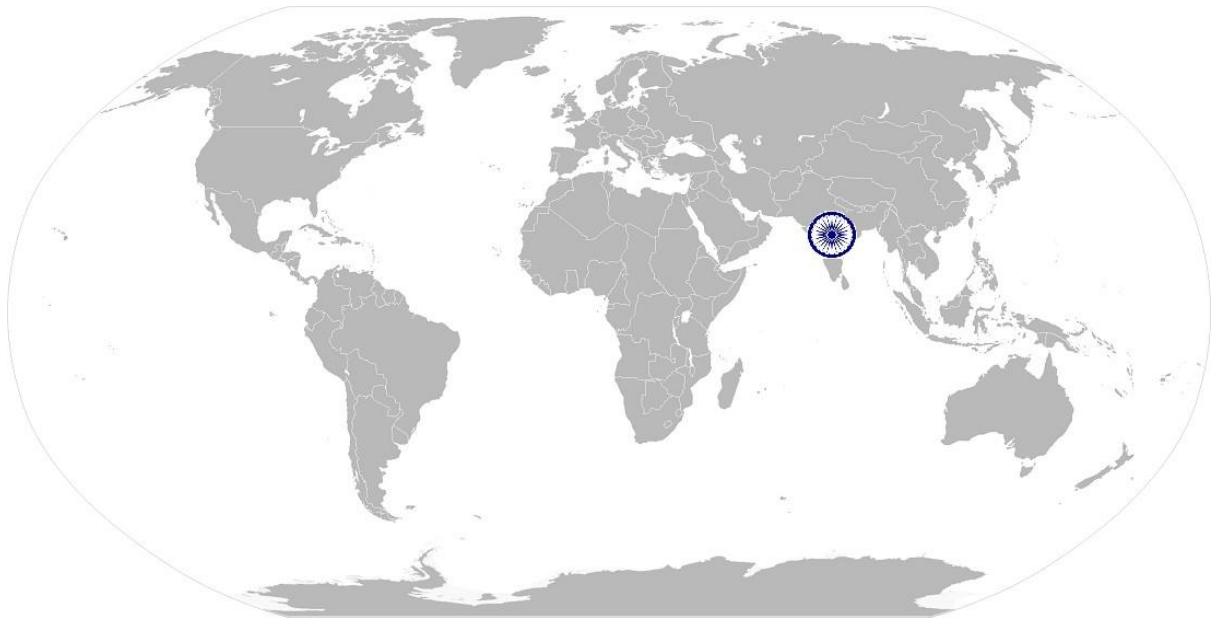
	<p>KB4. Gas cutting and welding KB5. Pipe bending as per required profile KB6. Different types of pipe fittings e.g. socket, union, reducer, plug, elbow, T fittings, 4 way fitting, rotary fitting etc. KB7. Pipe line threading as required KB8. Cooling media e.g.- industrial water, soft water KB9. Leakages and their repairing KB10. Pressure testing of hearth cooling staves, bosh plates and tuyere (for blast furnace cooling system) KB11. Implications of not adhering to sequence of activities and operations for pipe line layout as per pipe line circuit drawing</p>	
Skills (S) w.r.t. the scope		
Element	Skills	
A. Core Skills/ Generic Skills	Writing Skills	
	The user/ individual on the job needs to know and understand how to: SA1. Construct simple sentences and express ideas clearly through written communication SA2. Fill up appropriate technical forms, process charts, activity logs in required format of the company	
	Reading and Understanding Skills	
	The user/individual on the job needs to know and understand how to: SA3. Read and interpret pipe line circuit drawing SA4. Interpret the sequence of activities SA5. Read and understand manuals, health and safety instructions, memos, reports, job cards etc.	
	Oral Communication (Listening and Speaking skills)	
	The user/individual on the job needs to know and understand how to: SA6. Express statements, opinions or information clearly so that others can hear and understand SA7. Respond appropriately to queries SA8. Communicate with team members and supervisor	
	B. Professional Skills	Decision Making
		The user/individual on the job needs to know and understand how to: SB1. Make appropriate decisions pertaining to the concerned area of work with respect to intended work objective, span of authority, responsibility, laid down procedure and guidelines
Plan and Organize		
The user/individual on the job needs to know and understand: SB2. Plan and organize their own work schedule, work area, tools, equipment and materials to maintain decorum and for improved productivity		
Customer Centricity		
N.A		
Problem Solving		
The user/individual on the job needs to know and understand how to: SB3. Think through the problem, evaluate the possible solution(s) and suggest an		



ISC/N0815:

Prepare for operation for water cooling system

	optimum /best possible solution(s) SB4. Identify immediate or temporary solutions to resolve delays SB5. Identify sources of support that can be availed of for problem solving for various kind of problems SB6. Seek appropriate assistance from other sources to resolve problems SB7. Report problems that you cannot resolve to appropriate authority
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB8. Identify cause and effect relations in their area of work SB9. Use cause and effect relations to anticipate potential problems and their solution
	Critical Thinking
	N.A



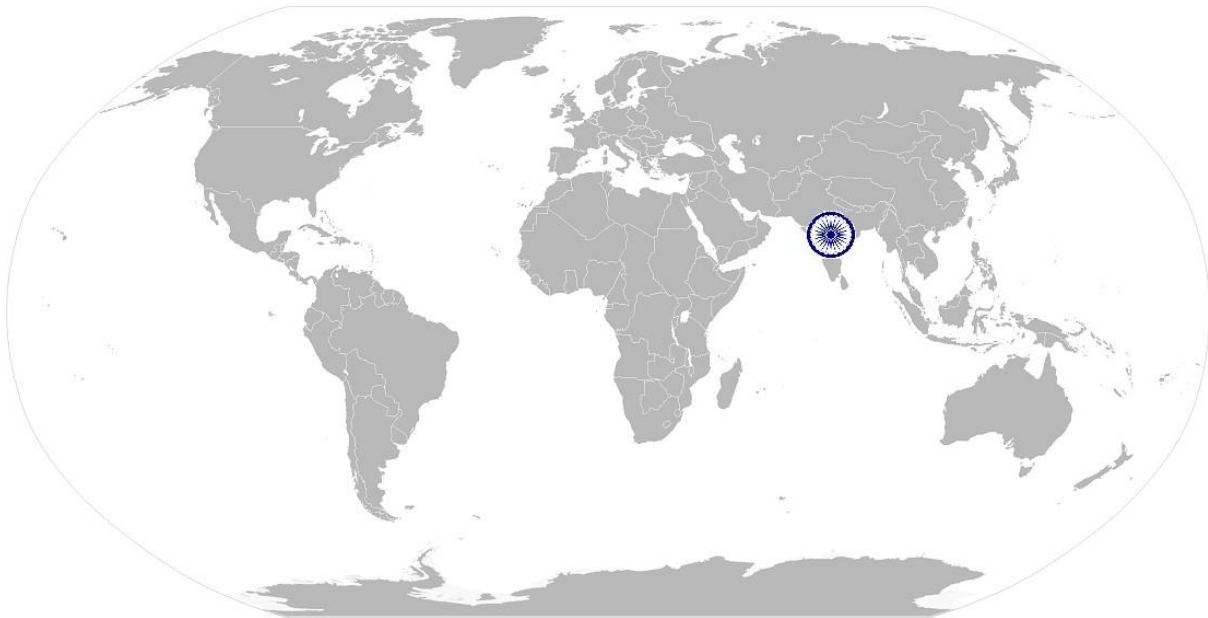


ISC/N0815:

