

## 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

#### Contact Us:

Capital Goods Skill  
Council, C/O Awfis, 1st  
Floor, L-29 Outer Circle  
Connaught Place  
New Delhi – 110001  
E-mail:

[inder.gahlaut@cgsc.in](mailto:inder.gahlaut@cgsc.in)



## Contents

1. Introduction and Contacts.....	1
2. Qualifications Pack.....	2
3. Glossary of Key Terms.....	4
4. OS Units.....	6
5. Annexure: Nomenclature for QP & OS.....	29
6. Assessment Criteria.....	31

## Introduction

### Qualifications Pack- Draughtsman - Piping

**SECTOR/S:** 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/Q0403

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

**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.

Job Details	Qualifications Pack Code	CSC/Q0403		
	Job Role	Draughtsman - Piping [Applicable for National Scenarios]		
	Credits	TBD	Version number	1.0
	Sector	Capital Goods	Drafted on	15/01/2016
	Sub-sector	<ol style="list-style-type: none"> <li>1. Machine Tools</li> <li>2. Plastics Manufacturing Machinery</li> <li>3. Textile Manufacturing Machinery</li> <li>4. Process Plant Machinery</li> <li>5. Electrical and Power Machinery</li> <li>6. Light Engineering Goods</li> </ol>	Last reviewed on	24/11/2017
	Occupation	Design	Next review date	24/11/2021
	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 piping system.
NSQF level	4
Minimum Educational Qualifications	Diploma - Mechanical Engineering
Maximum Educational Qualifications	Not Applicable
Prerequisite License or Training	2D Computer Aided Design System Training
Minimum Job Entry Age	18 Years
Experience	No Previous Experience Required
Applicable National Occupational Standards (NOS)	<b>Compulsory:</b> <ol style="list-style-type: none"> <li>1. <a href="#">CSC/N0403 Make or modify 2D piping drawings using computer aided design (CAD) system</a></li> <li>2. <a href="#">CSC/N1335 Use basic health and safety practices at the workplace</a></li> <li>3. <a href="#">CSC/N1336 Work effectively with others</a></li> </ol>
Performance Criteria	As described in the relevant OS units

