QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR POWER SECTOR

Contents

What are Occupational Standards(OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

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Introduction

Qualifications Pack-Senior Lineman- Distribution

SECTOR: POWER

SUB-SECTOR: Distribution

OCCUPATION: Lineman

REFERENCE ID: PSS/ Q 0103

ALIGNED TO: NCO-2004/7248.50

Senior Lineman Distribution inspects operation, maintainence and repair of overhead and underground electrical distribution systems.

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 attend to customer breakdown complaints and requests, releasing and restoring connections. They lead a team of linemen and technical helpers in conducting the above work.

Personal Attributes: The candidate should be able to read, write and communicate effectively and clearly with a number of stakeholders. 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.

Job Details

Qualifications Pack Code	**PSS/ Q 0103**		
Job Role	**Senior Lineman - Distribution**		
Credits (NSQF)	**TBD**	**Version number**	**1.0**
Sector	**Power**	**Drafted on**	**26/03/15**
Sub-sector	**Distribution**	**Last reviewed on**	**26/03/15**
Occupation	**Lineman**	**Next review date**	**26/03/17**

Job Role	**Senior Lineman - Distribution**
Role Description	Senior Lineman - Distribution inspects and works with a team to construct, operate, maintain and repair overhead and underground power distribution systems. They interact with customers, senior management, vendors and other authorities.
NSQF level	5
Minimum Educational Qualifications	8th
Maximum Educational Qualifications	NA
Training (Suggested but not mandatory)	Electrical - 6 months, preferably ITI
Experience	5 years as a lineman
Applicable National Occupational Standards (NOS)	**Compulsory:** 1. PSS N 0109 (Inspection of Power Distribution Substation, Lines and Components) 2. PSS N 0105 (Repair and maintenance of power distribution lines and components) 3. PSS N 0107 (Operation and maintenance of 11/0.433 KV Distribution Substation) 4. PSS N 0110 (Supervise work and crew in power distribution installation and maintenance work) 5. PSS/ N 2001 (Use basic health and safety practices for power related work) 6. CSC/ N 1336 (Work effectively with others) **Optional:** N.A.
Performance Criteria	As described in the relevant OS units

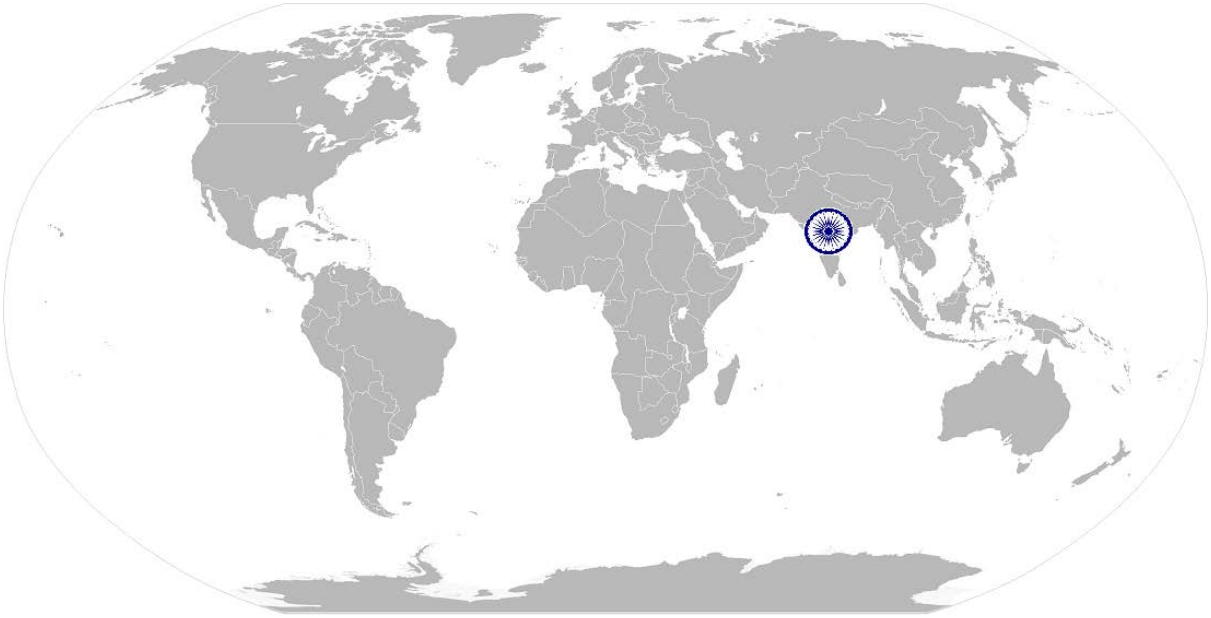
Definitions

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

Acronyms

Keywords /Terms	Description
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

National Occupational Standard



Overview

This unit covers the competencies required for inspection of Power Distribution Substation, Lines and Components. It also covers the respective health and safety competencies required to perform such operations.

PSS/ N 0109: Inspection of Power Distribution Substation, Lines and Components

National Occupational Standard

Unit Code	PSS/ N 0109
Unit Title (Task)	Inspection of Power Distribution, Substation, Lines and components
Description	This unit covers the competencies required by senior technicians for inspection of Power Distribution Substation, Lines and Components. This includes patrolling and visual, sensory and instrument based testing and evaluation, handling of tools and equipment and carrying out necessary tasks in a safe, efficient and effective manner. This will also include making recommendations for preventive and corrective maintenance as well. The candidate will be expected to perform independently with little to no supervision.
Scope	This unit/task covers the following: • Working safely • Inspect Distribution Substation • Inspect Distribution Lines and Components • Post inspection activities

Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Working safely	The user / individual on the job should 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	The user / individual on the job should 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	The user / individual on the job should 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	The user / individual on the job should 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 (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. relevant legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions KA2. relevant health and safety requirements applicable in the work place KA3. own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities KA4. reporting structure, inter-dependent functions, lines and procedures in the work area KA5. how to engage with specialists for support in order to resolve incidents and service requests KA6. importance of working in clean and safe environment practices and procedures KA7. relevant people and their responsibilities within the work area KA8. escalation matrix and procedures for reporting work and employment related

	issues
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. principles of electricity KB2. principles and practices of electrical safety KB3. relaying and control wiring drawings KB4. 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 KB5. specific terminology used in Distribution Line work **Terminology: e.g.** Technical and commercial loss, maximum power, KB6. elements of the power system **Elements:** e.g. generation, transmission, distribution, metering, etc. KB7. 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. KB8. 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 KB9. importance of carrying out regular and periodic inspection KB10. circumstances which may require ad-hoc inspections KB11. specific health and safety precautions which must be taken when carrying out Sub-station and Distribution lines inspection work KB12. various types of circuits **Types:** e.g. C.T., P.T., A.C., D.C., Control, Indication & Annunciation Circuits KB13. line diagrams, maps and circuitry KB14. key faults in substation, distribution lines and components KB15. fault indicators such as burns, tests, broken wires, damaged insulation, etc. KB16. overhead distribution system apparatus such as regulators and reclosers KB17. overhead distribution system standards KB18. access points such as vaults, open trenches and manholes KB19. underground distribution system apparatus such as transformers, switching cubicles and junction boxes KB20. cable locating and fault detecting equipment KB21. working, construction, fault finding and routine maintenance of transformers and shunt reactors KB22. co-existing underground utilities KB23. types and sizes of conductors and cables KB24. classification of conductor and insulator damage including fretting, abrasion, fatigue breaks, tensile breaks KB25. importance of ensuring that tools and equipment are suitable, well maintained, calibrated and operating effectively KB26. importance of following good housekeeping and fire prevention procedures KB27. material preparation methods and techniques to be undertaken, prior to

	using for testing and inspection activities KB28. preparation of equipment for testing and repair activities KB29. 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. KB30. 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) KB31. 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. KB32. importance of leaving the work area and equipment in a safe and clean condition on completion of the repair and maintenance activities KB33. importance of reporting problems in a timely manner KB34. methods and parameters to check quality of line components against required quality standards **Methods:** e.g. visual inspection, binoculars, measuring tape, use of instruments KB35. calibration schedule of all equipment used in inspection, repair and maintenance activities KB36. standard procedures how to deal with electric shocks and electrocutions to rescue and minimize damage and harm KB37. 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
Skills (S) [Optional]	
A. Core Skills/	**Communication**
	The user/ individual on the job needs to know and understand how to: SA1. read and interpret information correctly from various job specification

Generic Skills	documents, manuals, health and safety instructions, memos, etc. applicable to the job in English and/or local language SA2. fill up appropriate technical forms, process charts, activity logs as per organizational format in English and/or local language SA3. convey and share technical information clearly using appropriate language SA4. check and clarify task-related information SA5. liaise with appropriate authorities using correct protocol SA6. communicate with people in respectful form and manner in line with organizational protocol
	Numerical and computational skills
	The user/individual on the job needs to know and understand how to: SA7. undertake basic numerical computations and calculations **Numerical computations:** addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages SA8. 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 **Solid shapes:** cube, rectangular prism, cylinder SA9. use appropriate measuring techniques and units of measurement SA10. 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 SA11. use metric systems of measurement
	Learning
	The user/individual on the job needs to know and understand how to: SA12. participate in on-the-job and other learning, training and development interventions and assessments SA13. clarify task related information with appropriate personnel or technical adviser SA14. seek to improve and modify own work practices SA15. maintain current knowledge of application standards, legislation, codes of practice and product/process developments
B. Professional Skills	**Problem Solving**
	The user/individual on the job needs to know and understand how to: SB1. identify problems with work planning, procedures, output and behavior and their implications SB2. prioritize and plan for problem solving SB3. communicate problems appropriately to others SB4. identify sources of information and support for problem solving SB5. seek assistance and support from other sources to solve problems SB6. identify effective resolution techniques SB7. select and apply resolution techniques SB8. seek evidence for problem resolution
	Plan and Organize

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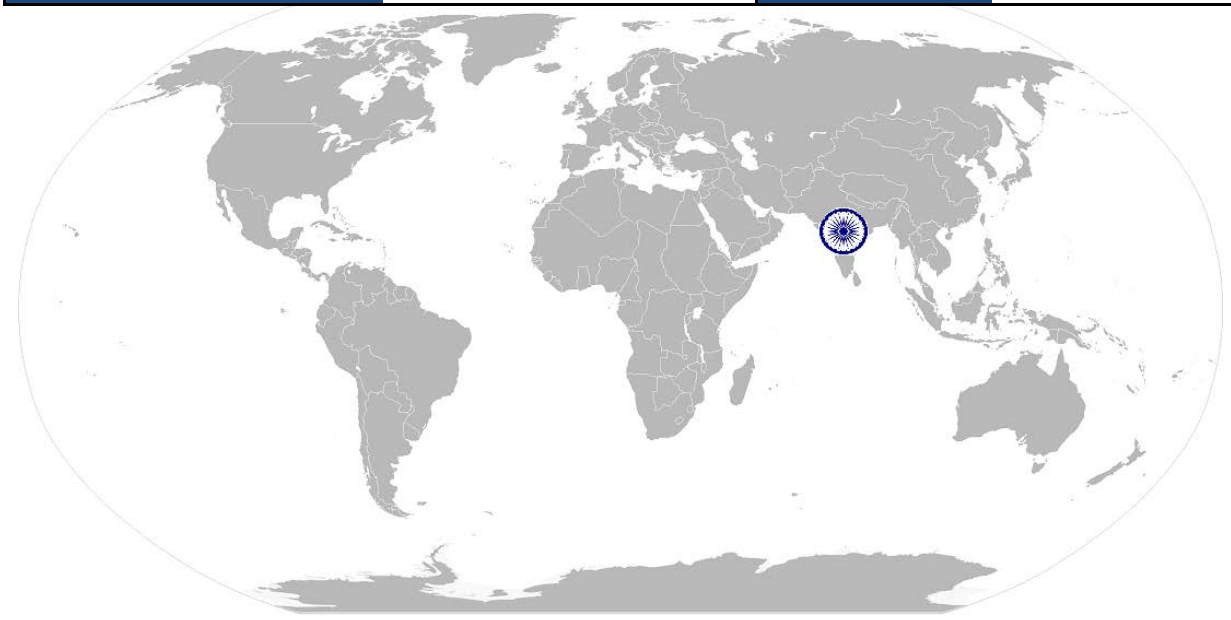
	The user/individual on the job needs to know and understand how to: SB9. plan, prioritize and sequence work operations as per job requirements SB10. organize and analyze information relevant to work SB11. basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time
	Initiative and Enterprise
	The user/individual on the job needs to know and understand how to: SB12. undertake and express new ideas and initiatives to others SB13. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses SB14. participate in improvement procedures including process, quality and internal/external customer/supplier relationships SB15. one's competencies in new and different situations and contexts to achieve more
	Self-Management
	The user/individual on the job needs to know and understand how to: SB16. exercise restraint while expressing dissent and during conflict situations SB17. avoid and manage distractions to be disciplined at work SB18. manage own time for achieving better results
	Teamwork
	The user/individual on the job needs to know and understand how to: SB19. work in a team in order to achieve better results SB20. identify and clarify work roles within a team SB21. communicate and cooperate with others in the team for better results SB22. seek assistance from fellow team members