Prepare for operation for water cooling system

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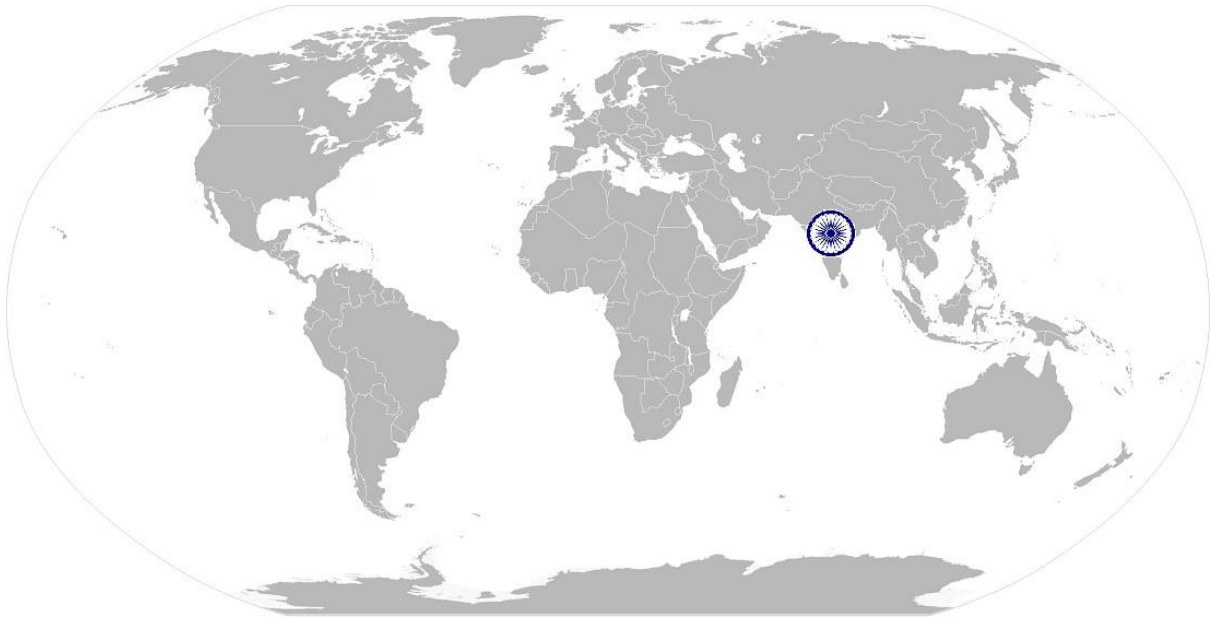
NOS Code	ISC/N0815		
Credits(NSQF)	TBD	Version number	1.0
Industry	Iron and Steel	Drafted on	08/09/2014
Industry Sub-sector	Mechanical Maintenance	Last reviewed on	25/03/2015
Occupation	Fitter	Next review date	1/04/2017





ISC/N0816: Carry out the assigned sequence of operation for water cooling system

National Occupational Standards



Overview

This unit is about carrying out the assigned operation of fitter water cooling system in terms of rectifying the identified problem or carrying out scheduled maintenance.



ISC/N0816: Carry out the assigned sequence of operation for water cooling system

Unit Code	ISC/N0816
Unit Title (Task)	Carry out the assigned sequence of operation for water cooling system
Description	This unit is about carrying out the assigned sequence of operation of fitter water cooling system in terms for rectifying the identified problem or carrying out scheduled maintenance.
Scope	This unit/task covers the following: <ul style="list-style-type: none"> Conduct routine maintenance or rectify the problem, as appropriate for cooling water pipe line circuit Conduct tests to ensure fitness of cooling water pipe line circuit Communicate to supervisor about completion of work or deviations if any
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Conduct routine maintenance or rectify the problem, as appropriate for cooling water pipe line circuit	To be competent, the user/individual on the job must be able to: PC1. Dismantle the damaged / choked pipe line circuit, as needed PC2. Correct the defect in the pipe line circuit part or replace the defective part PC3. Assemble the pipe line parts/fittings according to the pipe line circuit drawings, as required PC4. Replace damaged / choked / corroded pipes, pipe fittings and clamps etc. PC5. Adjust the water line valves for proper water flow in the pipe line circuit PC6. Check the discharge water temperature to ensure proper cooling
Conduct tests to ensure fitness of cooling water pipe line circuit	To be competent, the user/individual on the job must be able to: PC7. Check proper water flow with adequate pressure in the pipe line circuit for proper cooling PC8. Check the opening of valves to ensure flow, pressure, temperature etc. PC9. Check the clamping of the pipe line circuit to ensure rigidity and safety PC10. Test the pipe line circuit to ensure it is leak proof and fit to use before handover PC11. Record the test results in the prescribed format of the organization
Communicate to supervisor about completion of work or deviations if any	To be competent, the user/individual on the job must be able to: PC12. Ensure all activities are complete according to checklist PC13. Communicate to supervisor on completion of given job and in case of any deviations from checklist
Element	Knowledge and Understanding
A. Organisational Context (Knowledge of the Company/ Organisation and its processes)	The user/individual on the job needs to know and understand: KA1. Quality and damage checks to be done and importance of the same KA2. Risk and impact of not following defined procedures/work instructions KA3. Escalation matrix for reporting identified issues KA4. Safety procedures as applicable at the work sites
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. Pipe line circuit drawing KB2. Tools & tackles to be used for the pipe line job e.g. different types of pipe



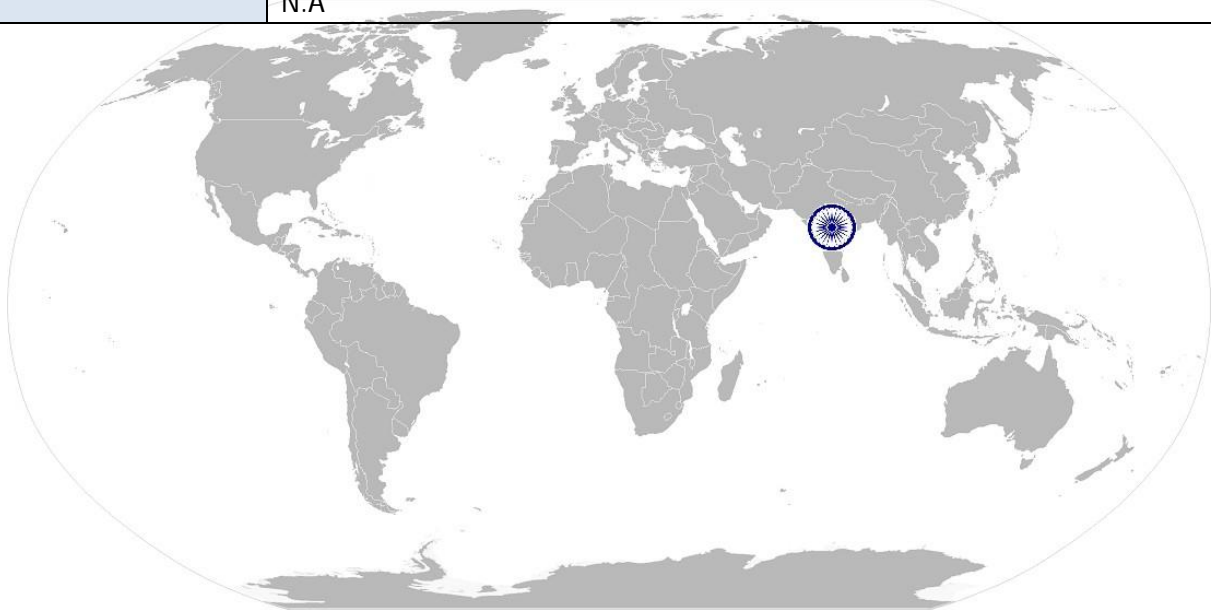
ISC/N0816: Carry out the assigned sequence of operation for water cooling system

