

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR CAPITAL GOODS INDUSTRY

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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

Introduction

Qualifications Pack: Draughtsman - Piping

SECTOR: CAPITAL GOODS

SUB-SECTOR:

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

OCCUPATION: Design

REFERENCE ID: CSC/ Q 0403

ALIGNED TO: NCO-2004/NIL

Draughtsman - Piping: Creation and modification of drawings for piping and piping systems design using CAD system. It also involves the detail drafting of drawings for piping and piping systems.

Brief Job Description: It involves select the appropriate equipment and drawing software to make or modify drawings of process flow, piping and instrumentation (P&ID) diagrams and isometric and spool drawings. It will also include orthogonal single and double line arrangement drawings of pipe installation systems and piping layouts..

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

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Job Details	Qualifications Pack Code	CSC/ Q 0403		
	Job Role	Draughtsman - Piping		
	Credits(NSQF)	TBD	Version number	1.0
	Sector	CAPITAL GOODS	Drafted on	10/04/14
	Sub-sector	<ol style="list-style-type: none"> 1. Machine Tools 2. Plastic Manufacturing Machinery 3. Textile Manufacturing Machinery 4. Process Plant Machinery 5. Electrical and Power Machinery 6. Light Engineering 	Last reviewed on	18/03/15
	Occupation	DESIGN	Next review date	30/08/16
	NSQC Clearance on	20/07/2015		

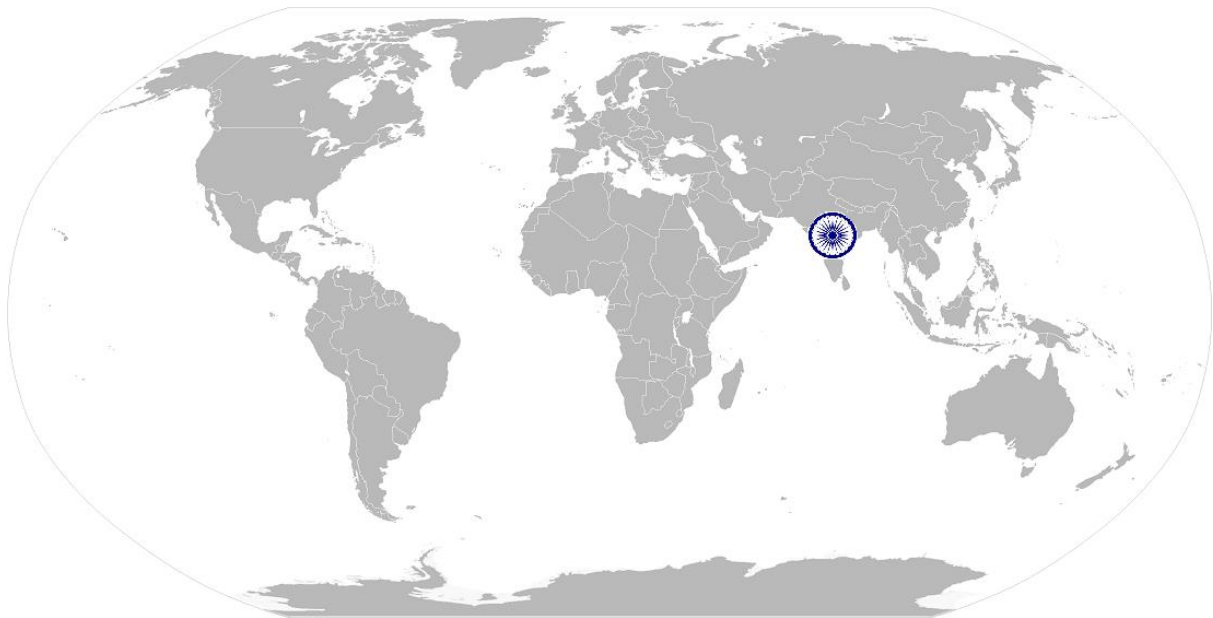
Job Role	Draughtsman- Piping
Role Description	Creation and modification of drawings for piping and piping system design using CAD system. It also involves the detail drafting of drawings for piping and pining system.
NSQF level	4
Minimum Educational Qualifications*	Diploma - Mechanical Engineering
Maximum Educational Qualifications*	NA
Training (Suggested but not mandatory)	2D Computer Aided Design System Training
Minimum Job Entry Age	18 Years Old
Experience	No Previous Experience Required
Applicable National Occupational Standards (NOS)	<p>Compulsory:</p> <ol style="list-style-type: none"> 1. CSC/ N 0403 (Make or modify 2D piping drawings using computer aided design (CAD) system) 2. CSC/ N 1335 (Use basic health and safety practices at the workplace) 3. CSC/ N 1336 (Work effectively with others) <p>Optional: N.A.</p>
Performance Criteria	As described in the relevant OS units

