

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR CAPITAL GOODS 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- Setter and Operator- Non Conventional Electro Discharge Machine (Spark Erosion)

SECTOR/S: CAPITAL GOODS

SUB-SECTOR:

- | | |
|------------------------------------|-------------------------------------|
| 1. Machine Tools | 3. Plastics Manufacturing Machinery |
| 2. Textile Manufacturing Machinery | 4. Dies Moulds and Press Tools |

OCCUPATION: Machining

REFERENCE ID: CSC/Q0122

ALIGNED TO: NCO-2004/NIL

Brief Job Description: It involves selecting the appropriate work holding devices, and mounting and positioning them to the machine in the correct location for the type of operation to be carried out. It also involves selecting the appropriate electrodes to use, check them for defects, and mount and secure them to the relevant parts of the machine and perform machining operations.

Personal Attributes: Basic communication, numerical and computational abilities. Openness to learning, ability to plan and organize own work and identify and solve problems in the course of working. Understanding the need to take initiative and manage self and work to improve efficiency and effectiveness.

Job Details	Qualifications Pack Code	CSC/Q0122		
	Job Role	Setter and Operator - Non-conventional Electro Discharge Machine (Spark Erosion) (Applicable for National Scenarios)		
	Credits	TBD	Version number	1.0
	Sector	Capital Goods	Drafted on	10/04/2014
	Sub-sector	<ol style="list-style-type: none"> 1. Machine Tools 2. Textile Manufacturing Machinery 3. Plastic Manufacturing Machinery 4. Dies, Moulds and Press Tools 	Last reviewed on	24/11/2017
	Occupation	Machining	Next review date	24/11/2021
	NSQC Clearance on	20/07/2015		

Job Role	Setter and Operator - Non-conventional Electro Discharge Machine (Spark Erosion)
Role Description	The individual on the job performs set up operations on Non-conventional Electro Discharge Machine (spark erosion) and to produce a range of component shapes, as per given specifications.
NSQF level	4
Minimum Educational Qualifications	12 th Standard pass, preferably
Maximum Educational Qualifications	Not Applicable
Prerequisite License or Training	No Previous Training Required
Minimum Job Entry Age	18 Years
Experience	Minimum 1 year as an NC EDM Operator
Applicable National Occupational Standards (NOS)	<p>Compulsory:</p> <ol style="list-style-type: none"> CSC/N0122 Set a non-conventional electro-discharge machine (spark erosion) for machining operations on metal components CSC/N0119 Perform machining operations on metal products using non-conventional controlled electro-dischargemachine (spark erosion) CSC/N1335 Use basic health and safety practices at the workplace CSC/N1336 Work effectively with others
Performance Criteria	As described in the relevant OS units

Definitions

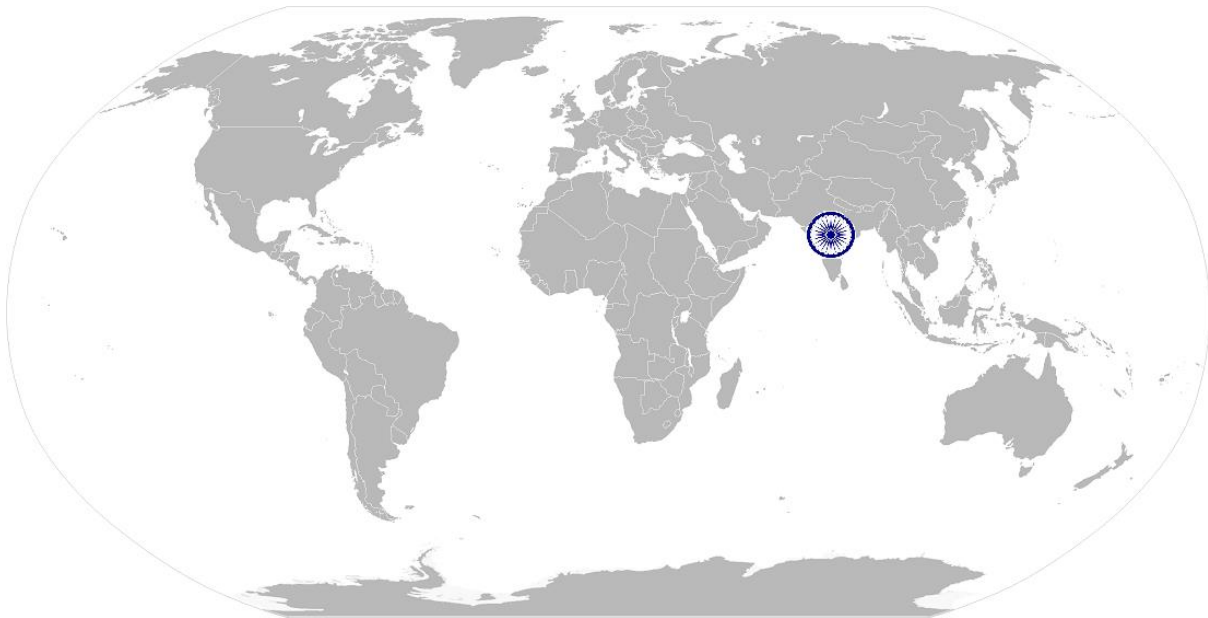
Keywords /Terms	Description
Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the knowledge and understanding they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria	Performance criteria are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack(QP)	QP comprises the set of OSs, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a 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 quality of performance required.
Knowledge and Understanding	Knowledge and understanding are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual need to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.

Acronyms

Core Skills/ Generic Skills	Core skills or generic skills are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. In the context of the OS, these include communication related skills that are applicable to most job roles.
Keywords /Terms	Description
CNC	Computer Numerically Controlled
VMC	Vertical Machining Center
EDM	Electro Discharge Machine
CAD	Computer Aided Design
2D	2 Dimensional
3D	3 Dimensional
VDI	Verein Deutscher Ingenieure, The Society Of German Engineers
H Limit	Hard Limit
DTI	Dial Test Indicators
BS/ ISO/ BS EN/ DIN	Quality Management Standards
PPE	Personal Protective Equipment
CO ₂	Carbon Dioxide
CPR	Cardiac Pulmonary Resuscitation
ISO	International Organization For Standardization

CSC/N0122 Set a non-conventional electro-discharge machine (spark erosion) for machining operations on metal components

National Occupational Standard



Overview

This unit covers setting a non-conventional electro discharge machine (EDM) (spark erosion) for machining of metal components as per given specifications.

CSC/N0122 Set a non-conventional electro-discharge machine (spark erosion) for machining operations on metal components

National Occupational Standard	Unit Code	CSC/N0122
	Unit Title (Task)	Set a non-conventional electro-discharge machine (spark erosion) for machining operations on metal components
	Description	This unit is about setting a spark erosion non-conventional EDM machine to produce component shapes. It covers setting an electro discharge machine (spark erosion) for machining of metal components as per given specifications. The candidate will also be expected to select the appropriate electrodes to use, check them for defects, and mount and secure them to the relevant parts of the machine.
	Scope	This unit/task covers the following: <ul style="list-style-type: none"> • Work safely • Set of EDM for machining operations
Performance Criteria(PC) w.r.t. the Scope		
Element	Performance Criteria	
Work safely	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. work safely at all times, complying with health and safety, environmental and other relevant regulations and guidelines</p> <p>PC2. check that all safety mechanisms are in place and that the equipment is set correctly for the required operations</p> <p>PC3. adhere to procedures or systems in place for health and safety, including personal protective equipment and other relevant safety regulations and procedures to contribute to a safe work environment</p> <p>PC4. wear the appropriate protective clothing and equipment, and keep the work area clean and tidy</p> <p>PC5. follow safe practice/approved setting up procedures at all times</p> <p>PC6. ensure that all measuring tools, equipment, power tool cables, extension leads are in a safe and usable condition</p> <p>Measuring tools: protractor; depth/internal/external micrometers; calipers (vernier, inside and outside, depth); gauges (height Vernier, feeler, bore/hole, slip, radius/profile, thread, plug); stick micrometers; dial stand and comparator; vee block with u-clamp</p> <p>PC7. ensure that the components used are free from foreign objects, dirt or other contamination</p>	
Set of EDM for machining operations	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC8. conduct a preliminary check of the readiness of the electro discharge machine</p> <p>Electro discharge machines: Spark Erosion</p> <p>Preliminary checks: e.g. machine is clean; position and alignment of the</p>	