	<p>wrench, pipe vice etc. KB3. Hard wares e.g. steam jointing, red lead powder, teflon tapes/grease etc. KB4. Gas cutting and welding KB5. Pipe bending as per required profile KB6. Different types of pipe fittings e.g. socket, union, reducer, plug, elbow, T fittings, 4 way fitting, rotary fitting etc. KB7. Pipe line threading as required KB8. Cooling media e.g.- industrial water, soft water KB9. Leakages and their repairing KB10. Pressure testing of hearth cooling staves, bosh plates and tuyere (for blast furnace cooling system) KB11. Implications of not adhering to sequence of activities and operations for pipe line layout as per pipe line circuit drawing</p>	
Skills (S) w.r.t. the scope		
Element	Skills	
A. Core Skills/ Generic Skills	Writing Skills	
	The user/ individual on the job needs to know and understand how to: SA1. Construct simple sentences and express ideas clearly through written communication SA2. Fill up appropriate technical forms, process charts, activity logs in required format of the company	
	Reading and Understanding Skills	
	The user/individual on the job needs to know and understand how to: SA3. Read and interpret pipe line circuit drawing SA4. Interpret the sequence of activities SA5. Read and understand manuals, health and safety instructions, memos, reports, job cards etc.	
	Oral Communication (Listening and Speaking skills)	
	The user/individual on the job needs to know and understand how to: SA6. Express statements, opinions or information clearly so that others can hear and understand SA7. Respond appropriately to queries SA8. Communicate with team members and supervisor	
	B. Professional Skills	Decision Making
		The user/individual on the job needs to know and understand how to: SB1. Make appropriate decisions pertaining to the concerned area of work with respect to intended work objective, span of authority, responsibility, laid down procedure and guidelines
Plan and Organize		
The user/individual on the job needs to know and understand: SB2. Plan and organize their own work schedule, work area, tools, equipment and materials to maintain decorum and for improved productivity		
	Customer Centricity	
	N.A	



ISC/N0816: Carry out the assigned sequence of operation for water cooling system

	Problem Solving
	The user/individual on the job needs to know and understand how to: SB3. Think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s) SB4. Identify immediate or temporary solutions to resolve delays SB5. Identify sources of support that can be availed of for problem solving for various kind of problems SB6. Seek appropriate assistance from other sources to resolve problems SB7. Report problems that you cannot resolve to appropriate authority
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB8. Identify cause and effect relations in their area of work SB9. Use cause and effect relations to anticipate potential problems and their solution
	Critical Thinking
	N.A

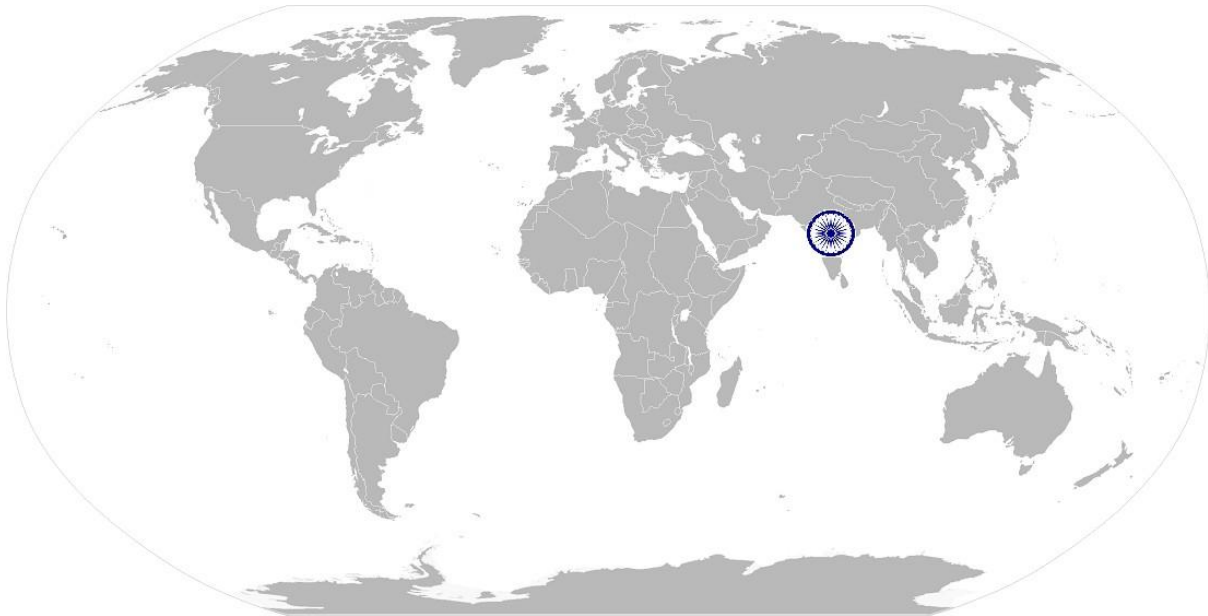




ISC/N0816: Carry out the assigned sequence of operation for water cooling system

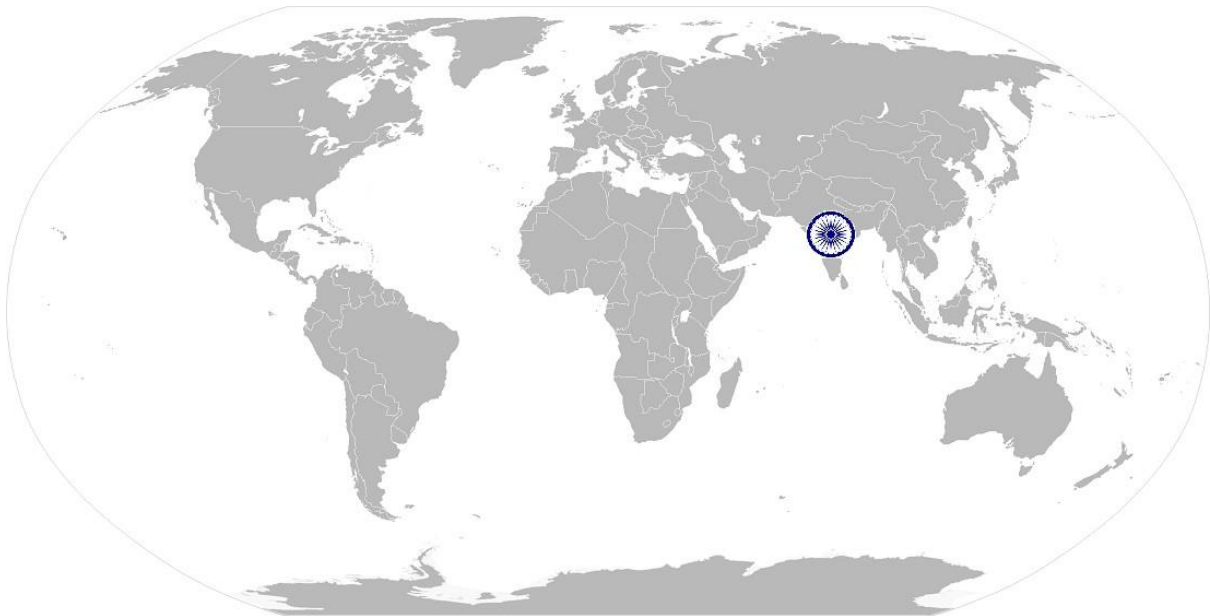
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NOS Code	ISC/N0816		
Credits(NSQF)	TBD	Version number	1.0
Industry	Iron and Steel	Drafted on	08/09/2014
Industry Sub-sector	Mechanical Maintenance	Last reviewed on	25/03/2015
Occupation	Fitter	Next review date	1/04/2017





