

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR IRON & STEEL INDUSTRY

What are Occupational Standards (OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- 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 – Iron & Steel - Machinist

SECTOR: Iron & Steel

SUB-SECTOR: Steel, Sponge Iron, Ferro Alloys, Re-Rollers, Refractory

REFERENCE ID: ISC/Q0909

ALIGNED TO: NCO-2004/NIL

Title of Job: This job is all about identifying the sequence of machining operations required to fabricate product components by studying their designs/ sample parts and fabricating the components using the appropriate tools and dies.

Personal Attributes: This job requires the individual to work independently as well in teams. He should be result oriented and positive in attitude. At all times he should strive to achieve highest quality standards.

Job Details	Qualifications Pack Code	ISC/Q0909		
	Job Role	Iron & Steel - Machinist		
	Credits(NSQF)	TBD	Version number	1.0
	Industry	Iron & Steel	Drafted on	23/07/2014
	Sub-sector	Steel, Sponge Iron, Ferro Alloys, Re-Rollers, Refractory	Last reviewed on	30/12/2014
	Occupation	Mechanical Maintenance	Next review date	30/12/2015
	NSQC Clearance on	18/06/2015		

Job Role	Iron & Steel - Machinist
Role Description	This role is about understanding engineering drawings and preparing the equipment for fabrication activities
NSQF level	3
Minimum Educational Qualifications	Class 12 th Pass
Maximum Educational Qualifications	ITI / Diploma Pass
Training (Suggested but not mandatory)	<p>Theoretical concepts, trainings on operation of machinery and the followings:</p> <ul style="list-style-type: none"> • Trades Safety: Getting Started and Working Safely with Chemicals • Linear and Distance Measurement • Introduction to Print Reading and knowledge in Tolerance and Symbols • Interpreting Geometric Dimensioning and Tolerancing • Bench Work and Quality Concepts: Tools and Applications
Minimum Job Entry Age	18 years
Experience	<ul style="list-style-type: none"> • 1-2 years' experience in similar function • In lieu of minimum qualification the incumbent should have

	<p>minimum 3-4 years of relevant work experience working as semi- skilled Machinist/Trainee</p>
<p>Occupational Standards (OS)</p>	<p>Compulsory:</p> <p>ISC/N0901: Understand design requirement and prepare equipment ISC/N0902: Perform fabrication activities ISC/N0903: Perform post - fabrication activities ISC/N0904: Perform maintenance activities ISC/N1004: Carry out housekeeping ISC/N1005: Carry out reporting and documentation ISC/N1006: Carry out quality checks ISC/N1007: Carry out problem identification and escalation ISC/N0008: Use basic health and safety practices at the workplace ISC/N0009: Works effectively with others</p> <p>Optional:</p> <p>N/A</p>
<p>Performance Criteria</p>	<p>As described in the relevant NOS units</p>

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

ISC/N0901: Understand design requirement and prepare equipment

National Occupational Standards

A world map in grayscale with the outline of India highlighted in blue. The map is centered on the Indian subcontinent.

Overview

This unit is about understanding engineering drawings and preparing the equipment and material required for fabrication of components.

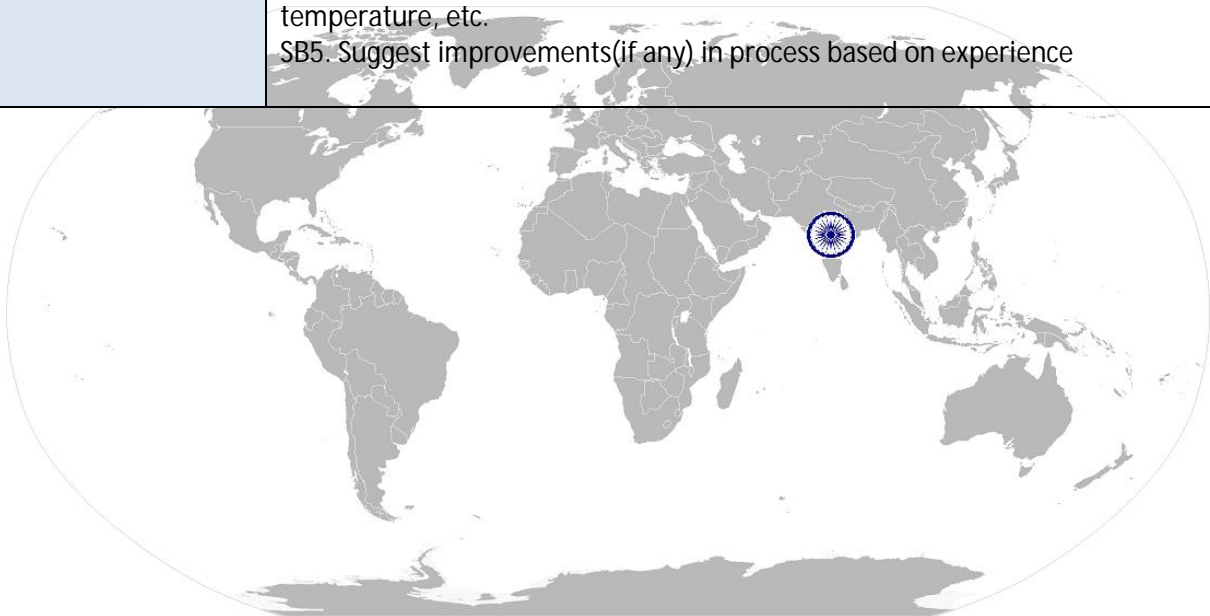
Unit Code	ISC/N0901
Unit Title (Task)	Understand design requirement and prepare equipment
Description	This unit is about understanding engineering drawings and preparing the equipment
Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> Understand the design requirement and sequence of operation by interpreting the engineering drawings Prepare the fabrication/ machining equipment Identify tools and moulds required for fabrication Prepare material required during fabrication of components Ensuring housekeeping and safety on the shop-floor
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Understand design requirements	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. Receive sample parts/ blueprints/ engineering drawings and other engineering information as per company procedures</p> <p>PC2. Analyze sample parts, engineering drawings and blueprints to plan sequence of operations for fabricating various components</p> <p>PC3. Report and rectify cases of inappropriate information in design documents as per organizational procedures</p> <p>PC4. Compute dimensions, sizes, shapes and tolerances of sub-assemblies of the machine based on specifications as per company procedures</p> <p>PC5. Identify and select machines required for fabrication of various components based on design and blueprints</p> <p>PC6. Identify and select tools for fabrication of components based on design and blueprints</p> <p>PC7. Identify and select moulds and dies for fabrication of components</p> <p>PC8. Identify and select lifting and rigging equipment based on design and blueprints</p> <p>PC9. Select appropriate metals to be used for fabrication based on design and Blueprints</p>
Equipment readiness	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC10. Ensure that equipment is clean</p> <p>PC11. Ensure machines such as lathes, milling machines and grinders required during fabrication process are ready for operation</p> <p>PC12. Set parameters for conventional or computer numerically controlled machines as per design requirements</p>

Identify tools	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC13. Collect tools required during the fabrication process PC14. Ensure that tools match the desired specifications PC15. Ensure tools and attachments required during fabrication process are free from physical damage and ready for operation PC16. Ensure the calibration status of all measuring equipment and instruments PC17. Ensure that no delays are caused as a result of improper preparation and failure to identify problems</p>
Material appropriateness and preparation	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC18. Ensure that metal work pieces and other materials required for fabrication are in the correct quantity PC19. Ensure, by visual inspection, that work pieces are of desired quality (free of rust, type of metal, etc.) PC20. Remove paint, grease, rust, or other contaminants from work piece PC21. Smoothen out the metal work piece prior to fabrication by grinding it PC22. Measure and mark metal work piece using instruments such as protractors, micrometers, scribes and rulers PC23. Ensure that no delays are caused as a result of improper preparation and failure to identify problems</p>
Health and safety	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC24. Ensure housekeeping and safety in work area PC25. Ensure that the exhaust systems are used to maintain the concentration levels of various particulate matters remain within limits PC26. Ensure use of mask during grinding to avoid inhaling the dust PC27. Ensure that the loose and torn clothes are not worn during working hours PC28. Ensure using hoist or forklift for lifting heavy materials to avoid physical injury PC29. Adhere to all other safety norms (like wearing shoes, gloves, safety goggles, helmets, etc.) PC30. Ensure that unpermitted materials such as fuels, paints etc. are removed from the work area PC31. Comply with health, safety, environment guidelines, regulations etc. in accordance with organizational SOP PC32. Identify any potential health hazards or dangers and escalate to supervisor as per organizational SOP</p>
Element	Knowledge and Understanding
A. Organisational Context (Knowledge of the Company/ Organisation and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. Implications of poorly prepared equipment, power failure etc. KA2. Importance of identifying non-conforming material and storage of the same KA3. Risk and impact of not following defined procedures/work instructions KA4. Escalation matrix for reporting identified problems</p>

	<p>KA5. Types of documentation in organization and importance of the same KA6. Records to be maintained and implications of non-maintenance of the same KA7. Importance of housekeeping & good shop-floor practices (e.g. 3S & 5S) KA8. Health, Safety and Environment guidelines, legislation and regulations applicable KA9. Personal protection(Which protective equipment to be used and how) KA10. Impact of poor practices on health, safety and environment KA11. Potential hazards and actions to minimize the same KA12. Escalation matrix and escalation procedure for reporting hazards</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. Metal fabrication processes such as forging, rolling, extrusion, bending, spinning, drawing, drilling, sawing, boring, threading, grinding, cutting, etc. KB2. Checks that need to be made to ensure that equipment is safe and ready to use (electrical connections, power return and earthing arrangements; equipment calibration, setting parameters) KB3. Operation of manual as well as CNC milling machines, lathes, grinders, laser and water cutting machines, wire electrical discharge machines, and other machine tools KB4. Machine operating parameters KB5. Engineering drawings KB6. Basic welding and brazing techniques KB7. Metals and their properties KB8. CAD/CAM technology, CNC machine tools, and computerized measuring machines KB9. Implications of not adhering to sequence of activities and operations KB10. Implications of delays in preparation process KB11. Potential problems in preparation process KB12. Indicators and reasons of potential problems KB13. Appropriate solutions to the problems encountered KB14. Units of measurement KB15. Basic mathematical principles, such as numbers and space, and techniques such as estimation and approximation, for practical purposes KB16. Response to emergencies e.g. Power failures ,fire and system failures KB17. Use of different type of fire extinguishers</p>
<p>Skills (S) w.r.t. the scope</p>	
<p>Element</p>	<p>Skills</p>
<p>A. Core Skills/ Generic Skills</p>	<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 SA2. Fill up appropriate technical forms, process charts, activity logs in required format of the company SA3. Write simple letters, mails etc. SA4. Perform functional mathematical operations, including apply basic</p>

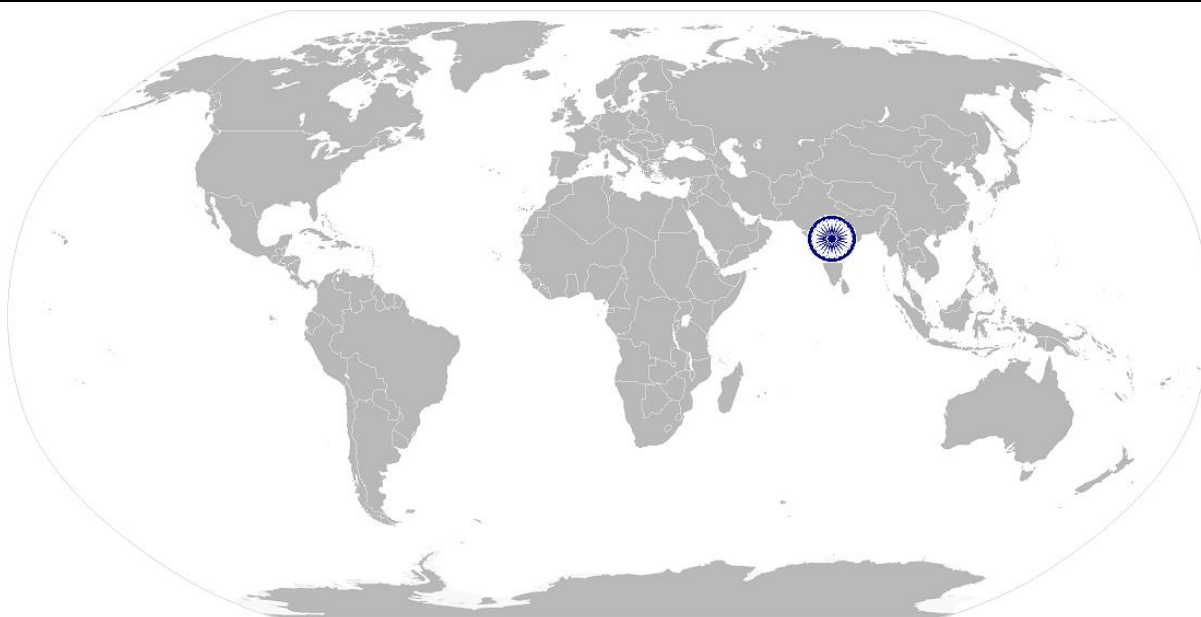
	<p>mathematical principles, such as numbers and space, and techniques such as estimation and approximation, for practical purposes</p>
	<p>Reading and Understanding Skills</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA5. Read and understand manuals, health and safety instructions, memos, reports, job cards etc. SA6. Read and interpret engineering and tool drawings</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>SA7. Express statements, opinions or information clearly so that others can hear and understand SA8. Respond appropriately to any queries SA9. Communicate with supervisor SA10. Communicate with upstream and downstream teams SA11. Work in a team and other behavioural skills required to support the small group activities (Quality Circle, Cross Functional Team, Suggestion Scheme)</p>
	<p>Integrity</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA12. Practice honesty with respect to company property and time SA13. Communicate with people in a form and manner and using language that is open and respectful SA14. Resolve any difficulties in relationships with colleagues , or get help from an appropriate person, in a way that preserves goodwill and trust</p>
	<p>Motivation</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA15. Take responsibility for completing one's own work assignment SA16. Take initiative to enhance/learn skills in others area of work SA17. The capacity to learn from experience in a range of settings and scenarios and the capacity to reflect on and analyse one's learning. SA18. Is open to new ways of doing things SA19. The capacity to envisage and articulate personal goals; to develop strategies and take action to achieve them</p>
	<p>Reliability</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA20. Avoid absenteeism SA21. Act objectively , rather than impulsively or emotionally when faced with difficult/stressful or emotional situations</p>

