



# Water Pump Operator

QP Code: PSC/Q0118

Version: 1.0

NSQF Level: 4

Water Management and Plumbing Skill Council |  
Unit No-606 & 609, DLF Prime Tower Okhla Phase-1 New Delhi  
110020



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## PSC/Q0118: Water Pump Operator

### Brief Job Description

The Water Pump Operator is responsible for the installation, operation and maintenance of pumps. The individual will also operate and maintain the water supply, water distribution and waste water treatment systems.

### Personal Attributes

The individual must be able to work independently and be comfortable in performing laborious work. The person should be good at following instructions and a team player with a positive attitude.

### Applicable National Occupational Standards (NOS)

#### Compulsory NOS:

1. [PSC/N0151: Install Pump Systems and Related Equipment](#)
2. [PSC/N0152: Operate and Maintain Pumps and Related Machinery](#)
3. [PSC/N0153: Perform Maintenance of Local Ground Water Source and Water Quality Monitoring at Water Supply Stations](#)
4. [PSC/N0154: Maintain of Water Distribution and Storage Systems at Water Supply Stations](#)
5. [PSC/N0155: Operate and Maintain Water Treatment Units](#)
6. [PSC/N0136: Apply Health and Safety Practices at the Workplace](#)
7. [PSC/N0137: Work Effectively with Others](#)
8. [SGJ/N1702: Optimize resource utilization at workplace](#)

### Qualification Pack (QP) Parameters

Sector	Plumbing
Sub-Sector	Industrial / Non-Industrial Plumbing
Occupation	Plumbing Systems Installation and Maintenance
Country	India

NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	2022/PLUM/WMP5/05465
Minimum Educational Qualification & Experience	<p>8th Class+ I.T.I (Plumbing) with 2 Years of relevant experience</p> <p>OR</p> <p>10th Class with 2 Years of relevant experience</p> <p>OR</p> <p>12th Class Pass</p> <p>OR</p> <p>8th Class+ NSQF Level-3 Certification (Assistant Plumber-General) with 2 Years of relevant experience.</p>
Minimum Level of Education for Training in School	10th Class
Pre-Requisite License or Training	NA
Minimum Job Entry Age	20 Years
Last Reviewed On	12-01-2022
Next Review Date	12-01-2027
NSQC Approval Date	24-02-2022
Version	1.0

## PSC/N0151: Install Pump Systems and Related Equipment

### Description

This unit is about installing pumps systems and related equipment for different plumbing applications in residential, agricultural and commercial setups.

### Scope

The scope covers the following :

- Prepare for work
- Install pump and related equipment
- Check the installation

### Elements and Performance Criteria

#### *Prepare for work*

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

- PC1. assemble pump components and equipment
- PC2. prepare the tools, area and materials for the task
- PC3. locate and mark position for inlet and outlet supply connections of pump

#### *Install pump and related equipment*

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

- PC4. fix the pump at the designated location as per instruction
- PC5. connect the hoses of inlet and outlet supply to the pump
- PC6. make provisions for electrical and other required connections
- PC7. ensure prevention of any contact of water and electrical connections with each other
- PC8. install and connect pump components without any damage to pump, fixture, pipe work, the surrounding environment, or to other services
- PC9. adjust pressure/flow as per required supply and demand

#### *Check the installation*

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

- PC10. check installed pump systems for correct functioning and compliance with specifications
- PC11. check for cracks, defects and anomalies in the pumping apparatus
- PC12. check for condition of couplings in the equipment and pumping on both suction and discharge sides
- PC13. check the oil level, fuel level, radiator coolant and engine condition of a diesel operated pump.
- PC14. check air release valve, and prime the pump

### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. standards, policies, and procedures followed in the company relevant to employment and performance conditions
- KU2. workplace safety requirements, hazard reporting and handling procedures
- KU3. various types of pumps used in residential, agricultural and commercial setups
- KU4. terminologies used in pump systems
- KU5. components of pump systems and related equipment
- KU6. tools and materials used in pump installation
- KU7. preparatory requirements for pump system installation
- KU8. types of water supply and its implication on pumping system
- KU9. performance measures, applications and properties of water pumps
- KU10. manufacturers' specifications related to the installation and fitting of pumps
- KU11. units of measurements
- KU12. how to calculate material requirements
- KU13. procedure of installing water pumps
- KU14. levelling and alignment procedures
- KU15. material disposal procedure and its importance
- KU16. basic fittings (valves, clamps, elbows, etc.) in the pumping apparatus
- KU17. different types of pumping apparatus (reciprocating, rotary etc.) and associated equipment and purposes
- KU18. gauges, dials, monitoring apparatus and their purpose
- KU19. condition monitoring of the equipment
- KU20. dos and don'ts of various pumping systems as per their Standard Operating Procedures (SOPs) specified by the equipment manufacturer.
- KU21. different types of valves and their functioning (stop valve, non-return valve, etc.)

## Generic Skills (GS)

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

- GS1. prepare checklists, reports and fill out forms in local language or Hindi/English
- GS2. perform arithmetic calculations of addition, subtraction, multiplication and division processes
- GS3. read and interpret information (symbols, dimensions, terminology, dates etc.) given in local language or Hindi
- GS4. state information, doubts and concerns about work related matters in local language or Hindi/English
- GS5. plan one's daily tasks to achieve maximum productivity
- GS6. establish priorities and deadlines in consultation with others and record them
- GS7. be punctual and work as per agreed priorities
- GS8. manage distractions and maintain workplace discipline
- GS9. listen to customer's concerns and doubts carefully and address them
- GS10. be courteous
- GS11. identify ways to increase productivity and reduce errors

## Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Prepare for work</i>	10	14	3	3
PC1. assemble pump components and equipment	4	5	1	1
PC2. prepare the tools, area and materials for the task	3	4	1	1
PC3. locate and mark position for inlet and outlet supply connections of pump	3	5	1	1
<i>Install pump and related equipment</i>	10	21	7	3
PC4. fix the pump at the designated location as per instruction	2	8	4	1
PC5. connect the hoses of inlet and outlet supply to the pump	2	5	1	0.5
PC6. make provisions for electrical and other required connections	1	2	0.5	0.5
PC7. ensure prevention of any contact of water and electrical connections with each other	1	2	0.5	0.5
PC8. install and connect pump components without any damage to pump, fixture, pipe work, the surrounding environment, or to other services	3	2	0.5	-
PC9. adjust pressure/flow as per required supply and demand	1	2	0.5	0.5
<i>Check the installation</i>	10	14	4	1
PC10. check installed pump systems for correct functioning and compliance with specifications	2	4	2	1
PC11. check for cracks, defects and anomalies in the pumping apparatus	2	2.5	0.5	-
PC12. check for condition of couplings in the equipment and pumping on both suction and discharge sides	2	2.5	0.5	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. check the oil level, fuel level, radiator coolant and engine condition of a diesel operated pump.	2	2.5	0.5	-
PC14. check air release valve, and prime the pump	2	2.5	0.5	-
<b>NOS Total</b>	<b>30</b>	<b>49</b>	<b>14</b>	<b>7</b>