National Occupational Standards



Overview

This unit covers health, safety and security at the workplace. This includes procedures and practices that candidates need to follow to help maintain a healthy, safe and secure work environment.



ISC/N0008:

Use basic health and safety practices at the workplace

National Occupational Standard

Unit Code	ISC/N0008
Unit Title (Task)	Use basic health and safety practices at the work place
Description	This OS unit is about knowledge and practices relating to health, safety and security that candidates need to use in the workplace. It covers responsibilities towards self, others, assets and the environment. It includes understanding of risks and hazards in the workplace, along with common techniques to minimize risk, deal with accidents, emergencies, etc.
Scope	This unit/task covers the following: <ul style="list-style-type: none"> • Health and safety procedures • Fire safety procedures • Emergencies, rescue and first aid procedures
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Health and safety procedures	<p>The user/individual on the job should be able to:</p> <p>PC1. Use protective clothing/equipment for specific tasks and work conditions Protective clothing includes:</p> <ul style="list-style-type: none"> • Leather or asbestos gloves • Flame proof aprons • Flame proof overalls buttoned to neck • Cuff less (without folds) trousers • Reinforced footwear • Helmets/hard hats • Cap and shoulder covers • Ear defenders/plugs • Safety boots • Knee pads • Particle masks • Glasses/gloves/visors <p>Equipment includes:</p> <ul style="list-style-type: none"> • Hand shields • Machine guards • Residual current devices • Shields • Dust sheets • Respirator <p>PC2. State the name and location of people responsible for health and safety in the workplace</p> <p>Various areas are listed below:</p> <ul style="list-style-type: none"> • On chemical containers • Equipment • Packages • Inside buildings

ISC/N0008:

Use basic health and safety practices at the workplace

	<ul style="list-style-type: none">• Open areas, public places etc. <p>PC3. State the names and location of documents that refer to health and safety in the workplace</p> <p>PC4. Identify job-site hazardous work and state possible causes of risk or accident in the workplace</p> <p>Hazards include:</p> <ul style="list-style-type: none">• Working with electrical and thermal tools and equipment• Sharp edged and heavy tools• Heated metals• Oxyfuel and gas cylinders• Welding radiation• Surfaces: sharp, slippery, uneven, chipped, broken, etc.• Substances: chemicals, gas, oxy-fuel, fumes, dust, etc.• Physical: working at heights, large and heavy objects and machines, sharp and piercing objects, tolls and machines, intense light, load noise, obstructions in corridors, by doors, blind turns, noise, over stacked shelves and packages, etc.• Electrical: power supply and points, loose and naked cables and wires, electrical machines and appliances, etc. <p>PC5. Carry out safe working practices while dealing with hazards to ensure the safety of self and others state methods of accident prevention in the work environment of the job role</p> <p>Safe working practices include:</p> <ul style="list-style-type: none">• Using protective clothing and equipment• Putting up and reading safety signs• Handle tools in the correct manner and store and maintain them properly• Keep work area clear of clutter, spillage and unsafe object lying casually• While working with electricity take all electrical precautions like insulated clothing, adequate equipment insulation, use of control equipment, dry work area, switch off the power supply when not required, etc.• Safe lifting and carrying practices• Use equipment that is working properly and is well maintained• Take due measures for safety while working in confined places, trenches or at heights, etc. Including safety harness, fall arrestors etc. <p>Methods are:</p> <ul style="list-style-type: none">• Training in health and safety procedures• Using health and safety procedures• Use of equipment and working practices (such as safe carrying procedures)• Safety notices, advice• Instruction from colleagues and supervisors <p>PC6. State location of general health and safety equipment in the workplace</p> <p>PC7. Inspect for faults, set up and safely use steps and ladders in general use</p> <p>Faults :</p> <ul style="list-style-type: none">• Corrosion of metal components
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Use basic health and safety practices at the workplace

	<ul style="list-style-type: none"> • Deterioration • Splits and cracks timber components • Imbalance • Loose rungs • Nuts or bolts, etc. <p>Set up:</p> <ul style="list-style-type: none"> • Firm/level base • Clip/lash down • Leaning at the correct angle, etc. <p>PC8. Work safely in and around trenches, elevated places and confined areas PC9. Lift heavy objects safely using correct procedures PC10. Apply good housekeeping practices at all times. Good housekeeping practices:</p> <ul style="list-style-type: none"> • Clean/tidy work areas • Removal/disposal of waste products • Protect surfaces <p>PC11. Identify common hazard signs displayed in various areas PC12. Retrieve and/or point out documents that refer to health and safety in the workplace</p>
<p>Fire safety procedures</p>	<p>The user/individual on the job should be able to:</p> <p>PC13. Use the various appropriate fire extinguishers on different types of fires correctly.</p> <p>Fire extinguishers:</p> <ul style="list-style-type: none"> • Sand • Water • Foam • Co2 • Dry powder <p>Fires:</p> <ul style="list-style-type: none"> • Class A: Ordinary solid combustibles, e.g. wood, paper, cloth, plastic, charcoal etc. • Class B: Flammable liquids and gases, e.g. gasoline, propane, diesel fuel, tar, cooking oil and similar substances • Class C: Electrical equipment e.g. appliances, wiring, breaker panels etc. (these categories of fires become Class A, B, and D fires when the electrical equipment that initiated the fire is no longer receiving electricity) • Class D: Combustible metals such as magnesium, titanium, and sodium (these fires burn at extremely high temperatures and require special suppression agents) <p>Causes of fires:</p> <ul style="list-style-type: none"> • Heating of metal • Spontaneous ignition • Sparking, • Electrical heating • Loose fires (e.g. Smoking, welding, etc.) • Chemical fires, etc. <p>PC14. Demonstrate rescue techniques applied during fire hazard</p>