	SA22. Work in disciplined factory environment SA23. Be punctual
B. Professional Skills	Material and Equipment Handling
	The user/individual on the job needs to know and understand how to: SB1. Handle different metal fabrication machines and tools wearing protective accessories SB2. Positioning work piece in machines according to design requirements SB3. Handling of various types of material handling equipment like forklifts, trolleys
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB4. Diagnose common problems in the machine based on visual inspection, sound, temperature, etc. SB5. Suggest improvements(if any) in process based on experience



NOS Version Control

NOS Code	ISC/N0901		
Credits(NSQF)	TBD	Version number	1.0
Industry	Iron and steel	Drafted on	23/07/2014
Industry Sub-sector	Steel, Sponge Iron, Ferro Alloys, Re-Rollers, Refractory	Last reviewed on	30/12/2014
Occupation	Mechanical Maintenance	Next review date	30/12/2015



ISC/N0902: Perform fabrication activities



National Occupational Standards

Overview

This unit is about performing fabrication of product components

Unit Code	ISC / N0902
Unit Title (Task)	Perform fabrication activities
Description	This unit is about performing fabrication of product components
Scope	This unit/task covers the following: <ul style="list-style-type: none"> Preparation of raw material Fabrication of product components using various machines, tools, etc. Ensuring housekeeping and safety on the shop-floor
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Preparation of raw material	To be competent, the user/individual on the job must be able to: <p>PC1. Ensure, by visual inspection, that work pieces are of desired quality (free of rust, type of metal, etc.)</p> <p>PC2. Ensure that each material is in the correct quantity</p>
Fabrication of product components using various machines, tools, etc.	To be competent, the user/individual on the job must be able to: <p>PC3. Lift and secure work pieces on surface plates or worktables using hoists, vises, v-blocks or angle plates</p> <p>PC4. Perform sawing to cut work pieces to desired shapes and sizes</p> <p>PC5. Perform drilling to thread holes in work pieces as per design</p> <p>PC6. Place work pieces in the appropriate machine as per design requirement</p> <p>PC7. Operate conventional or computer numerically controlled machine tools such as lathes, milling machines and grinders to bore, grind or shape parts to prescribed dimensions and finishes</p> <p>PC8. Perform milling to fabricate parts according to precise sizes and shapes</p> <p>PC9. Match the quality of output to company's product requirements</p> <p>PC10. Meet production quantity targets set for the operation</p> <p>PC11. Follow work instructions as laid down by the company</p>
Ensuring housekeeping and safety on the shop-floor	To be competent, the user/individual on the job must be able to: <p>PC12. Ensure housekeeping and safety in work area</p> <p>PC13. Ensure that the exhaust systems are used to maintain the concentration levels of various particulate matters remain within limits</p> <p>PC14. Ensure use of mask during grinding to avoid inhaling the dust</p> <p>PC15. Ensure that the loose and torn clothes are not worn during working hours</p> <p>PC16. Ensure safe distance between body and moving parts of the equipment</p> <p>PC17. Ensure using hoist or forklift for lifting heavy materials to avoid physical injury</p> <p>PC18. Adhere to all other safety norms (like wearing shoes, gloves, safety goggles, helmets, etc.)</p>

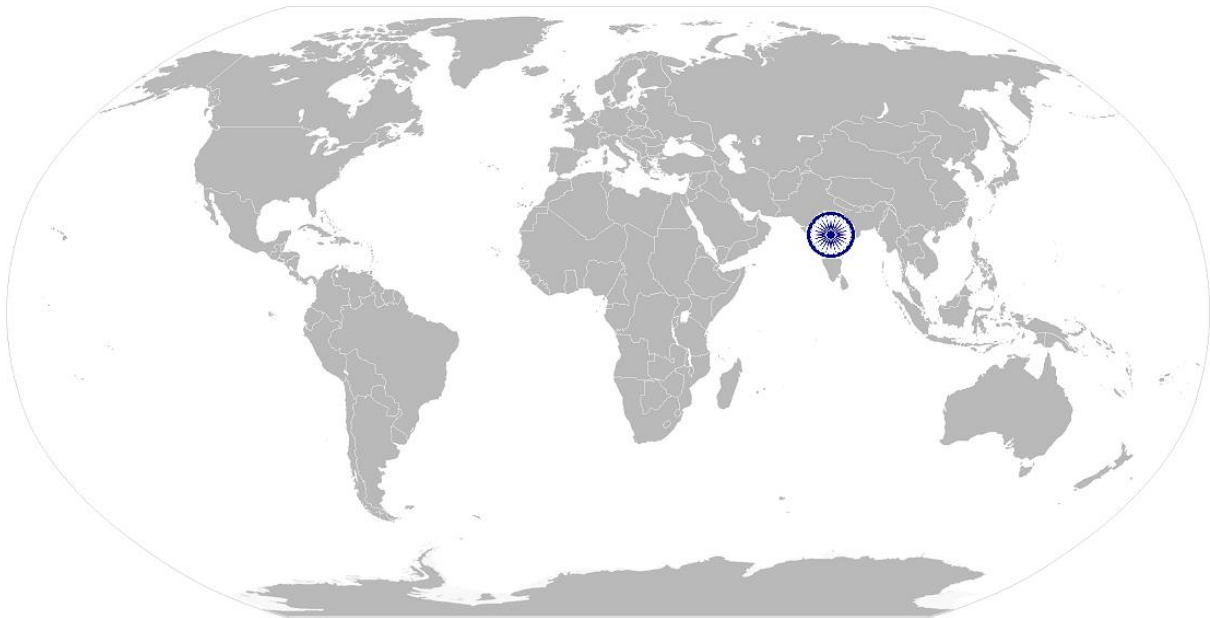
	<p>PC19. Ensure that unpermitted materials such as fuels, paints etc. are removed from the work area</p> <p>PC20. Comply with health, safety, environment guidelines, regulations etc. in accordance with organizational SOP</p> <p>PC21. Identify any potential health hazards or dangers and escalate to supervisor as per organizational SOP</p>
Element	Knowledge and Understanding
A. Organisational Context (Knowledge of the Company/ Organisation and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. Use of instruments to check dimensions etc.</p> <p>KA2. Implications of poorly prepared material, power failure etc.</p> <p>KA3. Material disposal procedure, importance of appropriate disposal of material and implications of not following the material disposal procedure</p> <p>KA4. Quality and damage checks to be done and importance of the same</p> <p>KA5. Risk and impact of not following defined procedures/work instructions</p> <p>KA6. Escalation matrix for reporting identified issues</p> <p>KA7. Types of documentation in organization and importance of the same</p> <p>KA8. Records to be maintained and implications of non-maintenance of the same</p> <p>KA9. Importance of housekeeping & good shop-floor practices (e.g. 3S & 5S)</p> <p>KA10. Health, Safety and Environment guidelines, legislation and regulations as applicable</p> <p>KA11. Personal protection(Which protective equipment to be used and how)</p> <p>KA12. Impact of poor practices on health, safety and environment</p> <p>KA13. Potential hazards and actions to minimize the same</p> <p>KA14. Escalation matrix and escalation procedure for reporting hazards</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. Metal fabrication processes such as forging, rolling, extrusion, bending, spinning, drawing, drilling, sawing, boring, threading, grinding, cutting, etc.</p> <p>KB2. Checks that need to be made to ensure that equipment is safe and ready to use (electrical connections, power return and earthing arrangements; equipment calibration, setting parameters)</p> <p>KB3. Operation of manual as well as CNC milling machines, lathes, grinders, laser and water cutting machines, wire electrical discharge machines, and other machine tools</p> <p>KB4. Basic welding and brazing techniques</p> <p>KB5. Machine operating parameters</p> <p>KB6. Engineering drawings</p> <p>KB7. Metals and their properties</p> <p>KB8. CAD/CAM technology, CNC machine tools, and computerized measuring machines</p> <p>KB9. Implications of not adhering to sequence of activities and operations</p> <p>KB10. Implications of delays in preparation process</p> <p>KB11. Potential problems in preparation process</p> <p>KB12. Indicators and reasons of potential problems</p> <p>KB13. Appropriate solutions to the problems encountered</p>

	KB14. Units of measurement KB15. Response to emergencies e.g. Power failures ,fire and system failures KB16. Basic mathematical principles, such as numbers and space, and techniques such as estimation and approximation, for practical purposes KB17. Use of different type of fire extinguishers
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 SA3. Write simple letters, mails, etc. SA4. Perform functional mathematical operations, including apply basic mathematical principles, such as numbers and space, and techniques such as estimation and approximation, for practical purposes
	Reading and Understanding Skills
	The user/individual on the job needs to know and understand how to: SA5. Read and understand manuals, health and safety instructions, memos, reports, job cards etc. SA6. Read and interpret engineering and tool drawings
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA7. Express statements, opinions or information clearly so that others can hear and understand SA8. Respond appropriately to any queries SA9. Communicate with supervisor SA10. Communicate with upstream and downstream teams SA11. Work in a team and other behavioural skills required to support the small group activities (Quality Circle, Cross Functional Team, Suggestion Scheme)
Integrity	
The user/individual on the job needs to know and understand how to: SA12. Practice honesty with respect to company property and time SA13. Communicate with people in a form and manner and using language that is open and respectful SA14. Resolve any difficulties in relationships with colleagues , or get help from an appropriate person, in a way that preserves goodwill and trust	

	<p>Motivation</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA15. Take responsibility for completing one's own work assignment SA16. Take initiative to enhance/learn skills in others area of work SA17. The capacity to learn from experience in a range of settings and scenarios and the capacity to reflect on and analyse one's learning SA18. Is open to new ways of doing things SA19. The capacity to envisage and articulate personal goals; to develop strategies and take action to achieve them</p>
	<p>Reliability</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA20. Avoid absenteeism SA21. Act objectively , rather than impulsively or emotionally when faced with difficult/stressful or emotional situations SA22. Work in disciplined factory environment SA23. Be punctual</p>
<p>B. Professional Skills</p>	<p>Material and Equipment Handling</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. Handle different metal fabrication machines and tools wearing protective accessories SB2. Positioning work piece in machines according to design requirements SB3. Handling of various types of material handling equipment like forklifts, trolleys</p>
	<p>Analytical Thinking</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB4. Diagnose common problems in the machine based on visual inspection, sound, temperature etc. SB5. Suggest improvements(if any) in process based on experience</p>

NOS Version Control

NOS Code	ISC/N0902		
Credits(NSQF)	TBD	Version number	1.0
Industry	Iron and steel	Drafted on	23/07/2014
Industry Sub-sector	Steel, Sponge Iron, Ferro Alloys, Re-Rollers, Refractory	Last reviewed on	30/12/2014
Occupation	Mechanical Maintenance	Next review date	30/12/2015



ISC/N0903: Perform post - fabrication activities

National Occupational Standards

A world map showing the continents in light gray. The country of India is highlighted in a darker shade of gray. A small circular icon of the Ashoka Chakra is placed over the geographical location of India.