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
	P&ID	Piping and Instrumentation Diagram
	CAD	Computer Aided Design
	2D	2 Dimensional
	3D	3 Dimensional
	CO2	Carbon dioxide
	CPR	Cardiac Pulmonary Resuscitation
	PPE	Personal Protective Equipment
	ISO	International Organization for Standardization

CSC/ N 0403: Make or modify 2D piping drawings using computer aided design (CAD) system

National Occupational Standard



Overview

This unit covers making or modifying 2D detailed and isometric drawings for piping and piping system used in mechanical engineering using computer aided design (CAD) system as per approved procedures.

CSC/ N 0403: Make or modify 2D piping drawings using computer aided design (CAD) system

National Occupational Standard

Unit Code	CSC / N 0403
Unit Title (Task)	Make or modify 2D piping drawings using computer aided design (CAD) system
Description	<p>This unit covers making or modifying 2D detailed and isometric drawings for piping and piping systems used in mechanical engineering using computer aided design (CAD) system as per approved procedures. The drawings produced will include process flow, piping and instrumentation (P&ID) diagrams and isometric and spool drawings. It will also include orthogonal single and double line arrangement drawings of pipe installation systems and piping layouts.</p> <p>It also involves preparing drawings with the use of computer- aided design (CAD) systems but may also be done manually. It also involves the use of macros, menus and default settings.</p> <p>The candidate will be expected to extract all necessary information in order to carry out the drawing operations from a drawing brief, select the appropriate equipment and drawing software to use based on the type and complexity of the drawing functions to be carried out. The candidate will be expected to produce a drawing template as well as fully detailed drawings to enable the manufacture, assembly, installation or modification of the product to take place.</p> <p>The candidate will be expected to work unsupervised taking full responsibility for their actions.</p> <p>The candidate will have knowledge and understanding of computer aided drawing procedures for engineering drawings, the computer system and software used, its application and the various tools and techniques used to produce the drawings. The candidate will also have the knowledge and understanding of the principles of producing orthogonal and isometric piping drawings, types of pipe fittings and components, different types of industrial pipe systems and the terminology associated with them.</p> <p>The candidate will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.</p>
Scope	<ul style="list-style-type: none"> • Determining work requirements • Analysing piping system components • Performing set-up activities • Making or modifying drawings/models for installation of industrial piping systems
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Determining work requirements	<p>The user/individual on the job should be able to:</p> <p>PC1. use appropriate sources to obtain the technical information relevant to the drawing to be created</p> <p>Technical information source: drawing brief; specifications(overall dimensions, materials, special procedures for manufacturing); drawing</p>

CSC/ N 0403: Make or modify 2D piping drawings using computer aided design (CAD) system

	<p>change or modification request; regulations; existing drawings/designs; sketches; notes from meetings/discussions; standards reference documents (eg. limits and fits, tapping drill charts, contraction allowances); Design features, as appropriate to the drawing being produced: function, materials, clearance, operating environment, quality, aesthetics, interfaces, physical space, ergonomics, tolerances</p> <p>PC2. ensure that the data and information received is complete and correct</p> <p>PC3. establish the drawing requirements from the data and information received</p> <p>PC4. report and rectify incorrect and inconsistent information in job specification documents as per organization procedures</p> <p>PC5. interpret and produce drawings using first angle orthographic projections, isometric/oblique projections, third angle orthographic projections, sectional elevations</p> <p>Drawings produced: lines (straight, curved/contour, angled); symbols and abbreviations; hidden detail; dimensions; circles or ellipses; parts lists; text; geometrical and dimensional tolerance; insertion of standard components; elevation; views (plane, side, sectional, detail)</p>
<p>Analysing piping system components</p>	<p>The user/individual on the job should be able to:</p> <p>PC6. interpret piping and instrumentation diagrams and specifications</p> <p>PC7. identify various pipe fittings and flanges and specify their application</p> <p>PC8. describe the function and application of valves and auxiliary equipment</p> <p>PC9. identify components used in piping project</p> <p>System fittings and components: ball, stop, gate, angle, cocks, flanges, t-pieces, elbows, plugs, caps, unions, connectors, reducers</p> <p>PC10. identify occupational health and safety (OHS) factors applying to piping system</p>
<p>Performing set-up activities</p>	<p>The user/individual on the job should be able to:</p> <p>PC11. power up the equipment and activate the appropriate drawing software</p> <p>PC12. set up and check that all peripheral devices are connected and correctly operating</p> <p>Peripheral devices: keyboard, mouse, light pen, digitizer/tablet, scanner, printer, plotter, etc.</p> <p>PC13. set the drawing datum at a convenient point</p> <p>PC14. set up drawing parameters to suit the drawing produced</p> <p>Drawing parameters: layers, line types, color, text styles, etc.</p> <p>PC15. check that all the equipment is correctly connected and in a safe and usable working condition</p>
<p>Making or modifying drawings/models for installation of industrial piping systems</p>	<p>The user/individual on the job should be able to:</p> <p>PC16. power up the equipment and activate the appropriate drawing software</p> <p>PC17. customize system variables, menus and drawing defaults to produce the drawing to the appropriate scale</p> <p>PC18. develop macros as per approved procedures</p> <p>PC19. set up drawing parameters to company procedures or to suit the drawing</p>