## National Occupational Standards (NOS) Parameters

NOS Code	PSC/N0151
NOS Name	Install Pump Systems and Related Equipment
Sector	Plumbing
Sub-Sector	Industrial / Non-Industrial Plumbing
Occupation	Plumbing Systems Installation and Maintenance
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	NA
Next Review Date	NA
Deactivation Date	NA
NSQC Clearance Date	NA

## PSC/N0152: Operate and Maintain Pumps and Related Machinery

### Description

This unit is about efficient pump operation and preventive maintenance of the pump and related machinery such as motor, valves and electrical components, etc.

### Scope

The scope covers the following :

- Operate the pump
- Maintain the pump and related machinery

### Elements and Performance Criteria

#### *Operate the pump*

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

- PC1. prepare a schedule for running the main pumps and the standby
- PC2. prime the centrifugal pump before start of operation
- PC3. ensure operation of the pump with full efficiency to improve output gain
- PC4. operate the delivery valve effectively to avoid overloading and sudden change of water pressure
- PC5. close bypass valves of reflux valve, sluice valve and butterfly valve during normal operation of the pumps
- PC6. monitor sound, vibration, temperature and other related parameters to ensure that the pump is operating smoothly
- PC7. maintain input/output parameters for the pump as per requirements
- PC8. check pump motor alignment
- PC9. take defined action in case of overload/under load when the load parameters are above/below the specified limits
- PC10. maintain a record of all pump operation timings, voltage, current, reading on gauges and flow meter, temperature, water level and any problem that occurred during the operation

#### *Maintain the pump and related machinery*

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

- PC11. prepare and apply a monthly, quarterly, bi-annual and annual preventive maintenance schedule
- PC12. clean the pump, related machinery, pump chamber filter beds, other structures and the area
- PC13. inspect the pump, related machinery and water supply system for faults, leaks, sparks, improper functioning, wear and tear or evidence of tampering
- PC14. record and report the faults, leaks, sparks, improper functioning, water supply complaints and tampering
- PC15. apply appropriate oil where oil levels are low as per standard
- PC16. repair or replace sparking motor and leaking or worn out parts
- PC17. check and rectify alignment of pump and drive

- PC18. tighten the foundation bolts and holding down bolts of pump and motor mounting
- PC19. calibrate all vital instruments such as pressure gauge, vacuum gauge, ammeter, voltmeter, watt meters, frequency meter, tachometer and flow meter
- PC20. conduct performance test of the pump for discharge, head and efficiency
- PC21. troubleshoot faults as per standard operating procedure

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. standards, policies, and procedures followed in the company relevant to employment and performance conditions
- KU2. workplace safety requirements, hazard reporting and handling procedures
- KU3. basic pumping / operation terminology
- KU4. different types of operation and maintenance schedules
- KU5. types of pump to be operated
- KU6. importance of preparing and following a schedule for pump operation and maintenance
- KU7. factors to be considered for preparing an operation and maintenance schedule
- KU8. need for standby pumps
- KU9. how to improve output gain from the pump
- KU10. need and process for avoiding overloading and sudden change of water pressure
- KU11. function and operation of various valves such as bypass valves of reflux valve, sluice valve and butterfly valve during operation of the pumps
- KU12. factors that effect the efficiency of the pump such as voltage, current, location, starting load, etc.
- KU13. common sounds, vibrations, temperature and other related parameters that can change during the operation of the pump and their significance.
- KU14. impact of various physical parameters like temperature, pressure, etc on the properties of final output
- KU15. various input/output parameters of the pump for various types of requirements
- KU16. purpose and procedure for checking pump motor alignment
- KU17. normal load parameters and indicators of overload/underload
- KU18. action to be taken in case of overload/underload
- KU19. importance of maintaining a record of pump operation timings, voltage, current, reading on gauges and flow meter, temperature, water level and any problem that occurred during the operation
- KU20. importance of preventive maintenance
- KU21. various preventive maintenance tasks to be performed daily, monthly, quarterly, bi-annually and annually
- KU22. considerations to be taken while making a preventive maintenance schedule
- KU23. dos and don'ts while cleaning the pump, related machinery, pump chamber filter beds, other structures and the area
- KU24. importance of regular inspections of the pump, related machinery and water supply system

- KU25. common indicators of faults, leaks, sparks, improper functioning, wear and tear or tampering in a pump and related machinery
- KU26. importance of timely recording and reporting of faults, leaks, sparks, improper functioning, water supply complaints and tampering
- KU27. appropriate oil levels and procedure to check it
- KU28. action to be taken if motor is sparking or parts are leaking or worn out
- KU29. procedure to check and rectify alignment of pump and drive
- KU30. various bolts to be tightened
- KU31. calibration procedure of all vital instruments such as pressure gauge, vacuum gauge, ammeter, voltmeter, watt meters, frequency meter, tachometer and flow meter
- KU32. performance testing procedure of the pump for discharge, head and efficiency
- KU33. action to be taken for common faults

## Generic Skills (GS)

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

- GS1. prepare checklists, reports and fill out forms in local language or Hindi/English
- GS2. measure all dimensions in metric scale
- GS3. perform arithmetic calculations of addition, subtraction, multiplication and division processes
- GS4. read and interpret information (symbols, dimensions, terminology, dates etc.) given in local language or Hindi
- GS5. state information, doubts and concerns about work related matters in local language or Hindi/English
- GS6. plan one's daily tasks to achieve maximum productivity
- GS7. be punctual and work as per agreed priorities
- GS8. listen to customer's concerns and doubts carefully and address them
- GS9. be courteous and polite with customers and team members
- GS10. establish workable solutions for problems in hand in consultation with others and record them
- GS11. breakdown relevant work process into its constituent activities for ease of analysis
- GS12. identify ways to increase productivity and reduce error

## Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Operate the pump</i>	13	23	5	3
PC1. prepare a schedule for running the main pumps and the standby	1	2	0.5	0.5
PC2. prime the centrifugal pump before start of operation	2	3	0.5	-
PC3. ensure operation of the pump with full efficiency to improve output gain	1	2	-	0.5
PC4. operate the delivery valve effectively to avoid overloading and sudden change of water pressure	1	2	0.5	-
PC5. close bypass valves of reflux valve, sluice valve and butterfly valve during normal operation of the pumps	1	2	0.5	-
PC6. monitor sound, vibration, temperature and other related parameters to ensure that the pump is operating smoothly	2	3	1	0.5
PC7. maintain input/output parameters for the pump as per requirements	2	3	1	0.5
PC8. check pump motor alignment	1	2	0.5	0.5
PC9. take defined action in case of overload/under load when the load parameters are above/below the specified limits	1	2	-	0.5
PC10. maintain a record of all pump operation timings, voltage, current, reading on gauges and flow meter, temperature, water level and any problem that occurred during the operation	1	2	0.5	-
<i>Maintain the pump and related machinery</i>	17	26	9	4
PC11. prepare and apply a monthly, quarterly, bi-annual and annual preventive maintenance schedule	1	2	0.5	0.5
PC12. clean the pump, related machinery, pump chamber filter beds, other structures and the area	1	2	1	0.5

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. inspect the pump, related machinery and water supply system for faults, leaks, sparks, improper functioning, wear and tear or evidence of tampering	3	4	1	1
PC14. record and report the faults, leaks, sparks, improper functioning, water supply complaints and tampering	1	1	0.5	-
PC15. apply appropriate oil where oil levels are low as per standard	1	2	0.5	0.5
PC16. repair or replace sparking motor and leaking or worn out parts	2	3	1	-
PC17. check and rectify alignment of pump and drive	1	2	0.5	0.5
PC18. tighten the foundation bolts and holding down bolts of pump and motor mounting	1	2	1	-
PC19. calibrate all vital instruments such as pressure gauge, vacuum gauge, ammeter, voltmeter, watt meters, frequency meter, tachometer and flow meter	2	2	1	-
PC20. conduct performance test of the pump for discharge, head and efficiency	2	3	1	0.5
PC21. troubleshoot faults as per standard operating procedure	2	3	1	0.5
<b>NOS Total</b>	<b>30</b>	<b>49</b>	<b>14</b>	<b>7</b>

## National Occupational Standards (NOS) Parameters

NOS Code	PSC/N0152
NOS Name	Operate and Maintain Pumps and Related Machinery
Sector	Plumbing
Sub-Sector	Industrial / Non-Industrial Plumbing
Occupation	Plumbing Systems Installation and Maintenance
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	NA
Next Review Date	NA
Deactivation Date	NA
NSQC Clearance Date	NA

## PSC/N0153: Perform Maintenance of Local Ground Water Source and Water Quality Monitoring at Water Supply Stations

### Description

This unit deals in detail with the maintenance of local ground water source, which include, dug well, hand pump and tube/bore well and monitoring of water quality at water supply stations.

### Scope

The scope covers the following :

- Maintain dug well
- Maintain hand pump
- Maintain tube well and bore well
- Monitor water quality
- Maintain spring source and surface water source

### Elements and Performance Criteria

#### *Maintain dug well*

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

- PC1. clean the concrete apron and debris in the well
- PC2. check the concrete apron and well seal for cracks and repair with cement mortar as needed
- PC3. check the condition of the rope, pulley, support posts, bucket and fence and repair or replace when needed.
- PC4. lubricate the pulley as needed with grease
- PC5. record the water level with a rope scale
- PC6. repair any structural damage to the well and surrounding structure
- PC7. dewater the well and clean the bottom
- PC8. inspect the well walls and lining and repair as needed
- PC9. check the water level and deepen/de-silt the well especially in monsoon

#### *Maintain hand pump*

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

- PC10. check all the flange nuts and bolts, axle bolt, flange bolts and tighten as needed
- PC11. tighten the handle axle nut and lock nut
- PC12. verify whether hand pump is firm on its base and fix it if needed
- PC13. open the cover and clean inside the pump
- PC14. dismantle the hand pump for inspection/cleaning and reassemble after inspection
- PC15. check the chain anchor bolt for proper position and tighten if needed
- PC16. verify rusty patches, clean with a wire brush and apply anticorrosive paint
- PC17. verify the discharge of water
- PC18. verify the handle position and repair if needed
- PC19. verify whether guide bush, roller chain is not excessively worn out and replace if needed



PC20. clean and de-calcify pump components

PC21. take action as per standard operating procedure to troubleshoot faults occurring in the hand pump

*Maintain tube well and bore well*

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

PC22. operate pump starter and isolation valve

PC23. check if readings on ammeter and voltmeter are normal - stop pump if electric motor is drawing too much current

PC24. verify whether adequate water is being delivered

PC25. clean the pump house

PC26. check for leaks in the rising main

PC27. remove the pump and rising main from the well and inspect

PC28. inspect pipes, electric cables, insulation between cables

PC29. record servicing and maintenance in logbook

PC30. re-cut corroded or damaged threads and replace badly corroded pipes

PC31. de-silt borehole if required

PC32. take action as per standard operating procedure to troubleshoot faults occurring in the tube or bore well

*Maintain spring source and surface water source*

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

PC33. check whether the area is free from waste disposal and defecation

PC34. check there is no unwanted human intervention or animal intrusion

PC35. check intake for clogging and submergence

PC36. repair any small damages to the intake system

PC37. dewater and clean the bottom of the spring source

PC38. check the water level of the surface water source and de-silt as per requirement

*Monitor water quality*

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

PC39. adhere to water sampling schedule as per standard operating procedure

PC40. identify a water sampling site representative to the source and in line with sampling guidelines

PC41. obtain water samples from dug well, hand pump, tube well and bore well for quality testing

PC42. test water quality using a field test kit

PC43. store and send samples for laboratory testing

PC44. interpret relevant information from water quality report

PC45. share water quality test results with appropriate authorities

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. standards, policies, and procedures followed in the company relevant to the task

KU2. workplace safety requirements, hazard reporting and handling procedures

- KU3. various ground water sources
- KU4. structure and use of dug well, hand pump, tube well and bore well
- KU5. maintenance activities performed for a dug well, hand pump, tube well and bore well and their importance
- KU6. maintenance activities to be performed for spring source and surface water source and their importance
- KU7. importance of water quality monitoring
- KU8. water quality monitoring tasks

### Generic Skills (GS)

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

- GS1. prepare checklists, reports and fill out forms in local language or Hindi/English
- GS2. measure all dimensions used in plumbing in metric scale
- GS3. perform arithmetic calculations of addition, subtraction, multiplication and division processes
- GS4. read and interpret information (symbols, dimensions, terminology, dates etc.) given in local language or Hindi
- GS5. state information, doubts and concerns about work related matters in local language or Hindi/English
- GS6. plan one's daily tasks to achieve maximum productivity
- GS7. be punctual and work as per agreed priorities
- GS8. listen to customer's concerns and doubts carefully and address them
- GS9. be courteous and polite with customers and team members
- GS10. establish workable solutions for problems in hand in consultation with others and record them
- GS11. breakdown relevant work process into its constituent activities for ease of analysis
- GS12. identify ways to increase productivity and reduce errors

## Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Maintain dug well</i>	6	9	3	1
PC1. clean the concrete apron and debris in the well	0.5	1	0.5	-
PC2. check the concrete apron and well seal for cracks and repair with cement mortar as needed	0.5	1	-	-
PC3. check the condition of the rope, pulley, support posts, bucket and fence and repair or replace when needed.	0.5	1	0.5	-
PC4. lubricate the pulley as needed with grease	0.5	1	0.5	-
PC5. record the water level with a rope scale	0.5	1	0.5	-
PC6. repair any structural damage to the well and surrounding structure	1	1	-	0.5
PC7. dewater the well and clean the bottom	0.5	1	0.5	-
PC8. inspect the well walls and lining and repair as needed	1	1	-	0.5
PC9. check the water level and deepen/de-silt the well especially in monsoon	1	1	0.5	-
<i>Maintain hand pump</i>	6	10	3	1
PC10. check all the flange nuts and bolts, axle bolt, flange bolts and tighten as needed	-	0.5	-	-
PC11. tighten the handle axle nut and lock nut	-	0.5	-	-
PC12. verify whether hand pump is firm on its base and fix it if needed	0.5	0.5	-	-
PC13. open the cover and clean inside the pump	0.5	1	0.5	-
PC14. dismantle the hand pump for inspection/cleaning and reassemble after inspection	0.5	2	1	-
PC15. check the chain anchor bolt for proper position and tighten if needed	0.5	0.5	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC16. verify rusty patches, clean with a wire brush and apply anticorrosive paint	0.5	1	-	-
PC17. verify the discharge of water	0.5	0.5	-	-
PC18. verify the handle position and repair if needed	0.5	1	-	-
PC19. verify whether guide bush, roller chain is not excessively worn out and replace if needed	0.5	1	-	-
PC20. clean and de-calcify pump components	0.5	0.5	0.5	-
PC21. take action as per standard operating procedure to troubleshoot faults occurring in the hand pump	1.5	1	1	1
<i>Maintain tube well and bore well</i>	<b>6.5</b>	<b>10</b>	<b>3</b>	<b>1</b>
PC22. operate pump starter and isolation valve	0.5	0.5	0.5	-
PC23. check if readings on ammeter and voltmeter are normal - stop pump if electric motor is drawing too much current	1	1	0.5	0.5
PC24. verify whether adequate water is being delivered	0.5	0.5	0.5	-
PC25. clean the pump house	0.5	0.5	-	-
PC26. check for leaks in the rising main	0.5	1	-	-
PC27. remove the pump and rising main from the well and inspect	0.5	1.5	0.5	-
PC28. inspect pipes, electric cables, insulation between cables	0.5	1	-	0.5
PC29. record servicing and maintenance in logbook	0.5	0.5	-	-
PC30. re-cut corroded or damaged threads and replace badly corroded pipes	0.5	1	-	-
PC31. de-silt borehole if required	0.5	1	0.5	-
PC32. take action as per standard operating procedure to troubleshoot faults occurring in the tube or bore well	1	1.5	0.5	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Maintain spring source and surface water source</i>	6	8	3	2
PC33. check whether the area is free from waste disposal and defecation	1	1	0.5	0.5
PC34. check there is no unwanted human intervention or animal intrusion	1	1	0.5	0.5
PC35. check intake for clogging and submergence	1	1	0.5	0.5
PC36. repair any small damages to the intake system	1	1	0.5	0.5
PC37. dewater and clean the bottom of the spring source	1	2	0.5	-
PC38. check the water level of the surface water source and de-silt as per requirement	1	2	0.5	-
<i>Monitor water quality</i>	6.5	10	3	2
PC39. adhere to water sampling schedule as per standard operating procedure	0.5	1	-	0.5
PC40. identify a water sampling site representative to the source and in line with sampling guidelines	1	2	0.5	0.5
PC41. obtain water samples from dug well, hand pump, tube well and bore well for quality testing	1	2	0.5	-
PC42. test water quality using a field test kit	1	2	0.5	0.5
PC43. store and send samples for laboratory testing	1	1	0.5	-
PC44. interpret relevant information from water quality report	1	1	0.5	0.5
PC45. share water quality test results with appropriate authorities	1	1	0.5	-
<b>NOS Total</b>	<b>31</b>	<b>47</b>	<b>15</b>	<b>7</b>

## National Occupational Standards (NOS) Parameters

NOS Code	PSC/N0153
NOS Name	Perform Maintenance of Local Ground Water Source and Water Quality Monitoring at Water Supply Stations
Sector	Plumbing
Sub-Sector	Industrial / Non-Industrial Plumbing
Occupation	Plumbing Systems Installation and Maintenance
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	NA
Next Review Date	NA
Deactivation Date	NA
NSQC Clearance Date	NA

## PSC/N0154: Maintain of Water Distribution and Storage Systems at Water Supply Stations

### Description

This unit deals in detail with operation and maintenance of the water distribution and storage systems at water supply stations.

### Scope

The scope covers the following :

- Maintain sump and storage tanks
- Maintain water meters
- Monitor and maintain flow meters
- Operate and maintain and repair pipelines

### Elements and Performance Criteria

#### *Maintain sump and storage tanks*

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

- PC1. dewater sump and tank
- PC2. clean, disinfect and rinse the sump and tank
- PC3. desilt the area and pump house.
- PC4. perform leakage test and carry out rectification if needed with epoxy coating, cement concreting, painting etc.