Overview

This unit is about performing post - fabrication activities

Unit Code	ISC/N0903
Unit Title (Task)	Perform post - fabrication activities
Description	This unit is about performing post - fabrication activities
Scope	This unit/task covers the following: <ul style="list-style-type: none"> • Quality check of the work pieces • Safe disposal of waste material • Ensuring housekeeping and safety on the shop-floor
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Quality check of the work pieces	To be competent, the user/individual on the job must be able to: <ul style="list-style-type: none"> PC1. Follow work instructions as laid down by the company PC2. Ensure that equipment is put in a safe condition (shutdown or idle state) on completion of fabrication activities PC3. Remove the work pieces as per company procedure PC4. Inspect finished parts for smoothness, contour conformity and defects by visual inspection PC5. Verify dimensions, alignments and clearance of finished part for conformance to specifications PC6. File, grind, shim etc. to make final adjustment
Safe disposal of waste material	To be competent, the user/individual on the job must be able to: <ul style="list-style-type: none"> PC7. Dispose off waste material as per waste disposal procedures laid down by the company PC8. Carry out disposal of waste material safely
Ensuring housekeeping and safety on the shop-floor	To be competent, the user/individual on the job must be able to: <ul style="list-style-type: none"> PC9. Ensure housekeeping and safety in work area PC10. Ensure that the exhaust systems are used to maintain the concentration levels of various particulate matters remain within limits PC11. Ensure use of mask during grinding to avoid inhaling the dust PC12. Ensure that the loose and torn clothes are not worn during working hours PC13. Ensure safe distance between body and moving parts of the equipment PC14. Ensure using hoist or forklift for lifting heavy materials to avoid physical injury PC15. Adhere to all other safety norms (like wearing shoes, gloves, safety

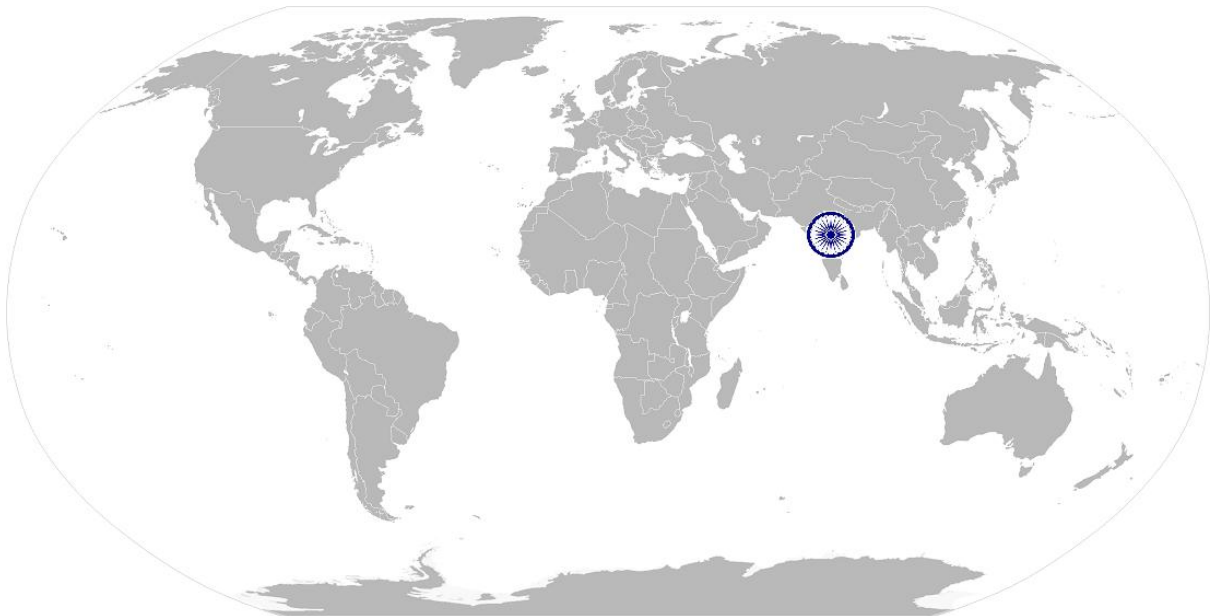
	<p>goggles, helmets, etc.)</p> <p>PC16. Ensure that unpermitted materials such as fuels, paints etc. are removed from the work area</p> <p>PC17. Comply with health, safety, environment guidelines, regulations etc. in accordance with organizational SOP</p> <p>PC18. Identify any potential health hazards or dangers and escalate to supervisor as per organizational SOP</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. Use of instruments to check dimensions etc.</p> <p>KA2. Implications of poorly prepared material, power failure etc.</p> <p>KA3. Material disposal procedure, importance of appropriate disposal of material and implications of not following the material disposal procedure</p> <p>KA4. Quality and damage checks to be done and importance of the same</p> <p>KA5. Risk and impact of not following defined procedures/work instructions</p> <p>KA6. Escalation matrix for reporting identified issues</p> <p>KA7. Types of documentation in organization and importance of the same</p> <p>KA8. Records to be maintained and implications of non-maintenance of the same</p> <p>KA9. Importance of housekeeping & good shop-floor practices (e.g. 3S & 5S)</p> <p>KA10. Health, Safety and Environment guidelines, legislation and regulations as applicable</p> <p>KA11. Personal protection (Which protective equipment to be used and how)</p> <p>KA12. Impact of poor practices on health, safety and environment</p> <p>KA13. Potential hazards and actions to minimize the same</p> <p>KA14. Escalation matrix and escalation procedure for reporting hazards</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. Metal fabrication processes such as forging, rolling, extrusion, bending, spinning, drawing, drilling, sawing, boring, threading, grinding, cutting, etc.</p> <p>KB2. Checks that need to be made to ensure that equipment is safe and ready to use (electrical connections, power return and earthing arrangements; equipment calibration, setting parameters)</p> <p>KB3. Operation of manual as well as CNC milling machines, lathes, grinders, laser and water cutting machines, wire electrical discharge machines, and other machine tools</p> <p>KB4. Procedures to check adherence to specifications and quality standards using equipment like vernier caliper, screw gauge, etc.</p> <p>KB5. Machine operating parameters</p> <p>KB6. Basic welding and brazing techniques</p> <p>KB7. Engineering and machine drawings</p> <p>KB8. Metals and their properties</p> <p>KB9. CAD/CAM technology, CNC machine tools, and computerized measuring machines</p> <p>KB10. Methods and importance of waste material disposal</p> <p>KB11. Implications of not adhering to sequence of activities and operations</p>

	KB12. Implications of delays in preparation process KB13. Potential problems in preparation process KB14. Indicators and reasons of potential problems KB15. Appropriate solutions to the problems encountered KB16. Units of measurement KB17. response to emergencies e.g. Power failures ,fire and system failures KB18. Basic mathematical principles, such as numbers and space, and techniques such as estimation and approximation, for practical purposes KB19. Use of different type of fire extinguishers
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 SA3. Write simple letters, mails, etc. SA4. Perform functional mathematical operations, including apply basic mathematical principles, such as numbers and space, and techniques such as estimation and approximation, for practical purposes
	Reading and Understanding Skills
	The user/individual on the job needs to know and understand how to: SA5. Read and understand manuals, health and safety instructions, memos, reports, job cards etc. SA6. Read and interpret engineering and tool drawings
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA7. Express statements, opinions or information clearly so that others can hear and understand SA8. Respond appropriately to any queries SA9. Communicate with supervisor SA10. Communicate with upstream and downstream teams SA11. Work in a team and other behavioural skills required to support the small group activities (Quality Circle, Cross Functional Team, Suggestion Scheme)
Integrity	
The user/individual on the job needs to know and understand how to: SA12. Practice honesty with respect to company property and time SA13. Communicate with people in a form and manner and using language that is	

	open and respectful SA14. Resolve any difficulties in relationships with colleagues , or get help from an appropriate person, in a way that preserves goodwill and trust
	Motivation
	The user/individual on the job needs to know and understand how to: SA15. Take responsibility for completing one's own work assignment SA16. Take initiative to enhance/learn skills in one's area of work SA17. The capacity to learn from experience in a range of settings and scenarios and the capacity to reflect on and analyse one's learning SA18. Is open to new ways of doing things SA19. The capacity to envisage and articulate personal goals; to develop strategies and take action to achieve them
	Reliability
	The user/individual on the job needs to know and understand how to: SA20. Avoid absenteeism SA21. Act objectively , rather than impulsively or emotionally when faced with difficult/stressful or emotional situations SA22. Work in disciplined factory environment SA23. Be punctual
B. Professional Skills	Material and Equipment Handling
	The user/individual on the job needs to know and understand how to: SB1. Handle different metal fabrication machines and tools wearing protective accessories SB2. Positioning work piece in machines according to design requirements SB3. Handling of various types of material handling equipment like forklifts, trolleys
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB4. Diagnose common problems in the machine based on visual inspection, sound, temperature etc. SB5. Suggest improvements(if any) in process based on experience

NOS Version Control

NOS Code	ISC/N0903		
Credits(NSQF)	TBD	Version number	1.0
Industry	Iron and steel	Drafted on	23/07/2014
Industry Sub-sector	Steel, Sponge Iron, Ferro Alloys, Re-Rollers, Refractory	Last reviewed on	30/12/2014
Occupation	Mechanical Maintenance	Next review date	30/12/2015



ISC/N0904: Perform maintenance activities

National Occupational Standards



Overview

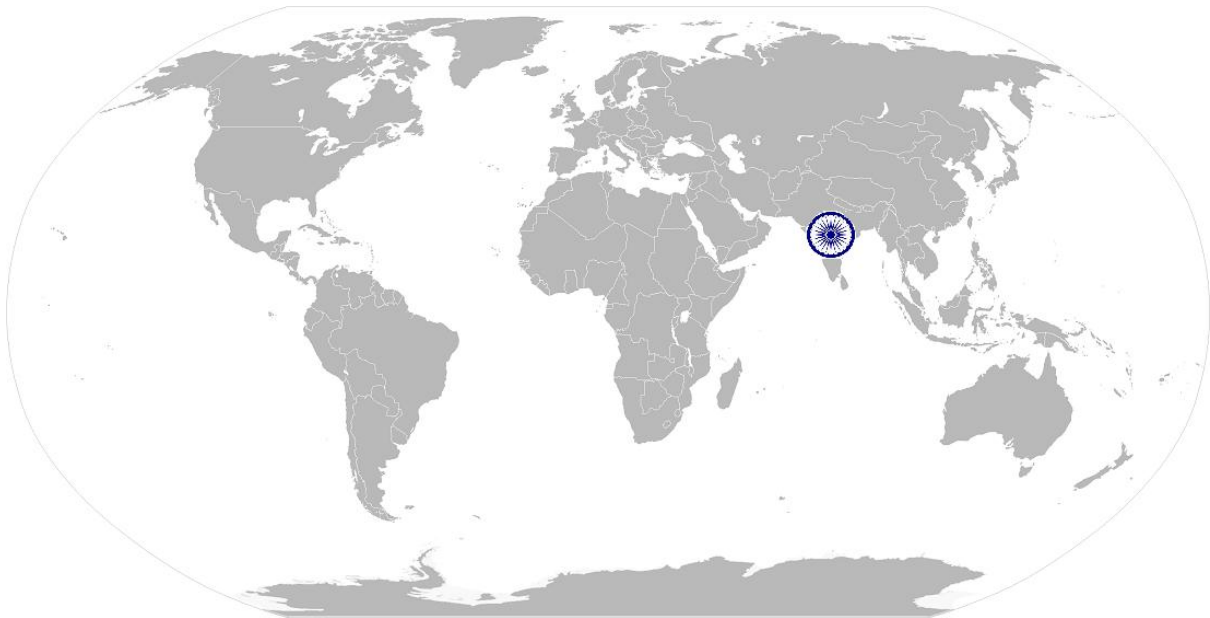
This unit is about performing maintenance of equipments used for fabrication

Unit Code	ISC/N0904
Unit Title (Task)	Perform maintenance activities
Description	This unit is about performing maintenance of equipments used for fabrication
Scope	This unit/task covers the following: <ul style="list-style-type: none"> Perform Preventive maintenance of machines Ensuring housekeeping and safety on the shop-floor
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Perform Preventive maintenance of machines	To be competent, the user/individual on the job must be able to: <ul style="list-style-type: none"> PC1. Select necessary inspection tools as per the job requirements PC2. Observe and listen to operating machines or equipment to diagnose machine malfunction and determine need for adjustment or repair PC3. Clean and maintain machines, tools and equipment used in fabrication to remove grease, rust, stains, and foreign matter PC4. Inspect condition of lubricants of machine in accordance with workplace procedures PC5. Make minor adjustment and alignments on loose bolts, belts, drive slacks, guards and covers PC6. Replace worn/faulty components or equipment PC7. Record all work done and report to supervisor in accordance with the company procedures
Ensuring housekeeping and safety on the shop-floor	To be competent, the user/individual on the job must be able to: <ul style="list-style-type: none"> PC8. Ensure housekeeping and safety in work area PC9. Ensure that the exhaust systems are used to maintain the concentration levels of various particulate matters remain within limits PC10. Ensure use of mask during grinding to avoid inhaling the dust PC11. Ensure that the loose and torn clothes are not worn during working hours PC12. Ensure safe distance between body and moving parts PC13. Ensure using hoist or forklift for lifting heavy materials to avoid physical injury PC14. Adhere to all other safety norms (like wearing shoes, gloves, safety goggles, helmets, etc.) PC15. Remove unpermitted materials such as fuels, paints etc. from the work area PC16. Comply with health, safety, environment guidelines, regulations etc. in accordance with organizational SOP PC17. Identify any potential health hazards or dangers and escalate to supervisor as per organizational SOP
Element	Knowledge and Understanding
A. Organisational	The user/individual on the job needs to know and understand:

Context (Knowledge of the Company/ Organisation and its processes)	<p>KA1. Checks to be done during preventive maintenance and importance of the same</p> <p>KA2. Risk and impact of not following defined procedures/work instructions</p> <p>KA3. Escalation matrix for reporting identified issues</p> <p>KA4. Types of documentation in organization and importance of the same</p> <p>KA5. Records to be maintained and implications of non-maintenance of the same</p> <p>KA6. Importance of housekeeping & good shop-floor practices (e.g. 3S & 5S)</p> <p>KA7. Health, Safety and Environment guidelines, legislation and regulations as applicable</p> <p>KA8. Personal protection(Which protective equipment to be used and how)</p> <p>KA9. Impact of poor practices on health, safety and environment</p> <p>KA10. Potential hazards and actions to minimize the same</p> <p>KA11. Escalation matrix and escalation procedure for reporting hazards</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. Engineering drawings and tools drawings</p> <p>KB2. Steps required to assemble/ dis-assemble an equipment with a given design</p> <p>KB3. Use of equipment such as thermometer, tachometer and vibration monitoring tools to perform preventive maintenance</p> <p>KB4. Understanding of normal running characteristics of machines</p> <p>KB5. Basic troubleshooting of machines</p> <p>KB6. Potential problems with machines, their causes and remedies</p> <p>KB7. Impact of poor practices on health, safety and environment</p> <p>KB8. Response to emergencies e.g. Power failures ,fire and system failures</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>SA3. Write simple letters, mails, etc.</p> <p>SA4. Perform functional mathematical operations, including apply basic mathematical principles, such as numbers and space, and techniques such as estimation and approximation, for practical purposes</p> <p>Reading and Understanding Skills</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA5. Read and understand manuals, health and safety instructions, memos, reports, job cards etc.</p> <p>SA6. Read and interpret engineering and tool drawings</p> <p>Oral Communication (Listening and Speaking skills)</p>

