QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR CAPITAL GOODS INDUSTRY

Contents

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, FICCI,
Federation House,
Tansen Marg,
New Delhi 110 001

E-mail:
inder.gahlaut@ficci.com

Introduction

Qualifications Pack: Production Engineer

SECTOR: CAPITAL GOODS

SUB-SECTOR:

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

OCCUPATION: Shop Floor Management

REFERENCE ID: CSC/ Q 0305

NCO-2004 : NIL

Production Engineer: Plan and organise workplace, resources and processes required for the production and assembly of machinery and components in accordance with approved procedures.

Brief Job Description: It involves the application of skills and knowledge at a specialist level. The range of production processes could include manufacturing operations such as machining, fabrication, welding, material finishing or manufacture, assembly, joining or other activities, such as performance and process improvement.

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/ Q 0305		
Job Role	**Production Engineer**		
Credits NSQF [*OPTIONAL*]		**Version number**	**1.0**
Sector	**CAPITAL GOODS**	**Drafted on**	**24/04/14**
Sub-sector	1. Machine Tools 2. Dies, Moulds And Press Tools 3. Plastics Manufacturing Machinery 4. Textile Manufacturing Machinery	**Last reviewed on**	
Occupation	**SHOP FLOOR MANAGEMENT**	**Next review date**	**30/08/15**

Job Role	Production Engineer
Role Description	Plan and organise workplace, resources and processes required for the production and assembly of machinery and components in accordance with approved procedures.
NSQF level	L5
Minimum Educational Qualifications*	Diploma/Degree – Mechanical/Production related engineering courses
Maximum Educational Qualifications*	
Training (Suggested but not mandatory)	No Previous Training Required
Experience	Minimum 1 year apprenticeship
Applicable National Occupational Standards (NOS)	**Compulsory:** CSC/ N 0305 Plan and organize machinery production and assembly processes CSC/ N 0135 Use basic health and safety practices at the workplace CSC/ N 0136 Work effectively with others **Optional:** 1. Nil
Performance Criteria	As described in the relevant OS units

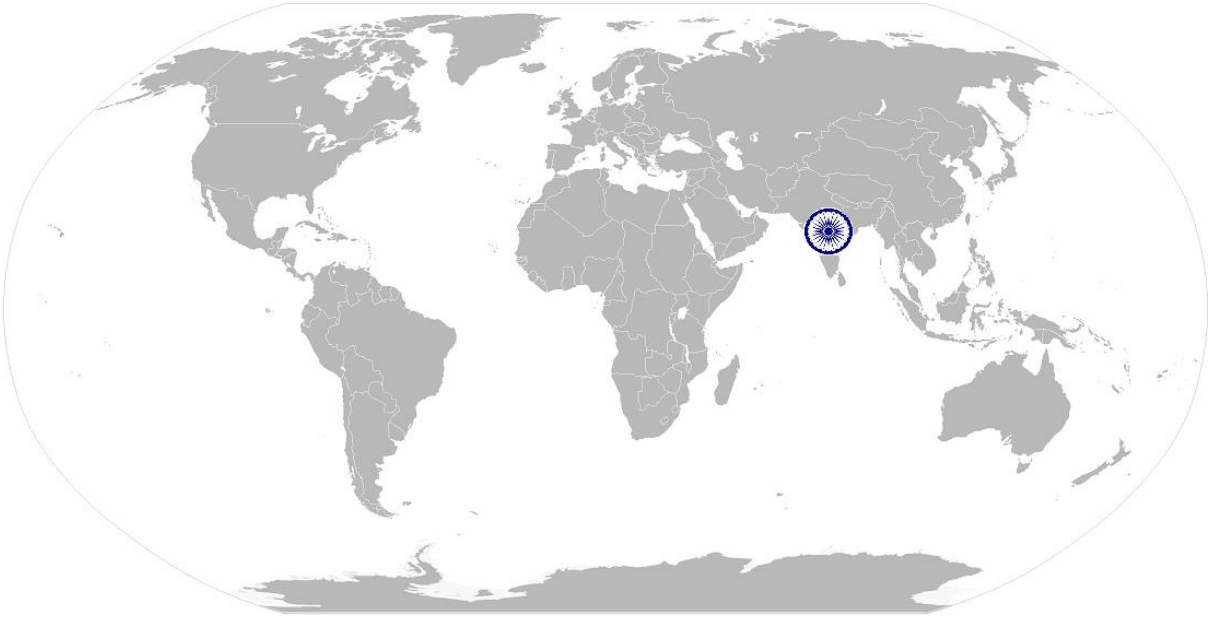
Definitions

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

Acronyms

Keywords /Terms	Description
CO2	Carbon dioxide
CPR	Cardiac pulmonary resuscitation
PPE	Personal protective equipment

National Occupational Standard



Overview

This unit covers the planning and organizing of workplace, resources and processes required for the production and assembly of machinery and components in accordance with approved procedures. It involves the application of skills and knowledge at a specialist level. The range of production processes could include manufacturing operations such as machining, fabrication, welding, material finishing or manufacture, assembly, joining and performance and process improvement.