CSC/N0122 Set a non-conventional electro-discharge machine (spark erosion) for machining operations on metal components

	<p>workpiece; lubrication is functioning; coolant level is correct; sub-systems are working correctly; etc.</p> <p>PC9. obtain job specification from a valid source and establish job requirements Valid sources: job instruction sheet/job card; work drawings and instructions; planning documentation; quality control documents; operation sheets; process specifications; instructions from supervisor Job specification documents: detailed component drawings; approved sketches/illustrations; national, international and organizational standards; reference tables and charts; operational diagrams Job requirements: raw materials or components required (type, quality, quantity); dimensions; limits and tolerances; surface texture requirements; operations required (list, sequence and procedures where applicable); shape or profiles to be machined; instruments and tools to be used; interdependencies; timelines</p> <p>PC10. set the machine to produce components within all of the quality and accuracy standards, as applicable to the operations performed Accuracy standards: components to be free from damage, false tool cuts, burrs, scratches and non-specified sharp edges; general dimensional tolerance $\pm 0.020\text{mm}$; flatness and squareness 0.05mm; angles within ± 1 degree</p> <p>PC11. determine what has to be done and how the machine will be set to achieve this</p> <p>PC12. prepare the electro-discharge machine in readiness for production</p> <p>PC13. mount and set the required workholding devices, workpiece and cutting tools</p> <p>PC14. position and secure workpieces to machine table using appropriate means</p> <p>PC15. select and mount appropriate electrodes for roughing and finishing</p> <p>PC16. set the machine tool operating parameters to achieve the component specification</p> <p>PC17. set up the machine in accordance with instructions and specifications Machine specifications: electrical conditions (eg. current density, spark frequency); alignment of electrodes; filtration equipment; linear feeds and speeds; dielectric flow rates; ventilation and fume extraction; safety mechanisms/devices; maximum weight carrying capacity</p> <p>PC18. set up the machine to produce internal and external profiles of various component features Features: flat faces, parallel and angular faces, forms (concave and convex, square/rectangular, profile), holes, engraving, cavities, radii/arcs, slots, sharp edges</p> <p>PC19. set up to machine components made from various materials</p>
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	<p>Range of materials: Ferrous: eg. low, medium and high carbon steels; low alloy steels; stainless steels; cast irons; Non-ferrous: eg. aluminum and aluminum alloys, bronze, silicon carbide</p> <p>PC20. conduct a trial runs and adjust parameters and positioning till output is as per required specifications</p> <p>PC21. hand-over the machine after set-up to the machine operator along with relevant instructions and documentation</p> <p>PC22. complete relevant documentation as per organizational procedure</p> <p>PC23. switch the non-conventional EDM machine on and off in normal and emergency situations</p> <p>PC24. return the old cutting tools, workholding device, fixtures, instruments, drawings and verified tapes and programs back to store, safely and correctly</p> <p>PC25. ensure that there is no damage to the electrode/fixture while doing the setting activities</p> <p>PC26. complete documentation during and post operations and submit as per organizational procedures Documentation: job card, progress records, incident reports</p> <p>PC27. deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve</p> <p>PC28. shut down the equipment to a safe condition on conclusion of the activities</p> <p>PC29. return all tools and equipment to the correct location on completion of the non-conventional EDM machining activities</p> <p>PC30. leave the work area in a safe and tidy condition on completion of the fitting activities</p>
Knowledge and Understanding (K)	
<p>A. Organizational Context (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. relevant legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions</p> <p>KA2. relevant health and safety requirements applicable in the work place</p> <p>KA3. importance of working in clean and safe environment</p> <p>KA4. own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities</p> <p>KA5. reporting structure, inter-dependent functions, lines and procedures in the work area</p> <p>KA6. relevant people and their responsibilities within the work area</p> <p>KA7. escalation matrix and procedures for reporting work and employment related issues</p> <p>KA8. documentation and related procedures applicable in the context of</p>

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	<p>employment and work</p> <p>KA9. importance and purpose of documentation in context of employment and work</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. specific safe working practices, precautions, non-conventional EDM procedures and environmental regulations that must be observed Safety precautions: obtain and use the appropriate documentation (eg. job instructions, drawings, quality control documentation); adhere to procedures or systems in place for risk assessment, Personal Protective Equipment and other relevant safety regulations and procedures to realise a safe system of work; follow safe practice/approved setting up procedures at all times; ensure that correctly adjusted machine guards are in place; check that electrodes are in a suitable condition; hold components securely without distortion; leave the work area and machine in a safe and appropriate condition on completion of the activities</p> <p>KB2. hazards associated with carrying out operations on a non-conventional EDM and how can they be minimized</p> <p>KB3. personal protective equipment to be used during the machining activities on an non-conventional EDM and where can it be obtained</p> <p>KB4. types and sources of appropriate job specifications Valid sources: job instruction sheet/job card; work drawings and instructions; planning documentation; quality control documents; operation sheets; process specifications; instructions from supervisor Job specification documents: detailed component drawings; approved sketches/illustrations; national, international and organizational standards; reference tables and charts; operational diagrams</p> <p>KB5. common terminology used for work related to non-conventional EDM</p> <p>KB6. how to read and interpret first and third angle component drawings</p> <p>KB7. how to extract information from engineering drawings or data and related specifications</p> <p>KB8. main features and working parts of the non-conventional EDM machine, and the accessories that can be used</p> <p>KB9. importance of following specified machining sequences and procedures</p> <p>KB10. importance of ensuring suitability of workpieces/materials and consumables for the specified job and related procedures</p> <p>KB11. importance and procedures to ensure that tools and equipment are in a safe and usable condition</p> <p>KB12. various non-conventional EDM machining operations that can be performed, and the methods and equipment used</p>

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	<p>KB13. range of workholding methods and devices that are used on nonconventional EDM</p> <p>KB14. how to set up workholding devices and electrodes on non-conventional EDM</p> <p>KB15. hazards associated with setting an non-conventional EDM (such as moving parts of machinery, electrical components, handling dielectrics, fumes), and how to minimize them and reduce any risks</p> <p>KB16. how to start and stop the machine in normal and emergency situations</p> <p>KB17. importance of ensuring that the machine is isolated from the power supply before mounting electrodes and workholding devices</p> <p>KB18. importance of wearing the appropriate protective clothing and equipment, and of keeping the work area clean and tidy</p> <p>KB19. basic principles of operation of the various EDM, and typical operations that they can perform</p> <p>KB20. how to handle and store electrodes safely and correctly</p> <p>KB21. how to extract and use information from engineering drawings and related specifications in relation to work undertaken</p> <p>KB22. how to use workpiece reference points and system of tolerancing</p> <p>KB23. range of eroded features that are produced on the electro-discharge machines</p> <p>KB24. range of workholding methods and devices that are used on electro-discharge machines Positioning and holding devices: clamping direct to machine table; pneumatic or magnetic table; machine vice (eg. plain, swivel, universal); angle plate; vee block and clamps; fixtures; chucks (eg. 3 or 4 jaw); ancillary indexing device</p> <p>KB25. different types of electrodes that are used, and how they are selected, prepared and mounted to the machine tool holding devices Electrodes: plain electrodes, profile electrodes, hollow electrodes</p> <p>KB26. factors that determine current density, spark frequency, linear feeds and speeds</p> <p>KB27. how the various types of material will affect the feeds and speeds that can be used Range of materials: Ferrous: eg. low, medium and high carbon steels; low alloy steels; stainless steels; cast irons; Non-ferrous: eg. aluminum and aluminum alloys, bronze, silicon carbide</p> <p>KB28. type of dielectrics that are used; filtration requirements; and precautions to be taken when handling and using them</p> <p>KB29. how to set up the various machines for the particular operations being performed</p> <p>KB30. need to conduct trial runs, and to check that the machine is set up and</p>
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	<p>running safely and correctly</p> <p>KB31. problems that can occur with setting up the electrodes, workholding devices, and machine operating parameters, and dealing with them appropriately</p> <p>KB32. method of flushing</p> <p>KB33. technical parameters for different machines</p> <p>KB34. quality control procedures that are used, inspection checks to be carried out, and the equipment that will need to be used</p> <p>KB35. how to check the quality of the shaped components against the required quality standards and dimensional parameters Dimensional parameters: parallelism, angle/taper, squareness, surface texture, linear dimensions, flatness, depths, angles, profiles, hole position hole size/fit</p> <p>KB36. importance of reporting problems in a timely manner</p> <p>KB37. range of materials used in common engineering applications</p> <p>KB38. forms of supply of materials</p> <p>KB39. identify materials by their physical and mechanical properties Mechanical properties: tensile strength, toughness, hardness, elasticity, ductility, malleability</p>
Skills (S)	
A. Core Skills/ Generic Skills	Reading Skills
	The user/ individual on the job needs to know and understand how to: SA1. read and interpret information correctly from various job specification documents, health and safety instructions, memos, etc. applicable to the job in English and/or local language
	Writing Skills
	The user/individual on the job needs to know and understand how to: SA2. fill up appropriate technical forms, process charts, activity logs as per organizational format in English and/or local language SA3. undertake numerical operations, and calculations/ formulae Numerical computations: addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages SA4. identify and draw various basic, compound and solid shapes as per dimensions given Basic shapes: square, rectangle, triangle, circle Compound shapes: involving squares, rectangles, triangles, circles, semicircles, quadrants of a circle Solid shapes: cube, rectangular prism, cylinder