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	<p>produced</p> <p>PC20. apply drafting principles to produce a drawing that is consistent with standard operating procedures within the organization Standards: organizational guidelines and procedures, recognized compliance agency/body standards, directives or codes of practice, CAD software standards/protocols , national and/or International standards or directives, customer standards and requirements, health, safety and environmental requirements</p> <p>PC21. apply operating principles and specifications of piping systems and equipment to drawing</p> <p>PC22. detail pipes, valves and auxiliary equipment</p> <p>PC23. indicate vertical and horizontal offsets and hand wheel orientation</p> <p>PC24. apply health and safety and environmental factors to drawing detail</p> <p>PC25. ensure drawing/model accurately reflects specifications, is presented according to organizational requirements and contains all relevant information</p> <p>PC26. create a drawing template to the required standards, which includes all necessary detail Template details: title, drawing number, scale, material, date, etc.</p> <p>PC27. use appropriate terminologies, codes and other references and techniques to create drawings, in the required formats, that are sufficiently and clearly detailed</p> <p>PC28. use keyboard command and pull down menus available in common CAD systems</p> <p>PC29. produce process flow, piping and instrumentation (P&ID) diagrams and isometric and spool drawings</p> <p>PC30. produce orthogonal single and double line arrangement drawings of pipe installation systems in accordance with engineer's sketches</p> <p>PC31. draw piping layouts, dimension and label the drawing as per approved procedures</p> <p>PC32. ensure that drawings are checked and approved by the appropriate person</p> <p>PC33. produce hard copies of the finished drawings and check that the drawing is correctly titled and referenced</p> <p>PC34. save the drawing to an appropriate storage medium (eg. hard drive, CD/DVD, external storage device)</p> <p>PC35. produce a hard copy printout of the drawing for file purposes</p> <p>PC36. deal promptly and effectively with problems within learner's control and seek help and guidance from the relevant people if you have problems that they cannot resolve</p> <p>PC37. shut down the CAD system to a safe condition on completion of the drawing activities</p>
Knowledge and Understanding (K)	
A. Organizational	The user/individual on the job needs to know and understand:

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<p>Context (Knowledge of the company / organization and its processes)</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> <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. organizational procedures and information systems for retrieving and storing drawing data</p> <p>KB2. system variables that can be customized</p> <p>KB3. procedures and need for customizing identified system variables</p> <p>KB4. applicable drafting standards/procedures</p> <p>KB5. procedures and need for customizing menus and system defaults</p> <p>KB6. procedures and need for developing macros</p> <p>KB7. appropriate projection for the drawing purpose</p> <p>KB8. reasons for selecting the chosen projection</p> <p>KB9. reasons for including auxiliary views in drawings</p> <p>KB10. procedures for producing component, layout and/or assembly drawings</p> <p>KB11. drawing specifications</p> <p>KB12. common symbols used in drawings</p> <p>KB13. how and where to obtain the relevant sources and methods for obtaining any required technical information relevant to the drawing</p> <p>Technical information source: drawing brief; specifications(overall dimensions, materials, special procedures for manufacturing); drawing change or modification request; regulations; existing drawings/designs; sketches; notes from meetings/discussions; standards reference documents (eg. limits and fits, tapping drill charts, contraction allowances)); Design features, as appropriate to the drawing being produced: function, materials, clearance, operating environment, quality, aesthetics, interfaces, physical space, ergonomics, tolerances</p> <p>KB14. standard specification of pipes, fittings and flanges</p> <p>KB15. standard valves and auxiliary equipment</p> <p>KB16. auxiliary equipment used in industrial piping</p> <p>KB17. principles of producing orthogonal and isometric piping drawings</p> <p>Piping drawings: e.g. standard shop details for pipe spools and pipe supports; standard shop drawings for layout and vendor equipment; single line and double line orthogonal arrangement drawings; transferring information from vendor equipment drawings to detail drawings; compiling cutting lists from</p>