CSC/ N 0305: Plan and organize machinery production and assembly processes

National Occupational Standard

Unit Code	CSC / N 0305
Unit Title (Task)	**Plan and organize machinery production and assembly processes**
Description	This unit covers the planning and organizing of workplace, resources and processes required for the production and assembly of machinery and components, in accordance with approved procedures. It involves the application of skills and knowledge at a specialist level. The range of production processes could include manufacturing operations such as machining, fabrication, welding, material finishing or manufacture, assembly, joining or other activities, such as productivity, performance and process improvement. It covers the identification of job requirements and resources required, as well as planning and organizing the production processes and activities and implementation as per plan. The candidate will be required to apply appropriate methods to confirm that conditions are suitable for the processes and to ensure that clear instructions are given to the relevant people and discipline at work is maintained. He/she will also be required to ensure that quality assurance and engineering support systems are operating correctly, and that the necessary resources are available. The candidate will be responsible for complying with organizational policy and procedures for ensuring the successful planning and organizing of the production processes, and to report any problems that they cannot personally resolve to the relevant authority. The candidate will be expected to work unsupervised, either on their own or as part of a team, which they may lead or direct, taking full responsibility for their actions, and possibly for the work of colleagues or subordinates. The candidate is required to have knowledge and understanding of general and discipline-specific engineering principles and processes. They will also be fully conversant with organizational procedures and systems. They will understand the engineering processes being implemented, and will know about quality assurance and resource management, in adequate depth to provide a sound basis for carrying out the activities to the required standard. The candidate will be fully aware of any health, safety and environmental requirements, and the appropriate legislative and regulatory frameworks applicable to their area of responsibility. They will be required to ensure that safe working practices are maintained throughout, and will understand the responsibility they owe to themselves and others in the workplace.
Scope	This unit/task covers the following: • Preparation for production and assembly • Resourcing • Developing production plan, schedule and job cards • Confirming that conditions are suitable for production • Implement production processes and activities • Monitor and review the plan

CSC/ N 0305: Plan and organize machinery production and assembly processes

Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Preparation for production and assembly	PC1. obtain specification of the product to be produced from an appropriate authority PC2. obtain details of the required production and assembly activities PC3. review the critical production requirements and quality criteria for each production and assembly activity **Critical production requirements**: specifications of the product to be produced, manpower requirements, material requirement, processes to be run, outsourcing requirements, equipment/component/system performance & life cycle, maintenance and repair, product or process quality PC4. obtain clarification from relevant people on any aspects of the activities that are unclear PC5. discuss and facilitate any changes needed to suit the operational requirements with the relevant people PC6. ensure that methods and procedures used meet relevant regulations and guidelines PC7. define the production requirements and communicate them to the relevant people PC8. record the requirements in the appropriate information systems
Resourcing	PC9. identify production team personnel and contractors required and check for their availability PC10. obtain the resources, based on required skills, using the appropriate organizational procedures and authorizations **Resources**: materials, equipment, information, costing, people, facilities PC11. identify materials, tools, equipment, jigs and other resources required using workplace job information **PC12.** resolve any resource supply or control **issues** **Issues**: e.g. availability (materials, equipment, information, finance, people, facilities); quality (materials, equipment, information, facilities); skills (personnel); time; budgets; safety & environment; etc. PC13. inspect and prepare the materials, tools, equipment, jigs for safe operation PC14. report faulty material, tools, equipment and jigs to appropriate personnel PC15. record all resource data on the appropriate company information system
Developing production plan, schedule and job cards	PC16. develop job cards showing personnel, consumables and resource costs PC17. develop production schedules showing job sequence and estimated start and completion dates PC18. submit job cards and production schedules to the appropriate personnel for approval
Confirming that conditions are suitable for production	PC19. confirm that appropriate authorization is obtained PC20. confirm the availability of resources to relevant team members PC21. confirm to appropriate personnel that materials, processes and the site are duly prepared PC22. confirm that the health, safety and environmental requirements applicable to the production activities are being adhered to

CSC/ N 0305: Plan and organize machinery production and assembly processes

Implement production processes and activities	PC23. provide clear and accurate instructions to all the relevant people PC24. ensure that all support and control systems operate effectively **Support and control systems**: quality assurance systems; transport; logistics; procurement; supervision or leadership structures; utilities; resource supply (such as materials, equipment, personnel); other technical support requirements PC25. ensure that quality assurance systems are correctly implemented PC26. ensure that engineering support systems are operating correctly PC27. control the use of resources to achieve the most effective results PC28. implement production processes that comply with organizational guidelines and procedures, customer standards and requirements or national and international standards or directives **Production processes**: procurement and production planning; raw material processing (cleaning, greasing, heat treatment, etc.); fitting and fabrication of components; subassembly; assembly; trial and testing; finishing; coordination with design, planning, procurement, vendors, quality, industrial engineering and customer interface PC29. identify opportunities to improve the production processes and activities and forward to relevant authorities PC30. report and communicate production processes and activities implemented through various company media **Media for reporting and communication**: e.g. verbal report, electronic mail, computer generated report, specific company form, visual display system, etc. PC31. record the implementation process on appropriate company media **Media for recording the process**: e.g. verbal report, electronic mail, computer generated report, specific company forms, visual display system, etc. PC32. conduct an evaluation of the effectiveness of the implementation process PC33. identify and record any deviations from specifications of the implemented activity PC34. ensure that the implementation of production processes and activities complies with all relevant regulations, directives and guidelines
Monitor and review the plan	PC35. inspect personnel, resources and timelines for production and confirm according to workplace procedures and requirements PC36. identify potential production problems and action according to workplace procedures PC37. put permanent corrective action in place to resolve production problems as per organizational procedure PC38. enhance productivity by adopting a number of appropriate measures (eg. automation, motivation, process planning, resource planning) PC39. inform appropriate personnel of production progress in a timely manner PC40. monitor production for quality, budget and time schedule PC41. ensure that work area and tools are cleaned and inspected according to workplace procedures PC42. complete job documentation according to workplace procedures