**Definitions**

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

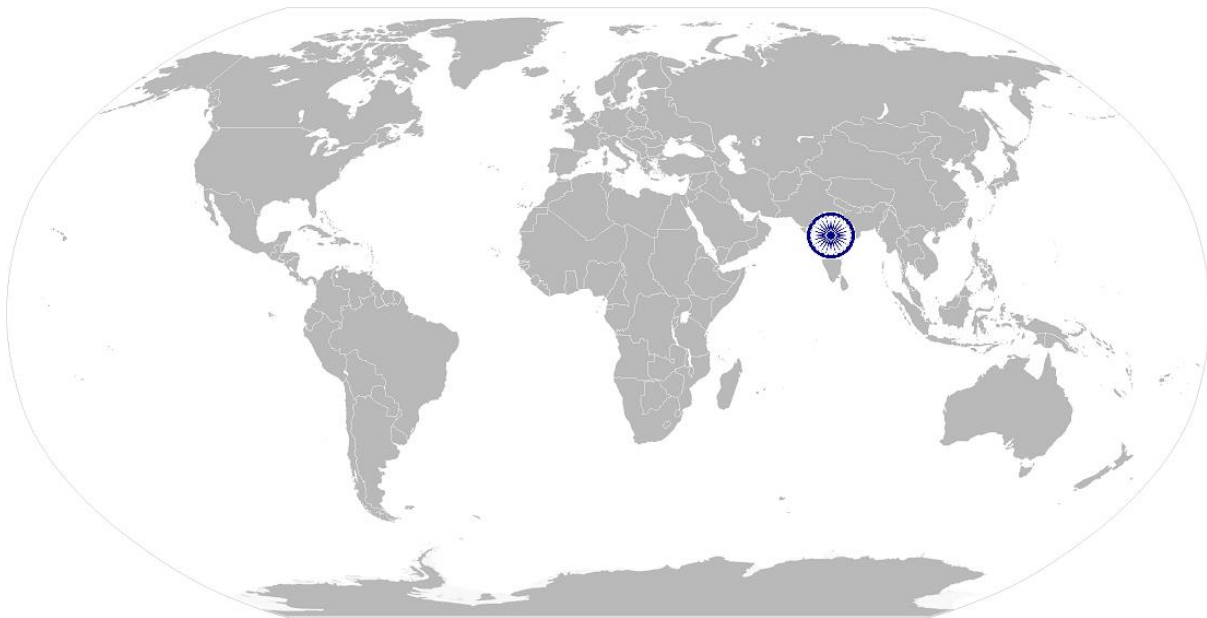
Acronyms

Core Skills/ Generic Skills	Core skills or generic skills are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. In the context of the OS, these include communication related skills that are applicable to most job roles.
Keywords /Terms	Description
P&ID	Piping And Instrumentation Diagram
CAD	Computer Aided Design
2D	2 Dimensional
3D	3 Dimensional
CO <sub>2</sub>	Carbon Dioxide
CPR	Cardiac Pulmonary Resuscitation
PPE	Personal Protective Equipment
ISO	International Organization For Standardization

**CSC/N0403 Make or modify 2D piping drawings using computer aided design (CAD) system**

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# 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/N0403 Make or modify 2D piping drawings using computer aided design (CAD) system**

National Occupational Standard	<b>Unit Code</b>	<b>CSC/N0403</b>
	<b>Unit Title (Task)</b>	<b>Make or modify 2D piping drawings using computer aided design (CAD) system</b>
	<b>Description</b>	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.
	<b>Scope</b>	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> <li>Determine work requirements</li> <li>Analyse piping system components</li> <li>Perform set-up activities</li> <li>Make or modify drawings/ models for installation of industrial piping systems</li> </ul>
	<b>Performance Criteria(PC) w.r.t. the Scope</b>	
	<b>Element</b>	<b>Performance Criteria</b>
	<b>Determine work requirements</b>	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. use appropriate sources to obtain the technical information relevant to the drawing to be created            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>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>



## CSC/N0403 Make or modify 2D piping drawings using computer aided design (CAD) system

<b>Analyse piping system components</b>	<p>To be competent, the user/individual on the job must 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>
<b>Perform set-up activities</b>	<p>To be competent, the user/individual on the job must 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>
<b>Make or modify drawings/models for installation of industrial piping</b>	<p>To be competent, the user/individual on the job must 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 produced</p> <p>PC20. apply drafting principles to produce a drawing that is consistent with standard operating procedures within the organization</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>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>



## CSC/N0403 Make or modify 2D piping drawings using computer aided design (CAD) system

	<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&amp;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>
<b>Knowledge and Understanding (K)</b>	
<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. 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>

**CSC/N0403 Make or modify 2D piping drawings using computer aided design (CAD) system**

	<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>
<b>B. Technical Knowledge</b>	<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 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 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 arrangement and detail drawings; etc.</p>

## CSC/N0403 Make or modify 2D piping drawings using computer aided design (CAD) system

	<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 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 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 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 Template details: title, drawing number, scale, material, date, etc.</p> <p>KB32. application and use of drawing tools 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>
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**CSC/N0403 Make or modify 2D piping drawings using computer aided design (CAD) system**

	KB37. how to produce hard copies of the drawings, and the advantages and disadvantages of printers and plotters
<b>Skills (S)</b>	
<b>A. Core Skills/ Generic Skills</b>	<b>Reading Skills</b>
	The user/ individual on the job needs to know and understand how to: SA1. read and interpret information correctly from various job specification documents, health and safety instructions, memos, etc. applicable to the job in English and/or local language
	<b>Writing Skills</b>
	The user/individual on the job needs to know and understand how to: SA2. fill up appropriate technical forms, process charts, activity logs as per organizational format in English and/or local language SA3. undertake numerical operations, and calculations/ formulae SA4. identify and draw various basic, compound and solid shapes as per dimensions given SA5. use appropriate measuring techniques and units of measurement SA6. use appropriate units and number systems to express degree of accuracy SA7. interpret and express tolerance in terms of limits on dimensions SA8. calculation of the value of angles in a triangle
	<b>Oral Communication (Listening and Speaking skills)</b>
	The user/individual on the job needs to know and understand how to: SA9. convey and share technical information clearly using appropriate language SA10. check and clarify task-related information SA11. liaise with appropriate authorities using correct protocol SA12. communicate with people in respectful form and manner in line with organizational protocol
<b>B. Professional Skills</b>	<b>Decision Making</b>
	NA
	<b>Plan and Organize</b>
	The user/individual on the job needs to know and understand how to: SB1. plan, prioritize and sequence work operations as per job requirements SB2. organize and analyze information relevant to work SB3. basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time
	<b>Customer Centricity</b>
	The user/individual on the job needs to know and understand how to: SB4. importance of taking responsibility for own work outcomes

