सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

Qualification Pack

N·S·D·C National Skill Development Corporation
Transforming the skill landscape

Senior Lineman- Distribution

QP Code: PSS/Q0103

Version: 1.0

NSQF Level: 5

Power Sector Skill Council || Plot No. 4, Institutional Area, CBIP Building, Malcha Marg, Chanakyapuri
New Delhi-110021

Contents

PSS/Q0103: Senior Lineman- Distribution

Brief Job Description

The incumbent in the job will oversee and carryout inspections, also perform repair and maintenance of poles, overhead and underground powerlines and cables, substations etc. They lead a team of linemen and technical helpers in conducting the above work.

Personal Attributes

The candidate will have to be able to lead people and provide necessary support to them for on-the-job performance. The candidate should demonstrate patience and ability to work and inspect work in detail. The candidate should be able to read, hear and understand instructions and warnings.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. PSS/N0105: Repair and maintenance of power distribution lines and components
2. PSS/N0107: Operation and maintenance of 11/0.433 KV Distribution Substation
3. PSS/N0109: Inspection of Power Distribution Substation, Lines and Components
4. PSS/N0110: Supervise work and crew in power distribution/transmission installation and maintenance work
5. PSS/N1336: Working effectively with others
6. PSS/N2001: Use basic health and safety practices for power related work

Qualification Pack (QP) Parameters

Sector	Power
Sub-Sector	Distribution
Occupation	Distribution System Operation & Maintenance
Country	India
NSQF Level	5
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7248.50

Minimum Educational Qualification & Experience	8th Class with 5-10 Years of experience Lineman
Minimum Level of Education for Training in School	Same as Min.Ed for Job
Pre-Requisite License or Training	Electrical - 6 months, preferably ITI (Suggested but not Mandatory)
Minimum Job Entry Age	23 Years
Last Reviewed On	13/09/2017
Next Review Date	31/03/2022
NSQC Approval Date	20/07/2015
Version	1.0
Reference code on NQR	2015/POW/PSSC/00884
NQR Version	1.0

PSS/N0105: Repair and maintenance of Power Distribution Lines and components

Description

This unit covers the competencies required by technicians for repair and maintenance for Power Distribution Lines and components. This includes handling of tools and equipment for installation and maintenance and carrying out necessary repair and maintenance tasks in a safe, efficient and effective manner.

Scope

This unit/task covers the following:

- Working safely
- Prepare for repair and maintenance of Power Distribution lines
- Carrying out maintenance for Power Distribution lines
- Operation of Switchgear (LT & HT)
- Post repair and maintenance activities

Elements and Performance Criteria

Working safely

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

PC1. Work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines

PC2. Adhere to procedures or systems in place for health and safety, personal protective equipment (PPE) and other relevant safety regulations for electrical and related operations

PC3. Work according to laid down procedures and instructions

PC4. Ensure that all tools, equipment, etc. Are in a safe and usable condition and are kept at secured location

PC5. Ensure work area is clean and safe from hazards before and after the job is completed

Prepare for repair and maintenance of power distribution lines

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

PC6. access and survey area in accordance with established procedures

PC7. Assess and confirm condition of pole structure and components based on Distribution line standards

PC8. Perform load checks to identify imbalanced and overloaded circuits

PC9. identify hazards of trimming trees such as limits of approach, public safety and step and touch potential

PC10. Conduct site inspection for emergency cases following established procedures

PC11. identify various types of circuits

PC12. Identify and acquire correct tools, equipment and instruments required for Distribution line assessment and inspection

PC13. Ensure the tools and equipment is well maintained, calibrated and approved for use

PC14. Prepare and maintain the work area as per procedure or operation specification

PC15. prepare and maintain the work area as per procedure or operation specification

PC16. switch off, isolate, discharge and earth (side) line cables

PC17. confirm and/or obtain PTW/work permit (shut down) is taken to proceed to work from appropriate personnel in accordance with standard procedure

PC18. safely operate switchgears e.g. on/off, earth, etc.

Repair and maintenance of Power Distribution lines

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

PC19. perform off-line overhead line maintenance procedure according to job specifications and requirements

PC20. perform off-line underground line maintenance procedure according to job specifications and requirements

PC21. perform stay wire assembly as per requirements and specifications, safely and efficiently

PC22. ensure lines are properly aligned by tightening appropriate nuts and bolts

PC23. ensure proper clearance of lowest conductor from ground

PC24. ensure guy insulators are of suitable capacity to the stay sets

PC25. select and use test equipment such as tong testers/clip-on meter, meggers and voltmeters to verify fault and integrity

PC26. sectionalize circuit to determine location of fault

PC27. isolate fault, damage or hazard and restore power to customers using equipment such as switches

PC28. repair conductor by splicing, jointing, using armor rods, line guards, vibration dampers

PC29. check work carried out by team members and ensure it is as per standard requirement

PC30. provide useful feedback regarding work matter to team members in a timely, polite and supportive manner

PC31. report trouble and required actions such as repairs or replacements, and estimated repair time to system authority

Carry out replacement activities as required

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

PC32. ensure pole dismantling and re-setting procedure is carried out as per standard procedure, where required

PC33. carry out conductor stringing procedures, paving conductor on the ground along the pole taking into account permissible span length and sagging

PC34. replace components such as transformers, disconnects, conductors, poles, switches, elbows and terminations and insulators safely and as per company procedure

PC35. replace other line components due to damage or unsuitability as per standard procedure, where required

PC36. make connections and energize replaced underground cables, as per standard procedures where required

Post-repair and maintenance activities

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

PC37. restore system to normal operating status by using switching procedures

PC38. deal promptly and effectively with problems within control, and seek help and guidance from the relevant people for problems that cannot be resolved

PC39. leave the work area in a safe and tidy condition on completion of the repair and maintenance activities

PC40. refer unresolved job related problems to appropriate personnel for support

PC41. monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. relevant legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions

KU2. relevant health and safety requirements applicable in the work place

KU3. own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities

KU4. reporting structure, inter-dependent functions, lines and procedures in the work area

KU5. how to engage with specialists for support in order to resolve incidents and service requests

KU6. importance of working in clean and safe environment practices and procedures

KU7. relevant people and their responsibilities within the work area

KU8. escalation matrix and procedures for reporting work and employment related issues

KU9. principles of electricity Principles: e.g. current, voltage, conductor size relation, series/parallel connections

KU10. common electricity terminology and correct interpretation of the same Terminology: e.g. Current, Voltage, Resistance, Inductance, Capacitance, Kilovolt ampere (kva), Kilowatt (kw), Kilowatt hour: (kwh)(unit of electric consumption), Power factor

KU11. specific terminology used in Distribution Line work Terminology: e.g. peak hours, peak load, load shedding, load transfer, Technical and commercial loss, maximum power,

KU12. elements of the power system Elements: e.g. generation, transmission, distribution, metering, equipment, etc

KU13. different types of material and accessories used in power Distribution Materials and accessories: e.g. Supports (Poles-Steel, Cement , Wooden), Conductors (Sizes, current carrying capacity), Conductor Accessories, Binding Tape, Binding Wire, P.G. Clamp, T Clamp etc. , switchgear panel, DT, Insulators (Pin, Disc, shackle, Guy etc.), Cross Arms, Stay sets, GO Switches etc. type of cross arms, etc.

KU14. tools and equipment used in testing, repair and maintenance Tools: e.g. Plier, Screwdriver, Wrench set, Hammer, Drilling machine, Hacksaw / cutting tools, Measuring tape, Pulleys (Force Pulley with sling), Tommy bar, Crimping machine, Round / flat file, Earth rod (discharge rod), leakage current monitoring kit

KU15. specific health and safety precautions which must be taken when carrying out Distribution lines repair and maintenance work especially live line or equipment Precautions: e.g. loose dhotis, pajamas, key chain or watch chains should not be worn; shoes with projecting nails or other types of metal parts not to be used; do not start work unless circuit is in off condition and discharged, confirmation of line clear permit is taken on equipment, equipment or line is properly earthed

KU16. various types of circuits Types: e.g. C.T., P.T., A.C., D.C., Control, Series, Parallel, Neutral phase, Indication & Annunciation Circuits

KU17. troubleshooting and repair methods

KU18. fault indicators

KU19. overhead distribution system apparatus such as regulators and reclosers

KU20. overhead distribution system standards

KU21. access points such as vaults, open trenches and manholes

KU22. underground distribution system apparatus such as transformers, switching cubicles, distribution and junction boxes

KU23. co-existing underground utilities

KU24. causes of conductor damage Causes: Aeolian vibration, sway oscillation, galloping, unbalanced loading, over loading

KU25. classification of conductor and insulator damage including fretting, abrasion, fatigue breaks, tensile breaks

KU26. need for an authorized permit on 11 KV and above voltage line

KU27. hazards associated with carrying out power line maintenance and how they can be minimizedHazards: e.g. live wires, faulty insulation, voltage surges, faulty and damaged equipment and components, unsecure cables, unstable ladders, insects and reptiles, and scaffolding, etc

KU28. importance of ensuring that tools and equipment are suitable, well maintained, calibrated and operating effectively

KU29. importance of following good housekeeping and fire prevention procedures

KU30. importance of following job instructions and defined maintenance procedures

KU31. material preparation methods and techniques to be undertaken, prior to using for testing and maintenance activities

KU32. preparation of equipment for testing and repair activities

KU33. components of Distribution lines Line components: e.g. cross arm, insulator, line hardware, x-brace, armor rod, conductor, jumper, copper bond, arching horn, spacer, gang operated switch, drop out fuse, lightning arrester, etc.