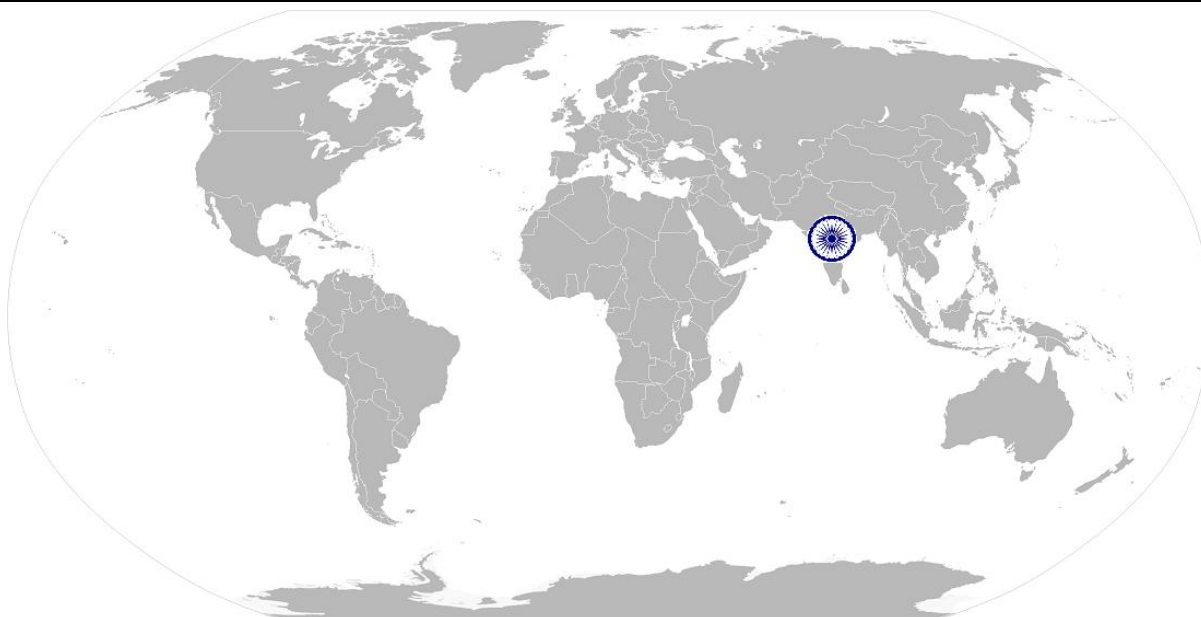
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA7. Express statements, opinions or information clearly so that others can hear and understand SA8. Respond appropriately to any queries SA9. Communicate with supervisor SA10. Communicate with upstream and downstream teams SA11. Work in a team and other behavioural skills required to support the small group activities (Quality Circle, Cross Functional Team, Suggestion Scheme)</p>
	<p>Integrity</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA12. Practice honesty with respect to company property and time SA13. Communicate with people in a form and manner and using language that is open and respectful SA14. Resolve any difficulties in relationships with colleagues , or get help from an appropriate person, in a way that preserves goodwill and trust</p>
	<p>Motivation</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA15. Take responsibility for completing one's own work assignment SA16. Take initiative to enhance/learn skills in one's area of work SA17. The capacity to learn from experience in a range of settings and scenarios and the capacity to reflect on and analyse one's learning SA18. Is open to new ways of doing things SA19. The capacity to envisage and articulate personal goals; to develop strategies and take action to achieve them</p>
	<p>Reliability</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA20. Avoid absenteeism SA21. Act objectively , rather than impulsively or emotionally when faced with difficult/stressful or emotional situations SA22. Work in disciplined factory environment SA23. Be punctual</p>
<p>B. Professional Skills</p>	<p>Material and Equipment Handling</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. Handle different metal fabrication machines and tools wearing protective accessories SB2. Positioning work piece in machines according to design requirements SB3. Handling of various types of material handling equipment like forklifts, trolley</p>

	<p>Analytical Thinking</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB4. Diagnose common problems in the machine based on visual inspection, sound, temperature etc.</p> <p>SB5. Suggest improvements(if any) in process based on experience</p>
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NOS Version Control

NOS Code	ISC/N0904		
Credits(NSQF)	TBD	Version number	1.0
Industry	Iron and steel	Drafted on	23/07/2014
Industry Sub-sector	Steel, Sponge Iron, Ferro Alloys, Re-Rollers, Refractory	Last reviewed on	30/12/2014
Occupation	Mechanical Maintenance	Next review date	30/12/2015



ISC/N1004: Carry out housekeeping

National Occupational Standards



Overview

This unit is about carrying out housekeeping

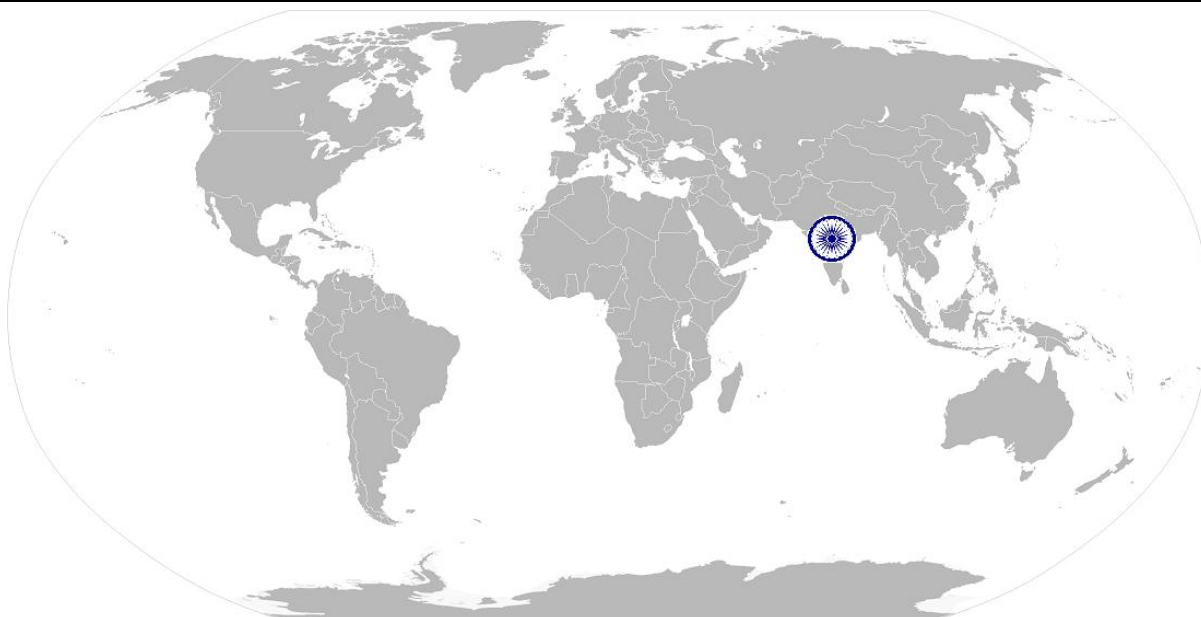
Unit Code	ISC/N1004
Unit Title (Task)	Carry out housekeeping
Description	This unit is about carrying out housekeeping activities
Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Preparing for housekeeping activities • Carry out housekeeping activities • Post housekeeping activities
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Preparing for housekeeping activities	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. Inspect the area while taking into account various surfaces PC2. Identify the material requirements for cleaning the areas inspected, by considering risk, time, efficiency and type of stain PC3. Ensure that the cleaning equipment is in proper working condition PC4. Select the suitable alternatives for cleaning the areas in case the appropriate equipment and materials are not available and inform the appropriate person PC5. Plan the sequence for cleaning the area to avoid re-soiling clean areas and surfaces PC6. Inform the affected people about the cleaning activity PC7. Display the appropriate signage for the work being conducted PC8. Ensure that there is adequate ventilation for the work being carried out PC9. Wear the personal protective equipment required for the cleaning method and materials being used</p>
Carry out housekeeping activities	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC10. Use the correct cleaning method for the work area, type of soiling and surface PC11. Carry out cleaning activity without disturbing others PC12. Deal with accidental damage, if any, caused while carrying out the work PC13. Report to the appropriate person any difficulties in carrying out your work PC14. Identify and report to the appropriate person any additional cleaning required that is outside one's responsibility or skill</p>
Post housekeeping activities	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC15. Ensure that there is no oily substance on the floor to avoid slippage PC16. Ensure that no scrap material is lying around PC17. Maintain and store housekeeping equipment and supplies PC18. Follow workplace procedures to deal with any accidental damage caused during the cleaning process PC19. Ensure that, on completion of the work, the area is left clean and dry and meets requirements</p>

	<p>PC20. Return the equipment, materials and personal protective equipment that were used to the right places making sure they are clean, safe and securely stored</p> <p>PC21. Dispose the waste garnered from the activity in an appropriate manner</p> <p>PC22. Dispose of used and un-used solutions according to manufacturer's instructions, and clean the equipment thoroughly</p>
Element	Knowledge and Understanding
A. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. The levels of hygiene required by workplace and why it is important to maintain them during your work</p> <p>KA2. How to inspect a work area to decide what cleaning it needs</p> <p>KA3. Methods and materials that used for cleaning variety of surfaces</p> <p>KA4. The types of cleansing agents that are not to be mixed together</p> <p>KA5. The correct method for cleaning equipment and/or machinery used during your work</p> <p>KA6. The importance of personal protective equipment</p> <p>KA7. Appropriate personal protective equipment for the work area, cleaning equipment, tools, materials and chemicals used</p> <p>KA8. The correct sequence for cleaning the work area</p> <p>KA9. The time taken by the treatment to work</p> <p>KA10. The importance of following manufacturer's instructions on cleaning agents</p> <p>KA11. The most appropriate place to carry out (es) cleans and why this should be done before applying treatments</p> <p>KA12. The importance of applying treatments evenly and the effect of not doing this</p> <p>KA13. Process of cleaning the surfaces without causing injury or damage</p> <p>KA14. The method to check the treated surface and equipment on completion of cleaning</p> <p>KA15. Procedures for reporting any unidentified soiling</p> <p>KA16. Procedures for disposing off waste</p> <p>KA17. Procedures for disposing off or storing personal protective equipment</p> <p>KA18. Escalation procedures for soils or stains that could not be removed</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>SA3. Write simple letters, mails, etc.</p> <p>SA4. Perform functional mathematical operations, including apply basic mathematical principles, such as numbers and space, and techniques such as estimation and approximation, for practical purposes</p> <p>Reading and Understanding Skills</p> <p>The user/individual on the job needs to know and understand how to:</p>

	<p>SA5. Read and understand manuals, health and safety instructions, memos, reports, job cards etc. SA6. Read and interpret engineering and tool drawings</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>SA7. Express statements, opinions or information clearly so that others can hear and understand SA8. Respond appropriately to any queries SA9. Communicate with supervisor SA10. Communicate with upstream and downstream teams SA11. Work in a team and other behavioural skills required to support the small group activities (Quality Circle, Cross Functional Team, Suggestion Scheme)</p>	
<p>Integrity</p>	
<p>The user/individual on the job needs to know and understand how to:</p> <p>SA12. Practice honesty with respect to company property and time SA13. Communicate with people in a form and manner and using language that is open and respectful SA14. Resolve any difficulties in relationships with colleagues , or get help from an appropriate person, in a way that preserves goodwill and trust</p>	
<p>Motivation</p>	
<p>The user/individual on the job needs to know and understand how to:</p> <p>SA15. Take responsibility for completing one's own work assignment SA16. Take initiative to enhance/learn skills in one's area of work SA17. The capacity to learn from experience in a range of settings and scenarios and the capacity to reflect on and analyse one's learning SA18. Is open to new ways of doing things SA19. The capacity to envisage and articulate personal goals; to develop strategies and take action to achieve them</p>	
<p>Reliability</p>	
<p>The user/individual on the job needs to know and understand how to:</p> <p>SA20. Avoid absenteeism SA21. Act objectively , rather than impulsively or emotionally when faced with difficult/stressful or emotional situations SA22. Work in disciplined factory environment SA23. Be punctual</p>	

NOS Version Control

NOS Code	ISC/N1004		
Credits(NSQF)	TBD	Version number	1.0
Industry	Iron and steel	Drafted on	23/07/2014
Industry Sub-sector	Steel, Sponge Iron, Ferro Alloys, Re-Rollers, Refractory	Last reviewed on	30/12/2014
Occupation	Mechanical Maintenance	Next review date	30/12/2015