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	<p>SA5. use appropriate measuring techniques and units of measurement</p> <p>SA6. use appropriate units and number systems to express degree of accuracy Units and number systems representing degree of accuracy: decimals places, significant figures, fractions as a decimal quantity</p> <p>SA7. use metric systems of measurement Angles in a triangle: right-angled, isosceles, equilateral</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>SA8. convey and share technical information clearly using appropriate language</p> <p>SA9. check and clarify task-related information</p> <p>SA10. liaise with appropriate authorities using correct protocol</p> <p>SA11. communicate with people in respectful form and manner in line with organizational protocol</p>
B. Professional Skills	<p>Decision Making</p>
	<p>NA</p>
	<p>Plan and Organize</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. plan, prioritize and sequence work operations as per job requirements</p> <p>SB2. organize and analyze information relevant to work</p> <p>SB3. basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time</p>
	<p>Customer Centricity</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB4. exercise restraint while expressing dissent and during conflict situations</p> <p>SB5. avoid and manage distractions to be disciplined at work</p> <p>SB6. manage own time for achieving better results</p> <p>SB7. work in a team in order to achieve better results</p> <p>SB8. identify and clarify work roles within a team</p> <p>SB9. communicate and cooperate with others in the team for better results</p> <p>SB10. seek assistance from fellow team members</p>
	<p>Problem Solving</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB11. identify problems with work planning, procedures, output and behavior and their implications</p> <p>SB12. prioritize and plan for problem solving</p> <p>SB13. communicate problems appropriately to others</p> <p>SB14. identify sources of information and support for problem solving</p>

CSC/N0122 Set a non-conventional electro-discharge machine (spark erosion) for machining operations on metal components

	SB15. seek assistance and support from other sources to solve problems
	SB16. identify effective resolution techniques
	SB17. select and apply resolution techniques
	SB18. seek evidence for problem resolution
	Analytical Thinking
The user/individual on the job needs to know and understand how to:	
SB19. undertake and express new ideas and initiatives to others	
SB20. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses	
SB21. participate in improvement procedures including process, quality and internal/external customer/supplier relationships	
SB22. enhance one's competencies in new and different situations and contexts to achieve more	
Critical Thinking	
The user/individual on the job needs to know and understand how to:	
SB23. maintain current knowledge of applicable standards, legislation, codes of practice and product/process developments	
SB24. participate in on-the-job and other learning, training and development interventions and assessment	
SB25. clarify task related information with appropriate personnel or technical adviser	
SB26. seek to improve and modify own work practices	

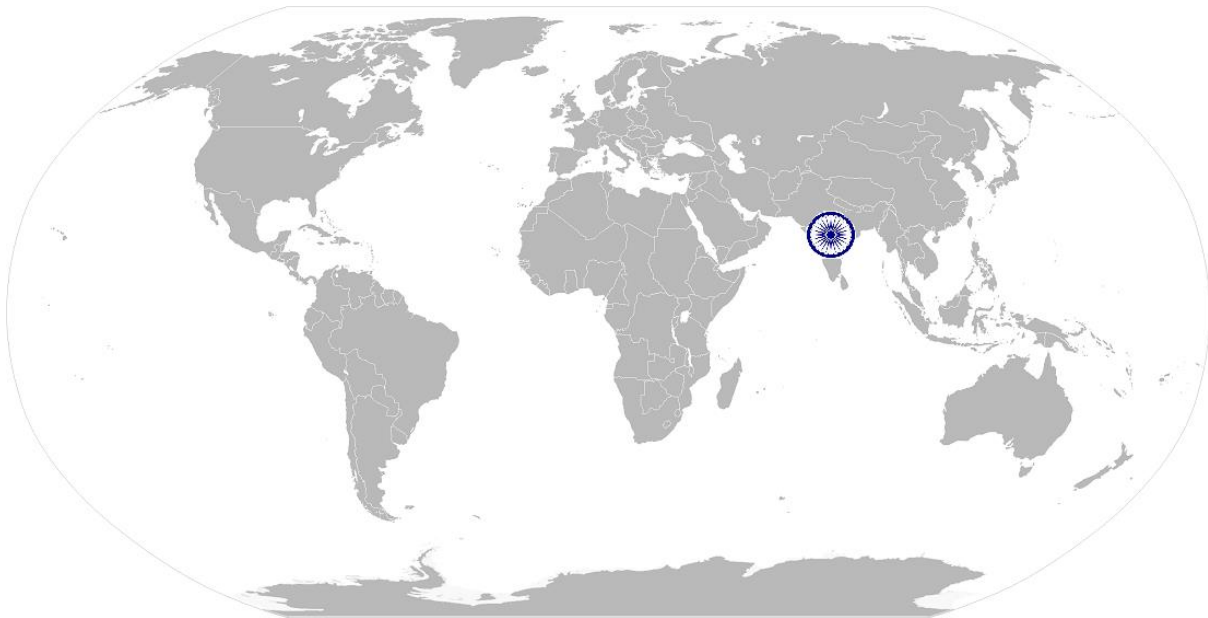
CSC/N0122 Set a non-conventional electro-discharge machine (spark erosion) for machining operations on metal components

NOS Version Control

NOS Code	CSC/N0122		
Credits	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	10/04/2014
Industry Sub-sector	1. Machine Tools 2. Textile Manufacturing Machinery 3. Plastic Manufacturing Machinery 4. Dies, Moulds and Press Tools	Last reviewed on	24/11/2017
Occupation	Machining	Next review date	24/11/2021

CSC/N0119 Perform machining operations on metal products using non-conventional controlled electro-discharge machine (spark erosion)

National Occupational Standard



Overview

This unit covers machining of metal components using a non-conventional electro discharge machine (EDM) to modify a range of component shapes via spark erosion, as per given specifications. It does not cover setting of EDM machines.