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	<p>PC15. Demonstrate good housekeeping in order to prevent fire hazards PC16. Demonstrate the correct use of a fire extinguisher</p>
<p>Emergencies, rescue and first-aid procedures</p>	<p>The user/individual on the job should be able to:</p> <p>PC17. Demonstrate how to free a person from electrocution PC18. Administer appropriate first aid to victims as required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc. PC19. Demonstrate basic techniques of bandaging PC20. Respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments . few General health and safety equipment are mentioned below :</p> <ul style="list-style-type: none"> • Fire extinguishers • First aid equipment • Safety instruments and clothing • Safety installations, e.g. Fire exits, exhaust fans etc. <p>PC21. Perform and organize loss minimization or rescue activity during an accident in real or simulated environments PC22. Administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases PC23. Demonstrate the artificial respiration and the CPR Process PC24. Participate in emergency procedures. Emergency procedures are:</p> <ul style="list-style-type: none"> • Raising alarm • Safe/efficient evacuation • Correct means of escape • Correct assembly point • Roll call • Correct return to work <p>PC25. Complete a written accident/incident report or dictate a report to another person, and send report to person responsible Incident Report should capture:</p> <ul style="list-style-type: none"> • Name • Date/time of incident • Date/time of report, • Location • Environment conditions • Persons involved • Sequence of events • Injuries sustained • Damage sustained • Actions taken • Witnesses • Supervisor/manager notified <p>Documents:</p> <ul style="list-style-type: none"> • Fire notices • Accident reports • Safety instructions for equipment and procedures • Company notices and documents • Legal documents (e.g. Government notices)



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	<p>Job titles:</p> <ul style="list-style-type: none"> • Health and safety officer • First aid officer • Fire officer <p>PC26. Demonstrate correct method to move injured people and others during an emergency</p>
Element	Knowledge and Understanding
<p>A. Organisational Context (Knowledge of the Company/ Organisation and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. State the names (and job titles if applicable), and describe where to find, all the people responsible for health and safety in a workplace</p> <p>KA2. State the names and location of documents that refer to health and safety in the workplace</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>The user/individual on the job needs to know and understand:</p> <p>KB1. Meaning of “hazards” and “risks”</p> <p>KB2. Health and safety hazards commonly present in the work environment and related precautions</p> <p>KB3. Possible causes of risk, hazard or accident in the workplace and why risk and/or accidents are possible</p> <p>KB4. Activities and causes of risk and accident</p> <p>KB5. Methods of accident prevention</p> <p>KB6. Safe working practices when working with tools and machines</p> <p>KB7. Safe working practices while working at various hazardous sites</p> <p>KB8. Where to find all the general health and safety equipment in the workplace</p> <p>KB9. Various dangers associated with the use of electrical equipment</p> <p>KB10. Preventative and remedial actions to be taken in the case of exposure to toxic materials.</p> <ul style="list-style-type: none"> • Exposure: ingested, contact with skin, inhaled • Preventative action: ventilation, masks, protective clothing/equipment • Remedial action: immediate first aid, report to supervisor • Materials: solvents, flux, lead <p>KB11. Importance of using protective clothing/equipment while working</p> <p>KB12. Precautionary activities to prevent the fire accident</p> <p>Activities and causes:</p> <ul style="list-style-type: none"> • Physical actions • Reading • Listening to and giving instructions • Inattention • Sickness and incapacity (e.g. Drunkenness) • Health hazards (e.g. Untreated injuries and contagious illness) <p>KB13. Various causes of fire</p> <p>KB14. Techniques of using the different fire extinguishers</p> <p>KB15. Different methods of extinguishing fire</p> <p>KB16. Rescue techniques applied during a fire hazard</p>



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Use basic health and safety practices at the workplace

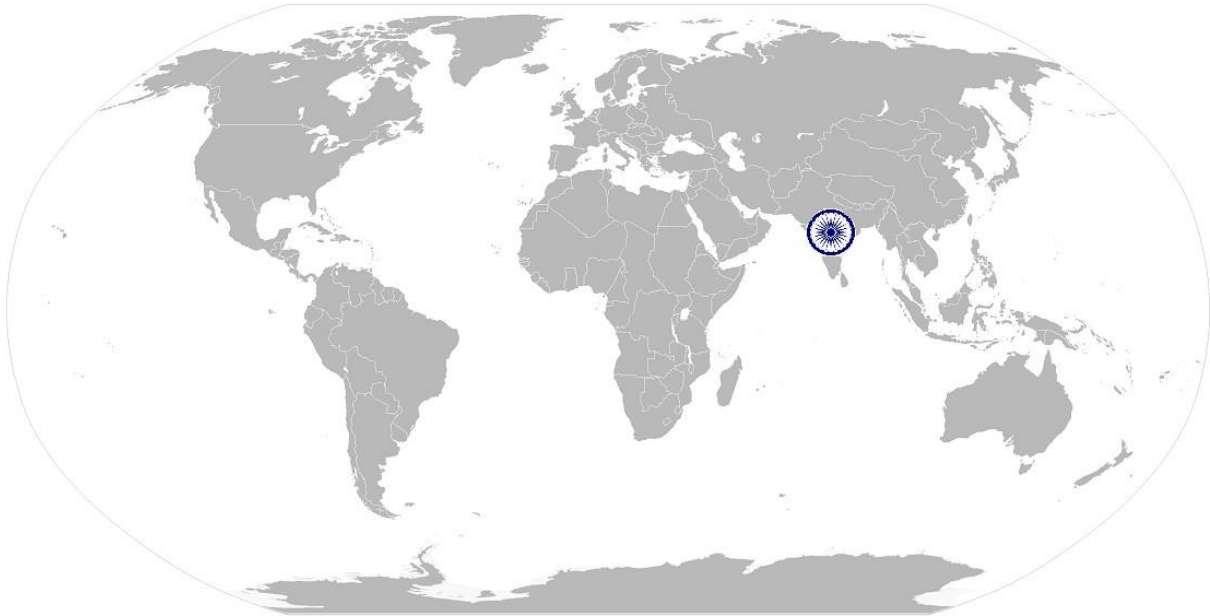
	<p>KB17. Various types of safety signs and what they mean KB18. Appropriate basic first aid treatment relevant to the condition e.g. Shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries KB19. Content of written accident report KB20. Potential injuries and ill health associated with incorrect manual handling KB21. Safe lifting and carrying practices KB22. Personal safety, health and dignity issues relating to the movement of a person by others KB23. Potential impact to a person who is moved incorrectly</p>
Skills (S) w.r.t. the scope	
Element	Skills
A. Core Skills/ Generic Skills	Reading and Writing Skills
	The user/individual on the job needs to know and understand how to: SA1. Read and comprehend basic content to read labels, charts, signages SA2. Read and comprehend basic English to read manuals of operations SA3. Read and write an accident/incident report in local language or English
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA4. Question co-workers appropriately in order to clarify instructions and other issues SA5. Give clear instructions to co-workers, subordinates others
B. Professional Skills	Decision Making
	The user/individual on the job needs to know and understand how to: SB1. Make appropriate decisions pertaining to the concerned area of work with respect to intended work objective, span of authority, responsibility, laid down procedure and guidelines
	Plan and Organize
	The user/individual on the job needs to know and understand: SB2. Plan and organize their own work schedule, work area, tools, equipment and materials to maintain decorum and for improved productivity
	Customer Centricity
	N.A
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB3. Think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s) SB4. Identify immediate or temporary solutions to resolve delays SB5. Identify sources of support that can be availed of for problem solving for various kind of problems SB6. Seek appropriate assistance from other sources to resolve problems SB7. Report problems that you cannot resolve to appropriate authority
Analytical Thinking	
The user/individual on the job needs to know and understand how to: SB8. Identify cause and effect relations in their area of work	



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	SB9. Use cause and effect relations to anticipate potential problems and their solution
	Critical Thinking
	N.A