KU34. procedures for handling Distribution line components with imperfections/defects that cannot be removed/repaired and how can they be minimized Imperfections/defects: e.g. Cross Arms (damaged cross arms, splitting or twisting, loose, broken, or missing nuts and braces, presence of insects), Insulators disc type (corroded pin, flashover, broken insulator, molds / moss or algae, hair crack), Insulator Synthetic polymer (broken rubber petticoat at hot end part, burned rubber petticoat at hot end part), Conductors (cut strand and loose conductor, loose vibration damper and spacer, low clearance (line to ground), Spot heating of connectors, other fittings and galvanized steel components (corroded bolts and nuts/steel pin, loose cotter key, dislocated steel pin, missing cotter / split pin), Ground wires and connectors (corroded earthwire, corroded / detached connector at jumper loop, corroded / cut ground lead, detached connector on ground lead and earthwire), Stay wires (rusted anchor rod, corroded)

KU35. problems and conditions which render electrical poles or towers in need of maintenance or replacement Problems and conditions: e.g. tower structure (corroded tower parts, loose or bent tower parts, eroded foundation), leaning pole, eroded pole, splitting, splitting or pulling of stay, twisting or raking, knots hole or birds nest, presence of insects, burned pole, excessive cracks, corroded poles, effects of lightning, etc.

KU36. importance of leaving the work area and equipment in a safe and clean condition on completion of the repair and maintenance activities

KU37. importance of reporting problems in a timely manner

KU38. methods and parameters to check quality of line components against required quality standards Methods: e.g. visual inspection, binoculars, measuring tape, use of instruments

KU39. principles and practices of electrical safety

KU40. standard procedures how to deal with electric shocks and electrocutions to rescue and minimize damage and harm

KU41. personal protective equipment (PPE) and clothing that must be worn during the inspection, repair and maintenance activity and from where can it be obtained PPE: e.g. safety helmet, safety glove, safety shoe, climbing harness, lanyard and tool belt (when climbing), earth rod (discharge rod), zola, safety rope

Generic Skills (GS)

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

GS1. read/listen and interpret information correctly from various job specification documents, manuals, health and safety instructions, memos, etc. applicable to the job in English and/or local language

GS2. fill up appropriate forms, activity logs, attendance sheets as per organizational format in English and/or local language

GS3. convey and share technical information clearly using appropriate language

GS4. check and clarify task-related information

GS5. liaise with appropriate authorities using correct protocol

GS6. communicate with people in respectful form and manner in line with organizational protocol

GS7. undertake basic numerical computations and calculations Numerical computations: addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages

GS8. identify various basic, compound and solid shapes as per dimensions given Basic shapes: square, rectangle, triangle, circle, quadrilaterals Compound shapes: involving squares, rectangles, triangles, circles, semicircles, quadrants of a circle Solid shapes: cube, rectangular prism, cylinder

GS9. use appropriate measuring techniques and units of measurement

GS10. use appropriate units and number systems to express degree of accuracy Units and number systems representing degree of accuracy: decimals places, significant figures, fractions as a decimal quantity

GS11. use metric systems of measurement

GS12. participate in on-the-job and other learning, training and development interventions and assessments

GS13. clarify task related information with appropriate personnel or technical adviser

GS14. seek to improve and modify own work practices

GS15. maintain current knowledge of application standards, legislation, codes of practice and product/process developments

GS16. identify problems with work planning, procedures, output and behavior and their implications

GS17. prioritize and plan for problem solving

GS18. communicate problems appropriately to others

GS19. identify sources of information and support for problem solving

GS20. seek assistance and support from other sources to solve problems

GS21. identify effective resolution techniques

GS22. select and apply resolution techniques

GS23. seek evidence for problem resolution

GS24. plan, prioritize and sequence work operations as per job requirements

GS25. organize and analyze information relevant to work

GS26. basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time

GS27. undertake and express new ideas and initiatives to others

GS28. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses

GS29. participate in improvement procedures including process, quality and internal/external customer/supplier relationships

GS30. ones competencies in new and different situations and contexts to achieve more

GS31. exercise restraint while expressing dissent and during conflict situations

GS32. avoid and manage distractions to be disciplined at work

GS33. manage own time for achieving better results

GS34. work in a team in order to achieve better results

GS35. identify and clarify work roles within a team

GS36. communicate and cooperate with others in the team for better results

GS37. seek assistance from fellow team members

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Working safely	**3**	**7**	**-**	**-**
PC1. Work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines	1	2	-	-
PC2. Adhere to procedures or systems in place for health and safety, personal protective equipment (PPE) and other relevant safety regulations for electrical and related operations	1	2	-	-
PC3. Work according to laid down procedures and instructions	1	1	-	-
PC4. Ensure that all tools, equipment, etc. Are in a safe and usable condition and are kept at secured location	-	1	-	-
PC5. Ensure work area is clean and safe from hazards before and after the job is completed	-	1	-	-
Prepare for repair and maintenance of power distribution lines	**7**	**21**	**-**	**-**
PC6. access and survey area in accordance with established procedures	1	2	-	-
PC7. Assess and confirm condition of pole structure and components based on Distribution line standards	2	2	-	-
PC8. Perform load checks to identify imbalanced and overloaded circuits	-	2	-	-
PC9. identify hazards of trimming trees such as limits of approach, public safety and step and touch potential	-	2	-	-
PC10. Conduct site inspection for emergency cases following established procedures	1	2	-	-
PC11. identify various types of circuits	-	1	-	-
PC12. Identify and acquire correct tools, equipment and instruments required for Distribution line assessment and inspection	-	1	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. Ensure the tools and equipment is well maintained, calibrated and approved for use	-	1	-	-
PC14. Prepare and maintain the work area as per procedure or operation specification	1	1	-	-
PC15. prepare and maintain the work area as per procedure or operation specification	1	1	-	-
PC16. switch off, isolate, discharge and earth (side) line cables	-	2	-	-
PC17. confirm and/or obtain PTW/work permit (shut down) is taken to proceed to work from appropriate personnel in accordance with standard procedure	1	2	-	-
PC18. safely operate switchgears e.g. on/off, earth, etc.	-	2	-	-
Repair and maintenance of Power Distribution lines	**10**	**26**	**-**	**-**
PC19. perform off-line overhead line maintenance procedure according to job specifications and requirements	2	2	-	-
PC20. perform off-line underground line maintenance procedure according to job specifications and requirements	2	2	-	-
PC21. perform stay wire assembly as per requirements and specifications, safely and efficiently	2	2	-	-
PC22. ensure lines are properly aligned by tightening appropriate nuts and bolts	-	2	-	-
PC23. ensure proper clearance of lowest conductor from ground	-	2	-	-
PC24. ensure guy insulators are of suitable capacity to the stay sets	-	2	-	-
PC25. select and use test equipment such as tong testers/clip-on meter, meggers and voltmeters to verify fault and integrity	-	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC26. sectionalize circuit to determine location of fault	-	2	-	-
PC27. isolate fault, damage or hazard and restore power to customers using equipment such as switches	-	2	-	-
PC28. repair conductor by splicing, jointing, using armor rods, line guards, vibration dampers	-	2	-	-
PC29. check work carried out by team members and ensure it is as per standard requirement	2	2	-	-
PC30. provide useful feedback regarding work matter to team members in a timely, polite and supportive manner	-	2	-	-
PC31. report trouble and required actions such as repairs or replacements, and estimated repair time to system authority	2	2	-	-
Carry out replacement activities as required	**4**	**11**	**-**	**-**
PC32. ensure pole dismantling and re-setting procedure is carried out as per standard procedure, where required	2	2	-	-
PC33. carry out conductor stringing procedures, paving conductor on the ground along the pole taking into account permissible span length and sagging	-	3	-	-
PC34. replace components such as transformers, disconnects, conductors, poles, switches, elbows and terminations and insulators safely and as per company procedure	1	2	-	-
PC35. replace other line components due to damage or unsuitability as per standard procedure, where required	1	2	-	-
PC36. make connections and energize replaced underground cables, as per standard procedures where required	-	2	-	-
Post-repair and maintenance activities	**1**	**10**	**-**	**-**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC37. restore system to normal operating status by using switching procedures	1	2	-	-
PC38. deal promptly and effectively with problems within control, and seek help and guidance from the relevant people for problems that cannot be resolved	-	2	-	-
PC39. leave the work area in a safe and tidy condition on completion of the repair and maintenance activities	-	2	-	-
PC40. refer unresolved job related problems to appropriate personnel for support	-	2	-	-
PC41. monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem	-	2	-	-
NOS Total	**25**	**75**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	PSS/N0105
NOS Name	Repair and maintenance of Power Distribution Lines and components
Sector	Power
Sub-Sector	Distribution
Occupation	Distribution System Operation & Maintenance
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	13/09/2017
Next Review Date	31/03/2022
NSQC Clearance Date	20/07/2015

PSS/N0107: Operation and Maintenance of an 11/0.433 KV Distribution Substation

Description

This unit covers the competencies required by lineman distribution to operate andmaintain 11/0.433 KV Distribution Substation. This includes working with the crew,handling of tools and equipment for operation & maintenance and carrying outnecessary tasks in a safe, efficient and effective manner.