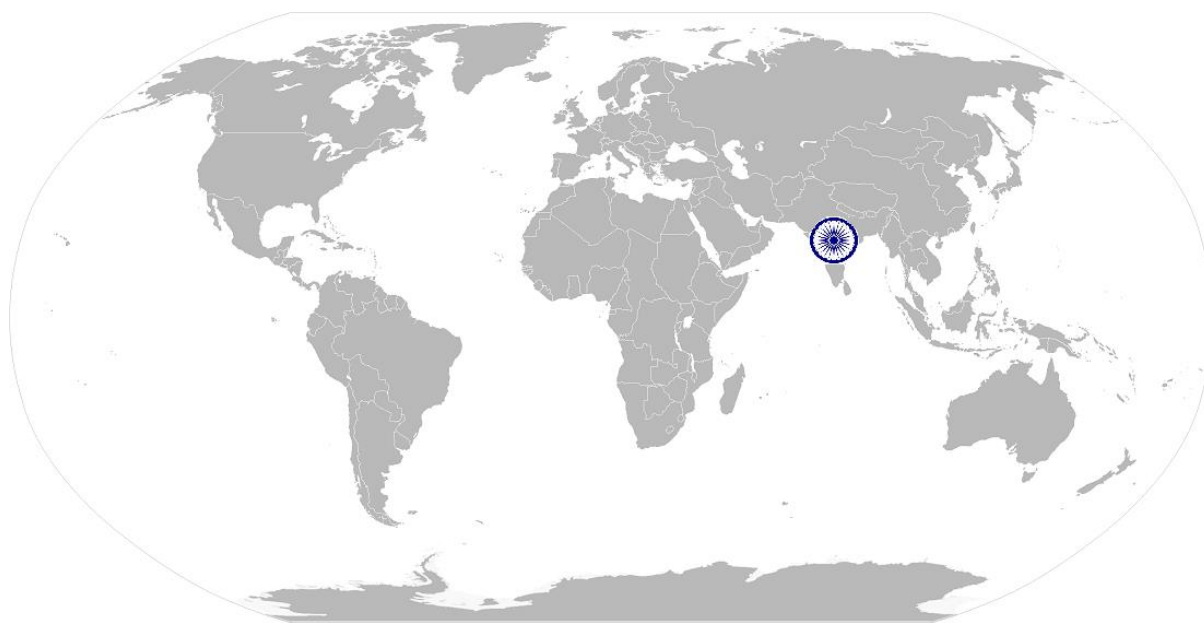
## CSC/N0403 Make or modify 2D piping drawings using computer aided design (CAD) system

	<p>SB5. importance of adherence to work timings, dress code and other organizational policies</p> <p>SB6. importance of following laid down rules, procedures, instructions and policies</p> <p>SB7. importance of exercising restraint while expressing dissent and during conflict situations</p> <p>SB8. how to avoid and manage distractions to be disciplined at work</p> <p>SB9. importance of time management for achieving better results</p> <p>SB10. work in a team in order to achieve better results</p> <p>SB11. identify and clarify work roles within a team</p> <p>SB12. communicate and cooperate with others in the team</p> <p>SB13. seek assistance from fellow team members</p>
	<b>Problem Solving</b>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB14. identify problems with work planning, procedures, output and behavior and their implications</p> <p>SB15. prioritize and plan for problem solving</p> <p>SB16. communicate problems appropriately to others</p> <p>SB17. identify sources of information and support for problem solving</p> <p>SB18. seek assistance and support from other sources to solve problems</p> <p>SB19. identify effective resolution techniques</p> <p>SB20. select and apply resolution techniques</p> <p>SB21. seek evidence for problem resolution</p>
	<b>Analytical Thinking</b>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB22. importance and impact of initiative and enterprise for achieving better results</p> <p>SB23. for self, others and organization</p> <p>SB24. how to undertake and express new ideas and initiatives to others</p> <p>SB25. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses</p> <p>SB27. participate in improvement procedures including process, quality and internal/external customer/supplier relationships</p> <p>SB28. enhance one's competencies in new and different situations and contexts to achieve more</p>
	<b>Critical Thinking</b>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB29. maintain current knowledge of applicable standards, legislation, codes of</p> <p>SB30. practice and product/process developments</p> <p>SB31. participate in on-the-job and other learning, training and development</p> <p>SB32. interventions and assessment</p>