CSC/N0119 Perform machining operations on metal products using non-conventional controlled electro-discharge machine (spark erosion)

National Occupational Standard	Unit Code	CSC/N0119
	Unit Title (Task)	Perform machining operations on metal products using non-conventional controlled electro-discharge machine (spark erosion)
	Description	This unit covers machining of metal components using a non-conventional electro discharge machine (EDM) to modify a range of component shapes via spark erosion, as per given specifications. It does not cover setting of EDM machines.
	Scope	This unit/task covers the following: <ul style="list-style-type: none"> • Work safely • Prepare machine for operations • Carry out machining operations on NC EDM
Performance Criteria(PC) w.r.t. the Scope		
Element	Performance Criteria	
Work safely	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. comply with health and safety, environmental and other relevant regulations and guidelines at work</p> <p>PC2. adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing calibration operations</p> <p>PC3. work following laid down procedures and instructions</p> <p>PC4. ensure work area is clean and safe from hazards</p> <p>PC5. ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition</p> <p>PC6. ensure that machine guards are in place and are correctly adjusted</p>	
Prepare machine for operations	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC7. conduct a preliminary check of the readiness of the electro discharge machine</p> <p>Electro discharge machines: Spark Erosion Preliminary checks: machine is clean; position and alignment of the workpiece; lubrication is functioning; coolant level is correct; sub-systems are working correctly; confirmation received from the machine setter that the machine is ready for production</p> <p>PC8. obtain job specification from a valid and approved source Valid sources: job instruction sheet/job card; work drawings and instructions; planning documentation; quality control documents; operation sheets; process specifications; instructions from supervisor</p> <p>PC9. read and establish job requirements from the job specification document accurately Job specification documents: detailed component drawings; approved</p>	

CSC/N0119 Perform machining operations on metal products using non-conventional controlled electro-discharge machine (spark erosion)

	<p>sketches/illustrations; national, international and organisational standards; reference tables and charts; operational diagrams</p> <p>PC10. report and rectify incorrect and inconsistent information in job specification documents as per organization procedures</p> <p>PC11. prepare the work area for the machining operations as per procedure or operational specification</p> <p>PC12. ensure that all measuring equipment is calibrated and approved for usage</p> <p>PC13. ensure that the components used are free from foreign objects, dirt or other contamination</p> <p>PC14. obtain correct workpieces/raw materials and consumables as per job requirements</p> <p>PC15. obtain appropriate measuring, marking tools and equipment as per job requirements</p> <p>Measuring and marking tools: protractor; depth/internal/external micrometers; calipers (vernier, inside and outside, depth); gauges (height Vernier, feeler, bore/hole, slip, radius/profile, thread, plug); stick micrometers; dial stand and comparator; vee block with u-clamp</p> <p>PC16. set work pieces as per job requirements using appropriate positioning and/or holding devices and support mechanisms</p> <p>Positioning and holding devices: clamping direct to machine table; pneumatic or magnetic table; machine vice (eg. plain, swivel, universal); angle plate; vee block and clamps; fixtures; chucks (eg. 3 or 4 jaw); auxiliary indexing device</p>
<p>Carry out machining operations on NC EDM</p>	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC17. manipulate the machine tool controls safely and correctly in line with operational procedures</p> <p>PC18. obtain and use the appropriate documentation (eg. job instructions, drawings, quality control documentation)</p> <p>PC19. ensure that machine settings are adjusted as and when required to maintain the required accuracy</p> <p>PC20. produce component shapes on a range of materials with various mechanical properties</p> <p>Range of materials: Ferrous: eg. low, medium and high carbon steels; low alloy steels; stainless steels; cast irons; Non-ferrous: eg. aluminum and aluminum alloys, bronze, silicon carbide</p> <p>Mechanical properties: tensile strength, toughness, hardness, elasticity, ductility, malleability</p> <p>PC21. produce machined components with the required features</p> <p>Features: flat; parallel and angular faces; forms(concave and convex,</p>

CSC/N0119 Perform machining operations on metal products using non-conventional controlled electro-discharge machine (spark erosion)

	<p>square/rectangular, profile); holes; cavities; slots; engraving; radii/arcs</p> <p>PC22. produce components with dimensional accuracy, form and surface finish within all the relevant quality and accuracy standards as is applicable to the operations performed Accuracy standards: components to be free from damage, false tool cuts, burrs, scratches and non-specified sharp edges; general dimensional tolerance +/- 0.020mm; flatness and squareness 0.05mm; angles within +/- 1 degree</p> <p>PC23. check the quality of the output as per required standards using visual checks and measurement of dimensional parameters Dimensional parameters: parallelism, angle/taper, squareness, surface texture, linear dimensions, flatness, depths, angles, profiles, hole position, hole size/fit</p> <p>PC24. complete documentation during and post operations as per organizational procedures Documentation: job card, progress records, incident reports</p> <p>PC25. return all tools and equipment to the correct location on completion of the fitting activities</p> <p>PC26. leave the work area in a safe and tidy condition on completion of job activities</p> <p>PC27. carry out sampling checks at suitable intervals</p> <p>PC28. ensure that the components produced meet the required specification for quality and accuracy</p> <p>PC29. use appropriate gauges or instruments to carry out the necessary checks, during production, for testing accuracy parameters Accuracy parameters: dimensions, parallelism, angle/taper, squareness, surface texture, profile</p> <p>PC30. deal promptly and effectively with problems within span of responsibility and control and report those that cannot be solved</p>
Knowledge and Understanding (K)	
<p>A. Organizational Context (Knowledge of the company / organization and its processes)</p>	<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. relevant health and safety requirements applicable in the work place</p> <p>KA3. importance of working in clean and safe environment</p> <p>KA4. own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities</p> <p>KA5. reporting structure, inter-dependent functions, lines and procedures in the work area</p>

CSC/N0119 Perform machining operations on metal products using non-conventional controlled electro-discharge machine (spark erosion)

	<p>KA6. relevant people and their responsibilities within the work area</p> <p>KA7. escalation matrix and procedures for reporting work and employment related issues</p> <p>KA8. documentation and related procedures applicable in the context of employment and work</p> <p>KA9. importance and purpose of documentation in context of employment and work</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. specific safe working practices and procedures to be followed whilst operating electro discharge machines Electro discharge machines: Spark Erosion Safety precautions: obtain and use the appropriate documentation (eg. job instructions, drawings, quality control documentation); adhere to procedures or systems in place for risk assessment, Personal Protective Equipment and other relevant safety regulations and procedures to realize a safe system of work; follow safe practice/approved setting up procedures at all times; ensure that correctly adjusted machine guards are in place; check that electrodes are in a suitable condition, hold components securely without distortion; leave the work area and machine in a safe and appropriate condition on completion of the activities</p> <p>KB2. hazards associated with the electro discharge machining operations (eg: moving machine parts, electrical components, handling dielectrics, fumes), and how they can be minimized</p> <p>KB3. safety mechanisms on the machine, and the procedure for checking that they function correctly</p> <p>KB4. operation of the machine controls in both hand and power modes (including rapid power, where appropriate)</p> <p>KB5. how to stop the machine in both normal and emergency situations, and the procedure for restarting after an emergency</p> <p>KB6. personal protective equipment to be worn and where this can be obtained</p> <p>KB7. importance of keeping the work area clean and tidy</p> <p>KB8. where to obtain the component drawings, specifications and/or job instructions required for the components to be machined</p> <p>KB9. information on engineering drawings and related specifications (to include symbols and conventions to appropriate BS or ISO standards in relation to work undertaken)</p> <p>KB10. imperial and metric systems of measurement</p> <p>KB11. main features, accessories and specifications of the electro discharge machine being used</p>

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	<p>Machine specifications: e.g. electrical conditions (eg. current density, spark frequency); alignment of electrodes; filtration equipment; linear feeds and speeds; dielectric flow rates; ventilation and fume extraction; safety mechanisms/devices; maximum weight carrying capacity; etc.</p> <p>KB12. various erosion operations that can be performed (methods and equipment used)</p> <p>KB13. effects of backlash in machine slides and screws and how this can be overcome</p> <p>KB14. various types of materials used for electrodes Materials: copper, tungsten copper, graphite Electrodes: plain electrodes, profile electrodes, hollow electrodes</p> <p>KB15. safe and correct handling and storing of electrodes</p> <p>KB16. importance of spark gap</p> <p>KB17. sparking and arcing in EDM machining and the course of action if it takes place</p> <p>KB18. importance of flushing and flow of EDM oil</p> <p>KB19. importance of +/- polarity</p> <p>KB20. application of roughing and finishing cuts and the effect on electrode life, surface finish and dimensional accuracy</p> <p>KB21. application of dielectric fluid with regard to a range of different materials</p> <p>KB22. effects of clamping the workpiece in a chuck/workholding device, and how this can cause distortion in the finished components</p> <p>KB23. how to recognise machining faults, and how to identify when electrodes need changing</p> <p>KB24. quality control procedures used, inspection checks to be carried out, and the equipment that will need to be used</p> <p>KB25. problems that can occur with the electro discharge machining activities, and how these can be overcome</p> <p>KB26. technical parameters for different machines</p>
Skills (S)	
A. Core Skills/ Generic Skills	Reading Skills
	The user/ individual on the job needs to know and understand how to: SA1. read and interpret information correctly from various job specification documents, health and safety instructions, memos, etc. applicable to the job in English and/or local language
	Writing Skills
	The user/individual on the job needs to know and understand how to: SA2. fill up appropriate technical forms, process charts, activity logs as per