CSC/ N 0305: Plan and organize machinery production and assembly processes

Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. health, safety and environmental requirements applicable to the engineering activities to be carried out KA2. type of impact the implementation could have on the organization KA3. company information systems, the importance of using them and how to record data to the system KA4. documentation to be completed KA5. responsibilities with regard to the reporting lines and procedures in the working area KA6. how to obtain and interpret legislative and regulatory documentation KA7. how to obtain and interpret company policy and procedures KA8. relevant reporting procedures, documentation and their application KA9. extent of their own authority, and to whom they should report to if they have problems that they cannot resolve
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. quality assurance systems that are being used KB2. how to determine the necessary resources KB3. procedures for obtaining and issuance of resources KB4. types of issue that could occur when obtaining resources, and how to resolve them KB5. how to obtain details of the production processes and activities being implemented **Production processes**: procurement and production planning; raw material processing (cleaning, greasing, heat treatment, etc.); fitting and fabrication of components; subassembly; assembly; trial and testing; finishing; coordination with design, planning, procurement, vendors, quality, industrial engineering and customer interface KB6. methods and procedures that could be used for different types of production processes and activities KB7. conditions that are suitable and unsuitable for different types of production processes and activities KB8. quality assurance systems that are being used KB9. engineering support systems that are operating KB10. different and most appropriate ways of instructing people on the engineering process or processes KB11. types of recommendation that could emerge from evaluation of the implemented engineering process KB12. how to obtain and interpret information on regulations, directives and guidelines KB13. difference between the abbreviations and notation used on various standard engineering drawings, circuit diagrams or piping layouts KB14. interpret and use the information that can be extracted from reference charts, tables, graphs and standards applicable KB15. use of databases and spreadsheets to display information KB16. basic principles of document control KB17. interpret drawings, dimensioning and labelling

	KB18. how to use engineering drawings to assess material requirements for the job and their quality requirements KB19. critically compare materials from a range found in fabrication engineering KB20. forms of supply of materials available KB21. criteria used for the selection of materials for a given application KB22. different material structures and variation in properties that result from the same KB23. requirements for the heat treatment of metals KB24. difference between characteristics of metallic and non-metallic materials used in engineering KB25. how carbon and alloying elements affect the properties of carbon and low alloy steels KB26. how heat treatments can affect the properties of carbon and low alloy steels KB27. causes of defects that can occur in materials/products and the importance of controlling them KB28. how to select materials to meet specification requirements in a typical engineering environment KB29. classification of bolting methods from a range found in fabrication engineering KB30. classification of mechanical fastenings applied to thin plate fabrication engineering KB31. reasons for and the methods available to protect metal surfaces prior to and after assembly KB32. classification of joint configurations from a range found in fabrication engineering KB33. benefits of using jigs and fixtures KB34. use of adhesive bonding in the joining of fabricated assemblies KB35. calculate joining allowances KB36. difference between features of welded joints KB37. how to apply weld dimensions to weld symbols KB38. reasons for types of distortion due to welding KB39. methods of distortion control and rectification KB40. explain the residual stress effects of welding KB41. range of machine tools available in terms of size, capacity, accuracy and production capability KB42. structural requirements of a range of common machine tools KB43. common methods of mounting machine tools KB44. importance of alignment in machine tools and methods to achieve it KB45. operating principles of computer numerically controlled machine tools KB46. Basic CAD/CAM design concepts KB47. how to produce a part-programme to demonstrate the relative work/tool movement of a CNC machine tool KB48. how to prove the part-programme using simulation software KB49. critically compare CNC machine tools against non-CNC machine tools KB50. how to evaluate cutting tools materials for given applications (CNC and non-CNC) KB51. differences between types of maintenance carried out on machine tools KB52. maintenance programme for a typical machine tool

	KB53. what would be included in a lubrication chart for a typical machine tool workshop KB54. classification of coolants and lubricants applicable to machine tool systems KB55. classification of methods of application for common surface coatings KB56. commissioning/maintenance procedures carried out on machine tools KB57. define the term quality and apply quality to contexts/perceptions KB58. define the terms inspection and quality control KB59. principles of quality control and inspection KB60. need for materials and components, inward inspection and correct documentation KB61. function of an incoming raw materials inspection department KB62. need for validating and calibrating test and measuring equipment KB63. how to check equipment is approved for use and how to take appropriate action to return/report equipment that has passed its approval date KB64. use of engineering standards in determining the fitness of purpose of items/equipment used in engineering production, construction and maintenance KB65. appropriate action to take when required standards of performance are not met KB66. limits of authority in respect of re-working, adjusting or scrapping a component/product KB67. need to inform a responsible person of the variation from the stated standard KB68. need to document all actions agreed upon and taken KB69. importance of quality records and the type of inspection records needed KB70. purpose of the ISO 9000 series of standards KB71. how to complete quality documents/records of work carried out and record test/inspection results KB72. interpret results from quality measurements and compare them with stated parameters KB73. make recommendations whether to re-work, adjust or scrap items/components that do not meet required standards KB74. Material handling equipments eg. crane, lifts
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	**Communication**
	The user/ individual on the job needs to know and understand how to: SA1. read, interpret, follow and communicate information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents SA2. produce sketches, diagrams, charts or graphs SA3. check and clarify task-related information SA4. recognize and use common mechanical engineering terminology and symbols SA5. liaise with appropriate authorities SA6. convey information in a clear, precise manner SA7. organizational protocols for communication between and with different personnel
	Numerical and Computational Ability