Scope

This unit/task covers the following:

- Working safely
- Operate an 11/0.433 KV Distribution Substation
- Carrying out maintenance for the Distribution Substation

Elements and Performance Criteria

Working safely

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

PC1. work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines

PC2. adhere to procedures or systems in place for health and safety, personal protective equipment (ppe) and other relevant safety regulations for electrical and related operations

PC3. work following laid down procedures and instructions

PC4. ensure that all tools, equipment, power cables are in a safe and usable condition and are kept at secured location

PC5. ensure work area is clean and safe from hazards before and after the job is completed

PC6. inspect the component to check if it is as per specification and without defects

Operate and maintain 11/0.433 KV Distribution Substation

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

PC7. identify job requirements for specific operations as per instructions given from valid sourcesvalid sources: job instruction sheet/job card; work drawings; supervisor/incharge

PC8. identify various components of the power system

PC9. ensure equipment and tools required for installation work are identified, acquired, calibrated, suitable and approved for use

PC10. identify, estimate and acquire correct materials required for the substation erection and installation work

PC11. follow standard specifications and procedures for installing a pole mounted distribution transformer

PC12. ensure poles set to proper depth, and properly aligned

PC13. carry out erection of channel on the double pole for preparation of transformer bed as per requirement

PC14. fix lightning arrester as per requirement and standard procedure
PC15. install earth connection as per standard procedure
PC16. install cross arm as per specifications and requirement
PC17. provide anti-climbing device on poles
PC18. arrange to lift the transformer and put it on the transformer bed in a safe and efficient manner
PC19. fit the gang operating (go switch) and dropout fuse as per standard procedure
PC20. follow applicable construction standards e.g. rec construction standards, for carrying out the erection procedures
PC21. connect low voltage cables as per standard procedures in a safe and efficient manner
PC22. carry out low voltage able joints as per standard procedures, safely and effectively
PC23. perform post-installation procedures for ensuring clean and safe environment in the work and surrounding area
PC24. check oil level and ensure leakages are attended to and arrested
PC25. check oil bdv and acidity at regular intervals as per schedule and standard procedure
PC26. checking for sludge, dust, dirt ,moisture ion in oil and address it effectively in a timely fashion
PC27. clean bushings regularly and inspect for any cracks
PC28. check, note and rectify dust & dirt deposition, salt or chemical deposition, cement or acid fumes depositions
PC29. check tap position and gap of arching horn and tighten connection as requirement to address any issues
PC30. check neutral grounding and ensure it is maintained as per standard
PC31. periodically check for any loose connections of the terminations of hv & lv side
PC32. examine the breather through color of silica gel , if pink heat it or replace if necessary

Post erection activities

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

PC33. ensure facility is locked and warning signs are displayed effectively
PC34. deal promptly and effectively with problems within control, and seek help and guidance from the relevant people for problems that cannot be resolved
PC35. leave the work area in a safe and tidy condition on completion of the substation construction and maintenance activities
PC36. refer unresolved job related problems to appropriate personnel for support
PC37. monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. relevant legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions
KU2. relevant health and safety requirements applicable in the work place

KU3. own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities

KU4. reporting structure, inter-dependent functions, lines and procedures in the work area

KU5. how to engage with specialists for support in order to resolve incidents and service requests

KU6. importance of working in clean and safe environment practices and procedures

KU7. relevant people and their responsibilities within the work area

KU8. escalation matrix and procedures for reporting work and employment related issues

KU9. various components of the power system Components: e.g. transformers, Isolators, CTs, PTs, Circuit breakers, LAs, various types of Panels & Sub-station protection systems

KU10. various components of the power system Components: e.g. transformers, Isolators, CTs, PTs, Circuit breakers, LAs, various types of Panels & Sub-station protection systems

KU11. specific health and safety precautions which must be taken when carrying out substation installation processes

KU12. hazards associated with carrying out substation construction and installation process and maintenance, and how they can be minimized Hazards: e.g. live wires and equipment, heavy objects, insects and reptiles, obstructions and blockages, sharp edges and equipment, etc

KU13. importance of following job instructions and defined installation and maintenance procedures

KU14. equipment used in substation construction and maintenance activities

KU15. importance of leaving the work area and equipment in a safe and clean condition on completion of the heat treatment activities

KU16. importance of reporting problems in a timely manner

KU17. methods and parameters to check quality of the components against required quality standards

KU18. types of cable joints Types: e.g. straight, T-joint, terminal joint

KU19. calibration schedule of all equipment used in the construction and maintenance procedures

KU20. importance of tools and equipment to be kept in a safe and usable condition

KU21. importance of displaying rating and diagram plates

KU22. personal protective equipment (ppe) and clothing that must be worn during the heat treatment activity and from where can it be obtained

Generic Skills (GS)

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

GS1. read and interpret information correctly from various job specification documents, manuals, health and safety instructions, memos, etc. applicable to the job in english and/or local language

GS2. fill up appropriate technical forms, process charts, activity logs as per organizational format in english and/or local language

GS3. convey and share technical information clearly using appropriate language

GS4. check and clarify task-related information

GS5. liaise with appropriate authorities using correct protocol

GS6. communicate with people in respectful form and manner in line with organizational protocol

GS7. undertake basic numerical computations and calculations numerical computations: addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages

GS8. identify various basic, compound and solid shapes as per dimensions given basic shapes: square, rectangle, triangle, circle, quadrilaterals compound shapes: involving squares, rectangles, triangles, circles, semicircles, quadrants of a circle solid shapes: cube, rectangular prism, cylinder

GS9. use appropriate measuring techniques and units of measurement

GS10. use appropriate units and number systems to express degree of accuracy units and number systems representing degree of accuracy: decimals places, significant figures, fractions as a decimal quantity

GS11. use metric systems of measurement

GS12. participate in on-the-job and other learning, training and development interventions and assessments

GS13. clarify task related information with appropriate personnel or technical adviser

GS14. seek to improve and modify own work practices

GS15. maintain current knowledge of application standards, legislation, codes of practice and product/process developments

GS16. identify problems with work planning, procedures, output and behavior and their implications

GS17. prioritize and plan for problem solving

GS18. communicate problems appropriately to others

GS19. identify sources of information and support for problem solving

GS20. seek assistance and support from other sources to solve problems

GS21. identify effective resolution techniques

GS22. select and apply resolution techniques

GS23. seek evidence for problem resolution

GS24. plan, prioritize and sequence work operations as per job requirements

GS25. organize and analyze information relevant to work

GS26. basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time

GS27. undertake and express new ideas and initiatives to others

GS28. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses

GS29. participate in improvement procedures including process, quality and internal/external customer/supplier relationships

GS30. ones competencies in new and different situations and contexts to achieve more