NOS Version Control

NOS Code	PSS/ N 0109		
Credits NSQF	TBD	Version number	1.0
Industry	Power	Drafted on	26/03/15
Industry Sub-sector	Distribution	Last reviewed on	26/03/15
		Next review date	26/03/17



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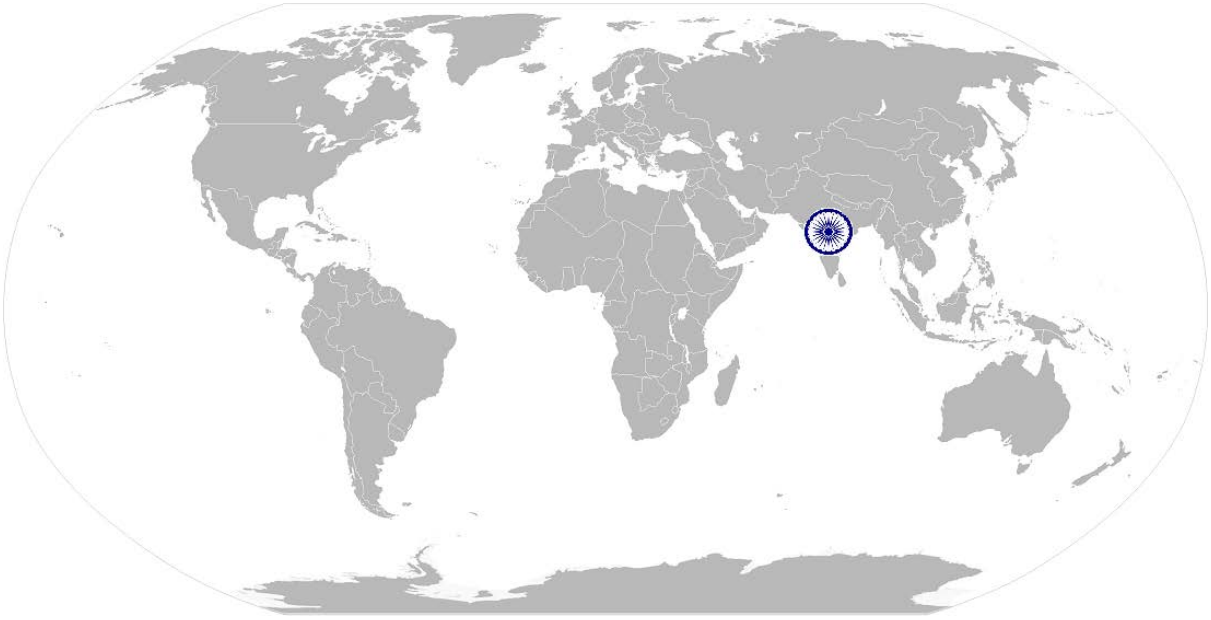

Overview

This unit covers the competencies required for repair and maintenance of Power Distribution Lines. It also covers the respective health and safety competencies required to perform such operations.

PSS/ N 0105: Repair and maintenance of Sub-station, Power Distribution Lines and components

National Occupational Standard

Unit Code	PSS/ N 0105
Unit Title (Task)	Inspection, 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. This will also include preventive and corrective maintenance of overhead and underground lines and cables. The candidate will be expected to perform independently with little to no supervision.
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

Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Working safely	The user / individual on the job should 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
Prepare for repair and maintenance of power distribution lines	The user / individual on the job should 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

PSS/ N 0105: Repair and maintenance of Sub-station, Power Distribution Lines and components