#### *Maintain water meters*

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

- PC5. clean the dirt box or strainer
- PC6. replace gaskets upon its wear and tear
- PC7. clean the chamber where meter is installed
- PC8. prevent water seepage into the water meter
- PC9. verify if water meter is given correct reading
- PC10. disassemble and reassemble the water meter for verification or repair
- PC11. take action as per standard operating procedure to troubleshoot common faults in water meters
- PC12. clean the disassembled parts

#### *Monitor and maintain flow meters*

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

- PC13. check the range and zero setting of the flow meter
- PC14. inspect for bearing wear out, deposits in flow meter or corrosion of attached pipes
- PC15. take action as per standard operating procedure to troubleshoot common faults in flow meters

#### *Operate and maintain and repair pipelines*

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

- PC16. operate water pipelines with positive pressure and by opening and shutting off the valves gradually
- PC17. flush the system to clear sediments
- PC18. service the valve chamber and valves
- PC19. inspect the pipelines for damage, wear and tear, leakage, entrainment and water hammer
- PC20. locate the leaks in the pipes
- PC21. replace faulty parts like gaskets, valves joints and pipes that are not repairable
- PC22. repair damaged pipelines
- PC23. apply cement mortar lining on corroded pipes

### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. standards, policies, and procedures followed in the company relevant to the task
- KU2. workplace safety requirements, hazard reporting and handling procedures
- KU3. overview of water distribution and storage systems at water supply stations
- KU4. operational and maintenance requirements and procedures for sump and storage tanks
- KU5. operational and maintenance requirements and procedures for water meters
- KU6. operational and maintenance requirements and procedures for flow meters
- KU7. operational and maintenance requirements and procedures for pipelines
- KU8. pipelines repair procedures

### Generic Skills (GS)

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

- GS1. prepare checklists, reports and fill out forms in local language or Hindi/English
- GS2. measure all dimensions used in plumbing in metric scale
- GS3. perform arithmetic calculations of addition, subtraction, multiplication and division processes
- GS4. read and interpret information (symbols, dimensions, terminology, dates etc.) given in local language or Hindi
- GS5. state information, doubts and concerns about work related matters in local language or Hindi/English
- GS6. plan one's daily tasks to achieve maximum productivity
- GS7. be punctual and work as per agreed priorities
- GS8. listen to customer's concerns and doubts carefully and address them
- GS9. be courteous and polite with customers and team members
- GS10. establish workable solutions for problems in hand in consultation with others and record them
- GS11. breakdown relevant work process into its constituent activities for ease of analysis
- GS12. identify ways to increase productivity and reduce errors



## Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Maintain sump and storage tanks</i>	6	9	2	1
PC1. dewater sump and tank	2	2	0.5	0.5
PC2. clean, disinfect and rinse the sump and tank	1	2	0.5	-
PC3. desilt the area and pump house.	1	2	0.5	-
PC4. perform leakage test and carry out rectification if needed with epoxy coating, cement concreting, painting etc.	2	3	0.5	0.5
<i>Maintain water meters</i>	8	13	3	1
PC5. clean the dirt box or strainer	1	1	-	-
PC6. replace gaskets upon its wear and tear	1	2	0.5	-
PC7. clean the chamber where meter is installed	1	1	-	-
PC8. prevent water seepage into the water meter	1	2	0.5	-
PC9. verify if water meter is given correct reading	1	1	-	0.5
PC10. disassemble and reassemble the water meter for verification or repair	1	3	1	-
PC11. take action as per standard operating procedure to troubleshoot common faults in water meters	1	3	1	0.5
PC12. clean the disassembled parts	1	-	-	-
<i>Monitor and maintain flow meters</i>	5	7	2	1
PC13. check the range and zero setting of the flow meter	1	1	0.5	-
PC14. inspect for bearing wear out, deposits in flow meter or corrosion of attached pipes	2	3	0.5	0.5

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC15. take action as per standard operating procedure to troubleshoot common faults in flow meters	2	3	1	0.5
<i>Operate and maintain and repair pipelines</i>	<b>10</b>	<b>20</b>	<b>7</b>	<b>4</b>
PC16. operate water pipelines with positive pressure and by opening and shutting off the valves gradually	1	2	1	0.5
PC17. flush the system to clear sediments	1	1	-	0.5
PC18. service the valve chamber and valves	1	2	1	0.5
PC19. inspect the pipelines for damage, wear and tear, leakage, entrainment and water hammer	2	3	1	1
PC20. locate the leaks in the pipes	1	3	1	0.5
PC21. replace faulty parts like gaskets, valves joints and pipes that are not repairable	1	3	1	1
PC22. repair damaged pipelines	2	3	1	-
PC23. apply cement mortar lining on corroded pipes	1	3	1	-
<b>NOS Total</b>	<b>29</b>	<b>49</b>	<b>14</b>	<b>7</b>

## National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	PSC/N0154
<b>NOS Name</b>	Maintain of Water Distribution and Storage Systems at Water Supply Stations
<b>Sector</b>	Plumbing
<b>Sub-Sector</b>	Industrial / Non-Industrial Plumbing
<b>Occupation</b>	Plumbing Systems Installation and Maintenance
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	NA
<b>Next Review Date</b>	NA
<b>Deactivation Date</b>	NA
<b>NSQC Clearance Date</b>	NA

## PSC/N0155: Operate and Maintain Water Treatment Units

### Description

This unit deals in detail with the operation and maintenance of water treatment units, such as slow sand filters and chlorinators.

### Scope

The scope covers the following :

- Operate and maintain water treatment units

### Elements and Performance Criteria

#### *Operate and maintain water treatment units*

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

- PC1. start and shut off the filtration process
- PC2. adjust the rate of filtration as needed
- PC3. add chemicals, such as ammonia, chlorine, or lime, to disinfect water or other liquids
- PC4. inspect equipment on a regular basis to ensure proper functioning and adherence to safety standards
- PC5. monitor operating conditions, meters, and gauges
- PC6. collect and test water and sewage samples
- PC7. record meter and gauge readings, and operational data
- PC8. operate equipment to purify and clarify water, or to process or dispose of sewage
- PC9. clean and maintain equipment, tanks, filter beds, and other work areas

### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. standards, policies, and procedures followed in the company relevant to the task
- KU2. workplace safety requirements, hazard reporting and handling procedures
- KU3. overview of water treatment units
- KU4. commonly used water treatment units such as slow sand filters and chlorinators
- KU5. operational and maintenance requirements and procedures for water treatment units
- KU6. start and shut off the filtration process
- KU7. rate of filtration and need for adjustment
- KU8. chemicals used in the water treatment units
- KU9. when and how to add chemicals, such as ammonia, chlorine, or lime, to disinfect water or other liquids
- KU10. importance of regular inspection and the inspection process
- KU11. various meter and gauges and information to be gathered from them

KU12. importance and procedure of water and sewage testing

KU13. importance of maintaining records

## Generic Skills (GS)

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

- GS1. write common words/signs and set phrases used in the work
- GS2. prepare checklists, reports and fill out forms in local language or Hindi/English
- GS3. measure all dimensions used in plumbing in metric scale
- GS4. perform arithmetic calculations of addition, subtraction, multiplication and division processes
- GS5. read and interpret information (symbols, dimensions, terminology, dates etc.) given in local language or Hindi
- GS6. state information, doubts and concerns about work related matters in local language or Hindi/English
- GS7. spot discrepancies or errors and select the most efficient solution
- GS8. plan one's daily tasks to achieve maximum productivity
- GS9. be punctual and work as per agreed priorities
- GS10. listen to customer's concerns and doubts carefully and address them
- GS11. be courteous and polite in communications with customers and team
- GS12. establish workable solutions for problems in hand in consultation with others and record them
- GS13. identify ways to improve quality of work and reduce errors

## Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Operate and maintain water treatment units</i>	30	49	14	7
PC1. start and shut off the filtration process	3	4	1	-
PC2. adjust the rate of filtration as needed	3	5	1	1
PC3. add chemicals, such as ammonia, chlorine, or lime, to disinfect water or other liquids	3	6	1	1
PC4. inspect equipment on a regular basis to ensure proper functioning and adherence to safety standards	4	6	2	1
PC5. monitor operating conditions, meters, and gauges	3	6	2	1
PC6. collect and test water and sewage samples	3	7	2	1
PC7. record meter and gauge readings, and operational data	3	5	2	-
PC8. operate equipment to purify and clarify water, or to process or dispose of sewage	4	6	2	1
PC9. clean and maintain equipment, tanks, filter beds, and other work areas	4	4	1	1
<b>NOS Total</b>	<b>30</b>	<b>49</b>	<b>14</b>	<b>7</b>

## National Occupational Standards (NOS) Parameters

NOS Code	PSC/N0155
NOS Name	Operate and Maintain Water Treatment Units
Sector	Plumbing
Sub-Sector	Industrial / Non-Industrial Plumbing
Occupation	Plumbing Systems Installation and Maintenance
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	NA
Next Review Date	NA
Deactivation Date	NA
NSQC Clearance Date	NA

## PSC/N0136: Apply Health and Safety Practices at the Workplace

### Description

This unit is about following safety procedures, communicating potential hazards and dangers of accidents on the job.

### Scope

The scope covers the following :

- Follow safety measures to avoid accidents
- Daily inspection of tools and equipment
- Deal with emergencies

### Elements and Performance Criteria

#### *Follow safety measures to avoid accidents*

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

- PC1. identify risks and hazards at the workplace
- PC2. wear personal protective equipment (PPE) as per the type of plumbing work
- PC3. place protective barricades and signages around the pits and trenches
- PC4. isolate the plumbing fittings and fixtures from electrical wiring to avoid accidents
- PC5. adhere to organisational procedures for reporting hazards and incidents to relevant authorities
- PC6. establish ventilation before entering underground work areas
- PC7. work safely in and around trenches, elevated places and confined areas
- PC8. ensure tools and hazardous materials are not left unattended
- PC9. ensure good housekeeping in order to prevent hazards e.g. fire
- PC10. dispose waste materials and used PPE according to regulations and codes of practice

#### *Follow hygiene and sanitation practices*

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

- PC11. follow recommended personal hygiene and sanitation practices, for example, washing/sanitizing hands, covering face with a bent elbow while coughing/sneezing etc.
- PC12. clean and disinfect work area, materials/supplies, equipment etc. before and after use.
- PC13. report hygiene and sanitation issues to appropriate authority

#### *Use tools, equipment and materials safely*

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

- PC14. check that the tools, equipment and materials are in good condition and as per industry standards before use
- PC15. use power tools and machinery that are grounded
- PC16. replace or repair split or loose tools before use
- PC17. store and transport various plumbing materials safely

#### *Deal with emergencies*



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

PC18. follow workplace emergency and evacuation procedures

PC19. use a fire extinguisher correctly

PC20. use safe methods to free a person from electrocution

PC21. administer appropriate first aid (such as CPR etc.) to victims in case of cuts, bleeding, burns, choking, electric shock, poisoning etc.

## **Knowledge and Understanding (KU)**

The individual on the job needs to know and understand:

KU1. possible causes of risk, hazard or accident in the workplace

KU2. organisational procedures for upkeep of tools and plumbing materials, health and safety

KU3. location of all the general health and safety equipment in the workplace

KU4. meaning of hazards and risks

KU5. hazardous environment encountered during work such as underground areas, elevated areas, areas with water and electricity supply, presence of biological waste, under construction sites etc.

KU6. work practices and precautions to control and prevent risks, hazards and accidents

KU7. importance of each personal protective equipment used such as eye protection mask, hard hats, gloves, apron, rubber boots etc.

KU8. tools and plumbing equipment as per latest industry standards

KU9. preventative and remedial actions to be taken in case of exposure to toxic materials

KU10. specific safety and health related problems faced in domestic, commercial and institutional setups

KU11. various causes of fire and precautionary activities to prevent the fire accident

KU12. techniques of using the different fire extinguishers

KU13. rescue techniques applied during a fire hazard

KU14. various types of safety signs and meaning

KU15. appropriate basic first aid treatment relevant to the condition e.g. shock, electrical shock, bleeding, minor burns, poisoning, eye injuries etc.

KU16. potential injuries and ill health associated with incorrect handling of tools and equipment

## **Generic Skills (GS)**

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

GS1. write an accident/incident report in local language or English

GS2. read and comprehend labels, charts, signages, manuals, plumbing symbols etc.

GS3. question coworkers appropriately in order to clarify instructions and other issues

GS4. plan and organize the work schedule, work area, tools, equipment and materials for improved productivity

GS5. determine key considerations and priorities when faced with problems



## Qualification Pack



GS6. seek official and authorised sources of help and guidance to resolve problems that cannot be solved at one's level of authority

## Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Follow safety measures to avoid accidents</i>	13	32	-	3
PC1. identify risks and hazards at the workplace	2	2	-	0.5
PC2. wear personal protective equipment (PPE) as per the type of plumbing work	2	2	-	0.5
PC3. place protective barricades and signages around the pits and trenches	1	4	-	0.5
PC4. isolate the plumbing fittings and fixtures from electrical wiring to avoid accidents	1	4	-	-
PC5. adhere to organisational procedures for reporting hazards and incidents to relevant authorities	2	4	-	0.5
PC6. establish ventilation before entering underground work areas	1	4	-	-
PC7. work safely in and around trenches, elevated places and confined areas	1	3	-	-
PC8. ensure tools and hazardous materials are not left unattended	1	3	-	-
PC9. ensure good housekeeping in order to prevent hazards e.g. fire	1	3	-	0.5
PC10. dispose waste materials and used PPE according to regulations and codes of practice	1	3	-	0.5
<i>Follow hygiene and sanitation practices</i>	3	8	-	1
PC11. follow recommended personal hygiene and sanitation practices, for example, washing/sanitizing hands, covering face with a bent elbow while coughing/sneezing etc.	1	3	-	0.5
PC12. clean and disinfect work area, materials/supplies, equipment etc. before and after use.	1	3	-	0.5
PC13. report hygiene and sanitation issues to appropriate authority	1	2	-	-
<i>Use tools, equipment and materials safely</i>	6	9	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. check that the tools, equipment and materials are in good condition and as per industry standards before use	1	3	-	0.25
PC15. use power tools and machinery that are grounded	1	2	-	0.25
PC16. replace or repair split or loose tools before use	2	2	-	0.25
PC17. store and transport various plumbing materials safely	2	2	-	0.25
<i>Deal with emergencies</i>	8	14	-	2
PC18. follow workplace emergency and evacuation procedures	2	3	-	0.5
PC19. use a fire extinguisher correctly	2	4	-	0.5
PC20. use safe methods to free a person from electrocution	2	3	-	0.5
PC21. administer appropriate first aid (such as CPR etc.) to victims in case of cuts, bleeding, burns, choking, electric shock, poisoning etc.	2	4	-	0.5
<b>NOS Total</b>	<b>30</b>	<b>63</b>	<b>-</b>	<b>7</b>

