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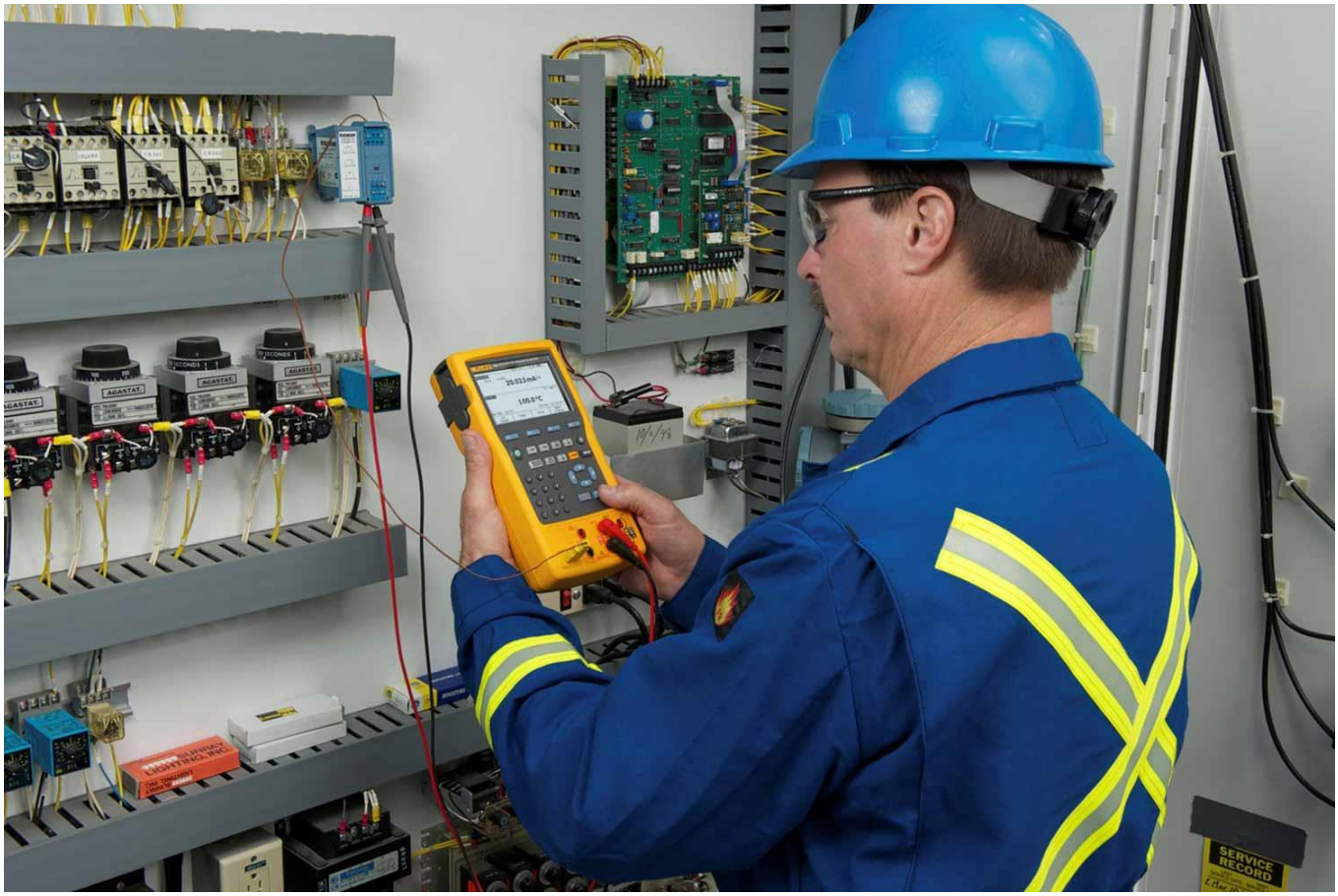
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

Qualification Pack

Transforming the skill landscape



Calibration Technician

QP Code: CSC/Q0801

Version: 2.0

NSQF Level: 4

Capital Goods Skill Council || Awfice Space Solutions Pvt. Ltd, 1st Floor, L-29, Outer Circle, Connaught Place
New Delhi – 110001

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CSC/Q0801: Calibration Technician

Brief Job Description

A Calibration Technician is responsible for setting, adjusting, validating mechanical, pneumatic, hydraulic, electrical, electronic measuring and control instruments using the relevant reference standards as per the applicable procedures.

