

# 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: Lab Technician - Radiographic Testing

**SECTOR:** CAPITAL GOODS

**SUB-SECTOR:**

- |                                    |                                   |
|------------------------------------|-----------------------------------|
| 1. Machine Tools                   | 5. Process Plant Machinery        |
| 2. Dies, Moulds and Press Tools    | 6. Electrical and Power Machinery |
| 3. Plastic Manufacturing Machinery | 7. Light Engineering Goods        |
| 4. Textile Manufacturing Machinery |                                   |

**OCCUPATION:** Quality

**REFERENCE ID:** CSC/ Q 0603

**ALIGNED TO:** NCO-2004/NIL

**Lab Technician - Radiographic Testing:** Performance of radiographic testing activities on metal products and materials, as per approved procedures

**Brief Job Description:** It involves preparing the products for testing, identifying the test area, checking that the radiographic test equipment complies with the specification requirements, is safe to use, fit for purpose. It also involves adjusting the radiographic equipment, choice of suitable technique for the product, carrying out the exposure, ensuring safe containment of the radiography source, process the exposed films in the prepared facility, checking the image quality before storing the film ready for interpretation. Compliance of regulations of the statutory authority; Atomic Energy Regulatory Board, Mumbai

**Personal Attributes:** Basic communication, basic 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

<b>Job Details</b>	<b>Qualifications Pack Code</b>	<b>CSC/ Q 0603</b>		
	<b>Job Role</b>	<b>Lab Technician – Radiographic Testing</b>		
	<b>Credits (NSQF)</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
	<b>Sector</b>	<b>CAPITAL GOODS</b>	<b>Drafted on</b>	<b>10/04/14</b>
	<b>Sub-sector</b>	<ol style="list-style-type: none"> <li>1. Machine Tools</li> <li>2. Dies, Moulds and Press Tools</li> <li>3. Plastics Manufacturing Machinery</li> <li>4. Textile Manufacturing Machinery</li> <li>5. Process Plant Machinery</li> <li>6. Electrical and Power Machinery</li> <li>7. Light Engineering Goods</li> </ol>	<b>Last reviewed on</b>	<b>18/03/15</b>
	<b>Occupation</b>	<b>QUALITY</b>	<b>Next review date</b>	<b>30/08/16</b>
	<b>NSQC Clearance on</b>	<b>20/07/2015</b>		

Job Role	Lab Technician - Radiographic Testing
Role Description	Performance of radiographic testing activities on metal products and materials, as per approved procedures
NSQF level	4
Minimum Educational Qualifications	Technical Diploma (Mechanical, Chemical, Metallurgy, etc.)
Maximum Educational Qualifications	N.A.
Training (Suggested but not mandatory)	No Previous Training Required
Minimum Job Entry Age	18 years Old
Experience	No Previous Experience Required
Applicable National Occupational Standards (NOS)	<p><b>Compulsory:</b></p> <ol style="list-style-type: none"> <li><a href="#">1. CSC/ N 0603 (Perform radiographic testing on metals)</a></li> <li><a href="#">2. CSC/ N 1335 (Use basic health and safety practices at the workplace)</a></li> <li><a href="#">3. CSC/ N 1336 (Work effectively with others)</a></li> </ol> <p><b>Optional:</b></p> <p>N.A.</p>
Performance Criteria	As described in the relevant OS units

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

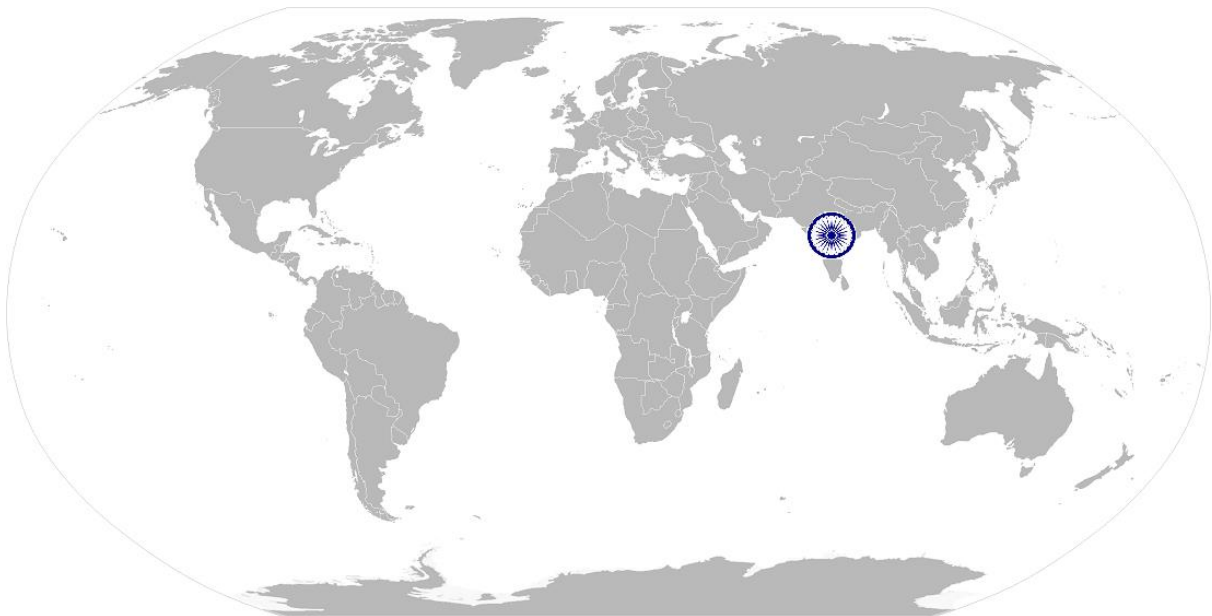
Acronyms	Keywords /Terms	Description
	CO2	Carbon dioxide
	CPR	Cardiac Pulmonary Resuscitation
	PPE	Personal Protective Equipment
	IQI	Image Quality Indication
	CTZ	Control Test Zone
	SFD	Source Focal Distance
	SMR	Source Movement Register

CSC/ N 0603:

**Perform radiographic testing on metals**

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# National Occupational Standard



## Overview

This unit covers the performance of radiographic testing activities on metal products and materials, as per approved procedures.