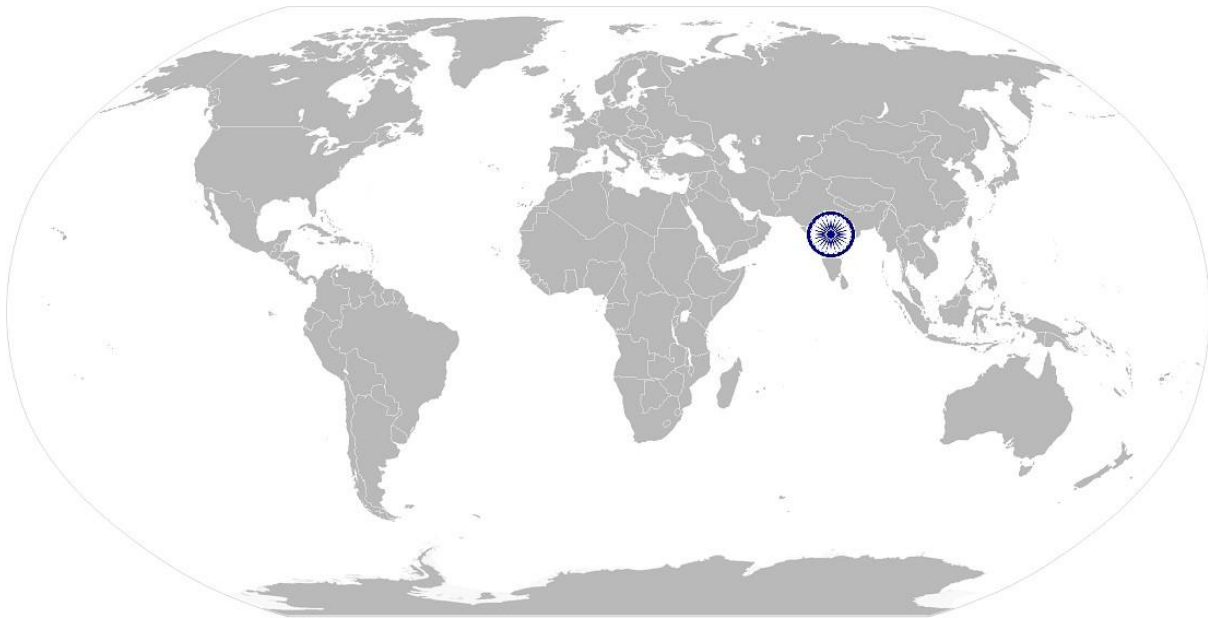




ISC/N0008: Use basic health and safety practices at the workplace

NOS Version Control

NOS Code	ISC/N0008		
Credits(NSQF)	TBD	Version number	1.0
Industry	Iron and Steel	Drafted on	23/07/2014
Industry Sub-sector	All Departments	Last reviewed on	30/12/2014
Occupation	Fitter	Next review date	1/04/2017

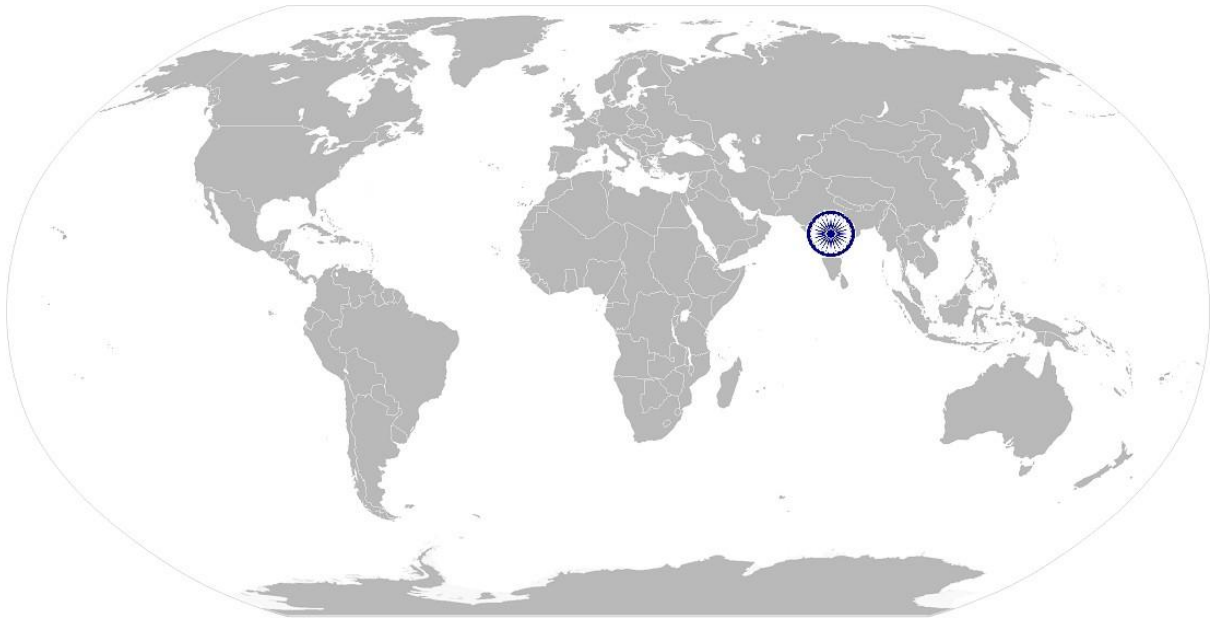




ISC/N0009:

Work effectively with others

National Occupational Standards



Overview

This unit covers basic practices that improve effectiveness of working with others in an organisational set-up.



ISC/N0009:

Work effectively with others

National Occupational Standard	Unit Code	ISC/N0009
	Unit Title (Task)	Work effectively with others
	Description	This unit covers basic etiquette and competencies that a candidate is required to possess and demonstrate in their behaviour and interactions with others at the workplace.
	Scope	This unit/task covers the following: <ul style="list-style-type: none"> Ensure appropriate communication with superiors, peers and others as applicable at work place Demonstrate appropriate behaviour and etiquette at work place
	Performance Criteria (PC) w.r.t. the Scope	
	Element	Performance Criteria
	Ensure appropriate communication with superiors, peers and others as applicable at work place	The user/individual on the job should be able to: PC1. Accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required PC2. Accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt PC3. Provide information to others clearly, at a pace and in a manner that helps them to understand
	Demonstrate appropriate behaviour and etiquette at work place	The user/individual on the job should be able to: PC4. Display helpful behaviour by assisting others in performing tasks in a positive manner, where required and possible PC5. Consult with and assist others to maximize effectiveness and efficiency in carrying out tasks PC6. Display appropriate communication etiquette while working PC7. Display active listening skills while interacting with others at work PC8. Use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism PC9. Demonstrate responsible and disciplined behaviours at the workplace PC10. Escalate grievances and problems to
	Element	Knowledge and Understanding
	A. Organisational Context (Knowledge of the Company/ Organisation and its processes)	The user/individual on the job needs to know and understand: KA1. Legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions KA2. Reporting structure, inter-dependent functions, lines and procedures in the work area KA3. Relevant people and their responsibilities within the work area KA4. Escalation matrix and procedures for reporting work and employment related issues



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Work effectively with others