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	<p>organizational format in English and/or local language</p> <p>SA3. undertake numerical operations, and calculations/ formulae Numerical computations: addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages</p> <p>SA4. identify and draw various basic, compound and solid shapes as per dimensions given Basic shapes: square, rectangle, triangle, circle Compound shapes: involving squares, rectangles, triangles, circles, semicircles, quadrants of a circle Solid shapes: cube, rectangular prism, cylinder</p> <p>SA5. use appropriate measuring techniques and units of measurement</p> <p>SA6. use appropriate units and number systems to express degree of accuracy Units and number systems representing degree of accuracy: decimals places, significant figures, fractions as a decimal quantity</p> <p>SA7. calculation of the value of angles in a triangle Angles in a triangle: right-angled, isosceles, equilateral</p> <p>SA8. use Pythagoras theorem for calculation</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>SA9. convey and share technical information clearly using appropriate language</p> <p>SA10. check and clarify task-related information</p> <p>SA11. liaise with appropriate authorities using correct protocol</p> <p>SA12. communicate with people in respectful form and manner in line with organizational protocol</p>
<p>B. Professional Skills</p>	<p>Decision Making</p> <p>NA</p> <p>Plan and Organize</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. plan, prioritize and sequence work operations as per job requirements</p> <p>SB2. organize and analyze information relevant to work</p> <p>SB3. basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time</p> <p>Customer Centricity</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB4. exercise restraint while expressing dissent and during conflict situations</p> <p>SB5. avoid and manage distractions to be disciplined at work</p> <p>SB6. manage own time for achieving better results</p>

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	<p>SB7. work in a team in order to achieve better results</p> <p>SB8. identify and clarify work roles within a team</p> <p>SB9. communicate and cooperate with others in the team for better results</p> <p>SB10. seek assistance from fellow team members</p>
	<p>Problem Solving</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB11. identify problems with work planning, procedures, output and behavior and their implications</p> <p>SB12. prioritize and plan for problem solving</p> <p>SB13. communicate problems appropriately to others</p> <p>SB14. identify sources of information and support for problem solving</p> <p>SB15. seek assistance and support from other sources to solve problems</p> <p>SB16. identify effective resolution techniques</p> <p>SB17. select and apply resolution techniques</p> <p>SB18. seek evidence for problem resolution</p>
	<p>Analytical Thinking</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB19. undertake and express new ideas and initiatives to others</p> <p>SB20. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses</p> <p>SB21. participate in improvement procedures including process, quality and internal/external customer/supplier relationships</p> <p>SB22. enhance one's competencies in new and different situations and contexts to achieve more</p>
	<p>Critical Thinking</p>
<p>The user/individual on the job needs to know and understand how to:</p> <p>SB23. maintain current knowledge of applicable standards, legislation, codes of practice and product/process developments</p> <p>SB24. participate in on-the-job and other learning, training and development interventions and assessment</p> <p>SB25. clarify task related information with appropriate personnel or technical adviser</p> <p>SB26. seek to improve and modify own work practices</p>	

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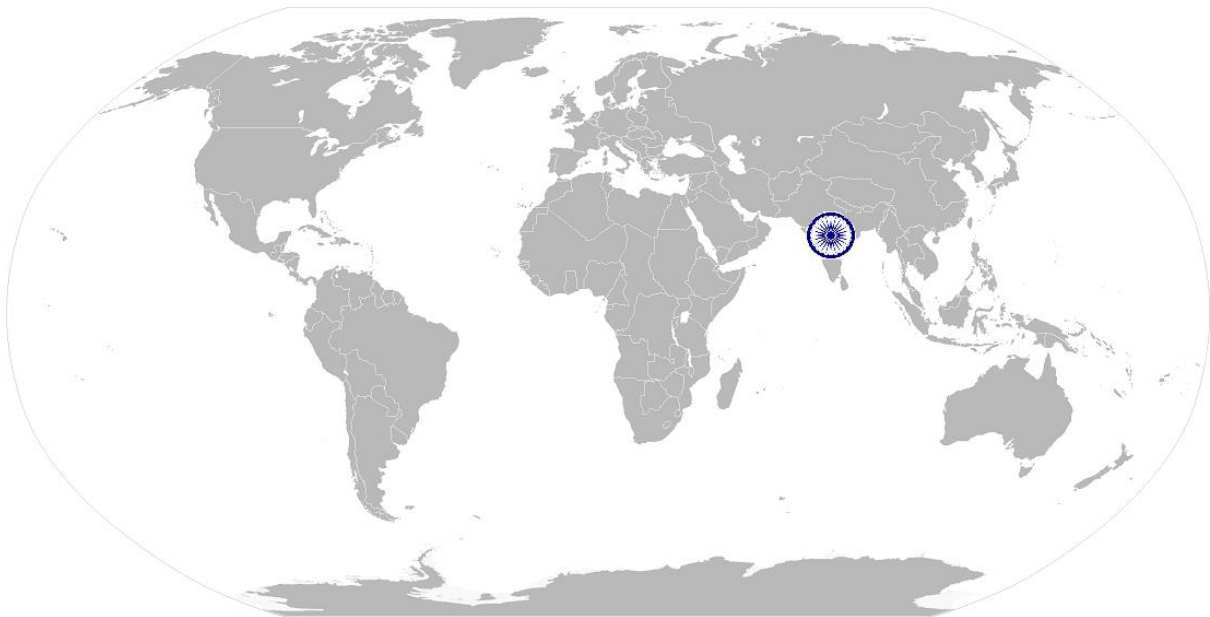
NOS Version Control

NOS Code	CSC/N0119		
Credits	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	10/04/2014
Industry Sub-sector	<ol style="list-style-type: none"> 1. Machine Tools 2. Textile Manufacturing Machinery 3. Plastic Manufacturing Machinery 4. Dies, Moulds and Press Tools 	Last reviewed on	24/11/2017
Occupation	Machining	Next review date	24/11/2021

CSC/N1335

Use basic health and safety practices at the workplace

National Occupational Standard



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.

CSC/N1335

Use basic health and safety practices at the workplace

National Occupational Standard	Unit Code	CSC/N1335
	Unit Title (Task)	Use basic health and safety practices at the workplace
	Description	This OS unit is about knowledge and practices relating to health, safety and security that candidates need to use in the workplace. It covers responsibilities towards self, others, assets and the environment.
	Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Health and safety • Fire safety • Emergencies, rescue and first-aid procedure
	Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria	
Health and safety	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. use protective clothing/equipment for specific tasks and work conditions Protective clothing: leather or asbestos gloves, flame proof aprons, flame proof overalls buttoned to neck, cuffless (without folds), trousers, reinforced footwear, helmets/hard hats, cap and shoulder covers, ear defenders/plugs, safety boots, knee pads, particle masks, glasses/goggles/visors Equipment: hand shields, machine guards, residual current devices, shields, dust sheets, respirator</p> <p>PC2. state the name and location of people responsible for health and safety in the workplace</p> <p>PC3. state the names and location of documents that refer to health and safety in the workplace</p> <p>PC4. identify job-site hazardous work and state possible causes of risk or accident in the workplace Hazards: sharp edged and heavy tools; heated metals; oxyfuel and gas cylinders; welding radiation; hazardous surfaces(sharp, slippery, uneven, chipped, broken, etc.); hazardous substances(chemicals, gas, oxy-fuel, fumes, dust, etc.); physical hazards(working at heights, large and heavy objects and machines, sharp and piercing objects, tolls and machines, intense light, load noise, obstructions in corridors, by doors, blind turns, noise, over stacked shelves and packages, etc.) electrical hazards (power supply and points, loose and naked cables and wires, electrical machines and appliances, etc.) Possible causes of risk and accident: physical actions; reading; listening to and giving instructions; inattention; sickness and incapacity (such as drunkenness); health hazards (such as untreated injuries and contagious</p>	