**CSC/N0403 Make or modify 2D piping drawings using computer aided design (CAD) system**

	<p>SB33. clarify task related information with appropriate personnel or technical adviser</p> <p>SB34. seek to improve and modify own work practices</p>
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## CSC/N0403 Make or modify 2D piping drawings using computer aided design (CAD) system

### NOS Version Control

NOS Code	CSC/N0403		
Credits	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	15/01/2016
Industry Sub-sector	1. Machine Tools	Last reviewed on	24/11/2017
	2. Plastics Manufacturing Machinery		
	3. Textile Manufacturing Machinery		
	4. Process Plant Machinery		
	5. Electrical and Power Machinery		
	6. Light Engineering Goods		
Occupation	Design	Next review date	24/11/2021

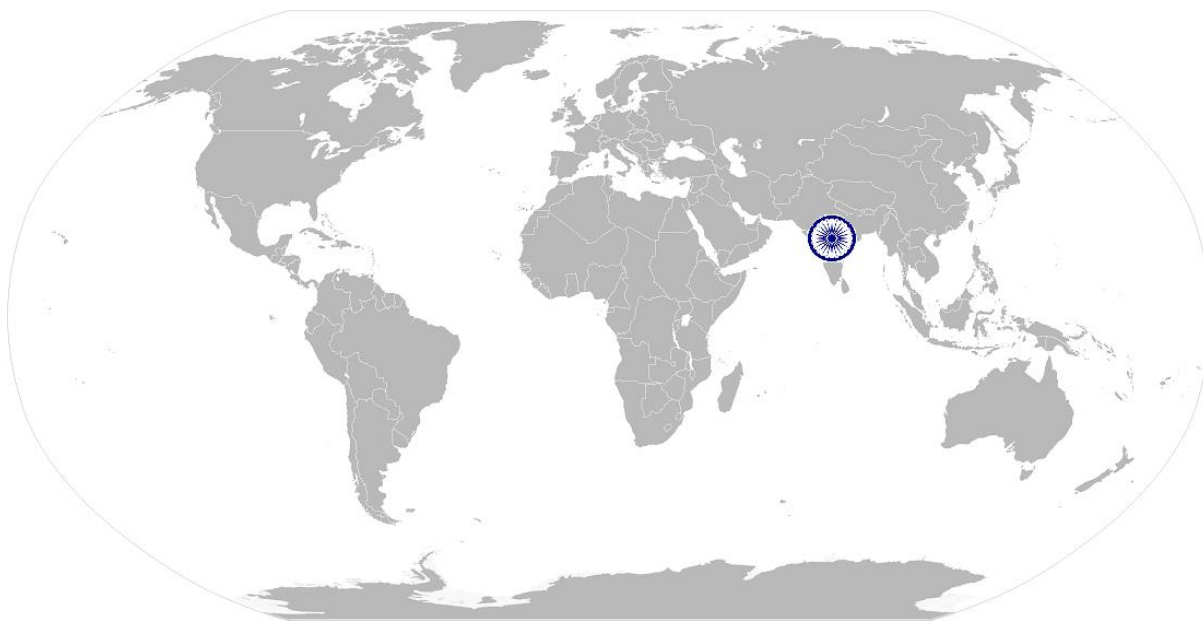


CSC/N1335

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/N1335

Use basic health and safety practices at the workplace

National Occupational Standard

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

**CSC/N1335**

**Use basic health and safety practices at the workplace**

	<p>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> <p>Documents: fire notices, accident reports, safety instructions for equipment</p>
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**CSC/N1335**