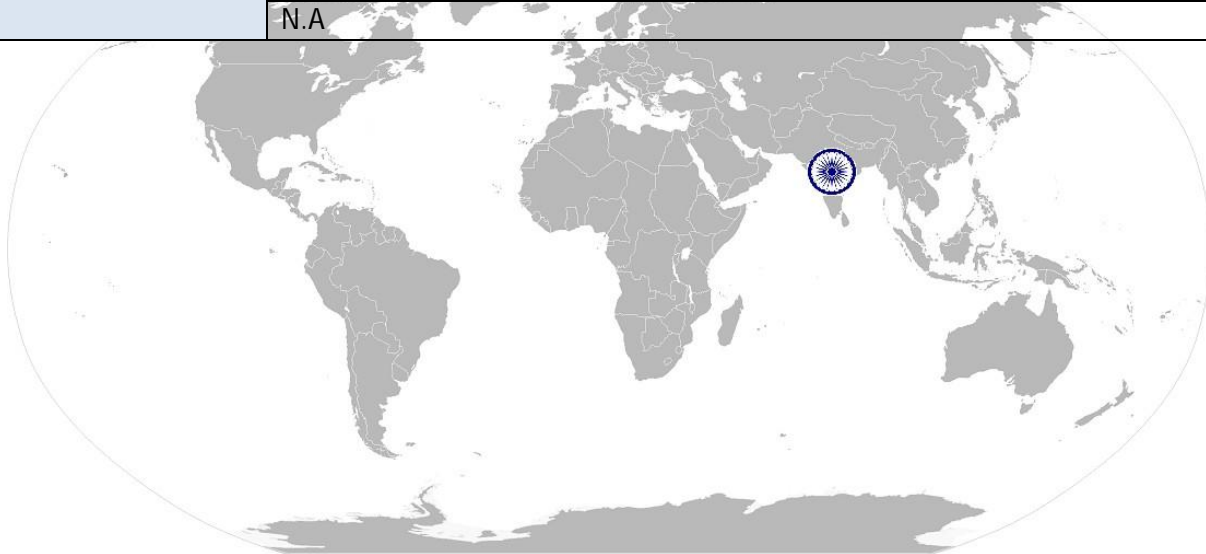
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. Various categories of people that one is required to communicate and co-ordinate with in the organization</p> <p>KB2. Importance of effective communication in the workplace</p> <p>KB3. Importance of teamwork in organizational and individual success</p> <p>KB4. Various components of effective communication</p> <p>KB5. Key elements of active listening</p> <p>KB6. Value and importance of active listening and assertive communication</p> <p>KB7. Barriers to effective communication</p> <p>KB8. Importance of tone and pitch in effective communication</p> <p>KB9. Importance of avoiding casual expletives and unpleasant terms while communicating professional circles</p> <p>KB10. How poor communication practices can disturb people, environment and cause problems for the employee, the employer and the customer</p> <p>KB11. Importance of ethics for professional success</p> <p>KB12. Importance of discipline for professional success</p> <p>KB13. What constitutes disciplined behaviour for a working professional</p> <p>KB14. Common reasons for interpersonal conflict</p> <p>KB15. Importance of developing effective working relationships for professional success</p> <p>KB16. Expressing and addressing grievances appropriately and effectively</p> <p>KB17. Importance and ways of managing interpersonal conflict effectively</p>
<p>Skills (S) w.r.t. the scope</p>	
<p>Element</p>	<p>Skills</p>
<p>A. Core Skills/ Generic Skills</p>	<p>Reading and Writing Skills</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA1. Read and comprehend basic content to read labels, charts, signage's</p> <p>SA2. Read and comprehend basic English to read manuals of operations</p> <p>SA3. Read and write an accident/incident report in local language or English</p> <p>Oral Communication (Listening and Speaking skills)</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA4. Question co-workers appropriately in order to clarify instructions and other issues</p> <p>SA5. Provide clear instructions to co-workers, subordinates others</p>
<p>B. Professional Skills</p>	<p>Decision Making</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. Make appropriate decisions pertaining to the concerned area of work with respect to intended work objective, span of authority, responsibility, laid down procedure and guidelines</p> <p>Plan and Organize</p> <p>The user/individual on the job needs to know and understand:</p> <p>SB2. Plan and organize their own work schedule, work area, tools, equipment and materials to maintain decorum and for improved productivity</p>



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	Customer Centricity
	N.A
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB3. Think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s) SB4. Identify immediate or temporary solutions to resolve delays SB5. Identify sources of support that can be availed of for problem solving for various kind of problems SB6. Seek appropriate assistance from other sources to resolve problems SB7. Report problems that you cannot resolve to appropriate authority
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB8. Identify cause and effect relations in their area of work SB9. Use cause and effect relations to anticipate potential problems and their solution
	Critical Thinking
	N.A



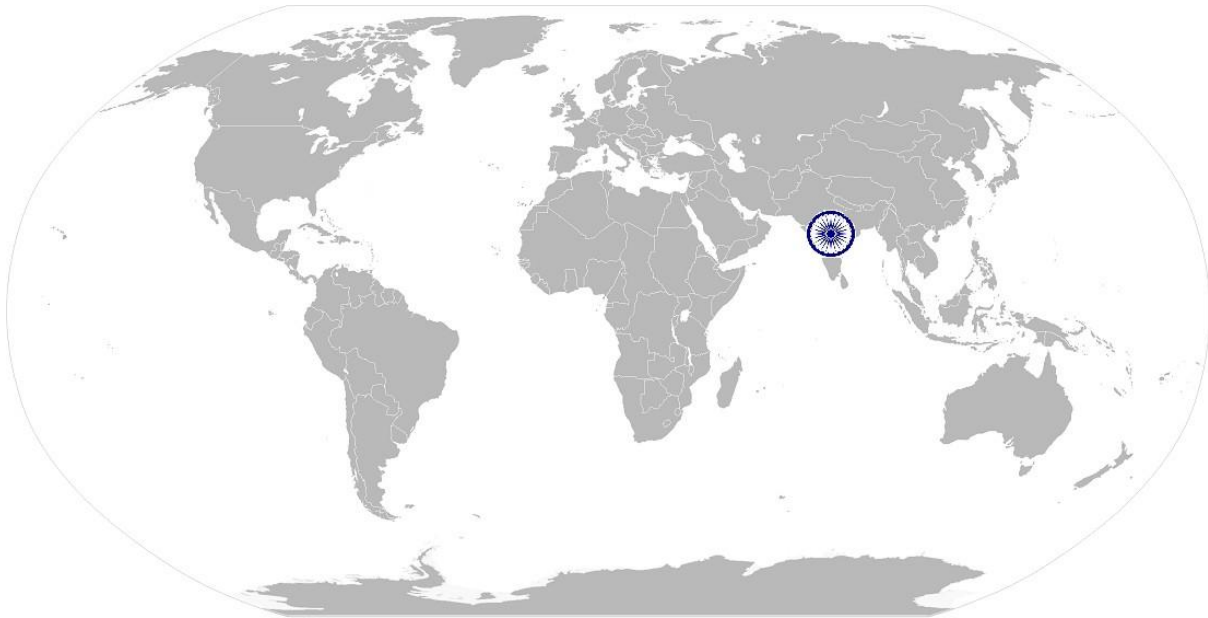


ISC/N0009:

Work effectively with others

NOS Version Control

NOS Code	ISC/N0009		
Credits(NSQF)	TBD	Version number	1.0
Industry	Iron and Steel	Drafted on	23/07/2014
Industry Sub-sector	All Departments	Last reviewed on	30/12/2014
Occupation	Fitter	Next review date	1/04/2017



CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role: Fitter & Maintenance Water Cooling

Qualification Pack: ISC/Q0820

Sector Skill Council: Indian Iron & Steel Sector Skill Council

Guidelines for Assessment:

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria.
5. To pass the Qualification Pack, every trainee should score a minimum of 60% in every NOS.
6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

Assessment outcomes	Assessment Criteria for outcomes	Marks Allocated			
		Total Marks 1000	Out Of	Theory	Practical
ISC/N0814: Understand the assigned job of fitter water cooling system	PC1. Interpret the checklist and understand the job requirements	300	20	5	15
	PC2. Plan, as appropriate to carry out the job		20	5	15
	PC3. Identify the source of leakage in water cooling system		20	5	15
	PC4. Identify part of the pipe line choking due to scale formation or other reasons		20	5	15
	PC5. Identify the pipe line damage due to corrosion		20	5	15
	PC6. Understand the pipe line circuit drawings		20	5	15



	PC7. Understand the symbols used in the pipe line circuit drawings		20	5	15
	PC8. Understand other specifications and identify the sequence of activities required to assemble the pipe line circuit		20	5	15
	PC9. Read and interpret pipe line circuit drawings to ensure correct layouts and quality of the material (pipes including fittings)		20	5	15
	PC10. Identify any clarifications that he/she wants to seek with respect to the given pipe line circuit drawing		20	5	15
	PC11. Recognize whom to contact for clarifications on the pipe line circuit drawing		20	5	15
	PC12. Escalate the concern to the supervisor or shift-in-charge, if needed		20	5	15
	PC13. Identify tools, tackles & equipment required to perform the pipe line job		20	5	15
	PC14. Ask helper to carry tools and tackles required to the desired work site		20	5	15
	PC15. Report to stores / supervisor in case of non-availability of tools, tackles, pipes and pipe line fittings etc. or stock-out		20	5	15
		Total	300	75	225
ISC/N0815: Prepare for operation for water cooling system	PC1. Reach the site with desired tools, tackles, hard wares, pipes, pipe line fittings and equipments	200	20	5	15
	PC2. Identify the root cause of the problem, if any		20	5	15
	PC3. Identify the source of leakage in water cooling system		20	5	15
	PC4. Identify part of the pipe line chocking due to scale formation		20	5	15
	PC5. Identify the pipe line damage due to corrosion		20	5	15
	PC6. Identify the temperate rise of the discharged water		20	5	15



	PC7. Prepare the list of tools, tackles, hard wares, pipes, pipe line fittings and equipments required for completion of the assigned pipe line job and ensure availability at the work site		20	5	15
	PC8. Ensure that tools, tackles, hard wares, pipes, pipe line fittings match the desired specifications of the given job		20	5	15
	PC9. Ensure tools, tackles, hard wares, pipes, pipe line fittings and equipment required for assembly are free from physical damage and ready for operation		20	5	15
	PC10. Report damaged / defective pipes, pipe fittings and equipment as per the escalation matrix		20	5	15
		Total	200	50	150
ISC/N0816: Carry out the assigned operation for water cooling system	PC1. Dismantle the damaged / choked pipe line circuit, as needed	250	15	5	10
	PC2. Correct the defect in the pipe line circuit part or replace the defective part		20	5	15
	PC3. Assemble the pipe line parts/fittings according to the pipe line circuit drawings, as required		20	5	15
	PC4. Replace damaged / choked / corroded pipes, pipe fittings and clamps etc.		20	5	15
	PC5. Adjust the water line valves for proper water flow in the pipe line circuit		20	5	15
	PC6. Check the discharge water temperature to ensure proper cooling		15	5	10
	PC7. Check proper water flow with adequate pressure in the pipe line circuit for proper cooling		20	5	15
	PC8. Check the opening of valves to ensure flow, pressure, temperature etc.		20	5	15
	PC9. Check the clamping of the pipe line circuit to ensure rigidity and safety		20	5	15
	PC10. Test the pipe line circuit to ensure it is leak proof and fit to use before handover		20	5	15



	PC11. Record the test results in the prescribed format of the organization		20	5	15
	PC12. Ensure all activities are complete according to checklist		20	5	15
	PC13. Communicate to supervisor on completion of given job and in case of any deviations from checklist		20	5	15
		Total	250	65	185
ISC/N0008: Use basic health and safety practices at the workplace	PC1. Use protective clothing/equipment for specific tasks and work conditions	150	10	5	5
	PC2. State the name and location of people responsible for health and safety in the workplace		5	0	5
	PC3. State the names and location of documents that refer to health and safety in the workplace		0	0	0
	PC4. Identify job-site hazardous work and state possible causes of risk or accident in the workplace		10	5	5
	PC5. Carry out safe working practices while dealing with hazards to ensure the safety of self and others state methods of accident prevention in the work environment of the job role		10	5	5
	PC6. State location of general health and safety equipment in the workplace		5	0	5
	PC7. Inspect for faults, set up and safely use steps and ladders in general use		5	0	5
	PC8. Work safely in and around trenches, elevated places and confined areas		5	0	5
	PC9. Lift heavy objects safely using correct procedures		5	0	5
	PC10. Apply good housekeeping practices at all times		0	0	0
	PC11. Identify common hazard signs displayed in various areas		5	5	0
	PC12. Retrieve and/or point out documents that refer to health and safety in the workplace		5	0	5
	PC13. Use the various appropriate fire extinguishers on different types of fires correctly		10	5	5



	PC14. Demonstrate rescue techniques applied during fire hazard		10	5	5
	PC15. Demonstrate good housekeeping in order to prevent fire hazards		0	0	0
	PC16. Demonstrate the correct use of a fire extinguisher		5	0	5
	PC17. Demonstrate how to free a person from electrocution		5	0	5
	PC18. Administer appropriate first aid to victims as required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc.		10	5	5
	PC19. Demonstrate basic techniques of bandaging		5	0	5
	PC20. Respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments		10	5	5
	PC21. Perform and organize loss minimization or rescue activity during an accident in real or simulated environments		5	0	5
	PC22. Administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases		5	0	5
	PC23. Demonstrate the artificial respiration and the CPR Process		5	0	5
	PC24. Participate in emergency procedures		5	0	5
	PC25. Complete a written accident/incident report or dictate a report to another person, and send report to person responsible		10	5	5
	PC26. Demonstrate correct method to move injured people and others during an emergency		0	0	0
		Total	150	45	105
ISC/N0009: Work effectively with others	PC1. Accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	100	10	5	5



PC2. Accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt		10	5	5
PC3. Provide information to others clearly, at a pace and in a manner that helps them to understand		10	0	10
PC4. Display helpful behaviour by assisting others in performing tasks in a positive manner, where required and possible		10	5	5
PC5. Consult with and assist others to maximize effectiveness and efficiency in carrying out tasks		10	5	5
PC6. Display appropriate communication etiquette while working		10	0	10
PC7. Display active listening skills while interacting with others at work		10	0	10
PC8. Use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism		10	5	5
PC9. Demonstrate responsible and disciplined behaviours at the workplace		15	5	10
PC10. Escalate grievances and problems to supervisor		5	0	5
	Total	100	30	70