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	<p>illness)</p> <p>PC5. carry out safe working practices while dealing with hazards to ensure the safety of self and others Safe working practices: using protective clothing and equipment; putting up and reading safety signs; handle tools in the correct manner and store and maintain them properly; keep work area clear of clutter, spillage and unsafe object lying casually; while working with electricity take all electrical precautions like insulated clothing, adequate equipment insulation, use of control equipment, dry work area, switch off the power supply when not required, etc.; safe lifting and carrying practices; use equipment that is working properly and is well maintained; take due measures for safety while working in confined places, trenches or at heights, etc. including safety harness, fall arrestors, etc.</p> <p>PC6. state methods of accident prevention in the work environment of the job role Methods of accident prevention: 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> <p>PC7. state location of general health and safety equipment in the workplace General health and safety equipment: fire extinguishers; first aid equipment; safety instruments and clothing; safety installations(eg fire exits, exhaust fans)</p> <p>PC8. inspect for faults, set up and safely use steps and ladders in general use Ladder faults: corrosion of metal components, deterioration, splits and cracks timber components, imbalance, loose rungs, missing/ unfixed nuts or bolts, etc. Ladders set up: firm/level base, clip/lash down, leaning at the correct angle, etc.</p> <p>PC9. work safely in and around trenches, elevated places and confined areas</p> <p>PC10. lift heavy objects safely using correct procedures</p> <p>PC11. apply good housekeeping practices at all times Good housekeeping practices: clean/tidy work areas, removal/disposal of waste products, protect surfaces</p> <p>PC12. identify common hazard signs displayed in various areas Various areas: on chemical containers; equipment; packages; inside buildings; in open areas and public spaces, etc.</p> <p>PC13. retrieve and/or point out documents that refer to health and safety in the workplace Documents: fire notices, accident reports, safety instructions for equipment and procedures, company notices and documents, legal documents (eg</p>
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<p>Fire safety</p>	<p>government notices)</p> <p>To be competent, the user/individual on the job must be able to:</p> <p>PC14. use the various appropriate fire extinguishers on different types of fires correctly</p> <p>Types of fires: Class A: eg. ordinary solid combustibles, such as wood, paper, cloth, plastic, charcoal, etc.; Class B: flammable liquids and gases, such as gasoline, propane, diesel fuel, tar, cooking oil, and similar substances; Class C: eg. electrical equipment such as 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> <p>PC15. demonstrate rescue techniques applied during fire hazard</p> <p>PC16. demonstrate good housekeeping in order to prevent fire hazards</p> <p>PC17. demonstrate the correct use of a fire extinguisher</p>
<p>Emergencies, rescue and first-aid procedures</p>	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC18. demonstrate how to free a person from electrocution</p> <p>PC19. administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc.</p> <p>PC20. demonstrate basic techniques of bandaging</p> <p>PC21. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments</p> <p>PC22. perform and organize loss minimization or rescue activity during an accident in real or simulated environments</p> <p>PC23. 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>PC24. demonstrate the artificial respiration and the CPR Process</p> <p>PC25. participate in emergency procedures</p> <p>Emergency procedures: raising alarm, safe/efficient, evacuation, correct means of escape, correct assembly point, roll call, correct return to work</p> <p>PC26. complete a written accident/incident report or dictate a report to another person, and send report to person responsible</p> <p>Incident Report includes details of: name, date/time of incident, date/time of report, location, environment conditions, persons involved, sequence of events, injuries sustained, damage sustained, actions taken, witnesses, supervisor/manager notified</p> <p>PC27. demonstrate correct method to move injured people and others during an emergency</p>

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Knowledge and Understanding (K)	
<p>A. Organizational Context (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. names (and job titles if applicable), and where to find, all the people responsible for health and safety in a workplace</p> <p>KA2. names and location of documents that refer to health and safety in the workplace</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. meaning of “hazards” and “risks”</p> <p>KB2. health and safety hazards commonly present in the work environment and related precautions</p> <p>KB3. possible causes of risk, hazard or accident in the workplace and why risk and/or accidents are possible</p> <p>KB4. possible causes of risk and accident Possible causes of risk and accident: physical actions; reading; listening to and giving instructions; inattention; sickness and incapacity (such as drunkenness); health hazards (such as untreated injuries and contagious illness)</p> <p>KB5. methods of accident prevention  Methods of accident prevention: 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> <p>KB6. safe working practices when working with tools and machines</p> <p>KB7. safe working practices while working at various hazardous sites</p> <p>KB8. where to find all the general health and safety equipment in the workplace</p> <p>KB9. various dangers associated with the use of electrical equipment</p> <p>KB10. preventative and remedial actions to be taken in the case of exposure to toxic materials Exposure: ingested, contact with skin, inhaled Preventative action: ventilation, masks, protective clothing/ equipment); Remedial action: immediate first aid, report to supervisor Toxic materials: solvents, flux, lead</p> <p>KB11. importance of using protective clothing/equipment while working</p> <p>KB12. precautionary activities to prevent the fire accident</p> <p>KB13. various causes of fire Causes of fires: heating of metal; spontaneous ignition; sparking; electrical heating; loose fires (smoking, welding, etc.); chemical fires; etc.</p> <p>KB14. techniques of using the different fire extinguishers</p> <p>KB15. different methods of extinguishing fire</p>

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	<p>KB16. different materials used for extinguishing fire Materials: sand, water, foam, CO₂, dry powder</p> <p>KB17. rescue techniques applied during a fire hazard</p> <p>KB18. various types of safety signs and what they mean</p> <p>KB19. appropriate basic first aid treatment relevant to the condition eg. shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries</p> <p>KB20. content of written accident report</p> <p>KB21. potential injuries and ill health associated with incorrect manual handling</p> <p>KB22. safe lifting and carrying practices</p> <p>KB23. personal safety, health and dignity issues relating to the movement of a person by others</p> <p>KB24. potential impact to a person who is moved incorrectly</p>
Skills (S)	
A. Core Skills/ Generic Skills	Reading Skills
	The user/ individual on the job needs to know and understand how to: <ul style="list-style-type: none"> SA1. read and comprehend basic content to read labels, charts, signages SA2. read and comprehend basic English to read manuals of operations SA3. read an accident/incident report in local language or English
	Writing Skills
	The user/individual on the job needs to know and understand how to: <ul style="list-style-type: none"> SA4. 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: <ul style="list-style-type: none"> SA5. question coworkers appropriately in order to clarify instructions and other issues SA6. give clear instructions to coworkers, subordinates others
B. Professional Skills	Decision Making
	The user/individual on the job needs to know and understand how to: <ul style="list-style-type: none"> SB1. make appropriate decisions pertaining to the concerned area of work with respect to intended work objective, span of authority, responsibility, laid down procedure and guidelines
	Plan and Organize
	The user/individual on the job needs to know and understand how to: <ul style="list-style-type: none"> SB2. plan and organize their own work schedule, work area, tools, equipment and materials to maintain decorum and for improved productivity
	Customer Centricity
	The user/individual on the job needs to know and understand how to:

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	<p>SB3. remain congenial while discussing and debating issues with co-workers</p> <p>SB4. follow appropriate protocols for communication based on situation, hierarchy, organizational culture and practice</p> <p>SB5. ask for, provide and receive required assistance where possible to ensure achievement of work related objectives</p> <p>SB6. thank coworkers for any assistance received</p> <p>SB7. offer appropriate respect based on mutuality and respect for fellow workmanship and authority</p>
	<p>Problem Solving</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB8. think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s)</p> <p>SB9. identify immediate or temporary solutions to resolve delays</p> <p>SB10. identify sources of support that can be availed of for problem solving for various kind of problems</p> <p>SB11. seek appropriate assistance from other sources to resolve problems</p> <p>SB12. report problems that you cannot resolve to appropriate authority</p>
	<p>Analytical Thinking</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB13. identify cause and effect relations in their area of work</p> <p>SB14. use cause and effect relations to anticipate potential problems and their solution</p>
	<p>Critical Thinking</p>
<p>NA</p>	