	Distribution line assessment and inspection PC13. ensure the tools and equipment is well maintained, calibrated and approved for use PC14. use Distribution line tools, equipment and hardware in line with job requirements for maintenance operations 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	The user / individual on the job should 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	The user / individual on the job should 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	The user / individual on the job should 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 (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. relevant legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions KA2. relevant health and safety requirements applicable in the work place KA3. own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities KA4. reporting structure, inter-dependent functions, lines and procedures in the work area KA5. how to engage with specialists for support in order to resolve incidents and service requests KA6. importance of working in clean and safe environment practices and procedures KA7. relevant people and their responsibilities within the work area KA8. escalation matrix and procedures for reporting work and employment related issues
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. principles of electricity **Principles:** e.g. current, voltage, conductor size relation, series/parallel connections KB2. 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 KB3. specific terminology used in Distribution Line work **Terminology:** e.g. peak hours, peak load, load shedding, load transfer, Technical and commercial loss, maximum power, KB4. elements of the power system **Elements:** e.g. generation, transmission, distribution, metering, equipment, etc. KB5. 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. KB6. 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 KB7. 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 KB8. various types of circuits **Types:** e.g. C.T., P.T., A.C., D.C., Control, Series, Parallel, Neutral phase, Indication & Annunciation Circuits KB9. troubleshooting and repair methods KB10. fault indicators KB11. overhead distribution system apparatus such as regulators and reclosers KB12. overhead distribution system standards KB13. access points such as vaults, open trenches and manholes KB14. underground distribution system apparatus such as transformers, switching cubicles, distribution and junction boxes KB15. co-existing underground utilities KB16. causes of conductor damage **Causes:** Aeolian vibration, sway oscillation, galloping, unbalanced loading, over loading KB17. classification of conductor and insulator damage including fretting, abrasion, fatigue breaks, tensile breaks KB18. need for an authorized permit on 11 KV and above voltage line KB19. hazards associated with carrying out power line maintenance and how they can be minimized **Hazards**: e.g. live wires, faulty insulation, voltage surges, faulty and damaged equipment and components, unsecure cables, unstable ladders, insects and reptiles, and scaffolding, etc. KB20. importance of ensuring that tools and equipment are suitable, well maintained, calibrated and operating effectively KB21. importance of following good housekeeping and fire prevention procedures KB22. importance of following job instructions and defined maintenance procedures KB23. material preparation methods and techniques to be undertaken, prior to using for testing and maintenance activities KB24. preparation of equipment for testing and repair activities KB25. 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. KB26. 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) KB27. 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. KB28. importance of leaving the work area and equipment in a safe and clean condition on completion of the repair and maintenance activities KB29. importance of reporting problems in a timely manner KB30. methods and parameters to check quality of line components against required quality standards **Methods:** e.g. visual inspection, binoculars, measuring tape, use of instruments KB31. principles and practices of electrical safety KB32. standard procedures how to deal with electric shocks and electrocutions to rescue and minimize damage and harm KB33. 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
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	**Communication** The user/ individual on the job needs to know and understand how to: SA1. read/listen and interpret information correctly from various job specification documents, manuals, health and safety instructions, memos, etc. applicable to

PSS/ N 0105: Repair and maintenance of Sub-station, Power Distribution Lines and components

	the job in English and/or local language SA2. fill up appropriate forms, activity logs, attendance sheets as per organizational format in English and/or local language SA3. convey and share technical information clearly using appropriate language SA4. check and clarify task-related information SA5. liaise with appropriate authorities using correct protocol SA6. communicate with people in respectful form and manner in line with organizational protocol
	Numerical and computational skills
	The user/individual on the job needs to know and understand how to: SA7. undertake basic numerical computations and calculations **Numerical computations:** addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages SA8. 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 **Solid shapes:** cube, rectangular prism, cylinder SA9. use appropriate measuring techniques and units of measurement SA10. 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 SA11. use metric systems of measurement
	Learning
	The user/individual on the job needs to know and understand how to: SA12. participate in on-the-job and other learning, training and development interventions and assessments SA13. clarify task related information with appropriate personnel or technical adviser SA14. seek to improve and modify own work practices SA15. maintain current knowledge of application standards, legislation, codes of practice and product/process developments
B. Professional Skills	**Problem Solving**
	The user/individual on the job needs to know and understand how to: SB1. identify problems with work planning, procedures, output and behavior and their implications SB2. prioritize and plan for problem solving SB3. communicate problems appropriately to others SB4. identify sources of information and support for problem solving SB5. seek assistance and support from other sources to solve problems SB6. identify effective resolution techniques SB7. select and apply resolution techniques SB8. seek evidence for problem resolution
	Plan and Organize

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	The user/individual on the job needs to know and understand how to: SB9. plan, prioritize and sequence work operations as per job requirements SB10. organize and analyze information relevant to work SB11. basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time
	Initiative and Enterprise
	The user/individual on the job needs to know and understand how to: SB12. undertake and express new ideas and initiatives to others SB13. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses SB14. participate in improvement procedures including process, quality and internal/external customer/supplier relationships SB15. one's competencies in new and different situations and contexts to achieve more
	Self-Management
	The user/individual on the job needs to know and understand how to: SB16. exercise restraint while expressing dissent and during conflict situations SB17. avoid and manage distractions to be disciplined at work SB18. manage own time for achieving better results
	Teamwork
	The user/individual on the job needs to know and understand how to: SB19. work in a team in order to achieve better results SB20. identify and clarify work roles within a team SB21. communicate and cooperate with others in the team for better results SB22. seek assistance from fellow team members