CSC/ N 0603:

**Perform radiographic testing on metals**

National Occupational Standard	<b>Unit Code</b>	CSC / N 0603
	<b>Unit Title (Task)</b>	<b>Perform radiographic testing on metals</b>
	<b>Description</b>	<p>This unit covers the competences required to carry out radiographic testing activities on metal products and materials, in accordance with approved procedures.</p> <p>This also involves preparing the products and or material for testing, identifying the test area, checking that the radiographic test equipment complies with the specification requirements, is safe to use, fit for purpose.</p> <p>The candidate will be expected to perform under minimum supervision, as per instructions given, take responsibility for own actions and for the quality and accuracy of the work produced.</p>
	<b>Scope</b>	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> <li>• Working safely</li> <li>• Preparing for carrying out Radiographic Testing</li> <li>• Carrying out testing on metal objects</li> <li>• Handling of unresolved problems</li> </ul>
<b>Performance Criteria(PC) w.r.t. the Scope</b>		
<b>Element</b>	<b>Performance Criteria</b>	
<b>Working safely</b>	<p>The user/individual on the job should be able to:</p> <p>PC1. comply with health and safety, environmental and other relevant regulations and guidelines at work and ensure process compliance</p> <p>PC2. adhere to procedures or systems in place for risk assessment, occupational standards, personal protective equipment (PPE) and other relevant occupational safety regulations</p> <p>PC3. work following laid down procedures and instructions</p> <p>PC4. evacuate the non-radiographic personnel from the area before starting the work</p> <p>PC5. ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition and are kept at secured location</p> <p>PC6. ensure that all measuring equipment are within calibration date and are approved for usage</p> <p>PC7. ensure work area is clean and safe from hazards before and after the job is completed</p>	
<b>Preparing for carrying out Radiographic Testing</b>	<p>The user/individual on the job should be able to:</p> <p>PC8. obtain job specification from a valid and approved source</p> <p><b>Valid sources:</b> job instruction sheet/job card; work drawings and instructions; planning documentation; quality control documents; process specifications; standard operating procedures; instructions from supervisor</p> <p>PC9. read and establish job requirements from the job specification document accurately</p> <p>PC10. report and rectify incorrect and inconsistent information in job specification documents as per organization procedures</p>	

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**Perform radiographic testing on metals**

	<p>PC11. prepare the work area for the testing operations as per procedure</p> <p>PC12. obtain correct work-pieces/raw materials to be tested</p> <p>PC13. identify the products and materials to be tested as per job specifications accurately</p> <p><b>Kinds of materials:</b> cast iron, bronzes, steels (low-carbon, low alloy, high yield, stainless), aluminium/aluminium alloys</p> <p>PC14. ensure that all features of the Controlled Test Zone are in place and are operating correctly (such as barriers, lights, signs, radiation, survey meters)</p> <p>PC15. ensure that the product test areas are correctly prepared and identified</p> <p><b>Test areas:</b> welded joints, castings, wrought products/materials (such as forged, rolled, extruded), cold formed products (such as by bending, pressing, rolling), heat treated components, other specific products</p> <p>PC16. check that all equipment and consumables are as specified and fit for purpose</p> <p>PC17. ensure that gamma ray source containers are removed from the approved store and recording done in the Source Movement Register</p> <p>PC18. set up the radiographic testing equipment to provide all of the following:</p> <ol style="list-style-type: none"> <li>correct source location, source focal distance (SFD) and beam orientation</li> <li>specified exposure parameters</li> <li>specified radiographic film and intensifying screens applied to the test areas</li> <li>correctly located image quality indicators (IQIs) and identification markers</li> </ol>
<p><b>Carrying out testing on metal objects</b></p>	<p>The user/individual on the job should be able to:</p> <p>PC19. check conditions required for tests to be undertaken</p> <p>PC20. power up equipment as per the testing methods to be undertaken</p> <p>PC21. prepare the test samples in accordance with the procedures and check their integrity</p> <p>PC22. follow the appropriate procedures for use of tools and equipment to carry out the required tests</p> <p>PC23. follow the defined radiographic testing procedures, and apply safe working practices and procedures at all times</p> <p>PC24. carry out the required tests in accordance with the procedures and confirm the safe containment of the radiation source in the equipment</p> <p>PC25. ensure radiographic tests are carried out in accordance with relevant standards, codes, specifications and OH&amp;S requirements</p> <p>PC26. process films to maximize quality of image</p> <p>PC27. record the results of the tests undertaken in the appropriate format</p> <p>PC28. methods used to communicate to required information about the test results in accordance with departmental and organisational procedures</p> <p><b>Methods:</b> written or typed report; computer-based record; specific workplace documentation; other appropriate media</p> <p>PC29. complete documentation post completion of work, as per procedure</p> <p>PC30. secure tools and equipment in a safe condition on completion of the testing activities</p> <p>PC31. close down the equipment to a safe condition</p> <p>PC32. return gamma radiation source containers to the approved store</p> <p>PC33. removing warning notices and barriers, and reinstating the work area</p>