**Use basic health and safety practices at the workplace**

	and procedures, company notices and documents, legal documents (eg government notices)
<b>Fire safety</b>	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC14. use the various appropriate fire extinguishers on different types of fires correctly</p> <p>Types of fires: Class A: eg. ordinary solid combustibles, such as wood, paper, cloth, plastic, charcoal, etc.; Class B: flammable liquids and gases, such as gasoline, propane, diesel fuel, tar, cooking oil, and similar substances; Class C: eg. electrical equipment such as appliances, wiring, breaker panels, etc. (These categories of fires become Class A, B, and D fires when the electrical equipment that initiated the fire is no longer receiving electricity); Class D: combustible metals such as magnesium, titanium, and sodium (These fires burn at extremely high temperatures and require special suppression agents)</p> <p>PC15. demonstrate rescue techniques applied during fire hazard</p> <p>PC16. demonstrate good housekeeping in order to prevent fire hazards</p> <p>PC17. demonstrate the correct use of a fire extinguisher</p>
<b>Emergencies, rescue and first-aid procedures</b>	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC18. demonstrate how to free a person from electrocution</p> <p>PC19. administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc.</p> <p>PC20. demonstrate basic techniques of bandaging</p> <p>PC21. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments</p> <p>PC22. perform and organize loss minimization or rescue activity during an accident in real or simulated environments</p> <p>PC23. administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases</p> <p>PC24. demonstrate the artificial respiration and the CPR Process</p> <p>PC25. participate in emergency procedures</p> <p>Emergency procedures: raising alarm, safe/efficient, evacuation, correct means of escape, correct assembly point, roll call, correct return to work</p> <p>PC26. complete a written accident/incident report or dictate a report to another person, and send report to person responsible</p> <p>Incident Report includes details of: name, date/time of incident, date/time of report, location, environment conditions, persons involved, sequence of events, injuries sustained, damage sustained, actions taken, witnesses, supervisor/manager notified</p> <p>PC27. demonstrate correct method to move injured people and others during an emergency</p>

**CSC/N1335 Use basic health and safety practices at the workplace**

Knowledge and Understanding (K)	
<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. 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>
<b>B. Technical Knowledge</b>	<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>



**CSC/N1335 Use basic health and safety practices at the workplace**

	<p>KB15. different methods of extinguishing fire</p> <p>KB16. different materials used for extinguishing fire Materials: 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> <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)</b>	
<b>A. Core Skills/ Generic Skills</b>	<b>Reading 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 an accident/incident report in local language or English
	<b>Writing Skills</b>
	The user/individual on the job needs to know and understand how to:
	SA4. write an accident/incident report in local language or English
<b>B. Professional Skills</b>	<b>Oral Communication (Listening and Speaking skills)</b>
	The user/individual on the job needs to know and understand how to:
	SA5. question coworkers appropriately in order to clarify instructions and other issues
	SA6. give clear instructions to coworkers, subordinates others
	<b>Decision Making</b>
	The user/individual on the job needs to know and understand how to:
	SB1. make appropriate decisions pertaining to the concerned area of work with respect to intended work objective, span of authority, responsibility, laid down procedure and guidelines
	<b>Plan and Organize</b>
	The user/individual on the job needs to know and understand how to:
	SB2. plan and organize their own work schedule, work area, tools, equipment and materials to maintain decorum and for improved productivity
	<b>Customer Centricity</b>