Personal Attributes

The individual must be physically fit to work for long durations with concentration. The person must have basic numerical abilities along with basic oral and written communication skills. The individual must be able to able to take decisions independently and work in coordination with others. The ability to identify and resolve problems quickly is another important requirement in the job role.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. CSC/N1335: Follow the health and safety practices at work
2. CSC/N1336: Coordinate with co-workers to achieve work efficiency
3. CSC/N0801: Calibrate hydraulic, pneumatic and mechanical measuring and control equipment
4. CSC/N0802: Calibrate electrical and electronic measuring and control equipment

Qualification Pack (QP) Parameters

Sector	Capital Goods
Sub-Sector	Machine Tools, Plastics Manufacturing Machinery, Textile Manufacturing Machinery, Process Plant Machinery, Electrical and Power Machinery, Light Engineering Goods
Occupation	Calibration and Instrumentation
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7311.67

Minimum Educational Qualification & Experience	8th Class Pass + ITI (2years) with 2 years of experience in the relevant field OR 10th Class Pass with 2 years of experience in the relevant field OR 10th Class Pass + ITI (1 year) with 1 year of experience in the relevant field OR 10th Class Pass + ITI (2 years) OR 12th Class Pass with 6 months of experience in the relevant field OR Certified in NSQF-L3 Operator - Calibration and Instrumentation with 2 years of experience in the relevant field
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	
Next Review Date	
Deactivation Date	
NSQC Approval Date	
Version	2.0
Reference code on NQR	2015/CCM/GCSC/00252
NQR Version	1.0

CSC/N1335: Follow the health and safety practices at work

Description

This OS unit is about following the appropriate health and safety practices at work. It covers responsibilities towards self and others to ensure a safe work environment.

Scope

This unit/task covers the following:

- Maintain personal health and safety
- Assist in hazard management
- Check the first aid box, firefighting and safety equipment
- Assist in waste management
- Follow the fire safety guidelines
- Follow the emergency and first-aid procedures
- Carry out relevant documentation and review

Elements and Performance Criteria

Maintain personal health and safety

To be competent, the user/individual on the job must be able to:

PC1. follow the recommended practices to ensure protection from infections and transmission to others, such as the use of hand sanitiser and face mask
PC2. check the work conditions, assess the potential health and safety risks, and take appropriate measures to mitigate them
PC3. select and use the appropriate Personal Protective Equipment (PPE) relevant to the task and work conditions
PC4. follow the recommended techniques while lifting and moving heavy objects to avoid injury
PC5. follow the manufacturer's instructions and workplace safety guidelines while working on heavy machinery, tools and equipment

Assist in hazard management

To be competent, the user/individual on the job must be able to:

PC6. identify existing and potential hazards at work
PC7. assess the potential risks and injuries associated with the identified hazards
PC8. coordinate with the supervisor or other relevant personnel to prevent or minimise the identified hazards
PC9. handle hazardous materials safely and store them in the designated storage

Check the first aid box, firefighting and safety equipment

To be competent, the user/individual on the job must be able to:

PC10. check the first aid box to ensure it is updated with the relevant first aid supplies
PC11. check and test the firefighting and various safety equipment to ensure they are in usable condition
PC12. coordinate with the supervisor for the repair and replacement of firefighting and safety equipment

Assist in waste management

To be competent, the user/individual on the job must be able to:

PC13. segregate waste into appropriate categories
PC14. recycle the recyclable waste appropriately
PC15. dispose of the non-recyclable waste in an environment-friendly manner, complying with the applicable regulations

Follow the fire safety guidelines

To be competent, the user/individual on the job must be able to:

PC16. use the appropriate type of fire extinguisher to extinguish different types of fires safely
PC17. follow the recommended practices for a safe rescue during a fire emergency
PC18. coordinate with the fire department to request assistance to extinguish a serious fire

Follow the emergency and first-aid procedures

To be competent, the user/individual on the job must be able to:

PC19. follow the organisational health and safety guidelines during workplace emergencies to ensure own and co-workers' safety
PC20. follow the recommended practices to minimise loss to organisational property during an emergency
PC21. follow the recommended procedure to free a person from electrocution
PC22. administer appropriate first aid to the injured personnel
PC23. perform Cardiopulmonary Resuscitation (CPR) on a potential victim of cardiac arrest
PC24. coordinate with the emergency services to request medical assistance for seriously injured/ ill personnel requiring professional medical attention or hospitalisation

Carry out relevant documentation and review

To be competent, the user/individual on the job must be able to:

PC25. carry out appropriate documentation following a health and safety incident at work, including all the required information
PC26. coordinate with the relevant personnel to review health and safety conditions at work regularly or following an incident
PC27. assist in implementing appropriate changes to improve the health and safety conditions at work

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the recommended practices to be followed to ensure protection from infections and transmission to others, such as the use of hand sanitiser and face mask
KU2. the importance and process of checking the work conditions, assessing the potential health and safety risks, and taking appropriate measures to mitigate them
KU3. the importance and process of selecting and using the appropriate PPE relevant to the task and work conditions
KU4. the recommended techniques to be followed while lifting and moving heavy objects to avoid injury
KU5. the importance of following the manufacturer's instructions and workplace safety guidelines while working on heavy machinery, tools and equipment
KU6. the importance and process of identifying existing and potential hazards at work
KU7. the process of assessing the potential risks and injuries associated with the various hazards

KU8. how to prevent or minimise different types of hazards
KU9. how to handle and store hazardous materials safely
KU10. the importance of ensuring the first aid box is updated with the relevant first aid supplies
KU11. the process of checking and testing the firefighting and various safety equipment to ensure they are in a usable condition
KU12. the criteria for segregating waste into appropriate categories
KU13. the appropriate methods for recycling the recyclable waste
KU14. the process of disposing of the non-recyclable waste safely and the applicable regulations
KU15. use of different types of fire extinguishers to extinguish different types of fires
KU16. the recommended practices to be followed for a safe rescue during a fire emergency
KU17. how to request assistance from the fire department to extinguish a serious fire
KU18. the appropriate practices to be followed during workplace emergencies to ensure safety and minimise loss to organisational property
KU19. common health and safety hazards present in a work environment, associated risks, and how to mitigate them
KU20. safe working practices to be followed while working at various hazardous sites and using electrical equipment
KU21. the importance of ensuring easy access to firefighting and safety equipment
KU22. the appropriate preventative and remedial actions to be taken in the case of exposure to toxic materials, such as poisonous chemicals and gases
KU23. various causes of fire in different work environments and the recommended precautions to be taken to prevent fire accidents
KU24. different methods of extinguishing fire
KU25. different materials used for extinguishing fire, such as sand, water, foam, CO2, dry powder, etc.
KU26. the applicable rescue techniques to be followed during a fire emergency
KU27. the importance of placing safety signs and instructions at strategic locations in a workplace and following them
KU28. different types of first aid treatment to be provided for different types of injuries
KU29. potential injuries associated with incorrect manual handling
KU30. how to move an injured person safely
KU31. various hazards associated with the use of various machinery, tools, implements, equipment and materials
KU32. the importance of ensuring no obstruction and free access to fire exits
KU33. how to free a person from electrocution safely
KU34. how to administer appropriate first aid to an injured person
KU35. how to perform Cardiopulmonary Resuscitation (CPR)
KU36. the importance of coordinating with the emergency services to request urgent medical assistance for persons requiring professional medical attention or hospitalisation
KU37. the appropriate documentation to be carried out following a health and safety incident at work, and the relevant information to be included
KU38. the importance and process of reviewing the health and safety conditions at work regularly or following an incident
KU39. the importance and process of implementing appropriate changes to improve the health and safety conditions at work