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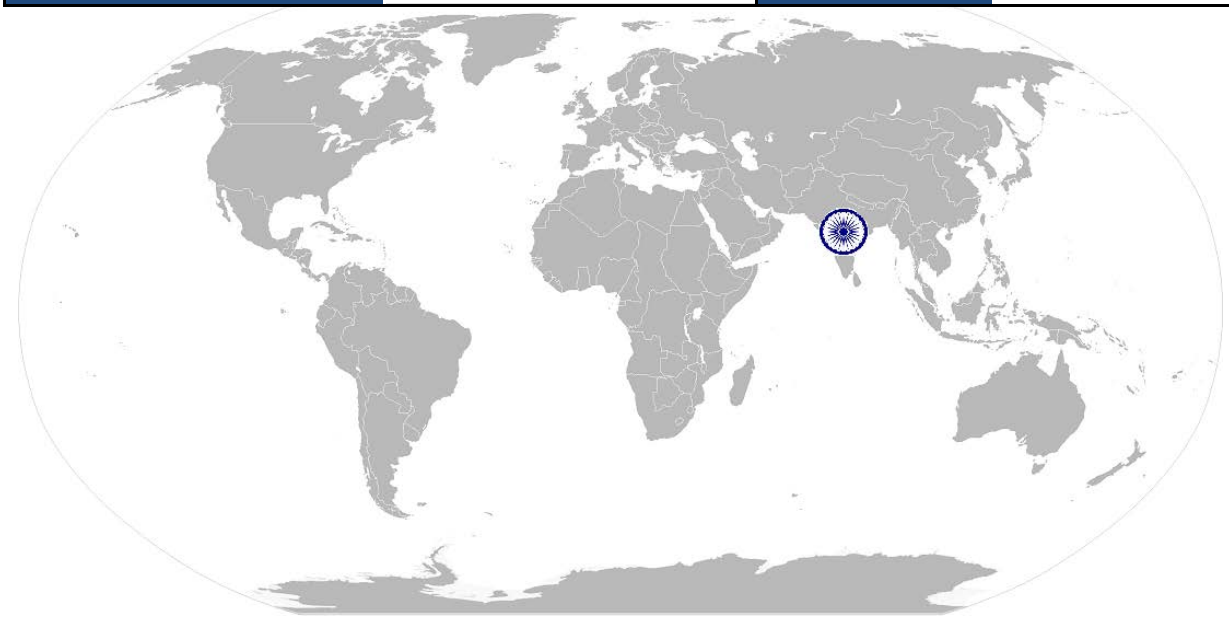
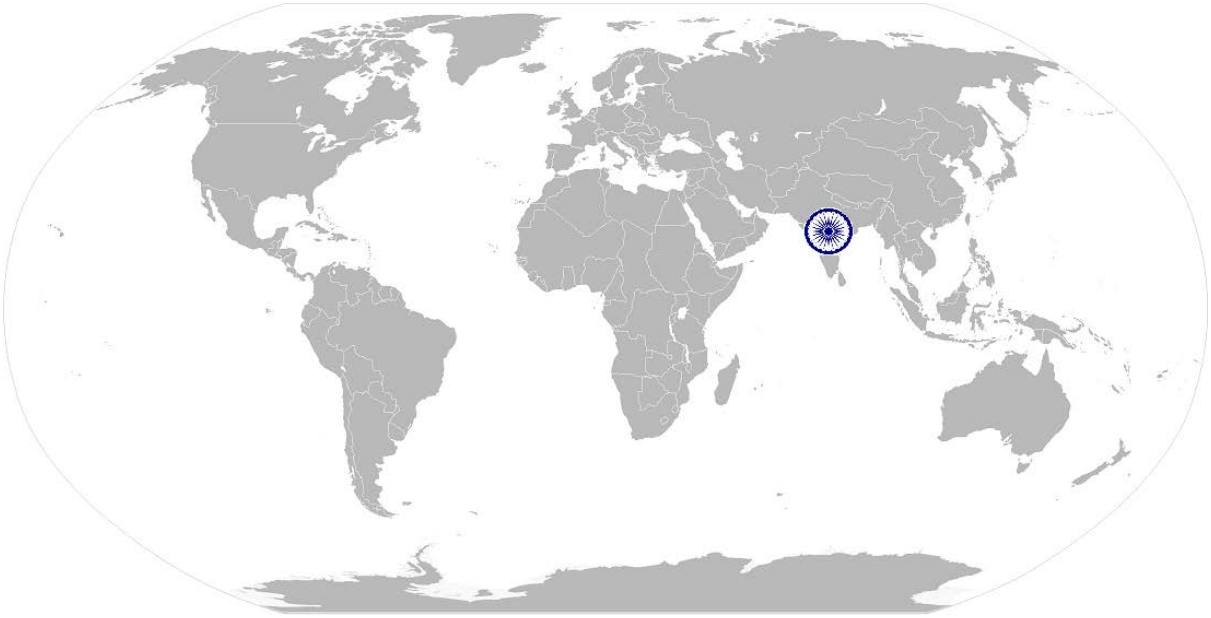
NOS Version Control

NOS Code	PSS/ N 0105		
Credits NSQF	TBD	Version number	1.0
Industry	Power	Drafted on	26/03/15
Industry Sub-sector	Distribution	Last reviewed on	26/03/15
		Next review date	26/03/17



National Occupational Standard



Overview

This unit covers the competencies required for operation and maintenance of an 11/0.433 KV Distribution Substation. It also covers the respective health and safety competencies required to perform such operations.

PSS/ N 0107: Operation and maintenance of 11/0.433 KV Distribution Substation

National Occupational Standard

Unit Code	**PSS/ N 0107**
Unit Title (Task)	**Operation and maintenance of an 11/0.433 KV Distribution Substation**
Description	This unit covers the competencies required technicians to erect and conduct maintenance for an 11/0.433 KV Distribution Substation. This includes working with the crew to install the Substation transformer, handling of tools and equipment for installation and maintenance and carrying out necessary tasks in a safe, efficient and effective manner. The candidate will be expected to perform independently with little or no supervision and as per job specifications.
Scope	This unit/task covers the following: • Working safely • Operate an 11/0.433 KV Distribution Substation • Carrying out maintenance for the Distribution Substation

Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Working safely	The user / individual on the job should 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	The user / individual on the job should be able to: PC7. identify job requirements for specific operations as per instructions given from valid sources **Valid 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

PSS/ N 0107: Operation and maintenance of 11/0.433 KV Distribution Substation

	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	The user / individual on the job should 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 (K)	
A. Organizational Context (Knowledge of the company / organization and its processes) as	The user/individual on the job needs to know and understand: KA1. relevant legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions KA2. relevant health and safety requirements applicable in the work place KA3. own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities KA4. reporting structure, inter-dependent functions, lines and procedures in the work area KA5. how to engage with specialists for support in order to resolve incidents and service requests KA6. importance of working in clean and safe environment practices and procedures KA7. relevant people and their responsibilities within the work area KA8. escalation matrix and procedures for reporting work and employment related issues
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. various components of the power system **Components:** e.g. transformers, Isolators, CTs, PTs, Circuit breakers, LAs, various types of Panels & Sub-station protection systems KB2. transformer part and their usage **Parts:** e.g. main tank, radiators, conservator, explosion vent, lifting lugs, air release plug, oil level indicator, tap changer, wheels, HV/LV bushings, filter valves, oil filling plug, drain plug, cable box KB3. specific health and safety precautions which must be taken when carrying out substation installation processes KB4. 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. KB5. importance of following job instructions and defined installation and maintenance procedures KB6. equipment used in substation construction and maintenance activities KB7. importance of leaving the work area and equipment in a safe and clean condition on completion of the heat treatment activities KB8. importance of reporting problems in a timely manner KB9. methods and parameters to check quality of the components against required quality standards KB10. types of cable joints **Types:** e.g. straight, T-joint, terminal joint KB11. calibration schedule of all equipment used in the construction and maintenance procedures KB12. importance of tools and equipment to be kept in a safe and usable condition KB13. importance of displaying rating and diagram plates KB14. personal protective equipment (PPE) and clothing that must be worn during