**CSC/N1335**

**Use basic health and safety practices at the workplace**

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



**CSC/N1335      Use basic health and safety practices at the workplace**

## **NOS Version Control**

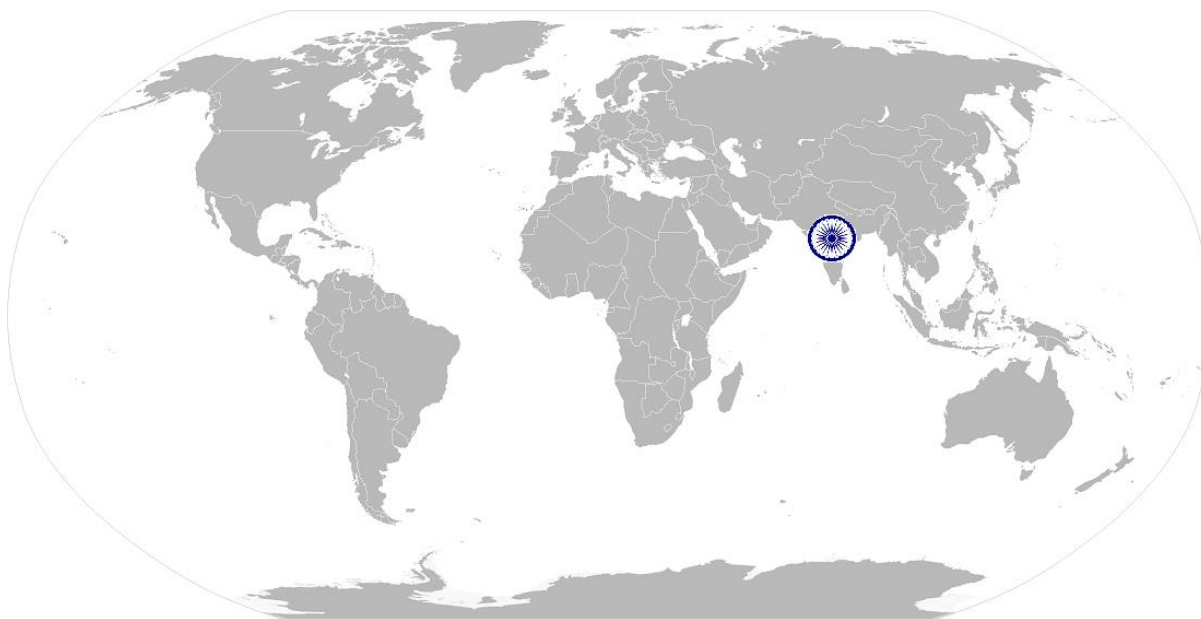
<b>NOS Code</b>	<b>CSC/N1335</b>		
<b>Credits</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
<b>Industry</b>	<b>Capital Goods</b>	<b>Drafted on</b>	<b>15/01/2016</b>
<b>Industry Sub-sector</b>	1. Machine Tools 2. Plastics Manufacturing Machinery 3. Textile Manufacturing Machinery 4. Process Plant Machinery 5. Electrical and Power Machinery 6. Light Engineering Goods	<b>Last reviewed on</b>	<b>24/11/2017</b>
<b>Occupation</b>	<b>Design</b>	<b>Next review date</b>	<b>24/11/2021</b>

CSC/N1336

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/N1336

Work effectively with others

National Occupational Standard	Unit Code	CSC/N1336
	Unit Title (Task)	Work effectively with others
	Description	This unit covers basic etiquette and competencies that a candidate is required to possess and demonstrate in their behavior and interactions with others at the workplace. These cover areas such as communication etiquette, discipline, listening etc.
	Scope	This unit/task covers the following: <ul style="list-style-type: none"> <li>Work effectively with others</li> </ul>
	Performance Criteria(PC) w.r.t. the Scope	
	Element	Performance Criteria
	Work effectively with others	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. receive information accurately and instructions from the supervisor and fellow workers, getting clarification where required</p> <p>PC2. pass information accurately to authorized persons who require it and within agreed timescale and confirm its receipt</p> <p>PC3. give information to others clearly, at a pace and in a manner that helps them to understand</p> <p>PC4. display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible</p> <p>PC5. consult with and assist others to maximize effectiveness and efficiency in carrying out tasks</p> <p>PC6. display appropriate communication etiquette while working Communication etiquette: do not use abusive language; use appropriate titles and terms of respect; do not eat or chew while talking (vice versa)etc.</p> <p>PC7. display active listening skills while interacting with others at work</p> <p>PC8. use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism</p> <p>PC9. demonstrate responsible and disciplined behaviors at the workplace Disciplined behaviors: e.g. punctuality; completing tasks as per given time and standards; not gossiping and idling time; eliminating waste, honesty, etc.</p> <p>PC10. escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict</p>
	Knowledge and Understanding (K)	
	A. Organizational Context (Knowledge of the company /	<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</p>