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	PC34. review the results and carry out further tests if necessary
<b>Handling of unresolved problems</b>	The user/individual on the job should be able to: PC35. refer unresolved job related problems to appropriate personnel for support PC36. monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem
<b>Knowledge and Understanding (K)</b>	
<b>A. Organizational Context (Knowledge of the company / organization and its processes)</b>	The user/individual on the job needs to know and understand: KA1. relevant legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions KA2. relevant health and safety requirements applicable in the work place KA3. own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities KA4. reporting structure, inter-dependent functions, lines and procedures in the work area KA5. how to engage with specialists for support in order to resolve incidents and service requests KA6. importance of working in clean and safe environment practices and procedures KA7. relevant people and their responsibilities within the work area KA8. escalation matrix and procedures for reporting work and employment related issues KA9. documentation and related procedures applicable in the context of employment and work
<b>B. Technical Knowledge</b>	The user/individual on the job needs to know and understand: KB1. common terminology used in testing procedures KB2. range of equipment, resources, machines and films to be used for testing different types of material <b>Resources:</b> consumables, utilities/facilities, instruments, test materials, equipment KB3. specific safety precautions to be taken when carrying out radiographic testing activities on engineering products and materials KB4. the hazards associated with radiographic testing activities (such as electrical contact, moving mechanical parts, radiation, toxic chemicals) and how they can be minimized KB5. safe work practices as prescribed by AERB in industrial radiography KB6. basic principles of radiographic testing <b>Principles:</b> use of x- and gamma radiation as a penetrating agent; shadow effect and projection and the capture of the image on photographic type film; development, fixing, washing and drying of the film; equipment used to view the exposed images KB7. sources of radiation used in radiographic testing activities (to include the X-ray tube (generator) and the use of radioactive isotopes) KB8. image formation (including rectilinear propagation; the geometry of shadow projection, inverse square law, focal spot, formation of penumbra and image quality indicators) KB9. preparation requirements of the X-ray tube generator, and how to set up the tube or radiation source (including equipment controls, establishment of testing parameters; focal spot size and safety devices; the use of exposure

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	<p>charts)</p> <p>KB10. care and control of the equipment (to include checking the condition of all electrical cables and connections, all mechanical functions and safety devices)</p> <p>KB11. care of gamma-ray source containers, and storage procedures for radioactive sources</p> <p>KB12. how to transport radioactive materials safely and correctly</p> <p>KB13. carrying out radiographic testing activities</p> <p>KB14. assessment procedures and techniques</p> <p>KB15. types of discontinuities and their consequences/effect on the material procedure for carrying out each radiographic test</p> <p>KB16. principal types of X-ray generators and radioisotopes and their effect on radiographic sensitivity tools, equipment, techniques and system verification checks relevant standards, regulations and codes</p> <p>KB17. procedures for specialized radiographic applications</p> <p>KB18. principles of image formation, film and chemical properties and processing techniques various types of films and screens, their properties and effects on image quality</p> <p>KB19. parameters on which quality of the developed image are to be checked <b>Parameters:</b> processing faults, image quality, contrast, sensitivity, density</p> <p>KB20. maintenance and storage procedures for test equipment</p> <p>KB21. safety features of radioisotope cameras and X-ray equipment</p> <p>KB22. how to prepare the products, materials or structures for the radiographic testing activities (including the identification of the test area and the use of lead markers) <b>Test areas:</b> welded joints, castings, wrought products/materials (such as forged, rolled, extruded), cold formed products (such as by bending, pressing, rolling), heat treated components, other specific products</p> <p>KB23. areas for which NDT report is prepared <b>Areas:</b> product identification; test areas covered by identified radiographs; test area geometries and thickness; radiographic parameters ; testing conditions; type of image quality indication (IQI); film type; processing conditions; personal data</p> <p>KB24. types and selection of radiographic films (including emulsion types; intensifying screens; film development, fixing, washing and drying; the significance of temperature on the film and how it is controlled)</p> <p>KB25. processing faults, characteristic curves, and the effect of development conditions on the finished film quality</p> <p>KB26. response of defects to penetrative radiation, and the resulting images on the film</p> <p>KB27. setting up/maintenance of storage facilities for unexposed film, exposed film and film which has been developed importance of monitoring the equipment settings and function during the testing process</p> <p>KB28. regulations and codes of practice to be followed when using radiographic testing equipment</p> <p>KB29. type(s) of personal protective equipment (PPE) to be used, and how to obtain it</p> <p>KB30. procedures to be adopted in the case of accident and emergency/incidents involving radioactive sources</p> <p>KB31. how to check the Controlled Test Zone complies with regulation requirements</p>
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	<p><b>Compliance checks:</b> the identification and marking of boundary exclusion zones; the erection of physical barriers; warning lights and visual signs to restrict unauthorized entrance; the sighting of radiation survey meters; the positioning of appropriate radiation screens</p> <p>KB32. importance of completing the documentation throughout the testing process</p> <p>KB33. potential problems associated with stages of the testing process, how they occur and how they can be prevented/corrected</p> <p>KB34. how to deal with problems which affect aspects of sample collection, inspection and testing activities and the interpretation of the results</p> <p>KB35. how to report any problems you are not able to deal with yourself and why it is important to report faults, variations or problems immediately</p>
<b>Skills (S) [Optional]</b>	
<b>B. Core Skills/ Generic Skills</b>	<b>Communication</b>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. read and interpret information correctly from various job specification documents, manuals, health and safety instructions, memos, etc. applicable to the job in English and/or local language</p> <p>SA2. fill up appropriate technical forms, process charts, activity logs as per organizational format in English and/or local language</p> <p>SA3. convey and share technical information clearly using appropriate language</p> <p>SA4. check and clarify task-related information</p> <p>SA5. liaise with appropriate authorities using correct protocol</p> <p>SA6. communicate with people in respectful form and manner in line with organizational protocol</p>
	<b>Numerical and computational skills</b>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA7. undertake basic numerical computations and calculations <b>Numerical computations:</b> addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages</p> <p>SA8. identify various basic, compound and solid shapes as per dimensions given <b>Basic shapes:</b> square, rectangle, triangle, circle, quadrilaterals <b>Compound shapes:</b> involving squares, rectangles, triangles, circles, semi-circles, quadrants of a circle <b>Solid shapes:</b> cube, rectangular prism, cylinder</p> <p>SA9. use appropriate measuring techniques and units of measurement</p> <p>SA10. use appropriate units and number systems to express degree of accuracy <b>Units and number systems representing degree of accuracy:</b> decimals places, significant figures, fractions as a decimal quantity</p> <p>SA11. use metric systems of measurement</p>
<b>Learning</b>	