GS31. exercise restraint while expressing dissent and during conflict situations

GS32. avoid and manage distractions to be disciplined at work

GS33. manage own time for achieving better results

GS34. work in a team in order to achieve better results

GS35. identify and clarify work roles within a team

GS36. communicate and cooperate with others in the team for better results

GS37. seek assistance from fellow team members

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Working safely	**4**	**11**	**-**	**-**
PC1. work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines	1	2	-	-
PC2. adhere to procedures or systems in place for health and safety, personal protective equipment (ppe) and other relevant safety regulations for electrical and related operations	1	2	-	-
PC3. work following laid down procedures and instructions	1	1	-	-
PC4. ensure that all tools, equipment, power cables are in a safe and usable condition and are kept at secured location	-	2	-	-
PC5. ensure work area is clean and safe from hazards before and after the job is completed	-	2	-	-
PC6. inspect the component to check if it is as per specification and without defects	1	2	-	-
Operate and maintain 11/0.433 KV Distribution Substation	**19**	**55**	**-**	**-**
PC7. identify job requirements for specific operations as per instructions given from valid sourcesvalid sources: job instruction sheet/job card; work drawings; supervisor/incharge	1	2	-	-
PC8. identify various components of the power system	1	1	-	-
PC9. ensure equipment and tools required for installation work are identified, acquired, calibrated, suitable and approved for use	-	2	-	-
PC10. identify, estimate and acquire correct materials required for the substation erection and installation work	-	2	-	-
PC11. follow standard specifications and procedures for installing a pole mounted distribution transformer	2	3	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. ensure poles set to proper depth, and properly aligned	-	2	-	-
PC13. carry out erection of channel on the double pole for preparation of transformer bed as per requirement	2	3	-	-
PC14. fix lightning arrester as per requirement and standard procedure	2	2	-	-
PC15. install earth connection as per standard procedure	1	2	-	-
PC16. install cross arm as per specifications and requirement	1	2	-	-
PC17. provide anti-climbing device on poles	-	2	-	-
PC18. arrange to lift the transformer and put it on the transformer bed in a safe and efficient manner	-	3	-	-
PC19. fit the gang operating (go switch) and dropout fuse as per standard procedure	2	3	-	-
PC20. follow applicable construction standards e.g. rec construction standards, for carrying out the erection procedures	2	2	-	-
PC21. connect low voltage cables as per standard procedures in a safe and efficient manner	1	2	-	-
PC22. carry out low voltage able joints as per standard procedures, safely and effectively	1	2	-	-
PC23. perform post-installation procedures for ensuring clean and safe environment in the work and surrounding area	-	2	-	-
PC24. check oil level and ensure leakages are attended to and arrested	-	2	-	-
PC25. check oil bdv and acidity at regular intervals as per schedule and standard procedure	1	2	-	-
PC26. checking for sludge, dust, dirt ,moisture ion in oil and address it effectively in a timely fashion	-	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC27. clean bushings regularly and inspect for any cracks	-	2	-	-
PC28. check, note and rectify dust & dirt deposition, salt or chemical deposition, cement or acid fumes depositions	-	2	-	-
PC29. check tap position and gap of arching horn and tighten connection as requirement to address any issues	1	2	-	-
PC30. check neutral grounding and ensure it is maintained as per standard	1	2	-	-
PC31. periodically check for any loose connections of the terminations of hv & lv side	-	2	-	-
PC32. examine the breather through color of silica gel , if pink heat it or replace if necessary	-	2	-	-
Post erection activities	**-**	**11**	**-**	**-**
PC33. ensure facility is locked and warning signs are displayed effectively	-	2	-	-
PC34. deal promptly and effectively with problems within control, and seek help and guidance from the relevant people for problems that cannot be resolved	-	3	-	-
PC35. leave the work area in a safe and tidy condition on completion of the substation construction and maintenance activities	-	2	-	-
PC36. refer unresolved job related problems to appropriate personnel for support	-	2	-	-
PC37. monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem	-	2	-	-
NOS Total	**23**	**77**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	PSS/N0107
NOS Name	Operation and Maintenance of an 11/0.433 KV Distribution Substation
Sector	Power
Sub-Sector	Distribution
Occupation	Distribution System Operation & Maintenance
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	25/07/2017
Next Review Date	31/03/2022
NSQC Clearance Date	20/07/2015

PSS/N0109: Inspection of Power Distribution Substation, Lines and Components

Description

This unit covers the competencies required by senior technicians for inspection ofPower Distribution Substation, Lines and Components. This includes patrolling andvisual, sensory and instrument based testing and evaluation, handling of tools andequipment and carrying out necessary tasks in a safe, efficient and effective manner.

Scope

This unit/task covers the following:

- Working safely
- Inspect Distribution Substation
- Inspect Distribution Lines and Components
- Post inspection activities

Elements and Performance Criteria

Working safely

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

PC1. work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines

PC2. adhere to procedures or systems in place for health and safety, personal protective equipment (PPE) and other relevant safety regulations for electrical and related operations

PC3. work following laid down procedures and instructions

PC4. ensure that all tools, equipment, etc. are in a safe and usable condition and are kept at secured location

PC5. ensure work area is clean and safe from hazards before and after the job is completed

Conducting Inspections of Power Substation

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

PC6. prepare and maintain the work area as per procedure or operation specification

PC7. inspect power transformers including general transformer appearance, bushings, free of contamination, no oil leaks, auxiliary cooling system safely and as per required and approved procedures

PC8. inspect circuit breakers including general breaker appearance, bushings, for contamination, oil leaks, doors locked and working safely and as per required and approved procedures

PC9. inspect insulators including substation, bus support, suspension, etc. using safe and correct methods

PC10. inspect any steel superstructures where applicable

PC11. inspect substation components including circuit switchers, disconnect switches, coupling capacitors, capacitors, cable potheads, lightning arresters, metal-clad switchgear, relays, etc. safely, as per required and approved procedures

PC12. inspect communication equipment, back-up battery systems, control house, etc. as per required and approved procedures

PC13. inspect for physical security including locks on switches, enclosures, and gates, fences, gates, and warning signs (including washouts) to identify risks

PC14. inspect grounds and the grounding system including broken, loose, or exposed wires and exposed ground rods as per required and approved procedures

PC15. inspect for weeds and bird nests, such growth which may hamper access, deteriorate conditions of equipment and components, increase moisture content and support insect growth

PC16. carry out specific equipment tests on the equipment based upon frequency of operation such as oil dielectric tests, relay tests, infrared tests, voltage regulation equipment tests accurately, efficiently and safely

PC17. carry out predictive maintenance tests of load tap changer motor-control circuitry, and of breaker operator mechanisms accurately and safely

PC18. carry out battery and battery-charger tests accurately and safely

Conducting Inspections of Power Distribution Lines

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

PC19. follow and develop plans and schedule inspections of distribution lines including regular periodic and special routines such as pre-monsoon inspection

PC20. identify various types of circuits and its components accurately

PC21. identify and acquire correct tools, equipment and instruments required for distribution line assessment and inspection

PC22. ensure the tools and equipment is well maintained, calibrated and approved for use

PC23. access and survey area in accordance with established procedures

PC24. assess components of distribution line for damage or risk for damage through visual, sensory and instrument methods

PC25. carry out pole to pole inspection using patrolling as per job requirement, safely and efficiently

PC26. assess and confirm condition of pole structure based on distribution line standards

PC27. check guys for damage, distance to primary conductor or equipment, insulator condition accurately

PC28. check pole top assemblies for damage, safely and as per required and approved procedures

PC29. perform load checks to identify imbalanced and overloaded circuits accurately and safely

PC30. assist engineer in testing cable integrity and designation by using methods such as ultra-low frequency (ulf), very low frequency (vlf)

PC31. check line conductors for damage, slack, tension, sparks and burns, foreign objects, clearance, etc. safely and as per required and approved procedures

PC32. identify hazards of trimming trees such as limits of approach, public safety and step and touch potential

PC33. conduct site inspection for emergency cases following established procedures

PC34. observe and follow safety procedures

PC35. document and record findings clearly, accurately and in required detail using correct forms and formats if any

PC36. prepare recommendations for corrective and preventive maintenance based on the findings of the inspection

PC37. clean and test distribution line tools according to standard procedures

PC38. inspect, repair and replace distribution line tools and equipment, if necessary after use

Post-inspection activities

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

PC39. restore system to normal operating status by using switching procedures where disconnected

PC40. record details of inspection accurately and clearly in required ledgers, forms and formats as per required and approved procedures

PC41. make correct and required recommendations for repair and maintenance where risks, faults or damage recorded

PC42. deal promptly and effectively with problems within control, and seek help and guidance from the relevant people for problems that cannot be resolved

PC43. leave the work area in a safe and tidy condition on completion of the inspection and testing activities

PC44. refer unresolved job related problems to appropriate personnel for support

PC45. monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. relevant legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions

KU2. relevant health and safety requirements applicable in the work place

KU3. own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities

KU4. reporting structure, inter-dependent functions, lines and procedures in thework area

KU5. how to engage with specialists for support in order to resolve incidents and service requests

KU6. importance of working in clean and safe environment practices and procedures

KU7. relevant people and their responsibilities within the work area

KU8. escalation matrix and procedures for reporting work and employment related issues

KU9. principles of electricity

KU10. principles and practices of electrical safety

KU11. relaying and control wiring drawings

KU12. common electricity terminology and correct interpretation of the same Terminology: e.g. Current, Voltage, Resistance, Inductance, Capacitance, Kilovolt ampere (kva), Kilowatt (kw), Active power, Kilowatt hour: (kwh)(unit of electric consumption), power factor

KU13. specific terminology used in distribution line work Terminology: e.g. technical and commercial loss, maximum power,

KU14. elements of the power system Elements: e.g. generation, transmission, distribution, metering, etc.