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. maintain work-related notes and records
GS2. communicate clearly and politely with co-workers and clients
GS3. read the relevant literature to get the latest updates about the field of work
GS4. listen attentively to understand the information being shared
GS5. plan and prioritise tasks to ensure timely completion
GS6. take quick decisions to deal with workplace emergencies and accidents
GS7. identify possible disruptions to work and take appropriate preventive measures
GS8. coordinate with the co-workers to achieve the work objectives
GS9. evaluate all possible solutions to a problem to select the best one

National Occupational Standards (NOS) Parameters

NOS Code	CSC/N1335
NOS Name	Follow the health and safety practices at the work
Sector	Capital Goods
Sub-Sector	Machine Tools, Process Plant Machinery, Dies, Moulds and Press Tools, Electrical and Power Machinery, Plastics Manufacturing Machinery, Light Engineering Goods, Textile Manufacturing Machinery
Occupation	Machining
NSQF Level	3
Credits	TBD
Version	2.0
Last Reviewed Date	
Next Review Date	
Deactivation Date	
NSQC Clearance Date	

CSC/N1336: Coordinate with co-workers to achieve work efficiency

Description

This OS unit is about working in coordination with co-workers to achieve the work objectives efficiently. It also covers practising inclusion at work.

Scope

This unit/task covers the following:

- Work effectively with co-workers
- Communicate effectively with co-workers
- Practice inclusion at work

Elements and Performance Criteria

Work effectively with co-workers

To be competent, the user/individual on the job must be able to:

PC1. plan daily tasks at work to ensure their timely completion and efficient use of time
PC2. carry out work responsibilities adhering to the limits of authority
PC3. follow the supervisor's instructions to ensure adherence to the applicable quality standards and timescales
PC4. coordinate with the co-workers to achieve the work objectives efficiently
PC5. prepare the relevant documents and reports as per the supervisor's instructions, providing appropriate information clearly and systematically
PC6. coordinate with the supervisor or relevant personnel to deal with out of authority tasks and concerns
PC7. mentor and assist subordinates in the execution of their work responsibilities
PC8. identify possible disruptions to work through coordination with the relevant stakeholders and take appropriate preventive measures
PC9. use various resources efficiently to ensure maximum utilisation and minimum wastage
PC10. follow the recommended practices to avoid and resolve conflicts at work
PC11. follow the relevant organisational policies to ensure disciplined behaviour with maximum productivity at work

Communicate effectively with co-workers

To be competent, the user/individual on the job must be able to:

PC12. follow the organisational policy for the efficient and timely dissemination of information to the authorised personnel
PC13. communicate clearly and politely to ensure effective communication with co-workers
PC14. follow the appropriate techniques for active listening during interactions

Practice inclusion at work

To be competent, the user/individual on the job must be able to:

PC15. empathise with Persons with Disabilities (PwD)
PC16. adopt gender-neutral behaviour at work

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the importance and process of effective communication in the workplace
KU2. the barriers to effective communication and how to overcome them
KU3. the importance of teamwork in an organisation's and individual's success
KU4. the importance of active listening in the work environment
KU5. the appropriate techniques to be followed for active listening
KU6. importance of tone and pitch in effective communication
KU7. importance of avoiding casual expletives and unpleasant terms while communicating professional circles
KU8. the importance of maintaining discipline and ethical behaviour at work
KU9. the common reasons for interpersonal conflict and how to resolve them
KU10. the importance of developing effective working relationships for professional success
KU11. how expressing and addressing grievances appropriately and effectively
KU12. the importance and process of planning daily tasks to ensure their timely completion and efficient use of time
KU13. the importance of adhering to the limits of authority at work
KU14. the importance of following the applicable quality standards and timescales at work
KU15. the importance of coordinating with the co-workers to achieve the work objectives efficiently
KU16. the relevant documentation requirements
KU17. the importance of providing appropriate information clearly and systematically in work documents
KU18. the escalation matrix to be followed to deal with out of authority tasks and concerns
KU19. the importance and process of mentoring and assisting subordinates in the execution of their work responsibilities
KU20. how to identify possible disruptions to work prevent them
KU21. how to use various resources efficiently to ensure maximum utilisation and minimum wastage
KU22. the recommended practices to be followed at work to avoid and resolve conflicts at work
KU23. the importance and process of efficient and timely dissemination of information to the authorised personnel
KU24. how to communicate clearly and politely to ensure effective communication
KU25. the importance of following the recommended practices to ensure an inclusive environment for PwD and all genders at work