ISC/N1005: Carry out reporting and documentation

National Occupational Standards



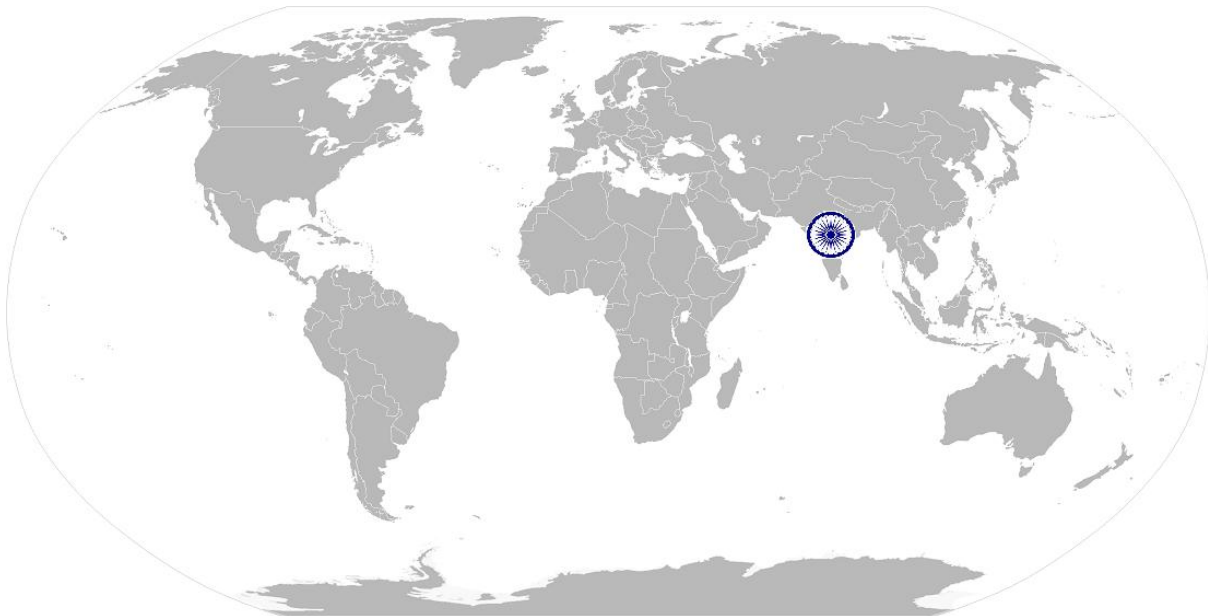
Overview

This unit is about reporting and documentation.

Unit Code	ISC/N1005
Unit Title (Task)	Carry out reporting and documentation
Description	This unit is about carrying out reporting and documentation
Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> Reporting of data/problem/incidents etc. Documentation Information Security
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Reporting	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. Report data/problems/incidents as applicable in a timely manner PC2. Report to the appropriate authority as laid down by the company PC3. Follow reporting procedures as prescribed by the company</p>
Recording and Documentation	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC4. Identify documentation to be completed relating to one's role PC5. Record details accurately an appropriate format PC6. Complete all documentation within stipulated time according to company procedure PC7. Ensure that the final document meets with the requirements of the persons who requested it or make any amendments accordingly PC8. Make sure documents are available to all appropriate authorities to inspect</p>
Information Security	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC9. Respond to requests for information in an appropriate manner whilst following organizational procedures PC10. Inform the appropriate authority of requests for information received</p>
Element	Knowledge and Understanding
A. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. Different methods of recording information KA2. Various documents that need to be maintained KA3. Company procedure for filling/maintaining up the documents KA4. Procedures for reporting to the appropriate authority KA5. Procedures for recording damage, breakages etc. KA6. Reporting incidents where standard operating procedures are not followed KA7. The importance of complete and accurate documentation KA8. How to maintain complete documentation accurately and within agreed timescales KA9. The importance of ensuring that the documents are correct</p>

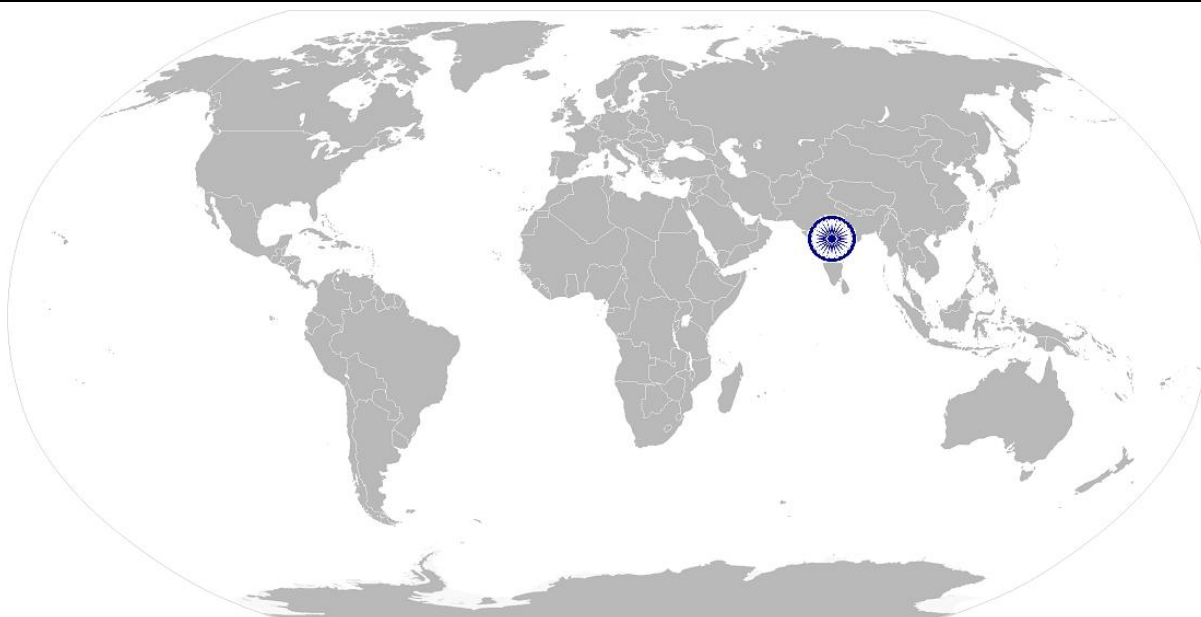
	KA10. The actions to be taken if the documents are not correct KA11. The importance of maintaining the security and confidentiality of recorded information KA12. Procedures to maintain confidentiality of information KA13. The appropriate method for responding to requests for information KA14. The reporting procedures to followed before disclosing information to any outside party
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
	SA3. Write simple letters, mails, etc.
	SA4. Perform functional mathematical operations, including apply basic mathematical principles, such as numbers and space, and techniques such as estimation and approximation, for practical purposes
	Reading and Understanding Skills
	The user/individual on the job needs to know and understand how to:
	SA5. Read and understand manuals, health and safety instructions, memos, reports, job cards etc.
	SA6. Read and interpret engineering and tool drawings
Oral Communication (Listening and Speaking skills)	
The user/individual on the job needs to know and understand how to:	
SA7. Express statements, opinions or information clearly so that others can hear and understand	
SA8. Respond appropriately to any queries	
SA9. Communicate with supervisor	
SA10. Communicate with upstream and downstream teams	
SA11. Work in a team and other behavioural skills required to support the small group activities (Quality Circle, Cross Functional Team, Suggestion Scheme)	
Integrity	
The user/individual on the job needs to know and understand how to:	
SA12. Practice honesty with respect to company property and time	
SA13. Communicate with people in a form and manner and using language that is open and respectful	
SA14. Resolve any difficulties in relationships with colleagues , or get help from an appropriate person, in a way that preserves goodwill and trust	
Motivation	
The user/individual on the job needs to know and understand how to:	

	<p>SA15. Take responsibility for completing one's own work assignment</p> <p>SA16. Take initiative to enhance/learn skills in others area of work</p> <p>SA17. The capacity to learn from experience in a range of settings and scenarios and the capacity to reflect on and analyse one's learning</p> <p>SA18. Is open to new ways of doing things</p> <p>SA19. The capacity to envisage and articulate personal goals; to develop strategies and take action to achieve them.</p>
	Reliability
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA20. Avoid absenteeism</p> <p>SA21. Act objectively , rather than impulsively or emotionally when faced with difficult/stressful or emotional situations</p> <p>SA22. Work in disciplined factory environment</p> <p>SA23. Be punctual</p>



NOS Version Control

NOS Code	ISC/N1005		
Credits(NSQF)	TBD	Version number	1.0
Industry	Iron and steel	Drafted on	23/07/2014
Industry Sub-sector	Steel, Sponge Iron, Ferro Alloys, Re-Rollers, Refractory	Last reviewed on	30/12/2014
Occupation	Mechanical Maintenance	Next review date	30/12/2015



ISC/N1006: Carry out quality checks

A world map in grayscale with a small Indian flag icon over the Indian subcontinent. The text 'National Occupational Standards' is overlaid in a large, bold, black serif font.

National Occupational Standards

Overview

This unit is about carrying out quality checks

Unit Code	ISC/N1006
Unit Title (Task)	Carry out quality checks
Description	This unit is about carrying out quality control activities
Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Carrying out quality checks to identify problems • Take corrective actions • Reporting the results
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Carrying out quality checks to identify problems	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. Ensure that total range of checks are regularly and consistently performed PC2. Use appropriate measuring instruments, equipment, tools, accessories etc. ,as required</p>
Take corrective actions	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC3. Identify non-conformities to quality assurance standards PC4. Identify potential causes of non-conformities to quality assurance standards PC5. Identify impact on final product due to non-conformance to company standards PC6. Evaluating the need for action to ensure that problems do not recur PC7. Suggest corrective action to address problem PC8. Review effectiveness of corrective action</p>
Reporting the results	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC9. Interpret the results of the operator level quality check correctly PC10. Inform any non-conformity to the appropriate authority within the stipulated time. PC11. Record of results of action taken PC12. Record adjustments not covered by established procedures for future reference PC13. Review effectiveness of action taken PC14. Follow reporting procedures where the cause of defect cannot be identified</p>
Element	Knowledge and Understanding
A. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. The importance of quality control procedures KA2. Relevance and importance of activities and how they contribute to the achievement of the quality objectives, KA3. Proper procedure for selecting the material/product and performing quality</p>

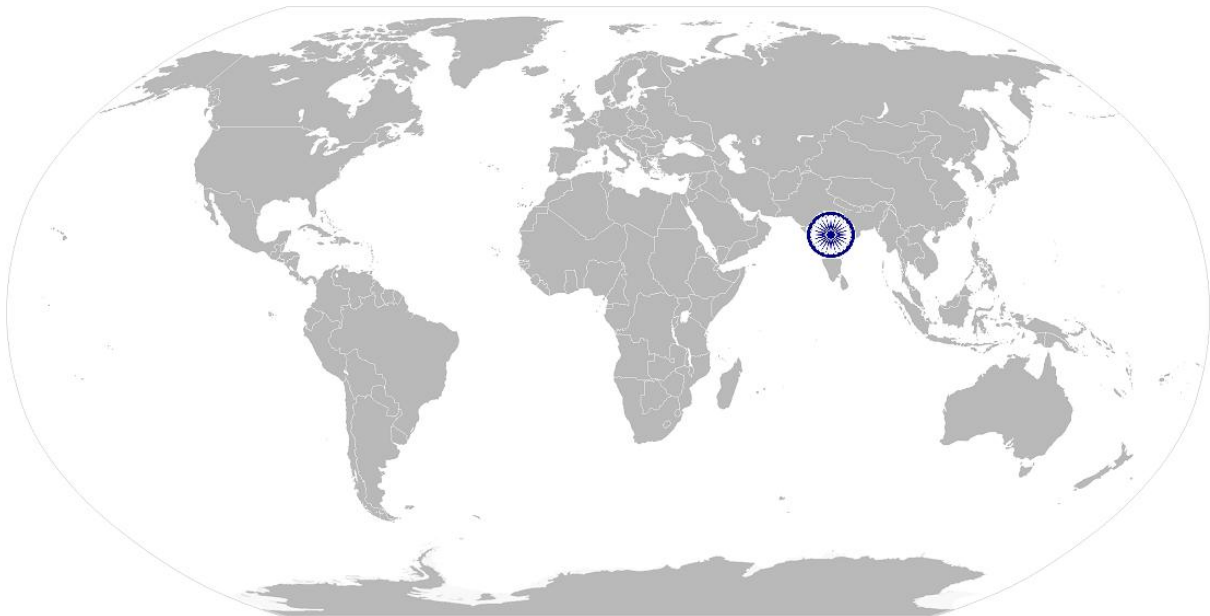
	<p>checks without affecting the material</p> <p>KA4. Availability of work instructions, as necessary,</p> <p>KA5. Characteristics of the product/material</p> <p>KA6. Use of suitable equipment</p> <p>KA7. Availability and use of monitoring and measuring devices,</p> <p>KA8. Requirements of records</p> <p>KA9. Importance of maintaining accurate up-to-date records</p> <p>KA10. The need to report within the stipulated time</p> <p>KA11. Implications of inaccurate measuring and testing instruments and equipment</p> <p>KA12. The cost of non-conformance to quality standards</p> <p>KA13. Implications (impact on internal/external customers) of defective products, materials or components</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>SA3. Write simple letters, mails, etc.</p> <p>SA4. Perform functional mathematical operations, including apply basic mathematical principles, such as numbers and space, and techniques such as estimation and approximation, for practical purposes</p>	
	<p>Reading and Understanding Skills</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA5. Read and understand manuals, health and safety instructions, memos, reports, job cards etc.</p> <p>SA6. Read and interpret engineering and tool drawings</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>SA7. Express statements, opinions or information clearly so that others can hear and understand</p> <p>SA8. Respond appropriately to any queries</p> <p>SA9. Communicate with supervisor</p> <p>SA10. Communicate with upstream and downstream teams</p> <p>SA11. Work in a team and other behavioural skills required to support the small group activities (Quality Circle, Cross Functional Team, Suggestion Scheme)</p>	
	<p>Integrity</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA12. Practice honesty with respect to company property and time</p> <p>SA13. Communicate with people in a form and manner and using language that is open</p>	

	and respectful SA14. Resolve any difficulties in relationships with colleagues , or get help from an appropriate person, in a way that preserves goodwill and trust
	Motivation
	The user/individual on the job needs to know and understand how to: SA15. Take responsibility for completing one's own work assignment SA16. Take initiative to enhance/learn skills in others area of work SA17. The capacity to learn from experience in a range of settings and scenarios and the capacity to reflect on and analyse one's learning. SA18. Is open to new ways of doing things SA19. The capacity to envisage and articulate personal goals; to develop strategies and take action to achieve them.
	Reliability
	The user/individual on the job needs to know and understand how to: SA20. Avoid absenteeism SA21. Act objectively , rather than impulsively or emotionally when faced with difficult/stressful or emotional situations SA22. Work in disciplined factory environment SA23. Be punctual