## National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	PSC/N0136
<b>NOS Name</b>	Apply Health and Safety Practices at the Workplace
<b>Sector</b>	Plumbing
<b>Sub-Sector</b>	Industrial / Non-Industrial Plumbing, Water Supply & Water Treatment & Quality Control, Sewerage & Sewage Treatment, Drainage, Water Harvesting & Ground Recharging, Firefighting & Safety Systems, Gas & Piping (Industrial / Medical), HVAC & Steam, Manufacturing of Plumbing / Firefighting Products, Micro-Hydel Power
<b>Occupation</b>	Plumbing Systems Installation and Maintenance, Designing, Sales, Material Handling, Plumbing Servicing, Plumbing Plant Operations
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	16/07/2020
<b>Next Review Date</b>	27/05/2026
<b>Deactivation Date</b>	27/05/2026
<b>NSQC Clearance Date</b>	27/05/2021

## PSC/N0137: Work Effectively with Others

### Description

This unit covers basic etiquette and competencies required in behavior and interactions with others at the workplace.

### Scope

The scope covers the following :

- Communicate effectively
- Work in a team effectively
- Respect diversity

### Elements and Performance Criteria

#### *Communicate effectively*

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

- PC1. obtain complete information and instructions
- PC2. seek clarifications from appropriate source when required
- PC3. provide information accurately and clearly
- PC4. use inclusive language (verbal, non-verbal and written) that is gender, disability and culturally sensitive

#### *Work in a team effectively*

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

- PC5. prioritize tasks as required
- PC6. consult with and assist others to maximize effectiveness and efficiency in carrying out tasks
- PC7. escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict
- PC8. act upon constructive feedback from others

#### *Respect diversity*

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

- PC9. transact with everyone without any personal bias based on gender, disability, caste, religion, colour, sexual orientation and culture
- PC10. recognize indicators of harassment and discrimination based on gender, disability, caste, religion, colour, sexual orientation and culture at workplace
- PC11. report incidents of harassment and discrimination to appropriate authority

### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. legislation, standards, policies, and procedures followed in the company relevant to employment, behavior, harassment, discrimination and performance conditions
- KU2. reporting structure, inter-dependent functions, lines and procedures in the work area

- KU3. escalation matrix and procedures for reporting work and employment related issues
- KU4. types of harassment and discrimination based on gender, disability, caste, religion and culture and how to recognize it.
- KU5. importance of effective communication and the impact of poor communication on the employee, the employer and the customer
- KU6. importance of teamwork in organizational and individual success
- KU7. various components of effective communication such as tone and pitch
- KU8. importance of ethics and discipline for professional success
- KU9. how to express and address grievances appropriately and effectively
- KU10. importance and ways of managing interpersonal conflict effectively
- KU11. different types of disabilities and the challenges faced by persons with disability (PwD)
- KU12. laws, acts and provisions defined for PwD by the statutory bodies
- KU13. government and private schemes and benefits available for PwD
- KU14. Importance of gender sensitivity and equality.
- KU15. gender, disability and cultural biases, stereotypes and impact on others
- KU16. gender and its concepts such as gender roles, gender spectrum, gender as an identity
- KU17. legislations, grievance redressal mechanisms, and penalties against harassment in the workplace

## Generic Skills (GS)

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

- GS1. write clear and legible notes, keep records, prepare to-do lists and take down instructions
- GS2. write basic numbers, quantities and basic work-related terminology for operational requirements in the local language and English
- GS3. read basic terminologies to accurately interpret labels, supervisor's instructions in the local language and English
- GS4. read and interpret accurate information from work-related documents and various relevant work instructions and records in local
- GS5. interact with the concerned personnel appropriately (correct protocol and manner of speaking etc.)
- GS6. display active listening skills while interacting with co-workers and others in the workplace
- GS7. deliver consistent and reliable service to internal and external customers
- GS8. work with co-workers and supervisor to resolve any issues that threaten work quality as per the planned schedule

## Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Communicate effectively</i>	11	26	-	2
PC1. obtain complete information and instructions	3	8	-	-
PC2. seek clarifications from appropriate source when required	1	5	-	-
PC3. provide information accurately and clearly	3	7	-	1
PC4. use inclusive language (verbal, non-verbal and written) that is gender, disability and culturally sensitive	4	6	-	1
<i>Work in a team effectively</i>	11	25	-	3
PC5. prioritize tasks as required	3	8	-	1
PC6. consult with and assist others to maximize effectiveness and efficiency in carrying out tasks	3	8	-	1
PC7. escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict	3	4	-	1
PC8. act upon constructive feedback from others	2	5	-	-
<i>Respect diversity</i>	8	12	-	2
PC9. transact with everyone without any personal bias based on gender, disability, caste, religion, colour, sexual orientation and culture	3	5	-	1
PC10. recognize indicators of harassment and discrimination based on gender, disability, caste, religion, colour, sexual orientation and culture at workplace	3	5	-	1
PC11. report incidents of harassment and discrimination to appropriate authority	2	2	-	-
<b>NOS Total</b>	<b>30</b>	<b>63</b>	<b>-</b>	<b>7</b>