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	<p>arrangement and detail drawings; etc.</p> <p>KB18. types of pipe fittings and components</p> <p>KB19. different types of industrial pipe systems</p> <p>KB20. terminology associated with industrial piping systems</p> <p>KB21. methods and procedures used to minimize the chances of infecting a computer with a virus</p> <p>KB22. procedure to follow in case there are corruptions or virus attacks</p> <p>KB23. practices that make systems vulnerable to corruption and damage</p> <p>KB24. basic set-up and operation of the computer system, and the peripheral devices that are used</p> <p>Peripheral devices: keyboard, mouse, light pen, digitizer/tablet, scanner, printer, plotter, etc.</p> <p>KB25. how to access the specific computer drawing software to be used, and the use of software manuals and related documents to aid operation of the relevant drawing system</p> <p>KB26. basic principles of engineering manufacturing operations that are used to produce the drawn item</p> <p>KB27. kinematics principles relevant manufacturing of machinery</p> <p>KB28. types of drawings that may be produced by the software</p> <p>Types of drawing; detail drawings, piping systems drawings, installation drawings</p> <p>KB29. how to set up the viewing screen to show multiple views of the drawing to help with drawing creation</p> <p>KB30. standards and conventions that are used for the drawings</p> <p>Standards: organizational guidelines and procedures, recognized compliance agency/body standards, directives or codes of practice, CAD software standards/protocols , national and/or International standards or directives, customer standards and requirements, health, safety and environmental requirements</p> <p>KB31. how to set up the drawing template parameters</p> <p>Template details: title, drawing number, scale, material, date, etc.</p> <p>KB32. application and use of drawing tools</p> <p>Drawing tools: straight lines; curves and circles; hatching and shading on drawings; adding dimensions and text to drawings; producing layers of drawings</p> <p>KB33. how to access, recognize and use a wide range of standard components and symbol libraries from the CAD equipment</p> <p>KB34. need for document control</p> <p>KB35. how to save and store drawings</p> <p>KB36. need to create backup copies, and to file them in a separate and safe location</p> <p>KB37. how to produce hard copies of the drawings, and the advantages and disadvantages of printers and plotters</p>
Skills (S) [Optional]	
A. Core Skills/	Communication

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Generic 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, manuals, health and safety instructions, memos, etc. applicable to the job in English and/or local language SA2. fill up appropriate technical forms, process charts, activity logs as per organizational format in English and/or local language SA3. convey and share technical information clearly using appropriate language SA4. check and clarify task-related information SA1. liaise with appropriate authorities using correct protocol SA5. communicate with people in respectful form and manner in line with organizational protocol
	Numerical and computational skills
	The user/individual on the job needs to know and understand how to: SA1. undertake numerical operations, and calculations/ formulae SA2. identify and draw various basic, compound and solid shapes as per dimensions given SA3. use appropriate measuring techniques and units of measurement SA4. use appropriate units and number systems to express degree of accuracy SA5. interpret and express tolerance in terms of limits on dimensions SA6. calculation of the value of angles in a triangle
	Learning
	The user/individual on the job needs to know and understand how to: SA6. maintain current knowledge of applicable standards, legislation, codes of practice and product/process developments SA7. participate in on-the-job and other learning, training and development interventions and assessment SA8. clarify task related information with appropriate personnel or technical adviser SA7. seek to improve and modify own work practices
B. Professional Skills	Problem Solving
	The user/individual on the job needs to know and understand how to: SB1. identify problems with work planning, procedures, output and behavior and their implications SB2. prioritize and plan for problem solving SB3. communicate problems appropriately to others SB4. identify sources of information and support for problem solving SB5. seek assistance and support from other sources to solve problems SB6. identify effective resolution techniques SB7. select and apply resolution techniques SB8. seek evidence for problem resolution
	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB9. plan, prioritize and sequence work operations as per job requirements SB10. organize and analyze information relevant to work SB11. basic concepts of shop-floor work productivity including waste reduction,