KU15. different types of material and accessories used in power Distribution Materials and accessories: e.g. Supports (Poles-Steel, Cement , Wooden), Conductors (Sizes, current carrying capacity), Conductor Accessories, Binding Tape, Binding Wire, P.G. Clamp, T Clamp etc. , Insulators (Pin, Disc, shackle, Guy etc.), Cross Arms, Stay sets, GO Switches etc. type of cross arms, etc

KU16. tools and equipment used in testing, repair and maintenance Tools: e.g. Plier, Screwdriver, Wrench set, Hammer, Drilling machine, Hacksaw / cutting tools, Measuring tape, Pulleys (Force Pulley with sling), Tommy bar, Crimping machine, Round / flat file, Earth rod (discharge rod), leakage current monitoring kit

KU17. importance of carrying out regular and periodic inspection

KU18. circumstances which may require ad-hoc inspections

KU19. specific health and safety precautions which must be taken when carrying out sub-station and distribution lines inspection work

KU20. various types of circuits Types: e.g. C.T., P.T., A.C., D.C., Control, Indication & Annunciation Circuits

KU21. line diagrams, maps and circuitry

KU22. key faults in substation, distribution lines and components

KU23. fault indicators such as burns, tests, broken wires, damaged insulation, etc.

KU24. overhead distribution system apparatus such as regulators and reclosers

KU25. overhead distribution system standards

KU26. access points such as vaults, open trenches and manholes

KU27. underground distribution system apparatus such as transformers, switching cubicles and junction boxes

KU28. cable locating and fault detecting equipment

KU29. working, construction, fault finding and routine maintenance of transformers and shunt reactors

KU30. co-existing underground utilities

KU31. types and sizes of conductors and cables

KU32. classification of conductor and insulator damage including fretting, abrasion, fatigue breaks, tensile breaks

KU33. importance of ensuring that tools and equipment are suitable, well maintained, calibrated and operating effectively

KU34. importance of following good housekeeping and fire prevention procedures

KU35. material preparation methods and techniques to be undertaken, prior to using for testing and inspection activities

KU36. preparation of equipment for testing and repair activities

KU37. components of Distribution lines Line components: e.g. cross arm, insulator, line hardware, x-brace, armor rod, conductor, jumper, copper bond, arching horn, spacer, gang operated switch, drop out fuse, lightning arrester, etc

KU38. procedures for handling Distribution line components with imperfections/ defects that cannot be removed/repaired and how can they be minimized Imperfections/defects: e.g. Cross Arms (damaged cross arms, splitting or twisting, loose, broken, or missing nuts and braces, presence of insects), Insulators disc type (corroded pin, flashover, broken insulator, molds / moss or algae, corona effect, hair crack), Insulator Synthetic polymer (broken rubber petticoat at hot end part, burned rubber petticoat at hot end part, corona effect), Conductors (cut strand and loose conductor, loose vibration damper and spacer, low clearance (line to ground), Spot heating of connectors, other fittings and galvanized steel components (corroded bolts and nuts/steel pin, loose cotter key, dislocated steel pin, missing cotter / split pin), Ground wires and connectors (corroded earthwire, corroded / detached connector at jumper loop, corroded / cut ground lead, detached connector on ground lead and earthwire), Stay wires (rusted anchor rod, corroded)

KU39. problems and conditions which render electrical poles or towers in need of maintenance or replacement Problems and conditions: e.g. tower structure (corroded tower parts, loose or bent tower parts, eroded foundation), leaning pole, eroded pole and tower foundation, splitting, splitting or pulling of stay, twisting or raking, knots hole or birds nest, presence of insects, burned pole, excessive cracks, corroded poles, effects of lightning, etc

KU40. importance of leaving the work area and equipment in a safe and clean condition on completion of the repair and maintenance activities

KU41. importance of reporting problems in a timely manner

KU42. methods and parameters to check quality of line components against required quality standards Methods: e.g. visual inspection, binoculars, measuring tape, use of instruments

KU43. calibration schedule of all equipment used in inspection, repair and maintenance activities

KU44. standard procedures how to deal with electric shocks and electrocutions to rescue and minimize damage and harm

KU45. personal protective equipment (ppe) and clothing that must be worn during the inspection, repair and maintenance activity and from where can it be obtained ppe: e.g. safety helmet, safety glove, safety shoe, climbing harness, lanyard and tool belt (when climbing), earth rod (discharge rod), zola, safety rope

Generic Skills (GS)

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

GS1. read and interpret information correctly from various job specification documents, manuals, health and safety instructions, memos, etc. applicable to the job in english and/or local language

GS2. fill up appropriate technical forms, process charts, activity logs as per organizational format in english and/or local language

GS3. convey and share technical information clearly using appropriate language

GS4. check and clarify task-related information

GS5. liaise with appropriate authorities using correct protocol

GS6. communicate with people in respectful form and manner in line with organizational protocol

GS7. undertake basic numerical computations and calculations numerical computations: addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages

GS8. identify various basic, compound and solid shapes as per dimensions given basic shapes: square, rectangle, triangle, circle, quadrilaterals compound shapes: involving squares, rectangles, triangles, circles, semi- circles, quadrants of a circle

GS9. use appropriate measuring techniques and units of measurement

GS10. use appropriate units and number systems to express degree of accuracy units and number systems representing degree of accuracy: decimals places, significant figures, fractions as a decimal quantity

GS11. use metric systems of measurement

GS12. participate in on-the-job and other learning, training and development interventions and assessments

GS13. clarify task related information with appropriate personnel or technical adviser

GS14. seek to improve and modify own work practices

GS15. maintain current knowledge of application standards, legislation, codes of practice and product/process developments

GS16. identify problems with work planning, procedures, output and behavior and their implications

GS17. prioritize and plan for problem solving

GS18. communicate problems appropriately to others

GS19. identify sources of information and support for problem solving

GS20. seek assistance and support from other sources to solve problems

GS21. identify effective resolution techniques

GS22. select and apply resolution techniques

GS23. seek evidence for problem resolution

GS24. plan, prioritize and sequence work operations as per job requirements

GS25. organize and analyze information relevant to work

GS26. basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time

GS27. undertake and express new ideas and initiatives to others

GS28. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses

GS29. participate in improvement procedures including process, quality and internal/external customer/supplier relationships

GS30. ones competencies in new and different situations and contexts to achieve more