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	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> <li>SA1. participate in on-the-job and other learning, training and development interventions and assessments</li> <li>SA2. clarify task related information with appropriate personnel or technical adviser</li> <li>SA3. seek to improve and modify own work practices</li> <li>SA4. maintain current knowledge of application standards, legislation, codes of practice and product/process developments</li> </ul>
<p><b>A. Professional Skills</b></p>	<p><b>Problem Solving</b></p>
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> <li>SB1. identify problems with work planning, procedures, output and behavior and their implications</li> <li>SB2. prioritize and plan for problem solving</li> <li>SB3. communicate problems appropriately to others</li> <li>SB4. identify sources of information and support for problem solving</li> <li>SB5. seek assistance and support from other sources to solve problems</li> <li>SB6. identify effective resolution techniques</li> <li>SB7. select and apply resolution techniques</li> <li>SB8. seek evidence for problem resolution</li> </ul>
	<p><b>Plan and Organize</b></p>
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> <li>SB9. plan, prioritize and sequence work operations as per job requirements</li> <li>SB10. organize and analyze information relevant to work</li> <li>SB11. basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time</li> </ul>
	<p><b>Initiative and Enterprise</b></p>
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> <li>SB12. undertake and express new ideas and initiatives to others</li> <li>SB13. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses</li> <li>SB14. participate in improvement procedures including process, quality and internal/external customer/supplier relationships</li> <li>SB15. one's competencies in new and different situations and contexts to achieve more</li> </ul>
	<p><b>Self-Management</b></p>
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> <li>SB16. exercise restraint while expressing dissent and during conflict situations</li> <li>SB17. avoid and manage distractions to be disciplined at work</li> <li>SB18. manage own time for achieving better results</li> </ul>
	<p><b>Teamwork</b></p>
<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> <li>SB19. work in a team in order to achieve better results</li> <li>SB20. identify and clarify work roles within a team</li> <li>SB21. communicate and cooperate with others in the team for better results</li> <li>SB22. seek assistance from fellow team members</li> </ul>	