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	efficient material usage and optimization of time
	Initiative and Enterprise
	The user/individual on the job needs to know and understand: SB12. importance and impact of initiative and enterprise for achieving better results for self, others and organization SB13. how to undertake and express new ideas and initiatives to others SB14. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses SB15. participate in improvement procedures including process, quality and internal/external customer/supplier relationships SB16. one's competencies can and should be applied in new and different situations and contexts to achieve more
	Self-Management
	The user/individual on the job needs to know and understand: SB17. importance of taking responsibility for own work outcomes SB18. importance of adherence to work timings, dress code and other organizational policies SB19. importance of following laid down rules, procedures, instructions and policies SB20. importance of exercising restraint while expressing dissent and during conflict situations SB21. how to avoid and manage distractions to be disciplined at work SB22. importance of time management for achieving better results
	Teamwork
	The user/individual on the job needs to know and understand how to: SB23. work in a team in order to achieve better results SB24. identify and clarify work roles within a team SB25. communicate and cooperate with others in the team SB26. seek assistance from fellow team members
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB1. apply, analyze, and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action

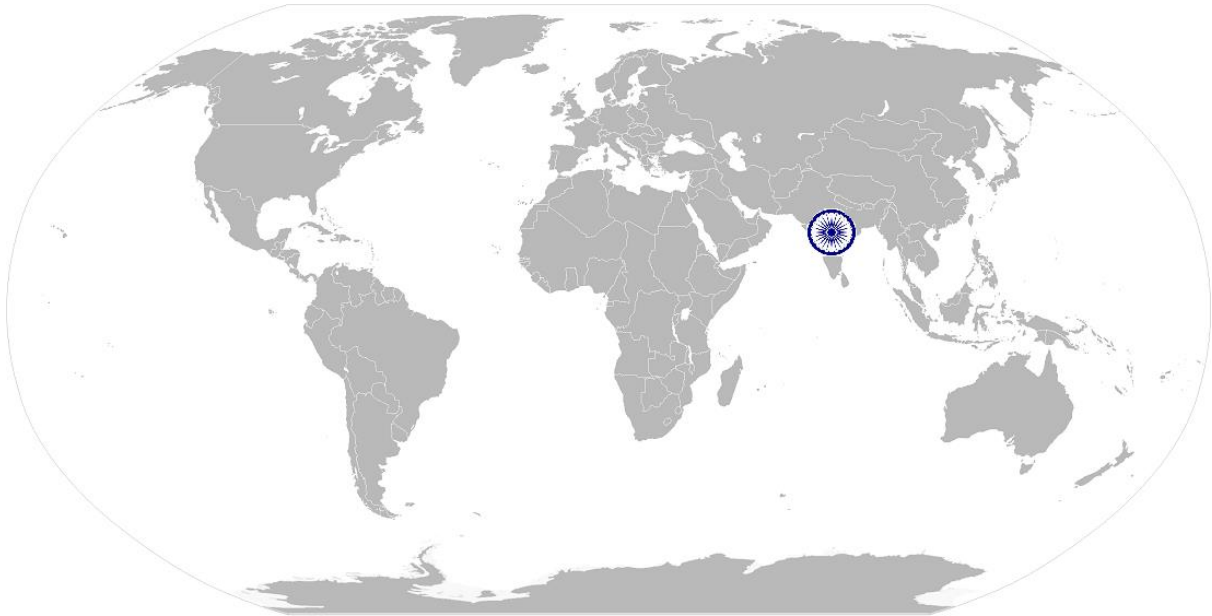
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NOS Version Control

NOS Code	CSC/ N 0403		
Credits(NSQF)	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	10/04/14
Industry Sub-sector	<ol style="list-style-type: none"> 1. Machine Tools 2. Tools Dies And Press Tools 3. Plastic Manufacturing Machinery 4. Textile Manufacturing Machinery 5. Process Plant Machinery 6. Electrical and Power Machinery 7. Light Engineering 	Last reviewed on	18/03/15
Occupation	Design	Next review date	30/08/16