**CSC/N1336**

**Work effectively with others**

organization and its processes)	<p>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>
<b>B. Technical Knowledge</b>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. various categories of people that one is required to communicate and co-ordinate with in the organization</p> <p>KB2. importance of effective communication in the workplace</p> <p>KB3. importance of teamwork in organizational and individual success</p> <p>KB4. various components of effective communication</p> <p>KB5. key elements of active listening</p> <p>KB6. value and importance of active listening and assertive communication</p> <p>KB7. barriers to effective communication</p> <p>KB8. importance of tone and pitch in effective communication</p> <p>KB9. importance of avoiding casual expletives and unpleasant terms while communicating professional circles</p> <p>KB10. how poor communication practices can disturb people, environment and cause problems for the employee, the employer and the customer</p> <p>KB11. importance of ethics for professional success</p> <p>KB12. importance of discipline for professional success</p> <p>KB13. what constitutes disciplined behavior for a working professional</p> <p>KB14. common reasons for interpersonal conflict</p> <p>KB15. importance of developing effective working relationships for professional success</p> <p>KB16. expressing and addressing grievances appropriately and effectively</p> <p>KB17. importance and ways of managing interpersonal conflict effectively</p>
<b>Skills (S)</b>	
<b>A. Core Skills/ Generic Skills</b>	<b>Reading Skills</b>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. read basic terms and terminologies to accurately interpret work related documents, labels, supervisor instructions in the local language</p> <p>SA2. read and interpret accurate information from various relevant work instructions and records</p>
	<b>Writing Skills</b>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA3. write clear and legible notes to self, colleagues and seniors to pass messages, keep records, prepare to-do lists, take down instructions</p> <p>SA4. write basic numbers, quantities and work related terminology for operational requirements in the local language</p>

**CSC/N1336**

**Work effectively with others**

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

**CSC/N1336**

**Work effectively with others**

## **NOS Version Control**

<b>NOS Code</b>	<b>CSC/N1336</b>		
<b>Credits</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
<b>Industry</b>	<b>Capital Goods</b>	<b>Drafted on</b>	<b>15/01/2016</b>
<b>Industry Sub-sector</b>	<ol style="list-style-type: none"> <li>1. Machine Tools</li> <li>2. Plastics Manufacturing Machinery</li> <li>3. Textile Manufacturing Machinery</li> <li>4. Process Plant Machinery</li> <li>5. Electrical and Power Machinery</li> <li>6. Light Engineering Goods</li> </ol>	<b>Last reviewed on</b>	<b>24/11/2017</b>
<b>Occupation</b>	<b>Design</b>	<b>Next review date</b>	<b>24/11/2021</b>

## Annexure

### Nomenclature for QP and NOS

#### Qualifications Pack

9 characters

[ABC]/ Q 0101

[Insert 3 letter codes for SSC]

Q denoting Qualifications Pack



QP number (2 numbers)

Occupation (2 numbers)

#### Occupational Standard

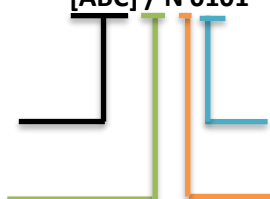
##### An example of NOS with 'N'

9 characters

[ABC] / N 0101

[Insert 3 letter codes for SSC]

N denoting National Occupational Standard



OS number (2 numbers)

Occupation (2 numbers)

[Back to top...](#)



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/Q0403

**Sector Skill Council:** Capital Goods Skill Council

### Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criterion.
6. To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.
7. In case of *unsuccessful completion*, the trainee may seek reassessment on the Qualification Pack.

Compulsory NOS				Marks Allocation	
Total Marks: 300					
Assessment outcomes	Assessment Criteria for outcomes	Total Marks	Out of	Theory	Skills Practical
CSC/N0403 Make or modify 2D piping drawings using computer aided design (CAD) system	PC1.use appropriate sources to obtain the technical information relevant to thedrawing to be created	100	2	0	2
	PC2.ensure that the data and information received is complete and correct		1	0	1
	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 organization 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		2	0	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	2	0	2
PC11.power up the equipment and activate the appropriate drawing software	3	0	3
PC12.set up and check that all peripheral devices are connected and correctly perating	2	0	2
PC13.set the drawing datum at a convenient point	2	0	2
PC14.set up drawing parameters to suit the drawing produced	1	0	1
PC15.check that all the equipment is correctly connected and in a safe and usable working condition	2	0	2
PC16.power up the equipment and activate the appropriate drawing software	3	1	2
PC17.customize system variables, menus and drawing defaults to produce the drawing to the appropriate scale	4	2	2
PC18.develop macros as per approved procedures	4	2	2
PC19.set up drawing parameters to company procedures or to suit the drawing produced	3	1	2
PC20.apply drafting principles to produce a drawing that is consistent with standardoperating procedures within the organization	2	0	2
PC21.apply operating principles and specifications of piping systems and equipmentto drawing	3	0	3
PC22.detail pipes, valves and auxiliary equipment	3	1	2
PC23.indicate vertical and horizontal offsets and hand wheel orientation	4	2	2
PC24.apply health and safety and environmental factors to drawing detail	2	0	2
PC25.ensure drawing/model accurately reflects specifications, is presented according to organizational requirements and contains all relevant information	2	0	2
PC26.create a drawing template to the required standards, which includes all necessary detail	4	2	2
PC27. use appropriate terminologies, codes and other references and techniques to create drawings, in the required formats, that are sufficiently and clearly detailed	4	1	3
PC28.use keyboard command and pull down menus available in common CAD systems	3	1	2
PC29.produce process flow, piping and instrumentation (P&ID) diagrams and isometric and spool drawings	5	2	3