**CSC/ N 0603: Perform radiographic testing on metals**

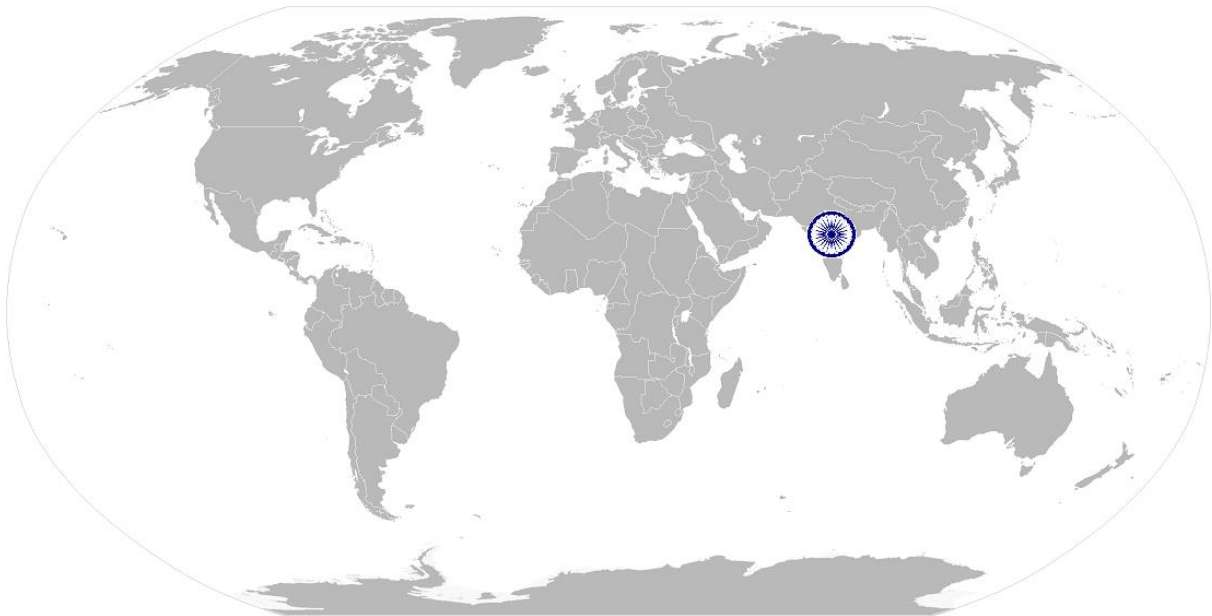
**NOS Version Control**

<b>NOS Code</b>	<b>CSC / N 0603</b>		
<b>Credits (NSQF)</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
<b>Industry</b>	<b>Capital Goods</b>	<b>Drafted on</b>	<b>10/04/14</b>
<b>Industry Sub-sector</b>	<ol style="list-style-type: none"> <li>1. Machine Tools</li> <li>2. Tools Dies And Press Tools</li> <li>3. Plastics Manufacturing Machinery</li> <li>4. Textile Manufacturing Machinery</li> <li>5. Process Plant Machinery</li> <li>6. Electrical and Power Machinery</li> <li>7. Light Engineering Goods</li> </ol>	<b>Last reviewed on</b>	<b>18/03/15</b>
<b>Occupation</b>	<b>Quality</b>	<b>Next review date</b>	<b>30/08/16</b>

**CSC/ N 1335: Use basic health and safety practices at the workplace**

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# 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/ N 1335: Use basic health and safety practices at the workplace**

National Occupational Standard	<b>Unit Code</b>	<b>CSC / N 1335</b>
	<b>Unit Title (Task)</b>	<b>Use basic health and safety practices at the workplace</b>
	<b>Description</b>	<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> <p>It covers knowledge of fire safety, common first aid applications, safe practices and emergency procedures.</p>
	<b>Scope</b>	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> <li>• Health and safety</li> <li>• Fire safety</li> <li>• Emergencies, rescue and first-aid procedures</li> </ul>
<b>Performance Criteria(PC) w.r.t. the Scope</b>		
<b>Element</b>	<b>Performance Criteria</b>	
<b>Health and safety</b>	<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><b>Protective clothing:</b> 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</p> <p><b>Equipment:</b> 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</p> <p><b>Hazards:</b> 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.)</p>	

**CSC/ N 1335: Use basic health and safety practices at the workplace**

	<p><b>Possible causes of risk and accident:</b> 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>PC5. carry out safe working practices while dealing with hazards to ensure the safety of self and others</p> <p><b>Safe working practices:</b> 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</p> <p><b>Methods of accident prevention:</b> 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</p> <p><b>General health and safety equipment:</b> 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</p> <p><b>Ladder faults:</b> corrosion of metal components, deterioration, splits and cracks timber components, imbalance, loose rungs, missing/unfixed nuts or bolts, etc.</p> <p><b>Ladders set up:</b> 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</p> <p><b>Good housekeeping practices:</b> clean/tidy work areas, removal/disposal of waste products, protect surfaces</p> <p>PC12. identify common hazard signs displayed in various areas</p> <p><b>Various areas:</b> 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</p>
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**CSC/ N 1335: Use basic health and safety practices at the workplace**

	<p><b>Documents:</b> fire notices, accident reports, safety instructions for equipment and procedures, company notices and documents, legal documents (eg government notices)</p>
<p><b>Fire safety</b></p>	<p>The user/individual on the job should be able to:</p> <p>PC14. use the various appropriate fire extinguishers on different types of fires correctly</p> <p><b>Types of fires:</b> 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><b>Emergencies, rescue and first-aid procedures</b></p>	<p>The user/individual on the job should 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><b>Emergency procedures:</b> 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><b>Incident Report includes details of:</b> 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>
<p><b>Knowledge and Understanding (K)</b></p>	

**CSC/ N 1335: Use basic health and safety practices at the workplace**

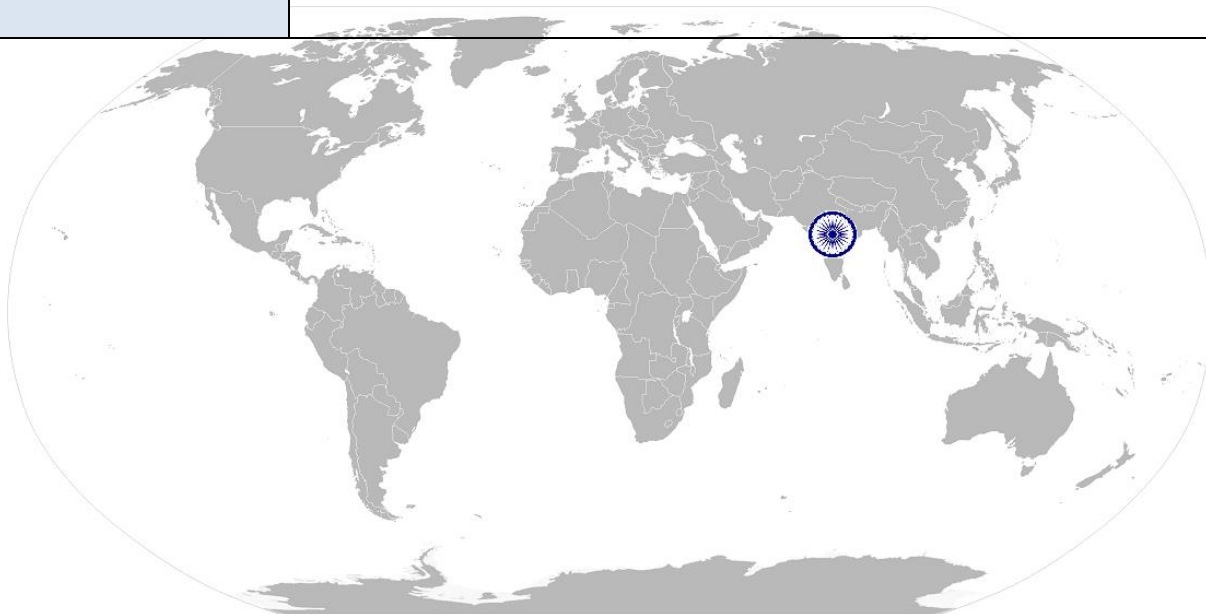
<p><b>A. Organizational Context</b> (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. names (and job titles if applicable), and where to find, all the people responsible for health and safety in a workplace.</p> <p>KA2. names and location of documents that refer to health and safety in the workplace.</p>
<p><b>B. Technical Knowledge</b></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 <b>Possible causes of risk and accident:</b> 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 <b>Methods of accident prevention:</b> 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 <b>Exposure:</b> ingested, contact with skin, inhaled <b>Preventative action:</b> ventilation, masks, protective clothing/ equipment); <b>Remedial action:</b> immediate first aid, report to supervisor <b>Toxic materials:</b> 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 <b>Causes of fires:</b> 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> <p>KB16. different materials used for extinguishing fire <b>Materials:</b> sand, water, foam, CO<sub>2</sub>, 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>