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

National Occupational Standard	Unit Code	CSC / N 1335
	Unit Title (Task)	Use basic health and safety practices at the workplace
	Description	<p>This OS unit is about knowledge and practices relating to health, safety and security that candidates need to use in the workplace. It covers responsibilities towards self, others, assets and the environment.</p> <p>It includes understanding of risks and hazards in the workplace, along with common techniques to minimize risk, deal with accidents, emergencies, etc.</p> <p>It covers knowledge of fire safety, common first aid applications, safe practices and emergency procedures.</p>
	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 procedures
Performance Criteria(PC) w.r.t. the Scope		
Element	Performance Criteria	
Health and safety	<p>The user/individual on the job should be able to:</p> <p>PC1. use protective clothing/equipment for specific tasks and work conditions</p> <p>Protective clothing: 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>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</p> <p>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.)</p>	

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

	<p>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>PC5. carry out safe working practices while dealing with hazards to ensure the safety of self and others</p> <p>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</p> <p>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</p> <p>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</p> <p>Ladder faults: corrosion of metal components, deterioration, splits and cracks timber components, imbalance, loose rungs, missing/unfixed nuts or bolts, etc.</p> <p>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</p> <p>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</p> <p>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</p>
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CSC/ N 1335: Use basic health and safety practices at the workplace

	<p>Documents: fire notices, accident reports, safety instructions for equipment and procedures, company notices and documents, legal documents (eg government notices)</p>
<p>Fire safety</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>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>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>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>
<p>Knowledge and Understanding (K)</p>	

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

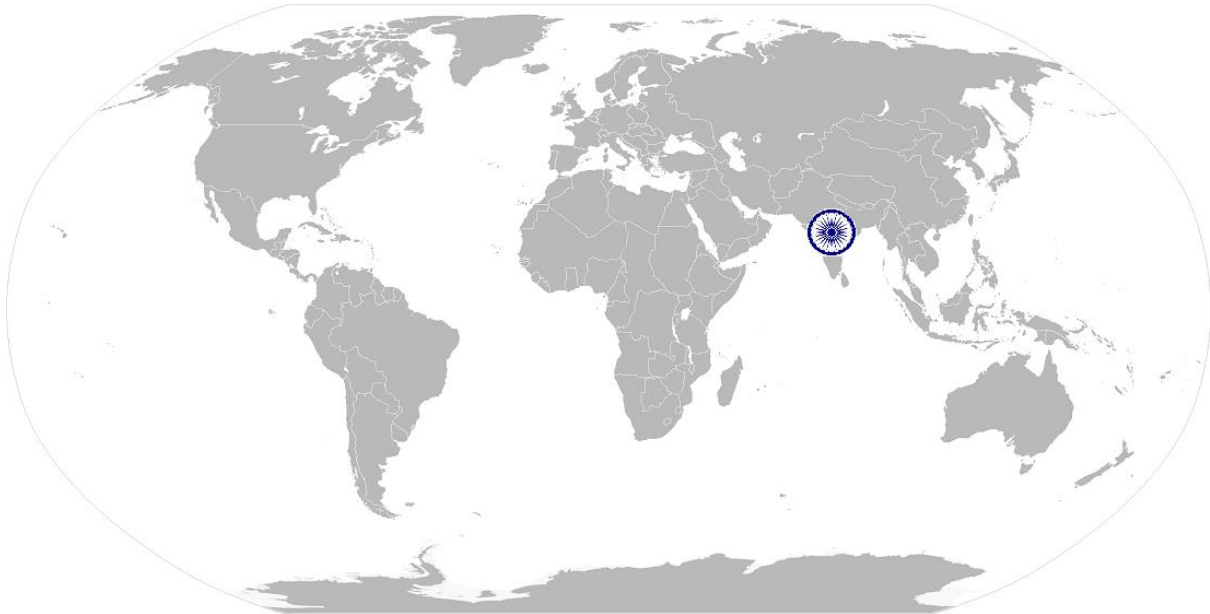
<p>A. Organizational Context (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. names (and job titles if applicable), and where to find, all the people responsible for health and safety in a workplace.</p> <p>KA2. 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> <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>