NOS Version Control

NOS Code	ISC/N1006		
Credits(NSQF)	TBD	Version number	1.0
Industry	Iron and steel	Drafted on	23/07/2014
Industry Sub-sector	Steel, Sponge Iron, Ferro Alloys, Re-Rollers, Refractory	Last reviewed on	30/12/2014
Occupation	Mechanical Maintenance	Next review date	30/12/2015



ISC/N1007: Carry out problem identification and escalation



National Occupational Standards

Overview

This unit is about problem identification and escalation

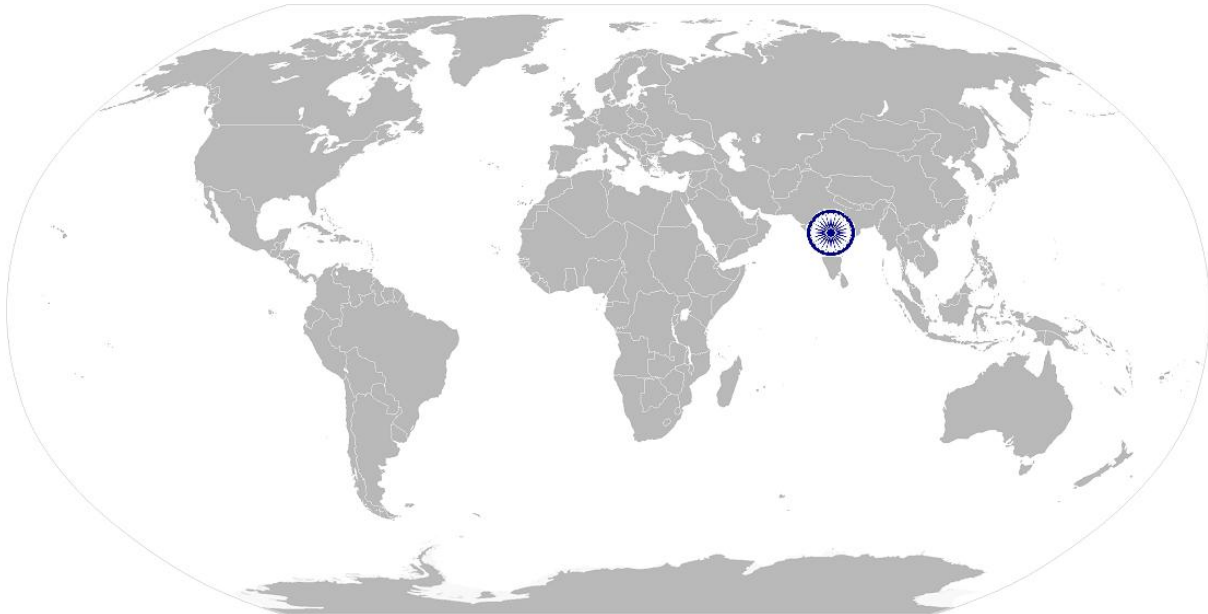
Unit Code	ISC/N1007
Unit Title (Task)	Carry out problem identification and escalation
Description	This unit is about problem identification and escalation
Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Identify problems across: <ul style="list-style-type: none"> • Materials • Products • Equipment • Others • Take corrective action • Escalation of unresolved identified problems
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Problem Identification	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. Identify defects/indicators of problems</p> <p>PC2. Identify any wrong practices that may lead to problems</p> <p>PC3. Identify practices that may impact the final product quality</p> <p>PC4. Identify if the problem has occurred before</p> <p>PC5. Identify other operations that might be impacted by the problem</p> <p>PC6. Ensure that no delays are caused as a result of failure to escalate problems</p>
Necessary Action	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC7. Take appropriate materials and sample to conduct tests</p> <p>PC8. Evaluate results to confirm suspected reasons for non-conformance (where required)</p> <p>PC9. Consider possible reasons for identification of problems</p> <p>PC10. Consider applicable corrections and formulate corrective action</p> <p>PC11. Formulate action in a timely manner</p> <p>PC12. Communicate problem/remedial action to appropriate parties</p> <p>PC13. Take corrective action in a timely manner</p> <p>PC14. Report/document problem and corrective action in an appropriate manner</p> <p>PC15. Monitor corrective action</p> <p>PC16. Evaluate implementation of corrective action taken to determine if the problem has been resolved</p> <p>PC17. Ensure that corrective action selected is viable and practical</p> <p>PC18. Ensure that correct solution is identified to an identified problem</p> <p>PC19. Take corrective action for problems identified according to the company procedures</p> <p>PC20. Ensure that no delays are caused as a result of failure to take necessary action</p>

Problem Escalation	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC21. Escalate problem as per laid down escalation matrix PC22. Escalate the problem within stipulated time PC23. Escalate the problem in an appropriate manner PC24. Ensure that no delays are caused as a result of failure to escalate problems</p>
Element	Knowledge and Understanding
A. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. Indicators of problems KA2. The working of the equipment and accessories(if applicable) KA3. The impact of operations on the user and equipment(if applicable) KA4. The impact of operations on the final product (if applicable) KA5. The effect of not rectifying the problems identified KA6. The reason for the occurrence of previous problems KA7. Measures and steps that have been taken to address the previous problems KA8. Possible solutions for various problems KA9. The correct method for carrying out corrective actions outlined for each problem KA10. The impact of not carrying out the corrective actions KA11. The documentation procedure for recording such problems, as per company norms KA12. The escalation matrix for reporting problems KA13. Escalation matrix for reporting unresolved problems KA14. The time frame within which in which each problem needs to be escalated KA15. Manner in which each problem needs to be escalated</p>
Skills (S) w.r.t. the scope	
Element	Skills
A. Core Skills/ Generic Skills	<p style="background-color: #e6f2ff;">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 SA2. Fill up appropriate technical forms, process charts, activity logs in required format of the company SA3. Write simple letters, mails, etc. SA4. Perform functional mathematical operations, including apply basic mathematical principles, such as numbers and space, and techniques such as estimation and approximation, for practical purposes</p> <p style="background-color: #e6f2ff;">Reading and Understanding Skills</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA5. Read and understand manuals, health and safety instructions, memos, reports, job cards etc.</p>

SA6. Read and interpret engineering and tool drawings
Oral Communication (Listening and Speaking skills)
The user/individual on the job needs to know and understand how to:
SA7. Express statements, opinions or information clearly so that others can hear and understand
SA8. Respond appropriately to any queries
SA9. Communicate with supervisor
SA10. Communicate with upstream and downstream teams
SA11. Work in a team and other behavioural skills required to support the small group activities (Quality Circle, Cross Functional Team, Suggestion Scheme)
Integrity
The user/individual on the job needs to know and understand how to:
SA12. Practice honesty with respect to company property and time
SA13. Communicate with people in a form and manner and using language that is open and respectful
SA14. Resolve any difficulties in relationships with colleagues , or get help from an appropriate person, in a way that preserves goodwill and trust
Motivation
The user/individual on the job needs to know and understand how to:
SA15. Take responsibility for completing one's own work assignment
SA16. Take initiative to enhance/learn skills in others area of work
SA17. The capacity to learn from experience in a range of settings and scenarios and the capacity to reflect on and analyse one's learning.
SA18. Is open to new ways of doing things
SA19. The capacity to envisage and articulate personal goals; to develop strategies and take action to achieve them.
Reliability
The user/individual on the job needs to know and understand how to:
SA20. Avoid absenteeism
SA21. Act objectively , rather than impulsively or emotionally when faced with difficult/stressful or emotional situations
SA22. Work in disciplined factory environment
SA23. Be punctual

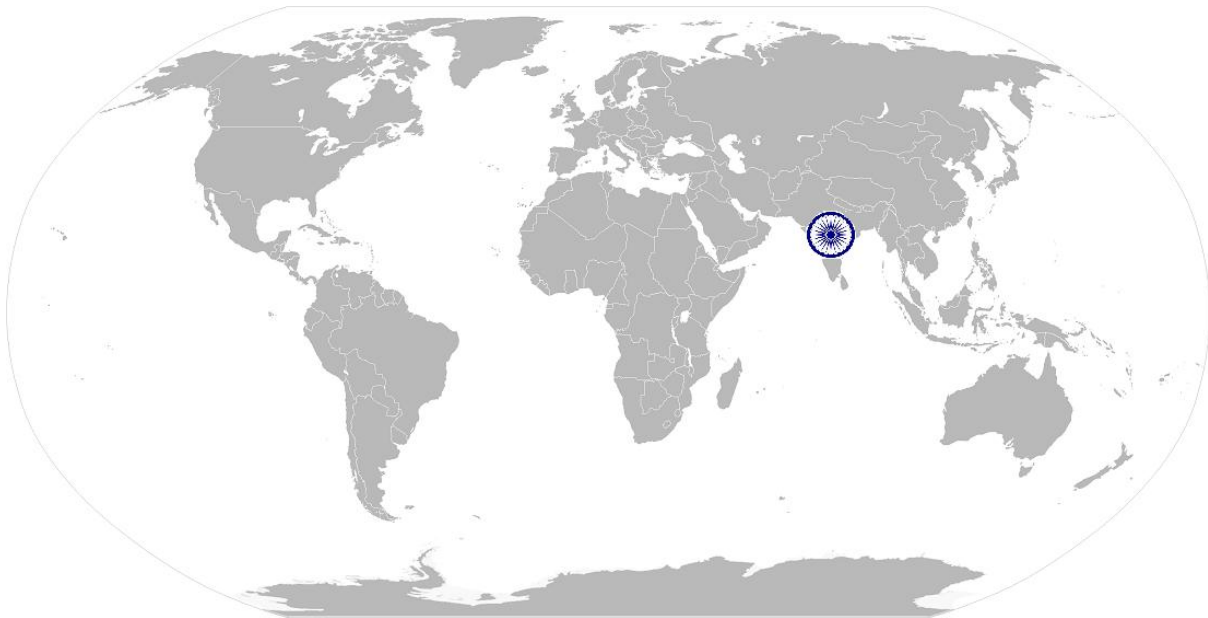
NOS Version Control

NOS Code	ISC/N1007		
Credits(NSQF)	TBD	Version number	1.0
Industry	Iron and steel	Drafted on	23/07/2014
Industry Sub-sector	Steel, Sponge Iron, Ferro Alloys, Re-Rollers, Refractory	Last reviewed on	30/12/2014
Occupation	Mechanical Maintenance	Next review date	30/12/2015



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

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.

Unit Code	ISC/N0008
Unit Title (Task)	Use basic health and safety practices at the workplace
Description	<p>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.</p> <p>It includes understanding of risks and hazards in the workplace, along with common techniques to minimize risk, deal with accidents, emergencies, etc.</p>
Scope	<p>This unit/task covers the following:</p> <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</p> <p>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>

Various areas are listed below:

- On chemical containers
- Equipment
- Packages
- Inside buildings
- Open areas and public spaces, etc.

PC3. State the names and location of documents that refer to health and safety in the workplace

PC4. Identify job-site hazardous work and state possible causes of risk or accident in the workplace

Hazards include:

- 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, tools 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.

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

Safe working practices include:

- 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.