	PC30.produce orthogonal single and double line arrangement drawings of pipe installation systems in accordance with engineer's sketches		4	1	3
	PC31.draw piping layouts, dimension and label the drawing as per approved procedures		3	1	2
	PC32.ensure that drawings are checked and approved by the appropriate person		1	0	1
	PC33.produce hard copies of the finished drawings and check that the drawing is correctly titled and referenced		1	0	1
	PC34.save the drawing to an appropriate storage medium (eg. hard drive, CD/DVD, external storage device)		2	0	2
	PC35.produce a hard copy printout of the drawing for file purposes		2	0	2
	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		3	1	2
	PC37.shut down the CAD system to a safe condition on completion of the drawing activities		2	0	2
	<b>Total</b>		<b>100</b>	<b>24</b>	<b>76</b>
CSC/N1335 Use basic health and safety practices at the workplace	PC1.use protective clothing/equipment for specific tasks and work conditions	100	4	1	3
	PC2.state the name and location of people responsible for health and safety in the workplace		3	1	2
	PC3.state the names and location of documents that refer to health and safety in the workplace		3	1	2
	PC4.identify job-site hazardous work and state possible causes of risk or accident in the workplace		5	2	3
	PC5.carry out safe working practices while dealing with hazards to ensure the safety of self and others		4	2	2
	PC6.state methods of accident prevention in the work environment of the job role		3	2	1
	PC7.state location of general health and safety equipment in the workplace		5	2	3
	PC8.inspect for faults, set up and safely use steps and ladders in general use		5	2	3
	PC9.work safely in and around trenches, elevated places and confined areas		5	2	3
	PC10.lift heavy objects safely using correct procedures		4	2	2
	PC11.apply good housekeeping practices at all times		5	2	3
	PC12.identify common hazard signs displayed in various areas		3	1	2
	PC13.retrieve and/or point out documents that refer to health and safety in the workplace		4	1	3

	PC14.use the various appropriate fire extinguishers on different types of fires correctly		3	1	2
	PC15.demonstrate rescue techniques applied during fire hazard		3	1	2
	PC16.demonstrate good housekeeping in order to prevent fire hazards		4	1	3
	PC17.demonstrate the correct use of a fire extinguisher		4	1	3
	PC18.demonstrate how to free a person from electrocution		4	1	3
	PC19.administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc.		3	1	2
	PC20.demonstrate basic techniques of bandaging		3	1	2
	PC21.respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments		3	1	2
	PC22.perform and organize loss minimization or rescue activity during an accident in real or simulated environments		3	1	2
	PC23.administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases		3	1	2
	PC24.demonstrate the artificial respiration and the CPR Process		3	1	2
	PC25.participate in emergency procedures		4	1	3
	PC26.complete a written accident/incident report or dictate a report to another person, and send report to person responsible		3	1	2
	PC27.demonstrate correct method to move injured people and others during an emergency		4	2	2
	<b>Total</b>		<b>100</b>	<b>36</b>	<b>64</b>
CSC/N1336 Work effectively with others	PC1.receive information accurately and instructions from the supervisor and fellow workers, getting clarification where required	100	10	3	7
	PC2.pass information accurately to authorized persons who require it and within agreed timescale and confirm its receipt		10	3	7
	PC3.give information to others clearly, at a pace and in a manner that helps them to understand		10	3	7
	PC4.display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible		10	3	7
	PC5.consult with and assist others to maximize effectiveness and efficiency in carrying out tasks		10	3	7

	PC6.display appropriate communication etiquette while working		10	3	7
	PC7.display active listening skills while interacting with others at work		10	3	7
	PC8.use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism		10	3	7
	PC9.demonstrate responsible and disciplined behaviors at the workplace		10	3	7
	PC10.escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict		10	3	7
		<b>Total</b>	<b>100</b>	<b>30</b>	<b>70</b>