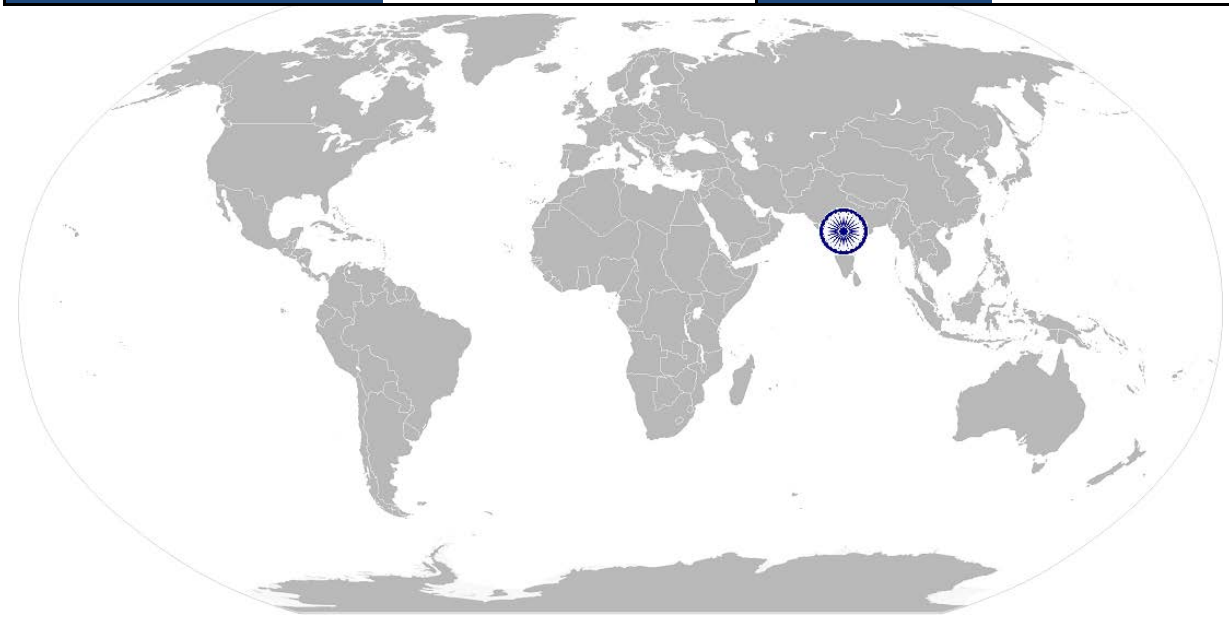
	the heat treatment activity and from where can it be obtained
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	**Communication**
	The user/ individual on the job needs to know and understand how to: SA1. read and interpret information correctly from various job specification documents, manuals, health and safety instructions, memos, etc. applicable to the job in English and/or local language SA2. fill up appropriate technical forms, process charts, activity logs as per organizational format in English and/or local language SA3. convey and share technical information clearly using appropriate language SA4. check and clarify task-related information SA5. liaise with appropriate authorities using correct protocol SA6. communicate with people in respectful form and manner in line with organizational protocol
	Numerical and computational skills
	The user/individual on the job needs to know and understand how to: SA7. undertake basic numerical computations and calculations **Numerical computations:** addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages SA8. 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 **Solid shapes:** cube, rectangular prism, cylinder SA9. use appropriate measuring techniques and units of measurement SA10. 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 SA11. use metric systems of measurement
	Learning
	The user/individual on the job needs to know and understand how to: SA12. participate in on-the-job and other learning, training and development interventions and assessments SA13. clarify task related information with appropriate personnel or technical adviser SA14. seek to improve and modify own work practices SA15. maintain current knowledge of application standards, legislation, codes of practice and product/process developments
B. Professional Skills	**Problem Solving**
	The user/individual on the job needs to know and understand how to: SB1. identify problems with work planning, procedures, output and behavior and their implications SB2. prioritize and plan for problem solving SB3. communicate problems appropriately to others

	SB4. identify sources of information and support for problem solving SB5. seek assistance and support from other sources to solve problems SB6. identify effective resolution techniques SB7. select and apply resolution techniques SB8. seek evidence for problem resolution
	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB9. plan, prioritize and sequence work operations as per job requirements SB10. organize and analyze information relevant to work SB11. basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time
	Initiative and Enterprise
	The user/individual on the job needs to know and understand how to: SB12. undertake and express new ideas and initiatives to others SB13. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses SB14. participate in improvement procedures including process, quality and internal/external customer/supplier relationships SB15. one's competencies in new and different situations and contexts to achieve more
	Self-Management
	The user/individual on the job needs to know and understand how to: SB16. exercise restraint while expressing dissent and during conflict situations SB17. avoid and manage distractions to be disciplined at work SB18. manage own time for achieving better results
	Teamwork
	The user/individual on the job needs to know and understand how to: SB19. work in a team in order to achieve better results SB20. identify and clarify work roles within a team SB21. communicate and cooperate with others in the team for better results SB22. seek assistance from fellow team members

PSS/ N 0107: Operation and maintenance of 11/0.433 KV Distribution Substation

NOS Version Control

NOS Code	PSS/ N 0107		
Credits NSQF	TBD	Version number	1.0
Industry	Power	Drafted on	26/03/15
Industry Sub-sector	Distribution	Last reviewed on	26/03/15
		Next review date	26/03/17



PSS/ N 0110: Supervise work and crew in power distribution installation and maintenance work