Methods are:

- 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 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 • 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

	<ul style="list-style-type: none"> • 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> <p>PC15. Demonstrate good housekeeping in order to prevent fire hazards</p> <p>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</p> <p>PC18. Administer appropriate first aid to victims as required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc.</p> <p>PC19. Demonstrate basic techniques of bandaging</p> <p>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</p> <p>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</p> <p>PC23. Demonstrate the artificial respiration and the CPR Process</p> <p>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</p> <p>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

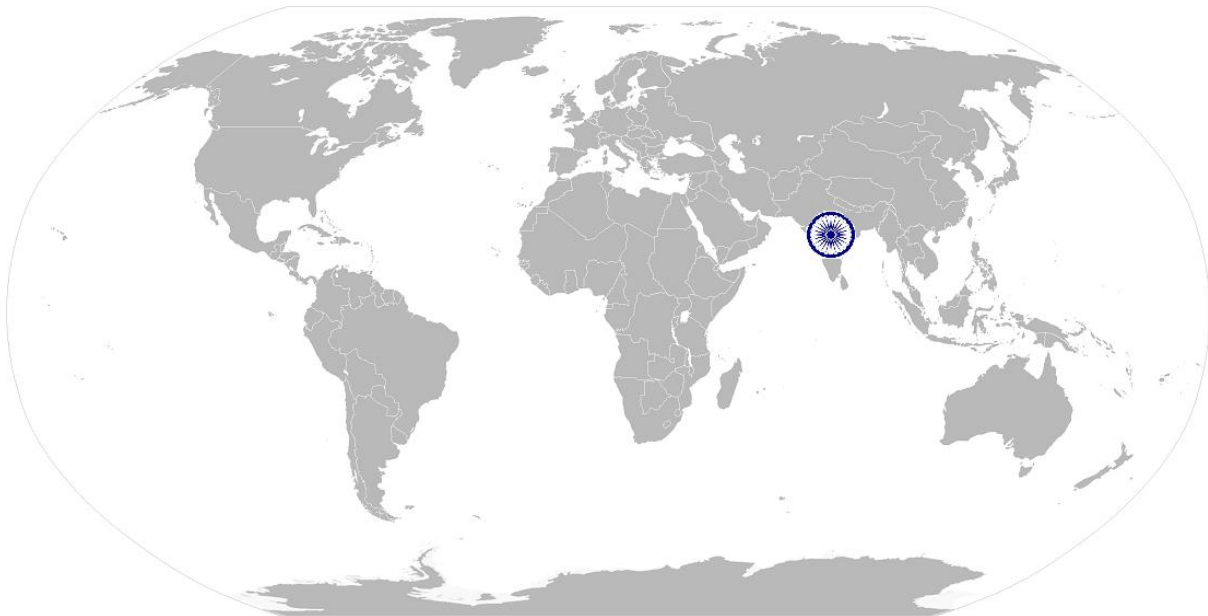
	<ul style="list-style-type: none"> • Supervisor/manager notified <p>Documents:</p> <ul style="list-style-type: none"> • Fire notices • Accident reports • Safety instructions for equipment and procedures • Company notices and documents • Legal documents (e.g. Government notices) <p>Job titles:</p> <ul 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
A. Organisational Context (Knowledge of the Company/Organisation and its processes)	<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>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB3. Meaning of “hazards” and “risks”</p> <p>KB4. Health and safety hazards commonly present in the work environment and related precautions</p> <p>KB5. Possible causes of risk, hazard or accident in the workplace and why risk and/or accidents are possible</p> <p>KB6. Activities and causes of risk and accident</p> <p>KB7. Methods of accident prevention</p> <p>KB8. Safe working practices when working with tools and machines</p> <p>KB9. Safe working practices while working at various hazardous sites</p> <p>KB10. Where to find all the general health and safety equipment in the workplace</p> <p>KB11. Various dangers associated with the use of electrical equipment</p> <p>KB12. 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>KB13. Importance of using protective clothing/equipment while working</p> <p>KB14. 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

	<ul style="list-style-type: none"> Inattention Sickness and incapacity (e.g. Drunkenness) Health hazards (e.g. Untreated injuries and contagious illness) <p>KB15. Various causes of fire</p> <p>KB16. Techniques of using the different fire extinguishers</p> <p>KB17. Different methods of extinguishing fire</p> <p>KB18. Rescue techniques applied during a fire hazard</p> <p>KB19. Various types of safety signs and what they mean</p> <p>KB20. Appropriate basic first aid treatment relevant to the condition e.g. Shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries</p> <p>KB21. Content of written accident report</p> <p>KB22. Potential injuries and ill health associated with incorrect manual handling</p> <p>KB23. Safe lifting and carrying practices</p> <p>KB24. Personal safety, health and dignity issues relating to the movement of a person by others</p> <p>KB25. 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, signage's
	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	
Decision Making	
The user/individual on the job needs to know and understand how to:	
SA6. 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	
B. Professional Skills	Plan and Organize
	The user/individual on the job needs to know and understand:
SB1. Plan and organize their own work schedule, work area, tools, equipment and materials to maintain decorum and for improved productivity	

	Working with others
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB2. Remain congenial while discussing and debating issues with co-workers SB3. Follow appropriate protocols for communication based on situation, hierarchy, organizational culture and practice SB4. Ask for, provide and receive required assistance where possible to ensure achievement of work related objectives SB5. Thank co-workers for any assistance received SB6. Offer appropriate respect based on mutuality and respect for fellow workmanship and authority</p>
	Problem Solving
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB7. Think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s) SB8. Identify immediate or temporary solutions to resolve delays SB9. Identify sources of support that can be availed of for problem solving for various kind of problems SB10. Seek appropriate assistance from other sources to resolve problems SB11. Report problems that you cannot resolve to appropriate authority</p>
	Analytical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB12. Identify cause and effect relations in their area of work SB13. Use cause and effect relations to anticipate potential problems and their solution</p>

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	Mechanical Maintenance	Next review date	30/12/2015



ISC/N0009: Works effectively with others

National Occupational Standards

A world map showing the continents in light gray. The country of India is highlighted in a darker shade of gray. A small circular icon of the Indian national flag is placed over the map of India.

Overview

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

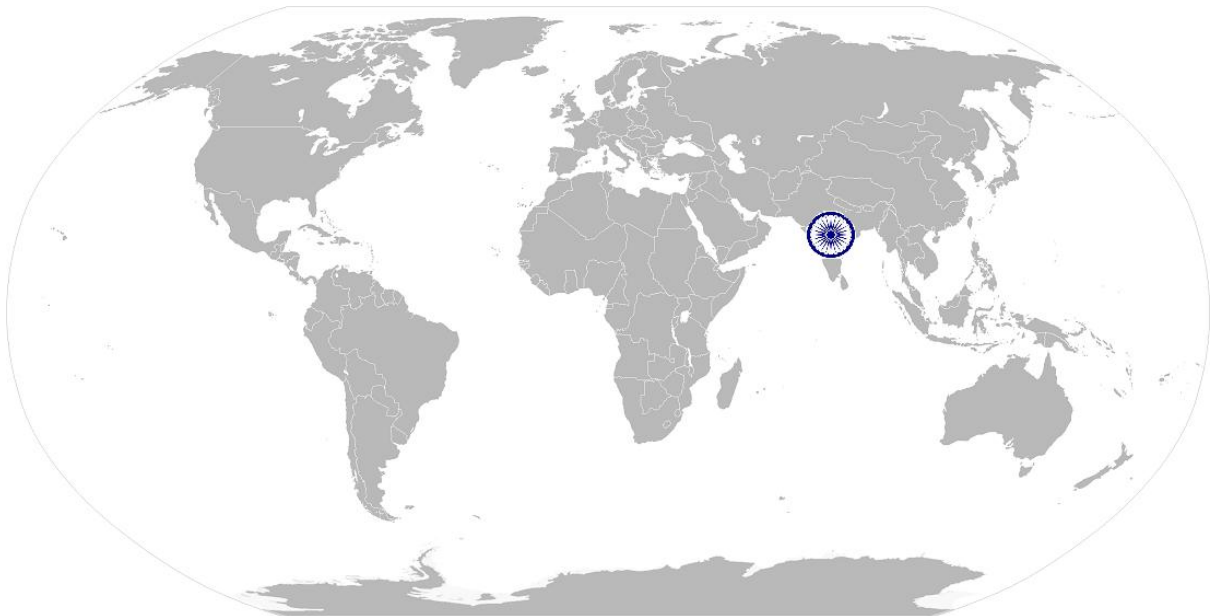
Unit Code	ISC/N0009
Unit Title (Task)	Works effectively with others
Description	This unit covers basic etiquette and competencies that a candidate is required to possess and demonstrate in their behaviour and interactions with others at the workplace.
Scope	<p>This unit/task covers the following:</p> <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	<p>The user/individual on the job should be able to:</p> <p>PC1. Accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required</p> <p>PC2. Accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt</p> <p>PC3. Provide information to others clearly, at a pace and in a manner that helps them to understand</p>
Demonstrate appropriate behaviour and etiquette at work place	<p>The user/individual on the job should be able to:</p> <p>PC4. Display helpful behaviour by assisting others in performing tasks in a positive manner, where required and possible</p> <p>PC5. Consult with and assist others to maximize effectiveness and efficiency in carrying out tasks</p> <p>PC6. Display appropriate communication etiquette while working</p> <p>PC7. Display active listening skills while interacting with others at work</p> <p>PC8. Use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism</p> <p>PC9. Demonstrate responsible and disciplined behaviours at the workplace</p> <p>PC10. Escalate grievances and problems to</p>
Element	Knowledge and Understanding
A. Organisational Context (Knowledge of the Company/ Organisation and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. Legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions</p> <p>KA2. Reporting structure, inter-dependent functions, lines and procedures in the work area</p> <p>KA3. Relevant people and their responsibilities within the work area</p> <p>KA4. Escalation matrix and procedures for reporting work and employment related</p>

	issues
B. Technical Knowledge	<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>
Skills (S) w.r.t. the scope	
Element	Skills
A. Core Skills/ Generic Skills	Reading and Writing Skills
	<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>
	Oral Communication (Listening and Speaking skills)
	<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>
	Decision Making
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA6. Make appropriate decisions pertaining to the concerned area of work with</p>

	respect to intended work objective, span of authority, responsibility, laid down procedure and guidelines
B. Professional Skills	Plan and Organize
	The user/individual on the job needs to know and understand:
	SB1. Plan and organize their own work schedule, work area, tools, equipment and materials to maintain decorum and for improved productivity
	Working with others
	The user/individual on the job needs to know and understand how to:
	SB2. Remain congenial while discussing and debating issues with co-workers SB3. Follow appropriate protocols for communication based on situation, hierarchy, organizational culture and practice SB4. Ask for, provide and receive required assistance where possible to ensure achievement of work related objectives SB5. Thank co-workers for any assistance received SB6. Offer appropriate respect based on mutuality and respect for fellow workmanship and authority
Problem Solving	
The user/individual on the job needs to know and understand how to:	
SB7. Think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s) SB8. Identify immediate or temporary solutions to resolve delays SB9. Identify sources of support that can be availed of for problem solving for various kind of problems SB10. Seek appropriate assistance from other sources to resolve problems SB11. Report problems that you cannot resolve to appropriate authority	
Analytical Thinking	
The user/individual on the job needs to know and understand how to:	
SB12. Identify cause and effect relations in their area of work SB13. Use cause and effect relations to anticipate potential problems and their solution	

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	Mechanical Maintenance	Next review date	30/12/2015



CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role: Iron & Steel - Machinist

Qualification Pack: ISC/Q0909

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.

NOSs	PCs	Marks Allocated			
		Total Marks 1000	Out Of	Theory	Practical
ISC/N0901: Understand design requirement and prepare equipment	PC1. Receive sample parts/ blueprints/ engineering drawings and other engineering information as per company procedures	200	5	0	5
	PC2. Analyze sample parts, engineering drawings and blueprints to plan sequence of operations for fabricating various components		10	5	5
	PC3. Report and rectify cases of inappropriate information in design documents as per organizational procedures		5	0	5

PC4. Compute dimensions, sizes, shapes and tolerances of sub-assemblies of the machine based on specifications as per company procedures	10	5	5
PC5. Identify and select machines required for fabrication of various components based on design and blueprints	10	5	5
PC6. Identify and select tools for fabrication of components based on design and blueprints	10	5	5
PC7. Identify and select moulds and dies for fabrication of components	10	5	5
PC8. Identify and select lifting and rigging equipment based on design and blueprints	10	5	5
PC9. Select appropriate metals to be used for fabrication based on design and blueprints	10	5	5
PC10. Ensure that equipment is clean	5	0	5
PC11. Ensure machines such as lathes, milling machines and grinders required during fabrication process are ready for operation	10	5	5
PC12. Set parameters for conventional or computer numerically controlled machines as per design requirements	10	5	5
PC13. Collect tools required during the fabrication process	5	0	5
PC14. Ensure that tools match the desired specifications	5	0	5
PC15. Ensure tools and attachments required during fabrication process are free from physical damage and ready for operation	5	0	5
PC16. Ensure the calibration status of all measuring equipment and instruments	10	5	5
PC17. Ensure that no delays are caused as a result of improper preparation and failure to identify problems	5	0	5

PC18. Ensure that metal work pieces and other materials required for fabrication are in the correct quantity	5	0	5
PC19. Ensure, by visual inspection, that work pieces are of desired quality (free of rust, type of metal, etc)	5	0	5
PC20. Remove paint, grease, rust, or other contaminants from work piece	5	0	5
PC21. Smoothen out the metal work piece prior to fabrication by grinding it	5	0	5
PC22. Measure and mark metal work piece using instruments such as protractors, micrometers, scribes and rulers	10	5	5
PC23. Ensure that no delays are caused as a result of improper preparation and failure to identify problems	5	0	5
PC24. Ensure housekeeping and safety in work area	3	0	3
PC25. Ensure that the exhaust systems are used to maintain the concentration levels of various particulate matters remain within limits	1	0	1
PC26. Ensure use of mask during grinding to avoid inhaling the dust	1	0	1
PC27. Ensure that the loose and torn clothes are not worn during working hours	5	0	5
PC28. Ensure using hoist or forklift for lifting heavy materials to avoid physical injury	8	5	3
PC29. Adhere to all other safety norms (like wearing shoes, gloves, safety goggles, helmets, etc.)	1	0	1
PC30. Ensure that unpermitted materials such as fuels, paints etc. are removed from the work area	1	0	1
PC31. Comply with health, safety, environment guidelines, regulations etc. in accordance with organizational SOP	5	0	5