	SA8. undertake numerical operations, geometry and calculations/ formulae **arithmetic**: addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages SA9. use appropriate measuring techniques SA10. express numerical solutions to a degree of accuracy that is appropriate to the value being calculated **degree of accuracy**: correct to three significant figures, correct to two decimal places, express a decimal fraction in standard form, express tolerance in terms of limits of size SA11. use a calculator to raise a number to a power and determine square roots SA12. use formulae to complete transpositions and solve problems **transpositions**: involving addition, subtraction, multiplication and division in any combination using a maximum of three terms, for example Ohm's Law, substitution of known values SA13. use algebraic expressions to solve linear equations SA14. plot and interpret straight line graphs SA15. apply pythagoras' theorem to perform calculations SA16. explain how to use sine, cosine and tangent to solve typical engineering problems **sine, cosine and tangent**: state their ratios for angles up to 90°, determine their values for given angles up to 90°, solve simple problems SA17. define density and relative density and solve related problems using formula SA18. define moments of a force and solve related problems using formula **moments of a force**: define and apply the 'Principle of Moments', define the meanings of the terms 'torque' & 'couple' SA19. define work, power and energy and solve related problems using formula **work, power and energy**: explain what is meant by energy; state that the unit of energy is the joule (J), the unit of power is the watt (W) and the unit of work is the joule (J); define power in terms of voltage/current and work done per second, perform calculations for work, power and energy, levers and couples work, power and energy, define work done in terms of force and distance moved SA20. define friction and solve related problems using formula **friction:** definition, explain coefficient of friction, explain how friction can be reduced, select materials that will rotate, or slide together with low frictional value, perform calculations for friction SA21. describe the relationship between temperature changes and changes in length **temperature:** define coefficient of expansion, solve numerical problems to determine the change in length due to temperature SA22. define types of heat and solve related problems using formula **heat:** define specific heat capacity, specific latent heat (fusion, evaporation) solve numerical problems associated with specific heat capacity, specific latent heat of fusion, specific latent heat of evaporation
	Learning

	The user/individual on the job needs to know and understand how to: SA23. check and clarify task related information with appropriate personnel or technical adviser SA24. identify customers' requirements with respect to the operation or quality of the product or service SA25. assess and modify own work practices SA26. use manuals, online help and other reference materials such as catalogues/lists as required SA27. maintain current knowledge of applicable standards, legislation, codes of practice and product/process developments SA28. assist with on the job training and assessment
	Computer Basics
	The user/individual on the job needs to know and understand how to: SA29. perform basic operations in a computer like switching it on/off, using the mouse and keyboard, accessing files, opening, closing, creating and deleting folders, etc. SA30. use basic office applications like spread sheet, word processor, presentations SA31. use ERP software and other organizational software specific to quality function SA32. use email to communicate within the organization as per organization guidelines SA33. retrieve and enter data using standard system forms and templates SA34. take printouts of documents
B. Professional Skills	**Problem Solving**
	The user/individual on the job needs to know and understand how to: SB1. inspect quality of own or other employee's work SB2. analyze information according to enterprise and work requirements SB3. assess operation and condition of components against specifications or manufacturer's requirements SB4. use diagnostic skills and tests to identify and determine causes of faults, including interpretation of in-built fault indicators and error codes SB5. develop, implement and evaluate solutions to problems SB6. translate designs into practical outcomes
	Plan and Organize
	The user/individual on the job needs to know and understand: SB7. plan, prioritize and sequence work operations/ complete activities/ scheduled production SB8. how to allocate and agree responsibilities with team members SB9. how to monitor the progress and quality of work in own area of responsibility and provide feedback SB10. how to review and amend plans of work for own area of responsibility and communicate changes
	Performance Management
	The user/individual on the job needs to know and understand: SB11. legal requirements, industry regulations, organisational policies and professional codes concerning performance

CSC/ N 0305: Plan and organize machinery production and assembly processes

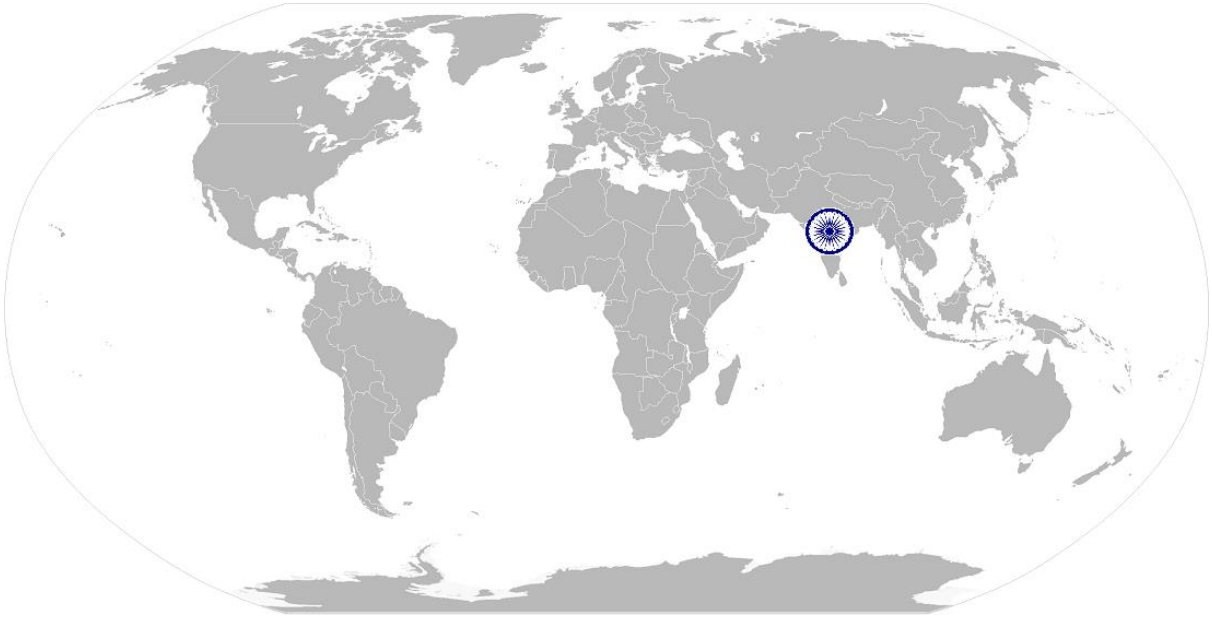
	SB12. standards of performance required for current or future role to team members SB13. how to identify performance problems of team members SB14. communicate and address the performance development needs for the individual SB15. available options available to support an individual in meeting desired standards of performance SB16. process for an individual to create a development plan SB17. how to monitor and evaluate an individual's progress against their development plan SB18. how to incorporate feedback to make development plan revisions SB19. how to encourage individuals to take responsibility for continuing their performance development
	Compliance and Risk Management
	The user/individual on the job needs to know and understand how to: SB20. monitor the operational compliance of procedures in meeting legal, regulatory, ethical and social requirements SB21. identify areas of non-compliance with legal, regulatory, ethical and social procedures SB22. examine reasons for non-compliance with procedures SB23. make recommendations for corrections to ensure compliance with procedures SB24. identify information from own area of responsibility to review the risk management process SB25. assess the effectiveness of the risk management process SB26. implement changes to the risk management process where SB27. potential improvements have been identified
	Team Building
	The user/individual on the job needs to know and understand how to: SB28. understand the purpose and required attributes of a team and select those that match the team's requirements SB29. be able to induct team members and communicate their roles and responsibilities SB30. understand how to support team development SB31. manage team performance using a range of methods