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. maintain work-related notes and records
GS2. read work-related and other relevant literature
GS3. communicate politely and -professionally
GS4. listen attentively to understand the information or instructions being shared
GS5. plan and prioritise tasks to ensure timely completion
GS6. take prompt decisions to deal with workplace emergencies and accidents
GS7. evaluate all possible solutions to a problem to select the best one

National Occupational Standards (NOS) Parameters

NOS Code	CSC/N1336
NOS Name	Coordinate with co-workers to achieve work efficiency
Sector	Capital Goods
Sub-Sector	Machine Tools, Dies, Moulds and Press Tools, Plastics Manufacturing Machinery, Textile Manufacturing Machinery, Process Plant Machinery, Electrical and Power Machinery, Light Engineering Goods
Occupation	Machining
NSQF Level	3
Credits	TBD
Version	2.0
Last Reviewed Date	
Next Review Date	
Deactivation Date	
NSQC Clearance Date	

CSC/N0801: Calibrate hydraulic, pneumatic and mechanical measuring and control equipment

Description

This OS unit is about setting, adjusting and validating mechanical, pneumatic, hydraulic measuring and control equipment using reference standards according to the applicable procedures.

Scope

This unit/task covers the following:

- Prepare for testing and calibration activities
- Test the measuring and control equipment
- Analyse and report the test results
- Calibrate the measuring and control equipment
- Use resources optimally

Elements and Performance Criteria

Prepare for testing and calibration activities

To be competent, the user/individual on the job must be able to:

PC1. determine the testing and calibration requirements
PC2. prepare and update the relevant testing/calibration schedules and plans
PC3. select the appropriate testing tools, equipment and accessories according to the requirement
PC4. check the testing tools, equipment and accessories for wear and tear/ faults/ damage
PC5. repair and replace the testing tools and equipment, as appropriate

Test the measuring and control equipment

To be competent, the user/individual on the job must be able to:

PC6. inspect the instruments to ensure they are free from damage and any foreign objects
PC7. conduct various tests such as standard serviceability/calibration test; special-to-type test; operational/function checks; gauge repeatability and reliability test, etc.
PC8. follow the applicable sequence while carrying out the testing/calibration activities, ensuring compliance with the agreed timescales
PC9. follow the applicable statistical process control techniques
PC10. check the calibration of measuring and control equipment against the manufacturer specifications
PC11. inspect and test the operation of instruments and systems using the appropriate testing devices
PC12. select the appropriate test application principles after the inspection of instrumentation systems/ equipment/ components
PC13. diagnose faults with the instruments and take appropriate action(s) as per the Standard Operating Procedure (SOP) to rectify them
PC14. follow the relevant device isolation methods and localize, as appropriate
PC15. follow the appropriate test procedures and application principles while assessing the operation of instrumentation systems/ equipment/ components
PC16. use the relevant Industry 4.0 manufacturing to ensure interconnectivity, automation, machine learning, and real-time data collection and analysis
PC17. coordinate with the supervisor or relevant personnel to resolve any issues identified with the

testing/calibration activities that are out of scope or the planned schedule

PC18. carry out appropriate documentation with respect to the testing/calibration activities

Analyse and report the test results

To be competent, the user/individual on the job must be able to:

PC19. analyse and verify test results against operational specifications to identify and localize faults

PC20. follow the organisational procedure to report potential and real faults

PC21. evaluate the faulty conditions and plan corrective action

PC22. document the action plan following the SOP

Calibrate the measuring and control equipment

To be competent, the user/individual on the job must be able to:

PC23. calibrate the measuring and control equipment according to the manufacturer specifications, applicable physical standards and requirements

PC24. use the appropriate calibration tools, equipment, and techniques as per the standard procedure

PC25. conduct zero and span check on indicators/controllers using the appropriate configuration

PC26. follow the appropriate methods of adjustment, using relevant calibration devices and document the prescribed procedures and operational specifications

PC27. recommission the equipment following the relevant procedures

PC28. coordinate with an expert to resolve any calibration issues beyond own area of expertise

PC29. monitor the process of problem resolution and update the supervisor regarding the progress

PC30. carry out appropriate documentation such as job cards, progress records, incident reports, calibration and test reports as per the organisational procedures

Use resources optimally

To be competent, the user/individual on the job must be able to:

PC31. use electricity and other resources optimally in various tasks and processes

PC32. connect the electrical tools and equipment safely and disconnect them when they are not in use

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. applicable documentation requirements in the job role such as the job cards, progress records, incident reports, calibration records and labels, test reports, non-conformance reports, calibration certificates, etc.

KU2. the concepts and benefits of Industry 4.0 and Industrial Internet of Things (IIoT)

KU3. the applicable standards and regulations regarding the use of measuring equipment

KU4. the process of testing and calibrating the measuring equipment, and the use of relevant tools and equipment such as pressure gauge, standard test gauges, micrometre, jigs and fixtures, insulation tester, Vernier calliper, deadweight tester, manometers, gyroscope, etc.

KU5. the standard procedure for commissioning and recommissioning measuring equipment

KU6. the specifications, components and operations of various measuring equipment

KU7. the appropriate checks to be conducted on the measuring equipment

KU8. use of the appropriate tools and equipment for checking measuring equipment for faults

KU9. common faults found in measuring equipment and how to rectify them

KU10. use of the relevant techniques for checking the calibration of measuring equipment for conformance to specifications

KU11. the process of calibrating the measuring equipment according to the applicable physical standards
KU12. the effects of various faults on the performance and accuracy of measuring equipment
KU13. various hazards and controls associated with calibrating measuring equipment
KU14. functions of various measuring equipment and applicable tolerance levels for calibration
KU15. applicable instrumentation principles such as controlling density, level, flow, temperature, composition, etc.
KU16. the principles of hydraulic and pneumatic flow
KU17. the application principles for assessing the operation of instrumentation systems/ equipment and components
KU18. the use of relevant equipment for inspecting and testing the instrumentation system
KU19. the procedures to be followed for calibrating the instrumentation systems/ equipment and components
KU20. the relevant dismantling, reassembly and testing techniques
KU21. the operations and specifications of the instrumentation system/equipment, and acceptable deviations
KU22. the applicable procedures for isolating instrumentation systems
KU23. various faults found in the instrumentation system/equipment components
KU24. the process of checking and verifying the operational function of the instrumentation system/equipment
KU25. the process of recording and completing service reports
KU26. how to deal with variations between test results and operational specifications
KU27. various faults found in the instrumentation system/equipment and components
KU28. the process of repairing faulty instrumentation system/ equipment
KU29. the process of conducting zero and span checks on instrumentation systems/equipment
KU30. use of the relevant tools and equipment for calibrating instrumentation systems/ equipment
KU31. functions of load cells/strain gauges, transducers, mechanical governors, control valves, valve actuators, positioners, etc.
KU32. the benefits and methods of resource optimisation

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. maintain work-related notes and records
GS2. read the relevant literature to learn about the latest developments in the field of work
GS3. listen attentively to understand the information or instructions being shared
GS4. perform work-related calculations
GS5. use the appropriate units of measurement and measuring techniques
GS6. communicate politely and professionally
GS7. organise and analyse work-related information
GS8. plan and prioritise tasks to ensure timely completion
GS9. identify possible disruptions to work and take appropriate preventive measures
GS10. evaluate all possible solutions to a problem to select the best one
GS11. coordinate with co-workers to achieve the work objectives
GS12. take prompt decisions to deal with workplace emergencies and accidents