GS31. exercise restraint while expressing dissent and during conflict situations

GS32. avoid and manage distractions to be disciplined at work

GS33. manage own time for achieving better results

GS34. work in a team in order to achieve better results

GS35. identify and clarify work roles within a team

GS36. communicate and cooperate with others in the team for better results

GS37. seek assistance from fellow team members

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Working safely	**3**	**7**	**-**	**-**
PC1. work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines	1	2	-	-
PC2. adhere to procedures or systems in place for health and safety, personal protective equipment (PPE) and other relevant safety regulations for electrical and related operations	1	2	-	-
PC3. work following laid down procedures and instructions	1	1	-	-
PC4. ensure that all tools, equipment, etc. are in a safe and usable condition and are kept at secured location	-	1	-	-
PC5. ensure work area is clean and safe from hazards before and after the job is completed	-	1	-	-
Conducting Inspections of Power Substation	**10**	**24**	**-**	**-**
PC6. prepare and maintain the work area as per procedure or operation specification	1	1	-	-
PC7. inspect power transformers including general transformer appearance, bushings, free of contamination, no oil leaks, auxiliary cooling system safely and as per required and approved procedures	1	2	-	-
PC8. inspect circuit breakers including general breaker appearance, bushings, for contamination, oil leaks, doors locked and working safely and as per required and approved procedures	1	2	-	-
PC9. inspect insulators including substation, bus support, suspension, etc. using safe and correct methods	1	2	-	-
PC10. inspect any steel superstructures where applicable	1	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. inspect substation components including circuit switchers, disconnect switches, coupling capacitors, capacitors, cable potheads, lightning arresters, metal-clad switchgear, relays, etc. safely, as per required and approved procedures	1	2	-	-
PC12. inspect communication equipment, back-up battery systems, control house, etc. as per required and approved procedures	1	2	-	-
PC13. inspect for physical security including locks on switches, enclosures, and gates, fences, gates, and warning signs (including washouts) to identify risks	1	2	-	-
PC14. inspect grounds and the grounding system including broken, loose, or exposed wires and exposed ground rods as per required and approved procedures	1	2	-	-
PC15. inspect for weeds and bird nests, such growth which may hamper access, deteriorate conditions of equipment and components, increase moisture content and support insect growth	1	1	-	-
PC16. carry out specific equipment tests on the equipment based upon frequency of operation such as oil dielectric tests, relay tests, infrared tests, voltage regulation equipment tests accurately, efficiently and safely	-	2	-	-
PC17. carry out predictive maintenance tests of load tap changer motor-control circuitry, and of breaker operator mechanisms accurately and safely	-	2	-	-
PC18. carry out battery and battery-charger tests accurately and safely	-	2	-	-
Conducting Inspections of Power Distribution Lines	**12**	**31**	**-**	**-**
PC19. follow and develop plans and schedule inspections of distribution lines including regular periodic and special routines such as pre-monsoon inspection	-	2	-	-
PC20. identify various types of circuits and its components accurately	-	1	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC21. identify and acquire correct tools, equipment and instruments required for distribution line assessment and inspection	1	1	-	-
PC22. ensure the tools and equipment is well maintained, calibrated and approved for use	-	1	-	-
PC23. access and survey area in accordance with established procedures	-	1	-	-
PC24. assess components of distribution line for damage or risk for damage through visual, sensory and instrument methods	-	1	-	-
PC25. carry out pole to pole inspection using patrolling as per job requirement, safely and efficiently	1	2	-	-
PC26. assess and confirm condition of pole structure based on distribution line standards	1	2	-	-
PC27. check guys for damage, distance to primary conductor or equipment, insulator condition accurately	1	2	-	-
PC28. check pole top assemblies for damage, safely and as per required and approved procedures	1	3	-	-
PC29. perform load checks to identify imbalanced and overloaded circuits accurately and safely	1	2	-	-
PC30. assist engineer in testing cable integrity and designation by using methods such as ultra-low frequency (ulf), very low frequency (vlf)	1	1	-	-
PC31. check line conductors for damage, slack, tension, sparks and burns, foreign objects, clearance, etc. safely and as per required and approved procedures	1	2	-	-
PC32. identify hazards of trimming trees such as limits of approach, public safety and step and touch potential	-	1	-	-
PC33. conduct site inspection for emergency cases following established procedures	1	2	-	-
PC34. observe and follow safety procedures	1	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC35. document and record findings clearly, accurately and in required detail using correct forms and formats if any	-	1	-	-
PC36. prepare recommendations for corrective and preventive maintenance based on the findings of the inspection	-	2	-	-
PC37. clean and test distribution line tools according to standard procedures	1	1	-	-
PC38. inspect, repair and replace distribution line tools and equipment, if necessary after use	1	1	-	-
Post-inspection activities	**3**	**10**	**-**	**-**
PC39. restore system to normal operating status by using switching procedures where disconnected	1	1	-	-
PC40. record details of inspection accurately and clearly in required ledgers, forms and formats as per required and approved procedures	1	1	-	-
PC41. make correct and required recommendations for repair and maintenance where risks, faults or damage recorded	1	2	-	-
PC42. deal promptly and effectively with problems within control, and seek help and guidance from the relevant people for problems that cannot be resolved	-	2	-	-
PC43. leave the work area in a safe and tidy condition on completion of the inspection and testing activities	-	1	-	-
PC44. refer unresolved job related problems to appropriate personnel for support	-	2	-	-
PC45. monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem	-	1	-	-
NOS Total	**28**	**72**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	PSS/N0109
NOS Name	Inspection of Power Distribution Substation, Lines and Components
Sector	Power
Sub-Sector	Distribution
Occupation	Distribution System Operation & Maintenance
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	13/09/2017
Next Review Date	31/03/2022
NSQC Clearance Date	20/07/2015

PSS/N0110: Supervise work and crew in power distribution installation and maintenance work

Description

This unit covers the competencies required by senior linemen for supervision of crew including linemen and technical helpers for carrying out work for installation,maintenance and repair of Power Distribution Substation, Lines and Components.

Scope

This unit/task covers the following:

- Working safely within regulations
- Supervising the team at work
- Accident, incident or grievance handling

Elements and Performance Criteria

Working safely and within regulations

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

PC1. work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines

PC2. work following laid down procedures and instructions

PC3. ensure that work is done within the specified departmental rules and regulations, organisation rules, span of authority, roles and responsibilities for self and other team members

PC4. ensure work area is clean and safe from hazards before and after the job is completed

PC5. ensure self and all team members have completed necessary training in electrical safety and other mandatory trainings

PC6. ensure while carrying out electrical work during repair and maintenance, installation or other work in the vicinity of power lines, substations, etc. all team members are complying with ppe requirements

PC7. requisition necessary equipment, tools, materials or ppe gear from the store for carrying out work as per job and safety requirements

Supervising the team at work

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

PC8. explain to team members requirements of the job or task plan and clarify for shared understanding

PC9. inspect work being carried out by team members to ensure work is being carried out safely and as per required and approved procedures

PC10. inspect preparation, process and output of work to assess suitability as per job specifications and compliance to organisational and other rules and regulations

PC11. ensure time on the job is utilised properly to achieve optimum productivity and efficiency

PC12. assist team members to develop their own knowledge, skills and abilities by providing timely and accurate guidance, feedback and responsibilities

PC13. address low performance through training, informal and formal guidance, support from other supervisors, management and hr department

PC14. record details of performance and other records required by organisation and departmental authorities, details accurately and clearly in required ledgers, forms and formats as per required and approved procedures

Accident, incident or grievance handling

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

PC15. address grievances and complaints promptly and as per organizational guidelines

PC16. report incident and accidents as per organisational procedure in a timely fashion with necessary detail

PC17. deal promptly and effectively with problems within control, and seek help and guidance from the relevant people for problems that cannot be resolved

PC18. refer unresolved job related problems to appropriate personnel for support

PC19. monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. relevant legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions

KU2. relevant health and safety requirements applicable in the work place

KU3. own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities

KU4. reporting structure, inter-dependent functions, lines and procedures in the work area

KU5. how to engage with specialists for support in order to resolve incidents and service requests

KU6. importance of working in clean and safe environment practices and procedures

KU7. relevant people and their responsibilities within the work area

KU8. escalation matrix and procedures for reporting work and employment related issues

KU9. importance of keeping and leaving the work area and equipment in a safe and clean condition on completion of the repair and maintenance activities

KU10. importance of reporting problems in a timely manner

KU11. methods and parameters to check quality of performance against required quality standards

KU12. reporting requirements in relation to team and personnel

KU13. concept of productivity

KU14. components of performance development such as skills, knowledge, values, etc.

KU15. importance of recording evidence of performance and incidents

KU16. importance of providing feedback and communicating with team regularly

KU17. procedures for making, receiving and handling complaints and grievances

Generic Skills (GS)

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

GS1. read and interpret information correctly from various job specification documents, manuals, health and safety instructions, memos, etc. applicable to the job in english and/or local language

GS2. fill up appropriate technical forms, process charts, activity logs as per organizational format in english and/or local language

GS3. convey and share technical information clearly using appropriate language

GS4. check and clarify task-related information

GS5. liaise with appropriate authorities using correct protocol

GS6. communicate with people in respectful form and manner in line with organizational protocol

GS7. undertake basic numerical computations and calculations numerical computations: addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages

GS8. identify various basic, compound and solid shapes as per dimensions given basic shapes: square, rectangle, triangle, circle, quadrilaterals compound shapes: involving squares, rectangles, triangles, circles, semicircles, quadrants of a circle solid shapes: cube, rectangular prism, cylinder

GS9. use appropriate measuring techniques and units of measurement

GS10. use appropriate units and number systems to express degree of accuracy units and number systems representing degree of accuracy: decimals places, significant figures, fractions as a decimal quantity

GS11. use metric systems of measurement

GS12. participate in on-the-job and other learning, training and development interventions and assessments

GS13. clarify task related information with appropriate personnel or technical adviser

GS14. seek to improve and modify own work practices

GS15. maintain current knowledge of application standards, legislation, codes of practice and product/process developments

GS16. identify problems with work planning, procedures, output and behavior and their implications

GS17. prioritize and plan for problem solving

GS18. communicate problems appropriately to others

GS19. identify sources of information and support for problem solving

GS20. seek assistance and support from other sources to solve problems

GS21. identify effective resolution techniques

GS22. select and apply resolution techniques

GS23. seek evidence for problem resolution

GS24. plan, prioritize and sequence work operations as per job requirements

GS25. organize and analyze information relevant to work

GS26. basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time

GS27. undertake and express new ideas and initiatives to others

GS28. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses

GS29. participate in improvement procedures including process, quality and internal/external customer/supplier relationships

GS30. ones competencies in new and different situations and contexts to achieve more