CSC/ N 0305: Plan and organize machinery production and assembly processes

NOS Version Control

NOS Code	**CSC / N 0305**		
Credits NSQF [*OPTIONAL*]		**Version number**	**1.0**
Industry	**Capital Goods**	**Drafted on**	**14/04/14**
Industry Sub-sector	1. Machine Tools 2. Tools Dies And Press Tools 3. Plastics Manufacturing Machinery 4. Textile Manufacturing Machinery	**Last reviewed on**	
		Next review date	**30/08/15**

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 0135: Use basic health and safety practices at the workplace

National Occupational Standard

Unit Code	CSC / N 0135
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. It includes understanding of risks and hazards in the workplace, along with common techniques to minimize risk, deal with accidents, emergencies, etc. It covers knowledge of fire safety, common first aid applications, safe practices and emergency procedures.
Scope	This unit/task covers the following: • 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	The user/individual on the job should be able to: PC1. use protective clothing/equipment for specific tasks and work conditions **Protective clothing**: leather or asbestos gloves, flame proof aprons, flame proof overalls buttoned to neck, cuffless (without folds), trousers, reinforced footwear, helmets/hard hats, cap and shoulder covers, ear defenders/plugs, safety boots, knee pads, particle masks, glasses/goggles/visors **Equipment**: hand shields, machine guards, residual current devices, shields, dust sheets, respirator PC2. state the name and location of people responsible for health and safety in the workplace PC3. state the names and location of documents that refer to health and safety in the workplace PC4. identify job-site hazardous work and state possible causes of risk or accident in the workplace **Hazards**: 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.)

CSC/ N 0135: Use basic health and safety practices at the workplace

	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) PC5. carry out safe working practices while dealing with hazards to ensure the safety of self and others **Safe working practices**: using protective clothing and equipment; putting up and reading safety signs; handle tools in the correct manner and store and maintain them properly; keep work area clear of clutter, spillage and unsafe object lying casually; while working with electricity take all electrical precautions like insulated clothing, adequate equipment insulation, use of control equipment, dry work area, switch off the power supply when not required, etc.; safe lifting and carrying practices; use equipment that is working properly and is well maintained; take due measures for safety while working in confined places, trenches or at heights, etc. including safety harness, fall arrestors, etc. PC6. state methods of accident prevention in the work environment of the job role **Methods of accident prevention**: training in health and safety procedures; using health and safety procedures; use of equipment and working practices (such as safe carrying procedures); safety notices, advice; instruction from colleagues and supervisors PC7. state location of general health and safety equipment in the workplace **General health and safety equipment**: fire extinguishers; first aid equipment; safety instruments and clothing; safety installations(eg fire exits, exhaust fans) PC8. inspect for faults, set up and safely use steps and ladders in general use **Ladder faults**: corrosion of metal components, deterioration, splits and cracks timber components, imbalance, loose rungs, missing/ unfixed nuts or bolts, etc. **Ladders set up**: firm/level base, clip/lash down, leaning at the correct angle, etc. PC9. work safely in and around trenches, elevated places and confined areas PC10. lift heavy objects safely using correct procedures PC11. apply good housekeeping practices at all times **Good housekeeping practices**: clean/tidy work areas, removal/disposal of waste products, protect surfaces PC12. identify common hazard signs displayed in various areas **Various areas**: on chemical containers; equipment; packages; inside buildings; in open areas and public spaces, etc. PC13. retrieve and/or point out documents that refer to health and safety in the workplace

	Documents: fire notices, accident reports, safety instructions for equipment and procedures, company notices and documents, legal documents (eg government notices)
Fire safety	The user/individual on the job should be able to: PC14. use the various appropriate fire extinguishers on different types of fires correctly **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) PC15. demonstrate rescue techniques applied during fire hazard PC16. demonstrate good housekeeping in order to prevent fire hazards PC17. demonstrate the correct use of a fire extinguisher
Emergencies, rescue and first-aid procedures	The user/individual on the job should be able to: PC18. demonstrate how to free a person from electrocution PC19. administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc. PC20. demonstrate basic techniques of bandaging PC21. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments PC22. perform and organize loss minimization or rescue activity during an accident in real or simulated environments 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 PC24. demonstrate the artificial respiration and the CPR Process PC25. participate in emergency procedures **Emergency procedures**: raising alarm, safe/efficient, evacuation, correct means of escape, correct assembly point, roll call, correct return to work PC26. complete a written accident/incident report or dictate a report to another person, and send report to person responsible **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 PC27. demonstrate correct method to move injured people and others during an emergency
Knowledge and Understanding (K)	