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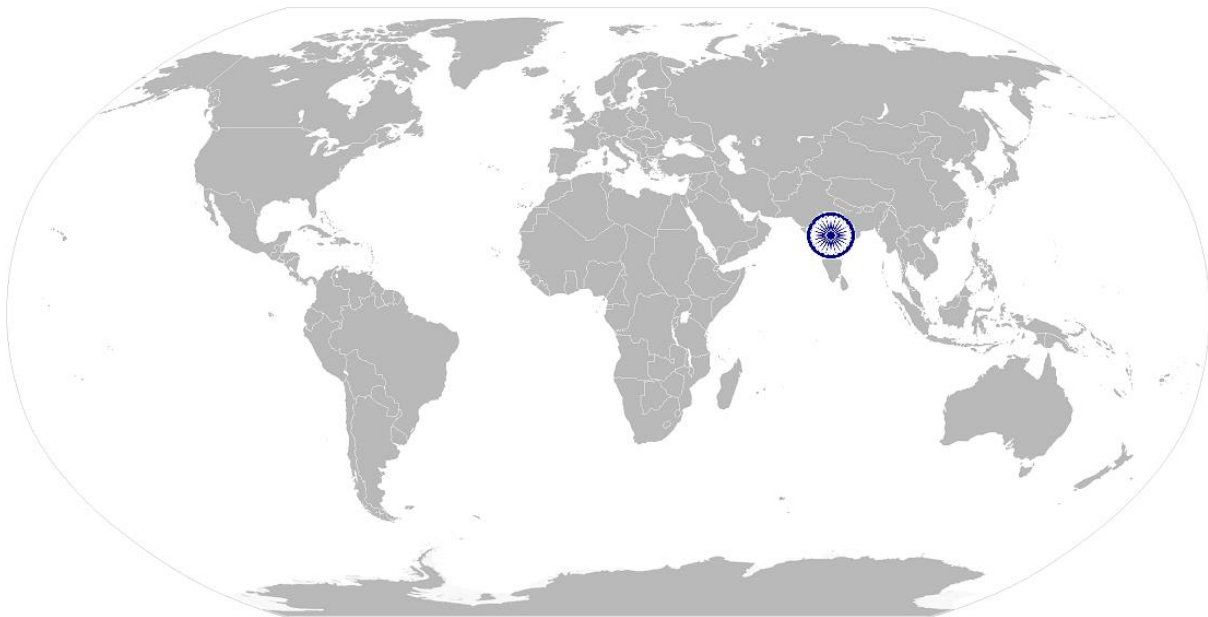
NOS Version Control

NOS Code	CSC/N1335		
Credits	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	10/04/2014
Industry Sub-sector	1. Machine Tools 2. Textile Manufacturing Machinery 3. Plastic Manufacturing Machinery 4. Dies, Moulds and Press Tools	Last reviewed on	24/11/2017
Occupation	Machining	Next review date	24/11/2021

CSC/N1336

Work effectively with others

National Occupational Standard



Overview

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

CSC/N1336

Work effectively with others

National Occupational Standard	Unit Code	CSC/N1336
	Unit Title (Task)	Work effectively with others
	Description	This unit covers basic etiquette and competencies that a candidate is required to possess and demonstrate in their behavior and interactions with others at the workplace. These cover areas such as communication etiquette, discipline, listening etc.
	Scope	This unit/task covers the following: <ul style="list-style-type: none"> • Work effectively with others
	Performance Criteria(PC) w.r.t. the Scope	
	Element	Performance Criteria
	Work effectively with others	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. receive information accurately and instructions from the supervisor and fellow workers, getting clarification where required</p> <p>PC2. pass information accurately to authorized persons who require it and within agreed timescale and confirm its receipt</p> <p>PC3. give information to others clearly, at a pace and in a manner that helps them to understand</p> <p>PC4. display helpful behavior 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 Communication etiquette: do not use abusive language; use appropriate titles and terms of respect; do not eat or chew while talking (vice versa)etc.</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 behaviors at the workplace Disciplined behaviors: e.g. punctuality; completing tasks as per given time and standards; not gossiping and idling time; eliminating waste, honesty, etc.</p> <p>PC10. escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict</p>
	Knowledge and Understanding (K)	
	A. Organizational Context (Knowledge of the company / organization and	The user/individual on the job needs to know and understand: <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>

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Work effectively with others

its processes)	<p>KA3. relevant people and their responsibilities within the work area</p> <p>KA4. escalation matrix and procedures for reporting work and employment related issues</p>
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 behavior 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)	
A. Core Skills/ Generic Skills	<p>Reading Skills</p> <p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. read basic terms and terminologies to accurately interpret work related documents, labels, supervisor instructions in the local language</p> <p>SA2. read and interpret accurate information from various relevant work instructions and records</p> <p>Writing Skills</p> <p>The user/ individual on the job needs to know and understand how to:</p> <p>SA3. write clear and legible notes to self, colleagues and seniors to pass messages, keep records, prepare to-do lists, take down instructions</p> <p>SA4. write basic numbers, quantities and work related terminology for operational requirements in the local language</p> <p>Oral Communication (Listening and Speaking skills)</p>

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	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA5. interact with the supervisor appropriately (correct protocol and manner of speaking) in order to understand the basic requirements of the product, production plans and other associated requirements</p> <p>SA6. give clear instructions to co-workers about the type of output required and answer queries</p> <p>SA7. display active listening skills while interacting with co-workers and other in the workplace</p>
B. Professional Skills	Decision Making
	NA
	Plan and Organize
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. use appropriate planning to maintain a smooth relationship with fellow team members</p> <p>SB2. take steps within one's limits of authority to initiate modification in plan if the circumstances require it</p>
	Customer Centricity
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB3. check that work meets customer requirements</p> <p>SB4. deliver consistent and reliable service to internal and external customers</p>
	Problem Solving
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB5. work with co-workers and supervisor to resolve any issues that threaten disruption, increase risk, cause delays or under-achievement of quality and targets as per the planned schedule</p>
	Analytical Thinking
	NA
Critical Thinking	
NA	

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Work effectively with others

NOS Version Control

NOS Code	CSC/N1336		
Credits	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	10/04/2014
Industry Sub-sector	1. Machine Tools 2. Textile Manufacturing Machinery 3. Plastic Manufacturing Machinery 4. Dies, Moulds and Press Tools	Last reviewed on	24/11/2017
Occupation	Machining	Next review date	24/11/2021

Annexure

Nomenclature for QP and NOS

Qualifications Pack

9 characters

[ABC]/ Q 0101

[Insert 3 letter codes for SSC]

Q denoting Qualifications Pack



QP number (2 numbers)

Occupation (2 numbers)

Occupational Standard

An example of NOS with 'N'

9 characters

[ABC] / N 0101

[Insert 3 letter codes for SSC]

N denoting National Occupational Standard



OS number (2 numbers)

Occupation (2 numbers)

The following acronyms/ codes have been used in the nomenclature above:

Sub-sector	Range of Occupation numbers
Machine Tools	01-13
Dies, Moulds and Press Tools	01-13
Plastic Manufacturing Machinery	01-13
Textile Manufacturing Machinery	01-13
Process Plant Machinery	01-13
Electrical and Power Machinery	01-13
Light Engineering Goods	01-13

Sequence	Description	Example
Three letters	Capital Goods	CSC
Slash	/	/
Next letter	Whether QP or NOS	N
Next two numbers	Occupation code	01
Next two numbers	OS number	01

Criteria For Assessment Of Trainees

Job Role: Setter and Operator - Non-conventional Electro Discharge Machine (Spark Erosion)

Qualification Pack: CSC/Q0122

Sector Skill Council: Capital Goods 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. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criterion.
6. To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.
7. In case of *unsuccessful completion*, the trainee may seek reassessment on the Qualification Pack.