## CSC/ N 1335: Use basic health and safety practices at the workplace

	<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>
<b>Skills (S) [Optional]</b>	
<b>A. Core Skills/ Generic Skills</b>	<b>Reading and Writing Skills</b>
	The user/individual on the job needs to know and understand how to:
	SA1. read and comprehend basic content to read labels, charts, signages
	SA2. read and comprehend basic English to read manuals of operations
	SA3. read and write an accident/incident report in local language or English
	<b>Oral Communication (Listening and Speaking skills)</b>
The user/individual on the job needs to know and understand how to:	
SA4. question coworkers appropriately in order to clarify instructions and other issues	
SA5. give clear instructions to coworkers, subordinates others	
<b>Decision Making</b>	
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>B. Professional Skills</b>	<b>Plan and Organize</b>
	The user/individual on the job needs to know and understand how to:
	SB1. plan and organize their own work schedule, work area, tools, equipment and materials to maintain decorum and for improved productivity
	<b>Working with others</b>
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 coworkers for any assistance received	
SB6. offer appropriate respect based on mutuality and respect for fellow workmanship and authority	

## CSC/ N 1335: Use basic health and safety practices at the workplace

	<b>Problem Solving</b>
	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
	<b>Analytical Thinking</b>
	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



**CSC/ N 1335: Use basic health and safety practices at the workplace**

## NOS Version Control

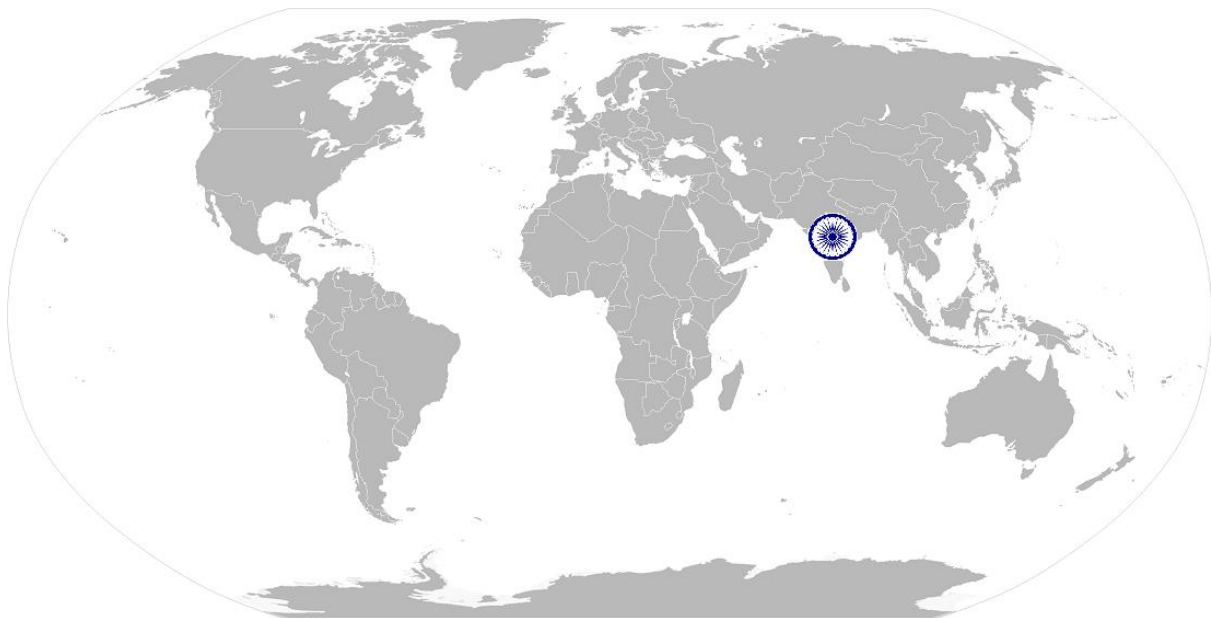
<b>NOS Code</b>	<b>CSC / N 1335</b>		
<b>Credits (NSQF)</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
<b>Industry</b>	<b>Capital Goods</b>	<b>Drafted on</b>	<b>10/04/14</b>
<b>Industry Sub-sector</b>	<ol style="list-style-type: none"> <li>1. Machine Tools</li> <li>2. Dies, Moulds And Press Tools</li> <li>3. Plastics Manufacturing Machinery</li> <li>4. Textile Manufacturing Machinery</li> <li>5. Process Plant Machinery</li> <li>6. Electrical and Power Generation Machinery</li> <li>7. Light Engineering Goods</li> </ol>	<b>Last reviewed on</b>	<b>18/03/15</b>
<b>Occupation</b>	<b>Quality</b>	<b>Next review date</b>	<b>30/08/16</b>