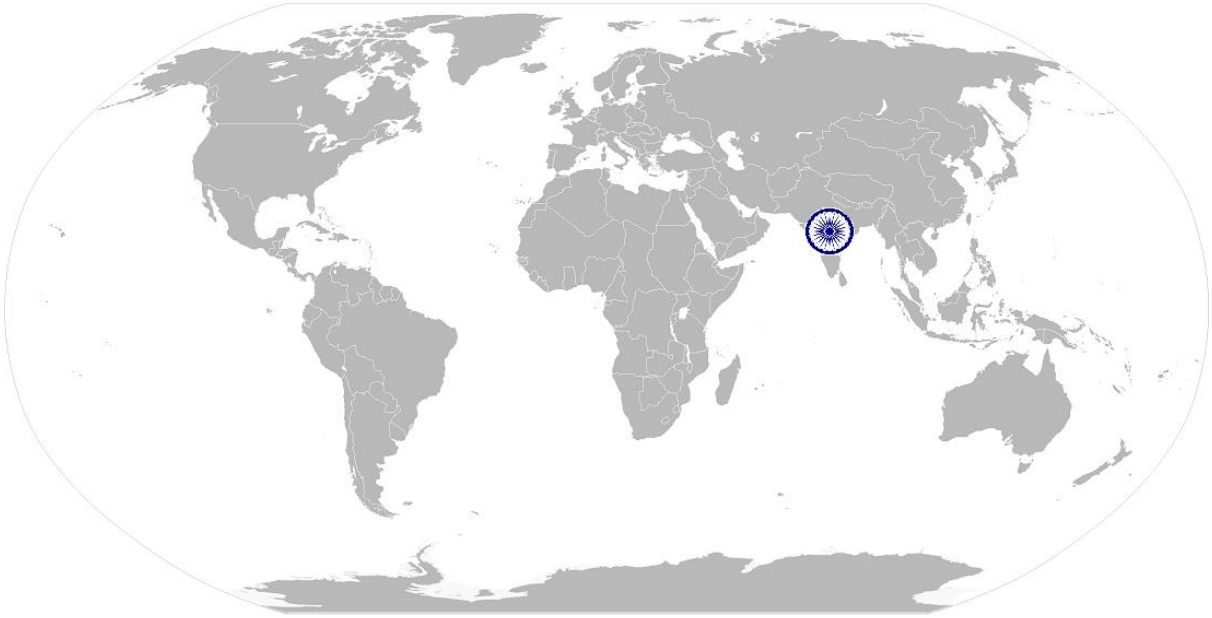
CSC/ N 0135: Use basic health and safety practices at the workplace

A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. names (and job titles if applicable), and where to find, all the people responsible for health and safety in a workplace. KA2. names and location of documents that refer to health and safety in the workplace.
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. meaning of "hazards" and "risks" KB2. health and safety hazards commonly present in the work environment and related precautions KB3. possible causes of risk, hazard or accident in the workplace and why risk and/or accidents are possible 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) 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 KB6. safe working practices when working with tools and machines KB7. safe working practices while working at various hazardous sites KB8. where to find all the general health and safety equipment in the workplace KB9. various dangers associated with the use of electrical equipment 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 KB11. importance of using protective clothing/equipment while working KB12. precautionary activities to prevent the fire accident KB13. various causes of fire **Causes of fires**: heating of metal; spontaneous ignition; sparking; electrical heating; loose fires (smoking, welding, etc.); chemical fires; etc. KB14. techniques of using the different fire extinguishers KB15. different methods of extinguishing fire KB16. different materials used for extinguishing fire **Materials**: sand, water, foam, CO2, dry powder KB17. rescue techniques applied during a fire hazard KB18. various types of safety signs and what they mean

	KB19. appropriate basic first aid treatment relevant to the condition eg. shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries KB20. content of written accident report KB21. potential injuries and ill health associated with incorrect manual handing KB22. safe lifting and carrying practices KB23. personal safety, health and dignity issues relating to the movement of a person by others KB24. potential impact to a person who is moved incorrectly
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 worksmanship and authority
	Problem Solving

CSC/ N 0135: Use basic health and safety practices at the workplace

	The user/individual on the job needs to know and understand how to: SB7. think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s) SB8. identify immediate or temporary solutions to resolve delays SB9. identify sources of support that can be availed of for problem solving for various kind of problems SB10. seek appropriate assistance from other sources to resolve problems SB11. report problems that you cannot resolve to appropriate authority
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB12. identify cause and effect relations in their area of work SB13. use cause and effect relations to anticipate potential problems and their solution