National Occupational Standards (NOS) Parameters

NOS Code	CSC/N0801
NOS Name	Calibrate hydraulic, pneumatic and mechanical measuring and control equipment
Sector	Capital Goods
Sub-Sector	Machine Tools, Plastics Manufacturing Machinery, Textile Manufacturing Machinery, Process Plant Machinery, Electrical and Power Machinery, Light Engineering Goods
Occupation	Calibration and Instrumentation
NSQF Level	4
Credits	TBD
Version	2.0
Last Reviewed Date	
Next Review Date	
Deactivation Date	
NSQC Clearance Date	

CSC/N0802: Calibrate electrical and electronic measuring and control equipment

Description

This OS unit is about setting, adjusting and validating electrical and electronic measuring and control equipment using appropriate reference standards according to the applicable procedures.

Scope

This unit/task covers the following:

- Plan and carry out the testing activities
- Analyse and report the test results
- Calibrate the measuring and control equipment

Elements and Performance Criteria

Plan and carry out the testing activities

To be competent, the user/individual on the job must be able to:

PC1. identify the testing requirements following the standard procedure
PC2. plan and prepare the schedules for carrying out testing/calibration activities
PC3. select the appropriate testing tools and equipment according to the requirement
PC4. perform visual inspection of the measuring and control equipment to ensure they are free from wear and tear/ damage and any foreign objects
PC5. conduct the relevant tests such as gauge repeatability and reliability tests; special-to-type tests; etc.
PC6. follow the applicable statistical process control techniques
PC7. check the calibration of measuring and control equipment against the manufacturer specifications
PC8. test the operation of instruments and systems to diagnose faults using the appropriate testing devices
PC9. follow the appropriate device isolation methods as per the requirement
PC10. test various components such as sensors, transmitters, converters, indicators, analysers, controllers, circuit boards to determine faults/ wear and tear/ damage
PC11. test the sensor units associated with determining/controlling density, level, flow, temperature, the composition of a range of materials, for the correct functioning
PC12. follow the appropriate testing procedures and sequence of activities along with application principles while carrying out testing activities on measuring and control equipment
PC13. ensure adherence to the applicable timescales to ensure testing activities are completed on time
PC14. coordinate with the supervisor or other relevant personnel to resolve any issues/ defects identified with the testing/ calibration activities which are out of scope or the planned schedule
PC15. carry out relevant documentation regarding the testing activities

Analyse and report the test results

To be competent, the user/individual on the job must be able to:

PC16. analyse and verify the test results against the operational specifications to identify and localize faults

PC17. follow the organisational procedure to report potential and real faults
PC18. evaluate the faulty conditions and plan corrective action
PC19. document the action plan following the SOP

Calibrate the measuring and control equipment

To be competent, the user/individual on the job must be able to:

PC20. calibrate the control and measuring equipment according to the applicable physical standards and manufacturer specifications
PC21. use the relevant calibration tools and equipment such as oscilloscope, pressure gauge, current injection device, voltmeter, analogue and digital meter appropriately
PC22. follow the calibration techniques recommended by the Original Equipment Manufacturer (OEM)
PC23. perform zero and span check on indicators/controllers, using the recommended configuration
PC24. follow the appropriate methods of adjustment, using relevant calibration devices and document the prescribed procedures and operational specifications
PC25. recommission the equipment following the applicable procedures
PC26. coordinate with an expert to resolve calibration issues beyond own area of expertise
PC27. monitor the process of problem resolution and update the supervisor regarding the progress
PC28. carry out appropriate documentation such as job cards, progress records, incident reports, calibration and test reports as per the organizational procedures