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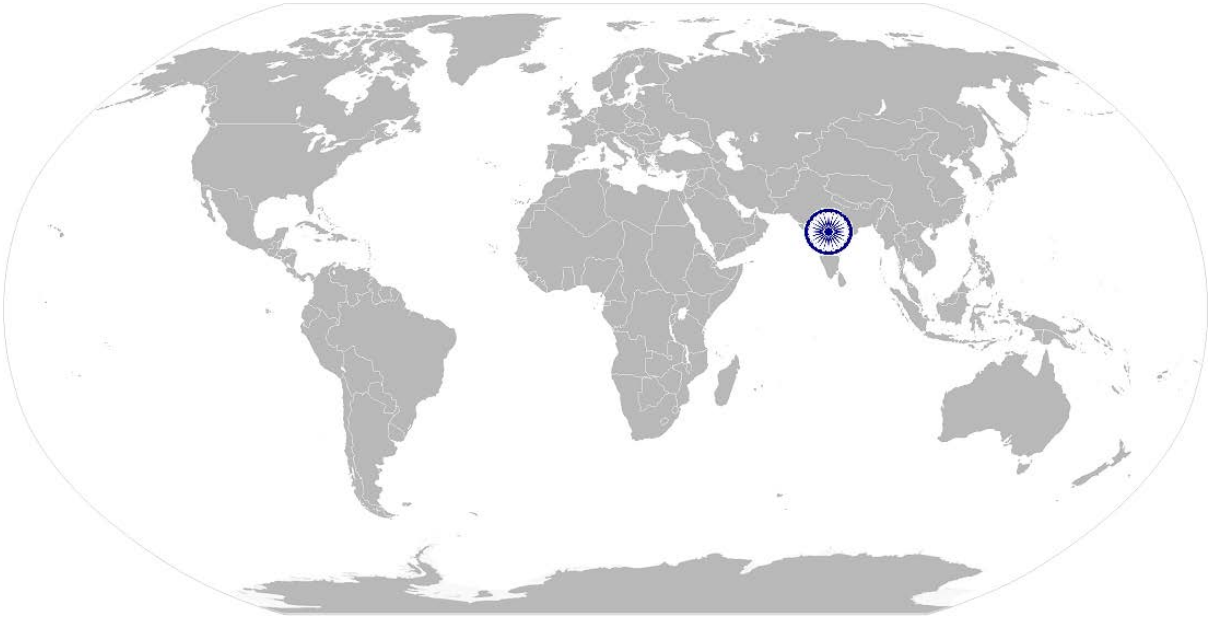
National Occupational Standard



Overview

This unit covers the competencies required supervisors in Power Distribution installation and maintenance work. It also covers the respective health and safety competencies required to perform such operations.

PSS/ N 0110: Supervise work and crew in power distribution installation and maintenance work

National Occupational Standard

Unit Code	PSS/ N 0110
Unit Title (Task)	**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. The candidate will be expected to perform independently with little to no supervision.
Scope	This unit/task covers the following: • Working safely within regulations • Supervising the team at work • Accident, incident or grievance handling
Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Working safely and within regulations	The user / individual on the job should 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	The user / individual on the job should 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

PSS/ N 0110: Supervise work and crew in power distribution installation and maintenance work

	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	The user / individual on the job should 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 (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. relevant legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions KA2. relevant health and safety requirements applicable in the work place KA3. own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities KA4. reporting structure, inter-dependent functions, lines and procedures in the work area KA5. how to engage with specialists for support in order to resolve incidents and service requests KA6. importance of working in clean and safe environment practices and procedures KA7. relevant people and their responsibilities within the work area KA8. escalation matrix and procedures for reporting work and employment related issues
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. importance of keeping and leaving the work area and equipment in a safe and clean condition on completion of the repair and maintenance activities KB2. importance of reporting problems in a timely manner KB3. methods and parameters to check quality of performance against required quality standards KB4. reporting requirements in relation to team and personnel KB5. concept of productivity KB6. components of performance development such as skills, knowledge, values, etc. KB7. importance of recording evidence of performance and incidents KB8. importance of providing feedback and communicating with team regularly

PSS/ N 0110: Supervise work and crew in power distribution installation and maintenance work

	KB9. procedures for making, receiving and handling complaints and grievances
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	**Communication**
	The user/ individual on the job needs to know and understand how to: SA1. 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 SA2. fill up appropriate technical forms, process charts, activity logs as per organizational format in English and/or local language SA3. convey and share technical information clearly using appropriate language SA4. check and clarify task-related information SA5. liaise with appropriate authorities using correct protocol SA6. communicate with people in respectful form and manner in line with organizational protocol
	Numerical and computational skills
	The user/individual on the job needs to know and understand how to: SA7. undertake basic numerical computations and calculations **Numerical computations:** addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages SA8. 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 **Solid shapes:** cube, rectangular prism, cylinder SA9. use appropriate measuring techniques and units of measurement SA10. 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 SA11. use metric systems of measurement
	Learning
	The user/individual on the job needs to know and understand how to: SA12. participate in on-the-job and other learning, training and development interventions and assessments SA13. clarify task related information with appropriate personnel or technical adviser SA14. seek to improve and modify own work practices SA15. maintain current knowledge of application standards, legislation, codes of practice and product/process developments
B. Professional Skills	**Problem Solving**
	The user/individual on the job needs to know and understand how to: SB1. identify problems with work planning, procedures, output and behavior and their implications SB2. prioritize and plan for problem solving

PSS/ N 0110: Supervise work and crew in power distribution installation and maintenance work