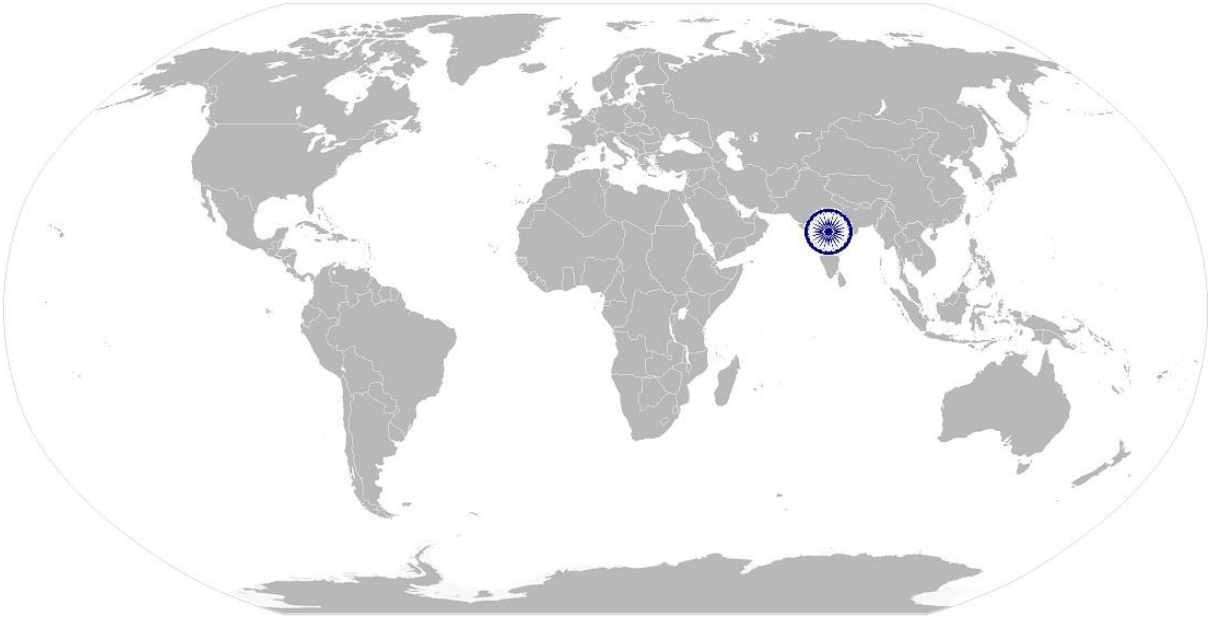


CSC/ N 0135: Use basic health and safety practices at the workplace

NOS Version Control

NOS Code	**CSC / N 0135**		
Credits(NSQF) [*OPTIONAL*]		**Version number**	**1.0**
Industry	**Capital Goods**	**Drafted on**	**10/04/14**
Industry Sub-sector	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**	
		Next review date	**30/08/15**

National Occupational Standard



Overview

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

CSC/ N 0136: Work effectively with others

National Occupational Standard

Unit Code	**CSC / N 0136**
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, handling conflict and grievances.
Scope	This unit/task covers the following: • Working with others

Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria**
Working with others	The user/individual on the job should be able to: PC1. accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required PC2. accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt PC3. give information to others clearly, at a pace and in a manner that helps them to understand PC4. display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible PC5. consult with and assist others to maximize effectiveness and efficiency in carrying out tasks 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. PC7. display active listening skills while interacting with others at work PC8. use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism 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. PC10. escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict

Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions KA2. reporting structure, inter-dependent functions, lines and procedures in the work area KA3. relevant people and their responsibilities within the work area KA4. escalation matrix and procedures for reporting work and employment related issues

CSC/ N 0136: Work effectively with others

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

CSC/ N 0136: Work effectively with others

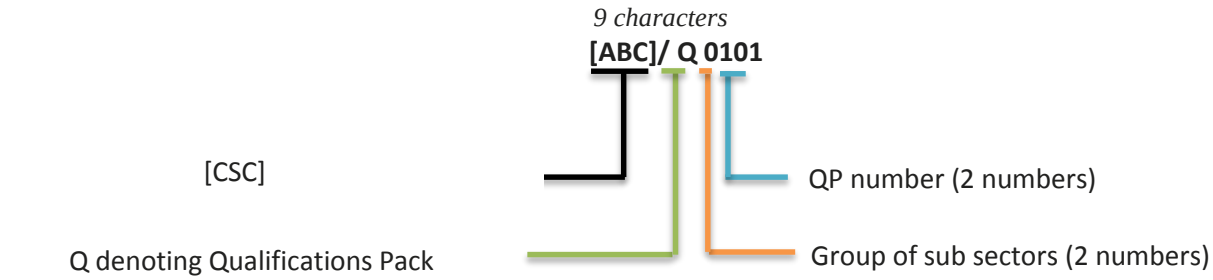
NOS Version Control

NOS Code	**CSC / N 0136**		
Credits(NSQF) [*OPTIONAL*]		**Version number**	**1.0**
Industry	**Capital Goods**	**Drafted on**	**10/04/14**
Industry Sub-sector	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 Machinery **7.** Light Engineering Goods	**Last reviewed on**	
		Next review date	**30/08/15**

Annexure

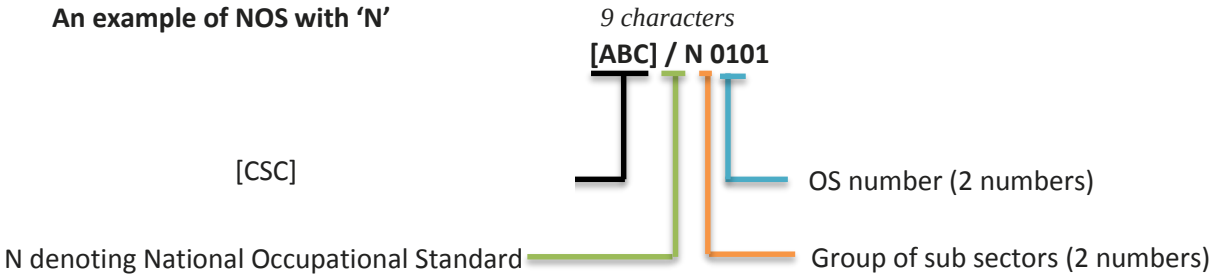
Nomenclature for QP and NOS

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 **Q**P or **N**OS	Q or N
Next two numbers	Occupation code	01
Next two numbers	OS number	01

[Back to top…](#)

ASSESSMENT CRITERIA

		Weightage
CSC/ N 0305	Plan and organize machinery production and assembly processes	70
CSC/ N 0135	Use basic health and safety practices at the workplace	20
CSC/ N 0136	Work effectively with others	10
		100