GS31. exercise restraint while expressing dissent and during conflict situations

GS32. avoid and manage distractions to be disciplined at work

GS33. manage own time for achieving better results

GS34. work in a team in order to achieve better results

GS35. identify and clarify work roles within a team

GS36. communicate and cooperate with others in the team for better results

GS37. seek assistance from fellow team members

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Working safely and within regulations	**11**	**23**	**-**	**-**
PC1. work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines	2	4	-	-
PC2. work following laid down procedures and instructions	1	3	-	-
PC3. ensure that work is done within the specified departmental rules and regulations, organisation rules, span of authority, roles and responsibilities for self and other team members	2	3	-	-
PC4. ensure work area is clean and safe from hazards before and after the job is completed	1	3	-	-
PC5. ensure self and all team members have completed necessary training in electrical safety and other mandatory trainings	1	3	-	-
PC6. ensure while carrying out electrical work during repair and maintenance, installation or other work in the vicinity of power lines, substations, etc. all team members are complying with ppe requirements	2	3	-	-
PC7. requisition necessary equipment, tools, materials or ppe gear from the store for carrying out work as per job and safety requirements	2	4	-	-
Supervising the team at work	**12**	**27**	**-**	**-**
PC8. explain to team members requirements of the job or task plan and clarify for shared understanding	1	4	-	-
PC9. inspect work being carried out by team members to ensure work is being carried out safely and as per required and approved procedures	2	4	-	-
PC10. inspect preparation, process and output of work to assess suitability as per job specifications and compliance to organisational and other rules and regulations	2	4	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. ensure time on the job is utilised properly to achieve optimum productivity and efficiency	2	3	-	-
PC12. assist team members to develop their own knowledge, skills and abilities by providing timely and accurate guidance, feedback and responsibilities	1	4	-	-
PC13. address low performance through training, informal and formal guidance, support from other supervisors, management and hr department	2	4	-	-
PC14. record details of performance and other records required by organisation and departmental authorities, details accurately and clearly in required ledgers, forms and formats as per required and approved procedures	2	4	-	-
Accident, incident or grievance handling	**7**	**20**	**-**	**-**
PC15. address grievances and complaints promptly and as per organizational guidelines	2	4	-	-
PC16. report incident and accidents as per organisational procedure in a timely fashion with necessary detail	2	4	-	-
PC17. deal promptly and effectively with problems within control, and seek help and guidance from the relevant people for problems that cannot be resolved	1	4	-	-
PC18. refer unresolved job related problems to appropriate personnel for support	1	4	-	-
PC19. monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem	1	4	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	PSS/N0110
NOS Name	Supervise work and crew in power distribution installation and maintenance work
Sector	Power
Sub-Sector	Distribution
Occupation	Distribution System Operation & Maintenance
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	13/09/2017
Next Review Date	31/03/2022
NSQC Clearance Date	20/07/2015

PSS/N1336: Working effectively with others

Description

This unit covers basic etiquette and competencies that a candidate is required to possess and demonstrate in their behavior and interactions with others at the workplace. These cover areas such as communication etiquette,discipline, listening, handling conflict and grievances.

Scope

This unit/task covers the following:

- working with others

Elements and Performance Criteria

working with others

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

PC1. accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required

PC2. accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt

PC3. give information to others clearly, at a pace and in a manner that helps them to understand

PC4. display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible

PC5. consult with and assist others to maximize effectiveness and efficiency in carrying out tasks

PC6. display appropriate communication etiquette while working

PC7. display active listening skills while interacting with others at work

PC8. use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism

PC9. demonstrate responsible and disciplined behaviors at the workplace

PC10. escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict

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 own employment and performance conditions

KU2. reporting structure, inter-dependent functions, lines and procedures in the work area

KU3. relevant people and their responsibilities within the work area

KU4. eescalation matrix and procedures for reporting work and employment related issues

KU5. various categories of people that one is required to communicate and co-ordinate with in the organization

KU6. importance of effective communication in the workplace
KU7. importance of teamwork in organizational and individual success
KU8. various components of effective communication
KU9. key elements of active listening
KU10. value and importance of active listening and assertive communication
KU11. barriers to effective communication
KU12. importance of tone and pitch in effective communication
KU13. importance of avoiding casual expletives and unpleasant terms while communicating professional circles
KU14. how poor communication practices can disturb people, environment and cause problems for the employee, the employer and the customer
KU15. importance of ethics for professional success
KU16. importance of discipline for professional success
KU17. what constitutes disciplined behavior for a working professional
KU18. common reasons for interpersonal conflict
KU19. importance of developing effective working relationships for professional success
KU20. expressing and addressing grievances appropriately and effectively
KU21. importance and ways of managing interpersonal conflict effectively

Generic Skills (GS)

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

GS1. note the information communicated by the officer incharge
GS2. note down observations (if any) related to the operation/maintenance
GS3. read and interpret the process required for different types of manuals
GS4. read and interpret the flowchart of all parts of an assembly
GS5. read manuals and documents to understand the product-details & how they can be used
GS6. discuss task lists, schedules and activities with the colleague/supervisor
GS7. effectively communicate with the team members
GS8. attentively listen and comprehend the information given by the colleague/supervisor/contractor
GS9. communicate clearly with the colleague on the issues faced during query/fault
GS10. follow colleague/contractor rule-based decision making process
GS11. take decisions with systematic course of actions and/or response
GS12. planning and organization of tasks to meet deadlines
GS13. build customer relationships and use customer centric approach
GS14. seek and comprehend operation related inputs for clarification find ways of modifying difficult operating stages to make it operation friendly
GS15. work systematically and logically to resolve the issues and identify causation and anticipate unexpected results. Quick approach and solution towards faults repairing

GS16. critically evaluate operation parameters in relation to system normality develop a holistic and comprehensive profile of grid station on segregated discrete processes

Assessment Criteria

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

National Occupational Standards (NOS) Parameters

NOS Code	PSS/N1336
NOS Name	Working effectively with others
Sector	Power
Sub-Sector	Generic
Occupation	Generic
NSQF Level	2
Credits	TBD
Version	1.0
Last Reviewed Date	13/09/2021
Next Review Date	31/03/2022
NSQC Clearance Date	20/07/2015

PSS/N2001: Use basic health and safety practices for power related work

Description

This unit covers health, safety and security for power related work. This includes procedures and practices that candidates need to follow to help maintain a healthy, safe and secure work environment in a power plant, power station/substation or on the field while working on power equipment. It covers responsibilities towards self, others, assets and the environment

Scope

This unit/task covers the following:

- health and safety
- fire safety
- emergencies, rescue and first-aid procedures

Elements and Performance Criteria

Health and safety

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

PC1. use protective clothing/equipment for specific tasks and work conditions

PC2. state the name and location of people responsible for health and safety in the workplace

PC3. state the names and location of documents that refer to health and safety in the workplace

PC4. identify job-site hazardous work and state possible causes of risk or accident in the workplace

PC5. follow electrical safe working procedures such as tag out/lock out and display ptw (permit to work),

PC6. follow warning signs (danger, out of service, etc.) while working with electrical systems

PC7. use standard safe working practices when working at heights, confined areas and trenches

PC8. test any electrical equipment and system using insulated testing devices before touching them

PC9. ensure positive isolation of electrical equipment & system as per given standards

PC10. recognize any abnormalities in electrical equipment or system installed alarm annunciation and/or noticing parameters from gauge/ indicator installed

PC11. carry out safe working practices while dealing with hazards to ensure the safety of self and others

PC12. state methods of accident prevention in the work environment of the job role

PC13. state location of general health and safety equipment in the workplace

PC14. inspect for faults, set up and safely use of scaffolds and elevated platforms and ladder

PC15. lift, carry and transport heavy objects & tools safely using correct procedures from storage to workplace and vice versa

PC16. inspect grid station and its equipment routinely for any signs of oil and water leakage

PC17. store flammable materials and machine lubricating oil safely and correctly

PC18. check that the emission and pollution control devices are working properly in line with environmental policy standards

PC19. ensure proper working condition of battery and battery charger

PC20. maintain electrolyte level of each cell with distilled water

PC21. maintain proper ventilation in battery room

PC22. apply good housekeeping practices at all times

PC23. identify common hazard signs displayed in various areas

PC24. retrieve and/or point out documents that refer to health and safety in the workplace

PC25. inform relevant authorities about any abnormal situation/behavior of any equipment/system promptly

Fire Safety

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

PC26. use the various appropriate fire extinguishers on different types of fires correctly

PC27. distinguish between various types of fire

PC28. demonstrate rescue techniques applied during fire hazard

PC29. demonstrate good housekeeping in order to prevent fire hazards

PC30. demonstrate the correct use of a fire extinguisher

Emergencies, rescue and first-aid procedures

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

PC31. demonstrate how to free a person from electrocution

PC32. administer appropriate first aid to victims where required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc.