Compulsory NOS				Marks Allocation	
Total Marks: 400					
Assessment outcomes	Assessment Criteria for outcomes	Total Marks	Out of	Theory	Skills Practical
CSC/N0122 Set a non-conventional electro-discharge machine (spark erosion) for machining operations on metal components	PC1.work safely at all times, complying with health and safety, environmental and other relevant regulations and guidelines	100	3	1	2
	PC2.check that all safety mechanisms are in place and that the equipment is set correctly for the required operations		3	1	2
	PC3.adhere to procedures or systems in place for health and safety, including personal protective equipment and other relevant safety regulations and procedures to contribute to a safe work environment		4	1	3
	PC4.wear the appropriate protective clothing and equipment, and keep the work area clean and tidy		2	0	2

PC5.follow safe practice/approved setting up procedures at all times	3	1	2
PC6.ensure that all measuring tools, equipment, power tool cables, extension leads are in a safe and usable condition	2	0	2
PC7.ensure that the components used are free from foreign objects, dirt or other contamination	2	0	2
PC8.conduct a preliminary check of the readiness of the electro discharge machine	3	1	2
PC9.obtain job specification from a valid source and establish job requirements	2	0	2
PC10.set the machine to produce components within all of the quality and accuracy standards, as applicable to the operations performed	5	2	3
PC11.determine what has to be done and how the machine will be set to achieve this	3	1	2
PC12.prepare the electro-discharge machine in readiness for production	2	0	2
PC13.mount and set the required workholding devices, workpiece and cutting tools	4	2	2
PC14.position and secure workpieces to machine table using appropriate means	4	2	2
PC15.select and mount appropriate electrodes for roughing and finishing	5	2	3
PC16.set the machine tool operating parameters to achieve the component specification	6	2	4
PC17.set up the machine in accordance with instructions and specifications	6	2	4
PC18.set up the machine to produce internal and external profiles of various component features	4	0	4
PC19.set up to machine components made from various materials	5	2	3
PC20.conduct a trial runs and adjust parameters and positioning till output is as per required specifications	5	2	3
PC21.hand-over the machine after set-up to the machine operator along with relevant instructions and documentation	3	0	3
PC22.complete relevant documentation as per organizational procedure	3	1	2
PC23.switch the non-conventional EDM machine on and off in normal and emergency situations	3	0	3
PC24.return the old cutting tools, workholding device, fixtures, instruments, drawings and verified tapes and programs back to store, safely and correctly	3	0	3
PC25.ensure that there is no damage to the electrode/fixture while doing the setting activities	3	0	3

	PC26.complete documentation during and post operations and submit as per organizational procedures		3	1	2
	PC27.deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve		3	0	3
	PC28.shut down the equipment to a safe condition on conclusion of the activities		2	0	2
	PC29.return all tools and equipment to the correct location on completion of the non-conventional EDM machining activities		2	0	2
	PC30.leave the work area in a safe and tidy condition on completion of the fitting activities		2	0	2
		Total	100	24	76
CSC/N0119 Perform machining operations on metal products using non-conventional controlled electro-discharge machine (spark erosion)	PC1.comply with health and safety, environmental and other relevant regulation and guidelines at work	100	3	1	2
	PC2.adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing calibration operations		4	1	3
	PC3.work following laid down procedures and instructions		3	1	2
	PC4.ensure work area is clean and safe from hazards		2	0	2
	PC5.ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition		2	0	2
	PC6.ensure that machine guards are in place and are correctly adjusted		2	0	2
	PC7.conduct a preliminary check of the readiness of the electro discharge machine		3	0	3
	PC8.obtain job specification from a valid and approved source		2	0	2
	PC9.read and establish job requirements from the job specification document accurately		3	0	3
	PC10.report and rectify incorrect and inconsistent information in job specification documents as per organization procedures		4	1	3
	PC11.prepare the work area for the machining operations as per procedure or operational specification		4	1	3
	PC12.ensure that all measuring equipment is calibrated and approved for usage		2	0	2
	PC13.ensure that the components used are free from foreign objects, dirt or other contamination		2	0	2

	PC14.obtain correct workpieces/raw materials and consumables as per job requirements		3	1	2
	PC15.obtain appropriate measuring, marking tools and equipment as per job requirements		3	1	2
	PC16.set work pieces as per job requirements using appropriate positioning and/or holding devices and support mechanisms		5	1	4
	PC17.manipulate the machine tool controls safely and correctly in line with operational procedures		6	2	4
	PC18.obtain and use the appropriate documentation (eg. job instructions, drawings, quality control documentation)		2	0	2
	PC19.ensure that machine settings are adjusted as and when required to maintain the required accuracy		3	0	3
	PC20.produce component shapes on a range of materials with various mechanical properties		4	0	4
	PC21.produce machined components with the required features		4	0	4
	PC22.produce components with dimensional accuracy, form and surface finish within all the relevant quality and accuracy standards as is applicable to the operations performed		6	2	4
	PC23.check the quality of the output as per required standards using visual checks and measurement of dimensional parameters		5	1	4
	PC24.complete documentation during and post operations as per organizational procedures		3	1	2
	PC25.return all tools and equipment to the correct location on completion of the fitting activities		2	0	2
	PC26.leave the work area in a safe and tidy condition on completion of job activities		2	0	2
	PC27.carry out sampling checks at suitable intervals		4	0	4
	PC28.ensure that the components produced meet the required specification for quality and accuracy		3	1	2
	PC29.use appropriate gauges or instruments to carry out the necessary checks, during production, for testing accuracy parameters		5	1	4
	PC30.deal promptly and effectively with problems within span of responsibility and control and report those that cannot be solved		4	0	4
		Total	100	16	84
CSC/N1335 Use basic health and safety practices at the workplace	PC1.use protective clothing/equipment for specific tasks and work conditions	100	4	1	3
	PC2.state the name and location of people responsible for health and safety in the workplace		3	1	2

PC3.state the names and location of documents that refer to health and safety in the workplace	3	1	2
PC4.identify job-site hazardous work and state possible causes of risk or accident in the workplace	5	2	3
PC5.carry out safe working practices while dealing with hazards to ensure the safety of self and others	4	2	2
PC6.state methods of accident prevention in the work environment of the job role	3	2	1
PC7.state location of general health and safety equipment in the workplace	5	2	3
PC8.inspect for faults, set up and safely use steps and ladders in general use	5	2	3
PC9.work safely in and around trenches, elevated places and confined areas	5	2	3
PC10.lift heavy objects safely using correct procedures	4	2	2
PC11.apply good housekeeping practices at all times	5	2	3
PC12.identify common hazard signs displayed in various areas	3	1	2
PC13.retrieve and/or point out documents that refer to health and safety in the workplace	4	1	3
PC14.use the various appropriate fire extinguishers on different types of fires correctly	3	1	2
PC15.demonstrate rescue techniques applied during fire hazard	3	1	2
PC16.demonstrate good housekeeping in order to prevent fire hazards	4	1	3
PC17.demonstrate the correct use of a fire extinguisher	4	1	3
PC18.demonstrate how to free a person from electrocution	4	1	3
PC19.administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc.	3	1	2
PC20.demonstrate basic techniques of bandaging	3	1	2
PC21.respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments	3	1	2
PC22.perform and organize loss minimization or rescue activity during an accident in real or simulated environments	3	1	2

	PC23.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		3	1	2
	PC24.demonstrate the artificial respiration and the CPR Process		3	1	2
	PC25.participate in emergency procedures		4	1	3
	PC26.complete a written accident/incident report or dictate a report to another person, and send report to person responsible		3	1	2
	PC27.demonstrate correct method to move injured people and others during an emergency		4	2	2
		Total	100	36	64
CSC/N1336 Work effectively with others	PC1.receive information accurately and instructions from the supervisor and fellow workers, getting clarification where required	100	10	3	7
	PC2.pass information accurately to authorized persons who require it and within agreed timescale and confirm its receipt		10	3	7
	PC3.give information to others clearly, at a pace and in a manner that helps them to understand		10	3	7
	PC4.display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible		10	3	7
	PC5.consult with and assist others to maximize effectiveness and efficiency in carrying out tasks		10	3	7
	PC6.display appropriate communication etiquette while working		10	3	7
	PC7.display active listening skills while interacting with others at work		10	3	7
	PC8.use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism		10	3	7
	PC9.demonstrate responsible and disciplined behaviors at the workplace		10	3	7
	PC10.escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict		10	3	7
		Total	100	30	70