## National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	PSC/N0137
<b>NOS Name</b>	Work Effectively with Others
<b>Sector</b>	Plumbing
<b>Sub-Sector</b>	Industrial / Non-Industrial Plumbing, Water Supply & Water Treatment & Quality Control, Sewerage & Sewage Treatment, Drainage, Water Harvesting & Ground Recharging, Firefighting & Safety Systems, Gas & Piping (Industrial / Medical), HVAC & Steam, Manufacturing of Plumbing / Firefighting Products, Micro-Hydel Power
<b>Occupation</b>	Plumbing Systems Installation and Maintenance, Designing, Sales, Material Handling, Plumbing Servicing, Plumbing Plant Operations
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	16/07/2020
<b>Next Review Date</b>	27/05/2026
<b>Deactivation Date</b>	27/05/2026
<b>NSQC Clearance Date</b>	27/05/2021

## SGJ/N1702: Optimize resource utilization at workplace

### Description

This unit is about adopting sustainable practices and optimizing use of resources, especially material, energy and waste, in day-to-day operations at work

### Scope

The scope covers the following :

- Material conservation practices
- Energy/electricity conservation practices
- Effective waste management/recycling practices

### Elements and Performance Criteria

#### *Material conservation practices*

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

- PC1. identify ways to optimize usage of material including water in various tasks/activities/processes
- PC2. check for spills/leakages in various tasks/activities/processes
- PC3. plug spills/leakages and escalate to appropriate authority if unable to rectify
- PC4. carry out routine cleaning of tools, machines and equipment

#### *Energy/electricity conservation practices*

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

- PC5. identify ways to optimize usage of electricity/energy in various tasks/activities/processes
- PC6. check if the equipment/machine is functioning normally before commencing work and rectify wherever required
- PC7. report malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment
- PC8. ensure electrical equipment and appliances are properly connected and turned off when not in use

#### *Effective waste management/recycling practices*

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

- PC9. identify recyclable and non-recyclable, and hazardous waste generated
- PC10. segregate waste into different categories
- PC11. dispose non-recyclable waste appropriately
- PC12. deposit recyclable and reusable material at identified location
- PC13. follow processes specified for disposal of hazardous waste

### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. potential hazards, risks and threats based on the nature of work
- KU2. layout of the workstation and electrical and thermal equipment used
- KU3. organizations procedures for minimizing waste
- KU4. efficient and inefficient utilization of material and water
- KU5. ways of efficiently managing material and water in the process
- KU6. basics of electricity and prevalent energy efficient devices
- KU7. ways to recognize common electrical problems
- KU8. common practices of conserving electricity
- KU9. usage of different colours of dustbins
- KU10. categorization of waste into dry, wet, recyclable, non-recyclable and items of single-use plastics
- KU11. waste management and methods of waste disposal
- KU12. common sources of pollution and ways to minimize it

### Generic Skills (GS)

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

- GS1. record data on waste disposal at workplace
- GS2. complete statutory documents relevant to safety and hygiene
- GS3. read Standard Operating Practices (SOP) documents
- GS4. communicate with colleagues on the significance of greening of jobs
- GS5. make timely decisions for efficient utilization of resources
- GS6. complete tasks efficiently and accurately within stipulated time
- GS7. work with supervisors/team members to carry out work related tasks
- GS8. identify cause and effect of greening of jobs

## Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Material conservation practices</i>	4	8	-	-
PC1. identify ways to optimize usage of material including water in various tasks/activities/processes	1	2	-	-
PC2. check for spills/leakages in various tasks/activities/processes	1	2	-	-
PC3. plug spills/leakages and escalate to appropriate authority if unable to rectify	1	2	-	-
PC4. carry out routine cleaning of tools, machines and equipment	1	2	-	-
<i>Energy/electricity conservation practices</i>	4	8	-	-
PC5. identify ways to optimize usage of electricity/energy in various tasks/activities/processes	1	2	-	-
PC6. check if the equipment/machine is functioning normally before commencing work and rectify wherever required	1	2	-	-
PC7. report malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment	1	2	-	-
PC8. ensure electrical equipment and appliances are properly connected and turned off when not in use	1	2	-	-
<i>Effective waste management/recycling practices</i>	5	10	-	-
PC9. identify recyclable and non-recyclable, and hazardous waste generated	1	2	-	-
PC10. segregate waste into different categories	1	2	-	-
PC11. dispose non-recyclable waste appropriately	1	2	-	-
PC12. deposit recyclable and reusable material at identified location	1	2	-	-
PC13. follow processes specified for disposal of hazardous waste	1	2	-	-
<b>NOS Total</b>	<b>13</b>	<b>26</b>	<b>-</b>	<b>-</b>

## National Occupational Standards (NOS) Parameters

NOS Code	SGJ/N1702
NOS Name	Optimize resource utilization at workplace
Sector	Green Jobs
Sub-Sector	Other Green Jobs
Occupation	Resource Optimization
NSQF Level	3
Credits	TBD
Version	1.0
Last Reviewed Date	21/09/2021
Next Review Date	21/09/2024
Deactivation Date	21/09/2026
NSQC Clearance Date	25/11/2021

## Assessment Guidelines and Assessment Weightage

### Assessment Guidelines

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

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
PSC/N0151.Install Pump Systems and Related Equipment	30	49	14	7	100	14
PSC/N0152.Operate and Maintain Pumps and Related Machinery	30	49	14	7	100	14
PSC/N0153.Perform Maintenance of Local Ground Water Source and Water Quality Monitoring at Water Supply Stations	31	47	15	7	100	14
PSC/N0154.Maintain of Water Distribution and Storage Systems at Water Supply Stations	29	49	14	7	99	14
PSC/N0155.Operate and Maintain Water Treatment Units	30	49	14	7	100	14
PSC/N0136.Apply Health and Safety Practices at the Workplace	30	63	-	7	100	10
PSC/N0137.Work Effectively with Others	30	63	-	7	100	10
SGJ/N1702.Optimize resource utilization at workplace	13	26	-	-	39	10



## Qualification Pack



National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
Total	223	395	71	49	738	100

## Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training



## Glossary

<b>Sector</b>	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.
<b>Sub-sector</b>	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
<b>Occupation</b>	Occupation is a set of job roles, which perform similar / related set of functions in an industry.
<b>Job role</b>	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
<b>Occupational Standards (OS)</b>	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.
<b>Performance Criteria (PC)</b>	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
<b>National Occupational Standards (NOS)</b>	NOS are occupational standards which apply uniquely in the Indian context.
<b>Qualifications Pack (QP)</b>	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.
<b>Unit Code</b>	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
<b>Unit Title</b>	Unit title gives a clear overall statement about what the incumbent should be able to do.
<b>Description</b>	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.
<b>Scope</b>	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.
<b>Knowledge and Understanding (KU)</b>	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.

<b>Organisational Context</b>	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.
<b>Technical Knowledge</b>	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
<b>Core Skills/ Generic Skills (GS)</b>	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.
<b>Electives</b>	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.
<b>Options</b>	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.