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. relevant documentation to be carried out in the job role
KU2. applicable standards and regulations with respect to the electrical and electronic measuring and control equipment and their calibration
KU3. the standard procedures for testing and calibrating the electrical and electronic measuring and control equipment, and the use of relevant tools and equipment
KU4. the process of commissioning and recommissioning electrical and electronic measuring and control equipment
KU5. recommended electrical and electronic measuring and control equipment specifications to be maintained
KU6. the process of testing and calibrating various components such as sensors, transmitters, converters, indicators, analysers, controllers, power supply units, removable circuit boards, sensor units, etc.
KU7. functions of various sensor units that determine/control density, level, flow, temperature, composition etc.
KU8. the appropriate techniques to be used to check the calibration of measuring and control equipment and ensure their conformance to the recommended/ manufacturer specifications and physical standards
KU9. common faults found in the electrical and electronic measuring and control equipment, their effects on the performance/accuracy on equipment performance, and how to rectify them
KU10. various hazards associated with calibration of electrical and electronic measuring and control equipment and how to minimise them
KU11. appropriate tolerance levels for calibration of electrical and electronic measuring and control equipment
KU12. effects of resistance, capacitance, inductance and impedance upon electrical circuit including Resistance-Inductance-Capacitance (RLC) series circuit
KU13. how to interpret schematics, wiring and block diagrams

KU14. the principles of electrical flow
KU15. the purpose/operational functions of instrumentation system
KU16. the process for inspecting, testing, calibrating and repairing instrumentation systems and equipment/ components
KU17. the recommended specifications for the relevant instrumentation system and acceptable deviations
KU18. the applicable dismantling, reassembly and testing techniques
KU19. the process of isolating instrumentation systems
KU20. various faults found in instrumentation system/equipment components, their causes and how to rectify them
KU21. the procedure for checking and verifying the operational function of the instrumentation system/equipment
KU22. how to deal with variations between test results and operational specifications of the instrumentation system
KU23. various errors indicated by built-in devices and how to rectify them
KU24. the process for documenting test and calibration results
KU25. the function and process of conducting zero and span check on instrumentation systems/equipment

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. maintain work-related notes and records
GS2. read the relevant literature to learn about the latest developments in the field of work
GS3. listen attentively to understand the information or instructions being shared
GS4. perform work-related calculation
GS5. use the appropriate measuring techniques and measuring units
GS6. communicate politely and professionally
GS7. organise and analyse work-related information
GS8. plan and prioritise tasks to ensure timely completion
GS9. take prompt decisions to deal with workplace emergencies and accidents
GS10. identify possible disruptions to work and take appropriate preventive measures
GS11. evaluate all possible solutions to a problem to select the best one
GS12. coordinate with co-workers to achieve the work objectives

National Occupational Standards (NOS) Parameters

NOS Code	CSC/N0802
NOS Name	Calibrate electrical and electronic measuring and control equipment
Sector	Capital Goods
Sub-Sector	Machine Tools, Plastics Manufacturing Machinery, Textile Manufacturing Machinery, Process Plant Machinery, Electrical and Power Machinery, Light Engineering Goods
Occupation	Calibration and Instrumentation
NSQF Level	4
Credits	TBD
Version	2.0
Last Reviewed Date	
Next Review Date	
Deactivation Date	
NSQC Clearance Date	

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for the Qualification Pack will be created by CGSC.
2. Performance Criteria (PC) have been assigned marks proportional to their importance in NOS. SSC will also lay down the proportion of marks for Theory and Skills Practical for each PC.
3. The assessment for the theory part will/may be based on a knowledge bank of questions approved by CGSC.
4. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
5. Assessment Agencies will create Assessor Guides comprising of Theory and Practical Assessment Set and Guidelines for each examination/training centre (as per assessment criteria below). The same will beapproved by CGSC for adequacy.
6. To successfully attain Certification on the Qualification Pack, the trainee must score a minimum of 70% in each Core NOS and a minimum of 50% in all non-core NOS. In addition, a candidate needs to attain a minimum overall pass percentage of 70% for certification.
7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

Minimum Aggregate Passing % at QP Level: 70

(**Please note**: Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage

Total						

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
CO2	Carbon Dioxide
CPR	Cardiac Pulmonary Resuscitation
PPE	Personal Protective Equipment
ISO	International Organization For Standardization

Glossary

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 (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) 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 OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
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 (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order 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.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) 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. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
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.