CSC/ N 1336:

Work effectively with others

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# National Occupational Standard



## Overview

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

CSC/ N 1336:

Work effectively with others

National Occupational Standard

<b>Unit Code</b>	<b>CSC / N 1336</b>
<b>Unit Title (Task)</b>	<b>Work effectively with others</b>
<b>Description</b>	<p>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.</p> <p>These cover areas such as communication etiquette, discipline, listening, handling conflict and grievances.</p>
<b>Scope</b>	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> <li>Working with others</li> </ul>
<b>Performance Criteria (PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Working with others</b>	<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. 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</p> <p><b>Communication etiquette:</b> 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</p> <p><b>Disciplined behaviors:</b> 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>
<b>Knowledge and Understanding (K)</b>	
<b>A. Organizational Context</b> (Knowledge of the company / organization 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 issues</p>

**CSC/ N 1336:**

**Work effectively with others**

**B. Technical  
Knowledge**

The user/individual on the job needs to know and understand:

- KB1. various categories of people that one is required to communicate and co-ordinate with in the organization
- KB2. importance of effective communication in the workplace
- KB3. importance of teamwork in organizational and individual success
- KB4. various components of effective communication
- KB5. key elements of active listening
- KB6. value and importance of active listening and assertive communication
- KB7. barriers to effective communication
- KB8. importance of tone and pitch in effective communication
- KB9. importance of avoiding casual expletives and unpleasant terms while communicating professional circles
- KB10. how poor communication practices can disturb people, environment and cause problems for the employee, the employer and the customer
- KB11. importance of ethics for professional success
- KB12. importance of discipline for professional success
- KB13. what constitutes disciplined behavior for a working professional
- KB14. common reasons for interpersonal conflict
- KB15. importance of developing effective working relationships for professional success
- KB16. expressing and addressing grievances appropriately and effectively
- KB17. importance and ways of managing interpersonal conflict effectively

**Skills (S) [Optional]**





CSC/ N 1336:

Work effectively with others

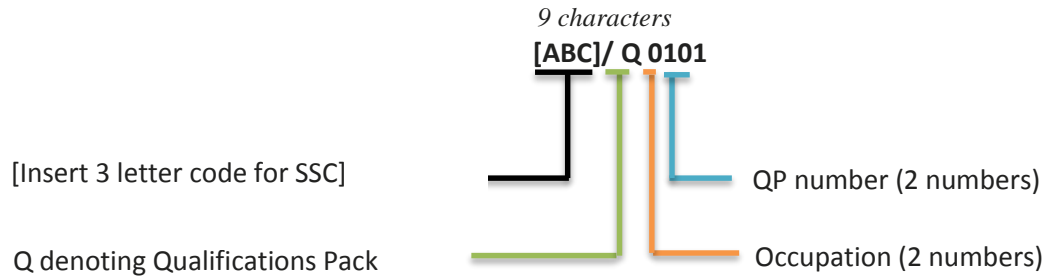
## NOS Version Control

NOS Code	CSC / N 1336		
Credits(NSQF)	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	10/04/14
Industry Sub-sector	1. Machine Tools 2. Dies, Moulds And Press Tools 3. Plastics Manufacturing Machinery 4. Textile Manufacturing Machinery 5. Process Plant Machinery 6. Electrical and Power Machinery 7. Light Engineering Goods	Last reviewed on	18/03/15
Occupation	Quality	Next review date	30/08/16

## Annexure

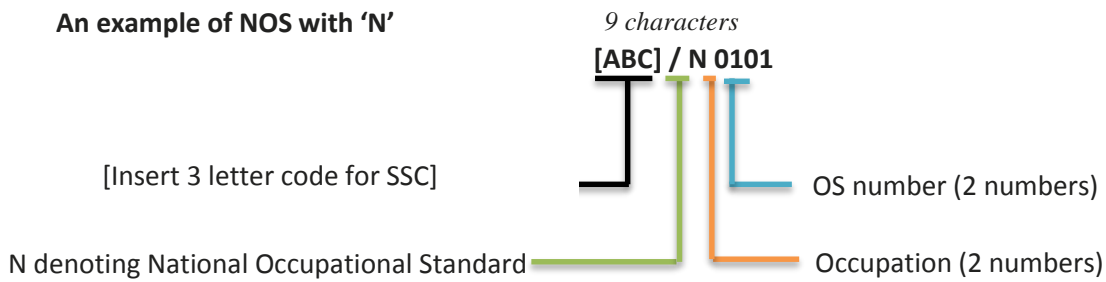
### Nomenclature for QP and NOS

#### Qualifications Pack



#### Occupational Standard

##### An example of NOS with 'N'



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
Process Plant Machinery	01-13
Plastic Manufacturing Machinery	01-13
Textile Manufacturing 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 : Lab Technician - Radiographic Testing**

**Qualification Pack : CSC/ Q 0603**

**Sector Skill Council : Capital Goods 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 70% 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.