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	<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) [Optional]	
A. Core Skills/ Generic Skills	Reading and Writing Skills
	The user/individual on the job needs to know and understand how to:
	SA1. read and comprehend basic content to read labels, charts, signages
	SA2. read and comprehend basic English to read manuals of operations
	SA3. read and write an accident/incident report in local language or English
	Oral Communication (Listening and Speaking skills)
The user/individual on the job needs to know and understand how to:	
SA4. question coworkers appropriately in order to clarify instructions and other issues	
SA5. give clear instructions to coworkers, subordinates others	
Decision Making	
The user/individual on the job needs to know and understand how to:	
SA6. make appropriate decisions pertaining to the concerned area of work with respect to intended work objective, span of authority, responsibility, laid down procedure and guidelines	
B. Professional Skills	Plan and Organize
	The user/individual on the job needs to know and understand:
	SB1. plan and organize their own work schedule, work area, tools, equipment and materials to maintain decorum and for improved productivity
	Working with others
	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	
Problem Solving	

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	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB7. think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s)</p> <p>SB8. identify immediate or temporary solutions to resolve delays</p> <p>SB9. identify sources of support that can be availed of for problem solving for various kind of problems</p> <p>SB10. seek appropriate assistance from other sources to resolve problems</p> <p>SB11. 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>SB12. identify cause and effect relations in their area of work</p> <p>SB13. use cause and effect relations to anticipate potential problems and their solution</p>



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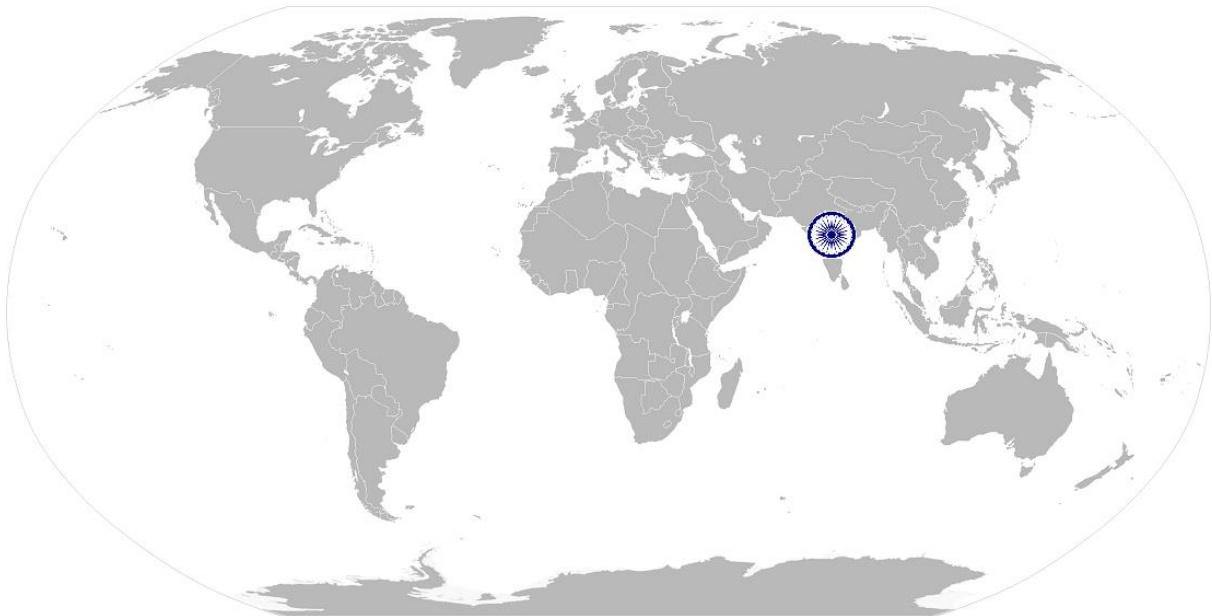
NOS Version Control

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

CSC/ N 1336:

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/ N 1336:

Work effectively with others

National Occupational Standard

Unit Code	CSC / N 1336
Unit Title (Task)	Work effectively with others
Description	<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>
Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> Working with others
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Working with others	<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>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</p> <p>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 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. barriers to effective communication
- KB6. value and importance of active listening and assertive communication
- KB7. key elements of active listening
- 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:

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Annexure

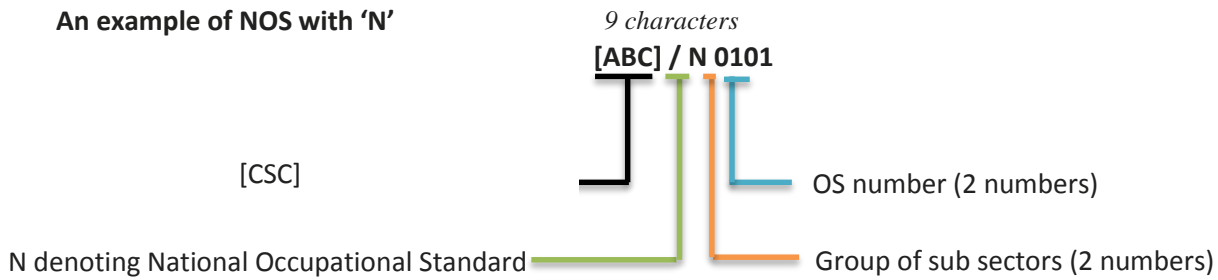
Nomenclature for QP and NOS

Qualifications Pack



Occupational Standard

An example of NOS with 'N'



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

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 : Draughtsman - Piping

Qualification Pack : CSC/ Q 0403

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
CSC/ N 0403 (Make or modify 2D piping drawings using computer aided design (CAD) system)	PC1. use appropriate sources to obtain the technical information relevant to the drawing to be created	100	2	0	2
	PC2. ensure that the data and information received is complete and correct		2	0	2
	PC3. establish the drawing requirements from the data and information received		2	0	2
	PC4. report and rectify incorrect and inconsistent information in job specification documents as per organizational procedures		4	2	2
	PC5. interpret and produce drawings using first angle orthographic projections, isometric/oblique projections, third angle orthographic projections, sectional elevations		3	0	3
	PC6. interpret piping and instrumentation diagrams and specifications		4	2	2
	PC7. identify various pipe fittings and flanges and specify their application		4	2	2
	PC8. describe the function and application of valves and auxiliary equipment		4	2	2

PC9. identify components used in piping project	2	0	2
PC10. identify occupational health and safety (OHS) factors applying to piping system	3	1	2
PC11. power up the equipment and activate the appropriate drawing software	2	0	2
PC12. set up and check that all peripheral devices are connected and correctly operating	2	0	2
PC13. set the drawing datum at a convenient point	2	0	2
PC14. check that all the equipment is correctly connected and in a safe and usable working condition	1	0	1
PC15. customize system variables, menus and drawing defaults to produce the drawing to the appropriate scale	2	0	2
PC16. develop macros as per approved procedures	3	1	2
PC17. set up drawing parameters to company procedures or to suit the drawing produced	4	2	2
PC18. apply drafting principles to produce a drawing that is consistent with standard operating procedures within the organization	5	2	3
PC19. apply operating principles and specifications of piping systems and equipment to drawing	5	2	3
PC20. detail pipes, valves and auxiliary equipment	1	0	1
PC21. indicate vertical and horizontal offsets and hand wheel orientation	3	0	3
PC22. apply health and safety and environmental factors to drawing detail	3	1	2
PC23. ensure drawing/model accurately reflects specifications, is presented according to organizational requirements and contains all relevant information	4	2	2
PC24. create a drawing template to the required standards, which includes all necessary detail	5	2	3
PC25. use appropriate terminologies, codes and other references and techniques to create drawings, in the required formats, that are sufficiently and clearly detailed	5	2	3
PC26. use keyboard command and pull down menus available in common CAD systems	1	0	1

	PC27. produce process flow, piping and instrumentation (P&ID) diagrams and isometric and spool drawings		4	1	3
	PC28. produce orthogonal single and double line arrangement drawings of pipe installation systems in accordance with engineer's sketches		5	2	3
	PC29. draw piping layouts, dimension and label the drawing as per approved procedures		5	2	3
	PC30. ensure that drawings are checked and approved by the appropriate person		1	0	1
	PC31. produce hard copies of the finished drawings and check that the drawing is correctly titled and referenced		2	0	2
	PC32. save the drawing to an appropriate storage medium (eg. hard drive, CD/DVD, external storage device)		1	0	1
	PC33. produce a hard copy printout of the drawing for file purposes		1	0	1
	PC34. deal promptly and effectively with problems within learner's control and seek help and guidance from the relevant people if you have problems that they cannot resolve		2	0	2
	PC35. shut down the CAD system to a safe condition on completion of the drawing activities		1	0	1
		Total	100	28	72
CSC/ N 1335: Use basic health and safety practices at the workplace	PC1. use protective clothing/equipment for specific tasks and work conditions	100	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
		Total	100	36	64
CSC/ N 1336: Work effectively with others	PC1. accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	100	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
			Total	100	30