	PC32. Identify any potential health hazards or dangers and escalate to supervisor as per organizational SOP		5	0	5
		Total	200	60	140
ISC/N0902:Perform fabrication activities	PC1. Ensure, by visual inspection, that work pieces are of desired quality (free of rust, type of metal etc.)	175	10	0	10
	PC2. Ensure that each material is in the correct quantity		5	0	5
	PC3. Lift and secure work pieces on surface plates or worktables using hoists, vises, v-blocks or angle plates		10	0	10
	PC4. Perform sawing to cut work pieces to desired shapes and sizes		10	0	10
	PC5. Perform drilling to thread holes in work pieces as per design		15	5	10
	PC6. Place work pieces in the appropriate machine as per design requirement		5	0	5
	PC7. Operate conventional or computer numerically controlled machine tools such as lathes, milling machines and grinders to bore, grind or shape parts to prescribed dimensions and finishes		20	5	15
	PC8. Perform milling to fabricate parts according to precise sizes and shapes		20	5	15
	PC9. Match the quality of output to company's product requirements		15	5	10
	PC10. Meet production quantity targets set for the operation		5	0	5
	PC11. Follow work instructions as laid down by the company		5	0	5
	PC12. Ensure housekeeping and safety in work area		5	0	5
	PC13. Ensure that the exhaust systems are used to maintain the concentration levels of various particulate matters remain within limits		5	0	5
	PC14. Ensure use of mask during grinding to avoid inhaling the dust		5	0	5

	PC15. Ensure that the loose and torn clothes are not worn during working hours		5	0	5
	PC16. Ensure safe distance between body and moving parts of the equipment		10	5	5
	PC17. Ensure using hoist or forklift for lifting heavy materials to avoid physical injury		5	0	5
	PC18. Adhere to all other safety norms (like wearing shoes, gloves, safety goggles, helmets, etc.)		5	0	5
	PC19. Ensure that unpermitted materials such as fuels, paints etc are removed from the work area		5	0	5
	PC20. Comply with health, safety, environment guidelines, regulations etc in accordance with organizational SOP		5	0	5
	PC21. Identify any potential health hazards or dangers and escalate to supervisor as per organizational SOP		5	0	5
		Total	175	25	150
ISC/N0903:Perform post - fabrication activities	PC1. Follow work instructions as laid down by the company	125	5	0	5
	PC2. Ensure that equipment is put in a safe condition (shutdown or idle state) on completion of fabrication activities		10	5	5
	PC3. Remove the work pieces as per company procedure		5	0	5
	PC4. Inspect finished parts for smoothness, contour conformity and defects by visual inspection		15	5	10
	PC5. Verify dimensions, alignments and clearance of finished part for conformance to specifications		15	5	10
	PC6. File, grind, shim etc. to make final adjustment		9	0	9
	PC7. Dispose off waste material as per waste disposal procedures laid down by the company		1	0	1
	PC8. Carry out disposal of waste material safely		10	5	5

	PC9. Ensure housekeeping and safety in work area		5	0	5
	PC10. Ensure that the exhaust systems are used to maintain the concentration levels of various particulate matters remain within limits		5	0	5
	PC11. Ensure use of mask during grinding to avoid inhaling the dust		5	0	5
	PC12. Ensure that the loose and torn clothes are not worn during working hours		5	0	5
	PC13. Ensure safe distance between body and moving parts of the equipment		10	5	5
	PC14. Ensure using hoist or forklift for lifting heavy materials to avoid physical injury		5	0	5
	PC15. Adhere to all other safety norms (like wearing shoes, gloves, safety goggles, helmets, etc.)		5	0	5
	PC16. Ensure that unpermitted materials such as fuels, paints etc are removed from the work area		5	0	5
	PC17. Comply with health, safety, environment guidelines, regulations etc in accordance with organizational SOP		5	0	5
	PC18. Identify any potential health hazards or dangers and escalate to supervisor as per organizational SOP		5	0	5
		Total	125	25	100
ISC/N0904:Perform maintenance activities	PC1. Select necessary inspection tools as per the job requirements	50	10	5	5
	PC2. Observe and listen to operating machines or equipment to diagnose machine malfunction and determine need for adjustment or repair		5	0	5
	PC3. Clean and maintain machines, tools and equipment used in fabrication to remove grease, rust, stains, and foreign matter		5	0	5
	PC4. Inspect condition of lubricants of machine in accordance with workplace procedures		10	5	5

	PC5. Make minor adjustment and alignments on loose bolts, belts, drive slacks, guards and covers		10	5	5
	PC6. Replace worn/faulty components or equipment		1	0	1
	PC7. Record all work done and report to supervisor in accordance with the company procedures		7	5	2
	PC8. Ensure housekeeping and safety in work area		1	0	1
	PC9. Ensure that the exhaust systems are used to maintain the concentration levels of various particulate matters remain within limits		1	0	1
	PC10. Ensure use of mask during grinding to avoid inhaling the dust		1	0	0
	PC11. Ensure that the loose and torn clothes are not worn during working hours		1	0	0
	PC12. Ensure safe distance between body and moving parts		1	0	0
	PC13. Ensure using hoist or forklift for lifting heavy materials to avoid physical injury		1	0	0
	PC14. Adhere to all other safety norms (like wearing shoes, gloves, safety goggles, helmets, etc.)		1	0	0
	PC15. Remove unpermitted materials such as fuels, paints etc from the work area		1	0	0
	PC16. Comply with health, safety, environment guidelines, regulations etc in accordance with organizational SOP		1	0	1
	PC17. Identify any potential health hazards or dangers and escalate to supervisor as per organizational SOP		1	0	1
		Total	50	20	30
ISC/N1004: Carry out housekeeping	PC1. Inspect the area while taking into account various surfaces	50	2	1	1

PC2. Identify the material requirements for cleaning the areas inspected, by considering risk, time, efficiency and type of stain	2	1	1
PC3. Ensure that the cleaning equipment is in proper working condition	2	1	1
PC4. Select the suitable alternatives for cleaning the areas in case the appropriate equipment and materials are not available and inform the appropriate person	2	1	1
PC5. Plan the sequence for cleaning the area to avoid re-soiling clean areas and surfaces equipment and materials are not available and inform the appropriate person	2	1	1
PC6. Inform the affected people about the cleaning activity	2	1	1
PC7. Display the appropriate signage for the work being conducted	3	1	2
PC8. Ensure that there is adequate ventilation for the work being carried out	3	1	2
PC9. Wear the personal protective equipment required for the cleaning method and materials being used	2	1	1
PC10. Use the correct cleaning method for the work area, type of soiling and surface	2	1	1
PC11. Carry out cleaning activity without disturbing others	2	1	1
PC12. Deal with accidental damage, if any, caused while carrying out the work	2	1	1
PC13. Report to the appropriate person any difficulties in carrying out your work	2	1	1
PC14. Identify and report to the appropriate person any additional cleaning required that is outside one's responsibility or skill	2	1	1
PC15. Ensure that there is no oily substance on the floor to avoid slippage	2	1	1

	PC16. Ensure that no scrap material is lying around		4	1	3
	PC17. Maintain and store housekeeping equipment and supplies		4	1	3
	PC18. Follow workplace procedures to deal with any accidental damage caused during the cleaning process		2	1	1
	PC19. Ensure that, on completion of the work, the area is left clean and dry and meets requirements		2	1	1
	PC20. Return the equipment, materials and personal protective equipment that were used to the right places making sure they are clean, safe and securely stored		2	1	1
	PC21. Dispose the waste garnered from the activity in an appropriate manner		2	1	1
	PC22. Dispose of used and un-used solutions according to manufacturer's instructions, and clean the equipment thoroughly		2	1	1
		Total	50	22	28
ISC/N1005: Carry out reporting and documentation	PC1. Report data/problems/incidents as applicable in a timely manner	50	5	2	3
	PC2. Report to the appropriate authority as laid down by the company		5	2	3
	PC3. Follow reporting procedures as prescribed by the company		5	2	3
	PC4. Identify documentation to be completed relating to one's role		5	2	3
	PC5. Record details accurately in appropriate format		5	2	3
	PC6. Complete all documentation within stipulated time according to company procedure		5	2	3
	PC7. Ensure that the final document meets with the requirements of the persons who requested it or make any amendments accordingly		5	2	3
	PC8. Make sure documents are available to all appropriate authorities to inspect		5	2	3

	PC9. Respond to requests for information in an appropriate manner whilst following organizational procedures		5	2	3
	PC10. Inform the appropriate authority of requests for information received		5	2	3
		Total	50	20	30
ISC/N1006:Carry out quality checks	PC1. Ensure that total range of checks are regularly and consistently performed	100	8	3	5
	PC2. Use appropriate measuring instruments, equipment, tools, accessories etc ,as required		8	3	5
	PC3. Identify non-conformities to quality assurance standards		10	5	5
	PC4. Identify potential causes of non-conformities to quality assurance standards		16	6	10
	PC5. Identify impact on final product due to non-conformance to company standards		16	6	10
	PC6. Evaluating the need for action to ensure that problems do not recur		14	6	8
	PC7. Suggest corrective action to address problem		14	6	8
	PC8. Review effectiveness of corrective action		10	5	5
	PC9. Interpret the results of the operator level quality check correctly		10	5	5
	PC10. Inform any non-conformity to the appropriate authority within the stipulated time		5	2	3
	PC11. Record of results of action taken		10	5	5
	PC12. Record adjustments not covered by established procedures for future reference		10	5	5
	PC13. Review effectiveness of action taken		10	5	5
	PC14. Follow reporting procedures where the cause of defect cannot be identified		9	6	3
		Total	150	68	82

ISC/N1007: Carry out problem identification and escalation	PC1. Identify defects/indicators of problems	50	3	1	2
	PC2. Identify any wrong practices that may lead to problems		3	1	2
	PC3. Identify practices that may impact the final product quality		3	1	2
	PC4. Identify if the problem has occurred before		2	1	1
	PC5. Identify other operations that might be impacted by the problem		2	1	1
	PC6. Ensure that no delays are caused as a result of failure to escalate problems		3	1	2
	PC7. Take appropriate materials and sample to conduct tests		7	1	6
	PC8. Evaluate results to confirm suspected reasons for non-conformance (where required)		5	1	4
	PC9. Consider possible reasons for identification of problems		4	1	3
	PC10. Consider applicable corrections and formulate corrective action		5	1	4
	PC11. Formulate action in a timely manner		5	1	4
	PC12. Communicate problem/remedial action to appropriate parties		4	1	3
	PC13. Take corrective action in a timely manner		4	2	2
	PC14. Report/document problem and corrective action in an appropriate manner		4	2	2
	PC15. Monitor corrective action		5	2	3
	PC16. Evaluate implementation of corrective action taken to determine if the problem has been resolved		4	2	2
	PC17. Ensure that corrective action selected is viable and practical		5	2	3
	PC18. Ensure that correct solution is identified to an identified problem		4	2	2
	PC19. Take corrective action for problems identified according to the company procedures		5	2	3

	PC20. Ensure that no delays are caused as a result of failure to take necessary action		5	2	3
	PC21. Escalate problem as per laid down escalation matrix		4	2	2
	PC22. Escalate the problem within stipulated time		4	2	2
	PC23. Escalate the problem in an appropriate manner		5	2	3
	PC24. Ensure that no delays are caused as a result of failure to escalate problems		5	2	3
		Total	100	36	64
ISC/N0008: Use basic health and safety practices at the workplace	PC1. Use protective clothing/equipment for specific tasks and work conditions	150	9	4	5
	PC2. State the name and location of people responsible for health and safety in the workplace		6	1	5
	PC3. State the names and location of documents that refer to health and safety in the workplace		2	1	1
	PC4. Identify job-site hazardous work and state possible causes of risk or accident in the workplace		8	4	4
	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		6	1	5
	PC6. State location of general health and safety equipment in the workplace		6	1	5
	PC7. Inspect for faults, set up and safely use steps and ladders in general use		6	1	5
	PC8. Work safely in and around trenches, elevated places and confined areas		6	1	5
	PC9. Lift heavy objects safely using correct procedures		6	1	5
	PC10. Apply good housekeeping practices at all times		2	1	1
	PC11. Identify common hazard signs displayed in various areas		6	5	1

PC12. Retrieve and/or point out documents that refer to health and safety in the workplace	5	1	4
PC13. Use the various appropriate fire extinguishers on different types of fires correctly	9	4	5
PC14. Demonstrate rescue techniques applied during fire hazard	8	4	4
PC15. Demonstrate good housekeeping in order to prevent fire hazards	2	1	1
PC16. Demonstrate the correct use of a fire extinguisher	6	1	5
PC17. Demonstrate how to free a person from electrocution	6	1	5
PC18. Administer appropriate first aid to victims as required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc.	8	3	5
PC19. Demonstrate basic techniques of bandaging	6	1	5
PC20. Respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments	7	2	5
PC21. Perform and organize loss minimization or rescue activity during an accident in real or simulated environments	6	1	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	6	1	5
PC23. Demonstrate the artificial respiration and the CPR Process	6	1	5
PC24. Participate in emergency procedures	6	1	5
PC25. Complete a written accident/incident report or dictate a report to another person, and send report to person responsible	4	1	3

	PC26. Demonstrate correct method to move injured people and others during an emergency		2	1	1
		Total	150	45	105
ISC/N0009: Works effectively with others	PC1. Accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	50	10	5	5
	PC2. Accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt		9	4	5
	PC3. Provide information to others clearly, at a pace and in a manner that helps them to understand		11	1	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		11	1	10
	PC7. Display active listening skills while interacting with others at work		11	1	10
	PC8. Use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism		8	3	5
	PC9. Demonstrate responsible and disciplined behaviours at the workplace		14	4	10
	PC10. Escalate grievances and problems to supervisor		6	1	5
		Total	100	30	70