Assessable Outcomes	Assessment Criteria	Total Marks (300)	Out of	Theory	Skills Practical
<b>CSC/ N 0603: Perform radiographic testing on metals</b>	PC1. comply with health and safety, environmental and other relevant regulations and guidelines at work and ensure process compliance	<b>100</b>	2	0	2
	PC2. adhere to procedures or systems in place for risk assessment, occupational standards, personal protective equipment (PPE) and other relevant occupational safety regulations		4	1	3
	PC3. work following laid down procedures and instructions		3	1	2
	PC4. evacuate the non-radiographic personnel from the area before starting the work		2	0	2
	PC5. ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition and are kept at secured location		2	0	2
	PC6. ensure that all measuring equipment are within calibration date and are approved for usage		2	0	2
	PC7. ensure work area is clean and safe from hazards before and after the job is completed		2	0	2
	PC8. obtain job specification from a valid and		2	0	2

approved source			
PC9. read and establish job requirements from the job specification document accurately	2	0	2
PC10. report and rectify incorrect and inconsistent information in job specification documents as per organization procedures	3	1	2
PC11. prepare the work area for the testing operations as per procedure	3	1	2
PC12. obtain correct work-pieces/raw materials to be tested	2	0	2
PC13. identify the products and material to be tested as per job specifications accurately	3	1	2
PC14. ensure that all features of the Controlled Test Zone are in place and are operating correctly (such as barriers, lights, signs, radiation, survey meters)	3	1	2
PC15. ensure that the product test areas are correctly prepared and identified	2	0	2
PC16. check that all equipment and consumables are as specified and fit for purpose	3	1	2
PC17. ensure that gamma ray source containers are removed from the approved store and recording done in the Source Movement Register	2	0	2
PC18. set up the radiographic testing equipment to provide all of the following: a. correct source location, source focal distance (SFD) and beam orientation b. specified exposure parameters c. specified radiographic film and intensifying screens applied to the test areas d. correctly located image quality indicators (IQIs) and identification markers	4	2	2
PC19. check conditions required for tests to be undertaken	3	1	2
PC20. power up equipment as per the testing methods to be undertaken	2	0	2
PC21. prepare the test samples in accordance with the procedures and check their integrity	4	2	2
PC22. follow the appropriate procedures for use of tools and equipment to carry out the required tests	4	1	3
PC23. follow the defined radiographic testing procedures, and apply safe working practices and procedures at all times	6	2	4

	PC24. carry out the required tests in accordance with the procedures and confirm the safe containment of the radiation source in the equipment		6	2	4
	PC25. ensure radiographic tests are carried out in accordance with relevant standards, codes, specifications and OH&S requirements		3	1	2
	PC26. process films to maximize quality of image		2	0	2
	PC27. record the results of the tests undertaken in the appropriate format		2	0	2
	PC28. methods used to communicate the required information about the test results in accordance with departmental and organizational procedures		3	1	2
	PC29. complete documentation post completion of work, as per procedure		3	1	2
	PC30. secure tools and equipment in a safe condition on completion of the testing activities		3	1	2
	PC31. close down the equipment to a safe condition		2	0	2
	PC32. return gamma radiation source containers to the approved store		3	1	2
	PC33. removing warning notices and barriers, and reinstating the work area		2	0	2
	PC34. review the results and carry out further tests if necessary		2	0	2
	PC35. refer unresolved job related problems to appropriate personnel for support		2	0	2
	PC36. monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem		2	0	2
	<b>Total</b>	<b>100</b>	<b>100</b>	<b>22</b>	<b>78</b>
<b>CSC/ N 1335: Use basic health and safety practices at the workplace</b>	PC1. use protective clothing/equipment for specific tasks and work conditions	<b>100</b>	5	2	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 state methods of accident prevention in the work environment of the job role	4	2	2
PC6. state location of general health and safety equipment in the workplace	3	2	1
PC7. inspect for faults, set up and safely use steps and ladders in general use	5	2	3
PC8. work safely in and around trenches, elevated places and confined areas	5	2	3
PC9. lift heavy objects safely using correct procedures	5	2	3
PC10. apply good housekeeping practices at all times	4	2	2
PC11. identify common hazard signs displayed in various areas	5	2	3
PC12. retrieve and/or point out documents that refer to health and safety in the workplace	3	1	2
PC13. use the various appropriate fire extinguishers on different types of fires correctly	4	1	3
PC14. demonstrate rescue techniques applied during fire hazard	4	1	3
PC15. demonstrate good housekeeping in order to prevent fire hazards	3	1	2
PC16. demonstrate the correct use of a fire extinguisher	4	1	3
PC17. demonstrate how to free a person from electrocution	4	1	3
PC18. administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc.	4	1	3
PC19. demonstrate basic techniques of bandaging	3	1	2
PC20. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments	4	1	3
PC21. perform and organize loss minimization or rescue activity during an accident in real or simulated environments	3	1	2
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	3	1	2

	PC23. demonstrate the artificial respiration and the CPR Process		3	1	2
	PC24. participate in emergency procedures		3	2	1
	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		4	1	3
		<b>Total</b>	<b>100</b>	<b>36</b>	<b>64</b>
<b>CSC/ N 1336: Work effectively with others</b>	PC1. accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	<b>100</b>	10	3	7
	PC2. accurately pass on information 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
		<b>Total</b>	<b>100</b>	<b>30</b>	<b>70</b>