		Marks Allocated	
CSC/ N 0305	Plan and organize machinery production and assembly processes	**Theory**	**Practical**
Preparation for production and assembly	PC1. obtain specification of the product to be produced from an appropriate authority	1	1
	PC2. obtain details of the required production and assembly activities	1	1
	PC3. review the critical requirements and quality criteria for each production and assembly activity	1	2
	PC4. obtain clarification from relevant people on any aspects of the activities that are unclear	1	1
	PC5. discuss and facilitate any changes needed to suit the operational requirements with the relevant people	1	2
	PC6. ensure that methods and procedures used meet relevant regulations and guidelines	1	1
	PC7. define the production requirements and communicate them to the relevant people	1	2
	PC8. record the requirements in the appropriate information systems	1	1
		8	11
Resourcing	PC9. identify production team personnel and contractors required and check for their availability	1	1
	PC10. obtain the resources, based on required skills, using the appropriate organizational procedures and authorizations	1	1
	PC11. identify materials, tools, equipment, jigs and other resources required using workplace job information	1	1
	PC12. resolve any resource supply or quality issues	1	1
	PC13. inspect and prepare the materials, tools, equipment, jigs for safe operation	1	2
	PC14. report faulty material, tools, equipment and jigs to appropriate personnel	1	1
	PC15. record all resource data on the appropriate company information system	1	2
		7	9
Developing production plan, schedule and job cards	PC16. develop job cards showing personnel, consumables and resource costs	1	3
	PC17. develop production schedules showing job sequence and estimated start and completion dates	2	4
	PC18. submit job cards and production schedules to the appropriate personnel for approval	2	2
		5	9
	PC19. confirm that appropriate authorization is obtained	1	1

Confirming that conditions are suitable for production	PC20. confirm the availability of resources to relevant team members	1	3
	PC21. confirm to appropriate personnel that materials, processes and the site are duly prepared	1	3
	PC22. confirm that the health, safety and environmental requirements applicable to the production activities are being adhered to	1	3
		4	10

Implement production processes and activities	PC23. provide clear and accurate instructions to all the relevant people	1	3
	PC24. ensure that quality assurance systems are correctly implemented	2	2
	PC25. ensure that engineering support systems are operating correctly	2	2
	PC26. control the use of resources to achieve the most effective results	1	3
	PC27. ensure that all support and control systems operate effectively	2	2
	PC28. identify opportunities to improve the production processes and activities and forward to relevant authorities	1	2
	PC29. implement engineering processes that comply with organizational guidelines and procedures, customer standards and requirements or national and international standards or directives	1	2
	PC30. record the implementation process on appropriate company media	1	1
	PC31. conduct an evaluation of the effectiveness of the implementation process	1	1
	PC32. identify and record any deviations from specifications of the implemented activity	1	1
	PC33. ensure that the implementation of production processes and activities complies with all relevant regulations, directives and guidelines	1	1
	PC34. report and communicate production processes and activities implemented	1	1
		15	21

Monitor and review the plan	PC35. inspect personnel, resources and timelines for production and confirm according to workplace procedures and requirements	1	3
	PC36. identify potential production problems and action according to workplace procedures	2	1
	PC37. put permanent corrective action in place to resolve production problems as per organizational procedure	1	1
	PC38. enhance productivity by adopting a number of appropriate measures (eg. automation, motivation, process planning, resource planning)	2	1
	PC39. inform appropriate personnel of production progress in a timely manner	1	1
	PC40. monitor production for quality, budget and time schedule	1	1
	PC41. ensure that work area and tools are cleaned and inspected according to workplace procedures	1	1

	PC42. complete job documentation according to workplace procedures	1	1
		10	**10**
		41	**59**
		100	

CSC/ N 0135	Use basic health and safety practices at the workplace	Marks Allocation	
		Theory	**Practical**
Health and safety	PC1. use protective clothing/equipment for specific tasks and work conditions	2	3
	PC2. state the name and location of people responsible for health and safety in the workplace	1	2
	PC3. state the names and location of documents that refer to health and safety in the workplace	1	2
	PC4. identify job-site hazardous work and state possible causes of risk or accident in the workplace	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	2	2
	PC6. state location of general health and safety equipment in the workplace	2	1
	PC7. inspect for faults, set up and safely use steps and ladders in general use	2	3
	PC8. work safely in and around trenches, elevated places and confined areas	2	3
	PC9. lift heavy objects safely using correct procedures	2	3
	PC10. apply good housekeeping practices at all times	2	2
	PC11. identify common hazard signs displayed in various areas	2	3
	PC12. retrieve and/or point out documents that refer to health and safety in the workplace	1	2
Fire safety	PC13. use the various appropriate fire extinguishers on different types of fires correctly	2	2
	PC14. demonstrate rescue techniques applied during fire hazard	2	2
	PC15. demonstrate good housekeeping in order to prevent fire hazards	2	1
	PC16. demonstrate the correct use of a fire extinguisher	2	2
Emergencies, rescue and first-aid procedures	PC17. demonstrate how to free a person from electrocution	1	3
	PC18. administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc.	1	3
	PC19. demonstrate basic techniques of bandaging	1	2
	PC20. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments	2	2
	PC21. perform and organize loss minimization or rescue activity during an accident in real or simulated environments	2	1
	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	1	2

	PC23. demonstrate the artificial respiration and the CPR Process	1	2
	PC24. participate in emergency procedures	2	1
	PC25. complete a written accident/incident report or dictate a report to another person, and send report to person responsible	1	3
	PC26. demonstrate correct method to move injured people and others during an emergency	1	3
		42	58
		100	

CSC/ N 0136 Work effectively with others

Work effectively with others	PC1. accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	3	7
	PC2. accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt	3	7
	PC3. give information to others clearly, at a pace and in a manner that helps them to understand	3	7
	PC4. display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible	3	7
	PC5. consult with and assist others to maximize effectiveness and efficiency in carrying out tasks	3	7
	PC6. display appropriate communication etiquette while working	3	7
	PC7. display active listening skills while interacting with others at work	3	7
	PC8. use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism	3	7
	PC9. demonstrate responsible and disciplined behaviors at the workplace	3	7
	PC10. escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict	3	7
		30	**70**
		100	