PC33. demonstrate basic techniques of bandaging

PC34. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments

PC35. perform and organize loss minimization or rescue activity during an accident in real or simulated environments

PC36. administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases

PC37. demonstrate the artificial respiration and the cpr process

PC38. participate in emergency procedures emergency procedures: raising alarm, safe/efficient, evacuation, correct means of escape, correct assembly point, roll call, correct return to work

PC39. write accident/incident report or dictate a report to another person, and send report to person responsible

PC40. demonstrate correct method to move injured people and others during an emergency

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 own employment and performance conditions

KU2. reporting structure, inter-dependent functions, lines and procedures in the work area

KU3. relevant people and their responsibilities within the work area
KU4. escalation matrix and procedures for reporting work and employment related issues
KU5. meaning of hazards and risks
KU6. health and safety hazards commonly present in the work environment and related precautions
KU7. possible causes of risk, hazard or accident in the workplace and why risk and/or accidents are possible
KU8. possible causes of risk and accident
KU9. methods of accident prevention
KU10. safe working practices when working with tools and machines
KU11. safe working practices while working at various hazardous sites
KU12. where to find all the general health and safety equipment in the workplace
KU13. various dangers associated with the use of electrical equipment
KU14. positive isolation of electrical equipment and system
KU15. safe handling and disposal of hazardous power plant wastes
KU16. use of emission and pollution control devices and measures taken to control pollution
KU17. various safety procedures and equipment used to work at heights, trenches and confined places
KU18. safe working practices specific to working with electrical equipment & system e.g. lock out/ tag out, ptw, etc.
KU19. preventative and remedial actions to be taken in the case of exposure to toxic materials
KU20. importance of using protective clothing/equipment and other insulated work gear while handling electrical system and equipment
KU21. precautionary activities taken to prevent fire accident
KU22. various causes of fire
KU23. techniques of using the different fire extinguishers
KU24. different methods of extinguishing fire
KU25. different materials used for extinguishing fire
KU26. emergency rescue techniques applied during a fire hazard
KU27. various types of safety signs and what they mean
KU28. appropriate basic first aid treatment relevant to the condition e.g. shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries

Generic Skills (GS)

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

GS1. note the information communicated by the officer incharge.
GS2. note down observations (if any) related to the operation/maintenance.
GS3. read and interpret the process required for different types of manuals for maintenance.
GS4. read and interpret the flowchart of all parts of an assembly.
GS5. read manuals and documents to understand the product-details & how they can be used.

GS6. discuss task lists, schedules and activities with the colleague/supervisor.

GS7. effectively communicate with the team members.

GS8. attentively listen and comprehend the information given by the colleague/supervisor/contractor.

GS9. communicate clearly with the colleague on the issues faced during query/fault.

GS10. follow colleague/contractor rule-based decision making process.

GS11. take decisions with systematic course of actions and/or response.

GS12. planning and organization of tasks to meet deadlines.

GS13. build customer relationships and use customer centric approach.

GS14. seek and comprehend operation related inputs for clarification

GS15. find ways of modifying difficult operating stages to make it operation friendly

GS16. work systematically and logically to resolve the issues and identify causation and anticipate unexpected results.

GS17. quick approach and solution towards faults repairing.

GS18. critically evaluate operation parameters in relation to system normality

GS19. develop a holistic and comprehensive profile of grid station on segregated discrete process.

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Health and safety	**11**	**46**	**-**	**-**
PC1. use protective clothing/equipment for specific tasks and work conditions	-	3	-	-
PC2. state the name and location of people responsible for health and safety in the workplace	-	2	-	-
PC3. state the names and location of documents that refer to health and safety in the workplace	-	2	-	-
PC4. identify job-site hazardous work and state possible causes of risk or accident in the workplace	1	1	-	-
PC5. follow electrical safe working procedures such as tag out/lock out and display ptw (permit to work),	1	2	-	-
PC6. follow warning signs (danger, out of service, etc.) while working with electrical systems	1	1	-	-
PC7. use standard safe working practices when working at heights, confined areas and trenches	1	2	-	-
PC8. test any electrical equipment and system using insulated testing devices before touching them	1	2	-	-
PC9. ensure positive isolation of electrical equipment & system as per given standards	1	2	-	-
PC10. recognize any abnormalities in electrical equipment or system installed alarm annunciation and/or noticing parameters from gauge/ indicator installed	1	2	-	-
PC11. carry out safe working practices while dealing with hazards to ensure the safety of self and others	1	1	-	-
PC12. state methods of accident prevention in the work environment of the job role	-	2	-	-
PC13. state location of general health and safety equipment in the workplace	-	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. inspect for faults, set up and safely use of scaffolds and elevated platforms and ladder	-	2	-	-
PC15. lift, carry and transport heavy objects & tools safely using correct procedures from storage to workplace and vice versa	-	2	-	-
PC16. inspect grid station and its equipment routinely for any signs of oil and water leakage	-	2	-	-
PC17. store flammable materials and machine lubricating oil safely and correctly	-	2	-	-
PC18. check that the emission and pollution control devices are working properly in line with environmental policy standards	1	1	-	-
PC19. ensure proper working condition of battery and battery charger	1	1	-	-
PC20. maintain electrolyte level of each cell with distilled water	-	2	-	-
PC21. maintain proper ventilation in battery room	-	1	-	-
PC22. apply good housekeeping practices at all times	1	2	-	-
PC23. identify common hazard signs displayed in various areas	-	2	-	-
PC24. retrieve and/or point out documents that refer to health and safety in the workplace	-	2	-	-
PC25. inform relevant authorities about any abnormal situation/behavior of any equipment/system promptly	-	3	-	-
Fire Safety	**4**	**9**	**-**	**-**
PC26. use the various appropriate fire extinguishers on different types of fires correctly	1	1	-	-
PC27. distinguish between various types of fire	1	2	-	-
PC28. demonstrate rescue techniques applied during fire hazard	1	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC29. demonstrate good housekeeping in order to prevent fire hazards	-	2	-	-
PC30. demonstrate the correct use of a fire extinguisher	1	2	-	-
Emergencies, rescue and first-aid procedures	**9**	**21**	**-**	**-**
PC31. demonstrate how to free a person from electrocution	1	2	-	-
PC32. administer appropriate first aid to victims where required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc.	-	3	-	-
PC33. demonstrate basic techniques of bandaging	1	2	-	-
PC34. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments	1	2	-	-
PC35. perform and organize loss minimization or rescue activity during an accident in real or simulated environments	1	2	-	-
PC36. administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases	1	2	-	-
PC37. demonstrate the artificial respiration and the cpr process	1	2	-	-
PC38. participate in emergency procedures emergency procedures: raising alarm, safe/efficient, evacuation, correct means of escape, correct assembly point, roll call, correct return to work	1	2	-	-
PC39. write accident/incident report or dictate a report to another person, and send report to person responsible	1	2	-	-
PC40. demonstrate correct method to move injured people and others during an emergency	1	2	-	-
NOS Total	**24**	**76**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	PSS/N2001
NOS Name	Use basic health and safety practices for power related work
Sector	Power
Sub-Sector	Generic
Occupation	Generic
NSQF Level	2
Credits	TBD
Version	1.0
Last Reviewed Date	19/07/2016
Next Review Date	31/03/2022
NSQC Clearance Date	20/07/2015

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Element/ Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each Element/ PC.

2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.

3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.

4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).

5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.

6. To pass the Qualification Pack assessment, every trainee should score the Recommended Pass % aggregate for the QP.

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
PSS/N0105.Repair and maintenance of power distribution lines and components	25	75	-	-	100	20
PSS/N0107.Operation and maintenance of 11/0.433 KV Distribution Substation	23	77	-	-	100	20
PSS/N0109.Inspection of Power Distribution Substation, Lines and Components	28	72	-	-	100	20
PSS/N0110.Supervise work and crew in power distribution/transmission installation and maintenance work	30	70	-	-	100	20
PSS/N1336.Working effectively with others	30	70	-	-	100	5
PSS/N2001.Use basic health and safety practices for power related work	24	76	-	-	100	15
Total	**160**	**440**	**-**	**-**	**600**	**100**

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
T&D	Transmission and Distribution
REC	Rural Electricfication Corporation
AB	Cables Aerial Bunched Cables
HT	Hight Tension
LT	Low Tension
HV	High Voltage
LV	Low Voltage
BDV	Breakdown Voltage
ULF	Ultra Low Frequency
VLF	Very Low Frequency
OPGW	Optical Groundwire
KV	Kilovolt
KWH	Kilo Watt Hour
KVA	Kilo Volt Ampere
PF	Power Factor
BIS	Bureau of Indian Standards

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.