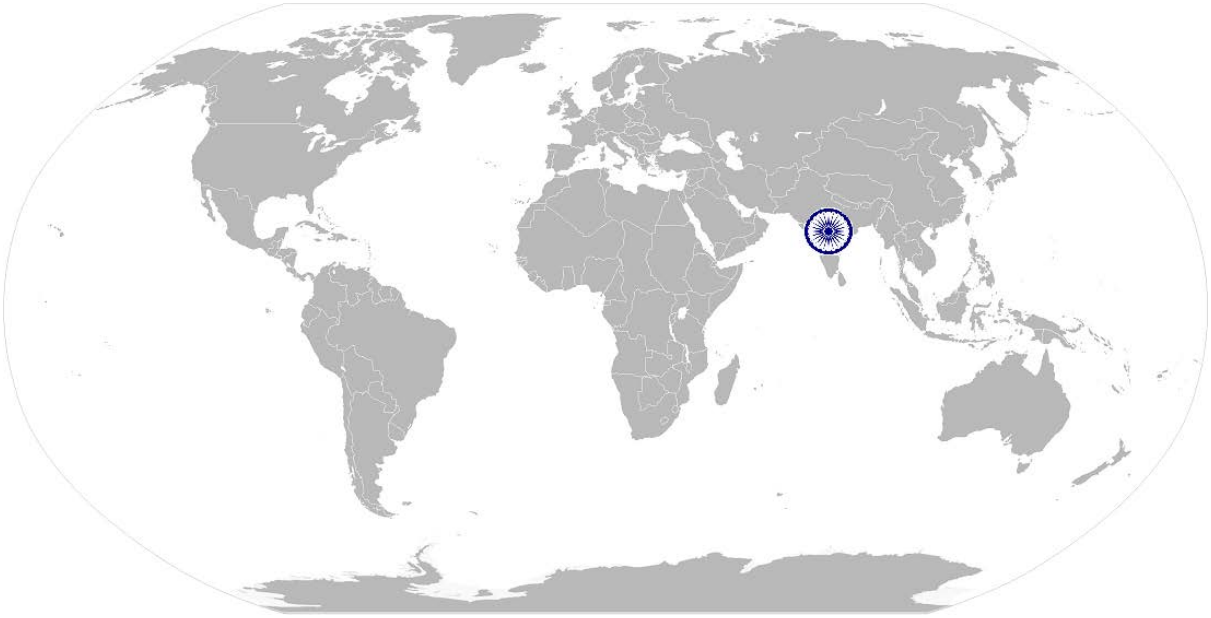
	SB3. communicate problems appropriately to others SB4. identify sources of information and support for problem solving SB5. seek assistance and support from other sources to solve problems SB6. identify effective resolution techniques SB7. select and apply resolution techniques SB8. seek evidence for problem resolution
	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB9. plan, prioritize and sequence work operations as per job requirements SB10. organize and analyze information relevant to work SB11. basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time
	Initiative and Enterprise
	The user/individual on the job needs to know and understand how to: SB12. undertake and express new ideas and initiatives to others SB13. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses SB14. participate in improvement procedures including process, quality and internal/external customer/supplier relationships SB15. one's competencies in new and different situations and contexts to achieve more
	Self-Management
	The user/individual on the job needs to know and understand how to: SB16. exercise restraint while expressing dissent and during conflict situations SB17. avoid and manage distractions to be disciplined at work SB18. manage own time for achieving better results
	Teamwork
	The user/individual on the job needs to know and understand how to: SB19. work in a team in order to achieve better results SB20. identify and clarify work roles within a team SB21. communicate and cooperate with others in the team for better results SB22. seek assistance from fellow team members

PSS/ N 0110: Supervise work and crew in power distribution installation and maintenance work

NOS Version Control

NOS Code	PSS/ N 0110		
Credits NSQF	TBD	Version number	1.0
Industry	Power	Drafted on	26/03/15
Industry Sub-sector	Generation, Transmission, Distribution, Renewable Energy, Power Equipment Manufacturing	Last reviewed on	26/03/15
		Next review date	26/03/17

National Occupational Standard



Overview

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.

PSS/ N 2001: Use basic health and safety practices for power related work

National Occupational Standard

Unit Code	PSS / N 2001
Unit Title (Task)	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. It includes understanding of risks and hazards in the workplace, along with common techniques to minimize risk, deal with accidents, emergencies, etc. It covers knowledge of fire safety, common first aid applications, safe practices and emergency procedures.
Scope	This unit/task covers the following: • Health and safety • Fire safety • Emergencies, rescue and first-aid procedures
Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Health and safety	The user/individual on the job should be able to: PC1. use protective clothing/equipment for specific tasks and work conditions **Protective clothing**: leather or asbestos gloves, flame proof aprons, flame proof overalls buttoned to neck, cuffless (without folds), trousers, reinforced footwear, helmets/hard hats, cap and shoulder covers, ear defenders/plugs, safety boots, knee pads, particle masks, glasses/goggles/visors **Equipment**: hand and face shields, machine guards, residual current devices, shields, dust sheets, respirator PC2. state the name and location of people responsible for health and safety in the workplace PC3. state the names and location of documents that refer to health and safety in the workplace PC4. identify job-site hazardous work and state possible causes of risk or accident in the workplace **Hazards**: electrical hazards (dealing with high voltage equipment, power supply and points, loose and naked cables and wires, electrical machines and appliances, etc.); sharp edged and heavy tools; heated metals; oxyfuel and gas cylinders; welding radiation; hazardous surfaces(sharp, slippery, uneven, chipped, broken, etc.); hazardous substances(chemicals, gas, oxy-fuel, fumes, dust, hazardous waste materials, etc.); physical hazards(working at heights, working in windy

	or moist areas, large and heavy objects and machines, sharp and piercing objects, moving objects and part of machinery, tolls and machines, intense light, load noise, abnormal temperature; obstructions in corridors, by doors, blind turns, over stacked shelves and packages, etc.); working in high temperatures **Possible causes of risk and accident**: physical actions; not following instructions; inattention; sickness and incapacity (such as drunkenness); health hazards (such as untreated injuries and contagious illness); not taking safety precautions PC5. follow electrical safe working procedures such as Tag out/Lock out, 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 **Parameters**: temperature, pressure, flow& current PC11. carry out safe working practices while dealing with hazards to ensure the safety of self and others **Safe working practices**: using protective clothing and equipment; putting up and reading safety signs; handle tools in the correct manner and store and maintain them properly; keep work area clear of clutter, spillage and unsafe object lying casually; while working with electricity take all electrical precautions like insulated clothing, adequate equipment insulation, use of control equipment, dry work area, switch off the power supply when not required, etc.; safe lifting and carrying practices; use equipment that is working properly and is well maintained; take due measures for safety while working at heights, etc. including safety harness, fall arrestors, guardrails, proper work positioning, do not jump or overload, etc.; take due measures for safety while working in confined spaces or trenches, etc. PC12. state methods of accident prevention in the work environment of the job role **Methods of accident prevention**: training in health and safety procedures; using health and safety procedures; use of equipment and working practices (such as safe carrying procedures); safety notices, advice; instruction from colleagues and supervisors PC13. state location of general health and safety equipment in the workplace **General health and safety equipment**: fire extinguishers; first aid equipment; safety instruments and clothing; safety installations(e.g.

PSS/ N 2001: Use basic health and safety practices for power related work

	fire exits, exhaust fans) PC14. inspect for faults, set up and safely use of scaffolds and elevated platforms and ladders **Faults**: corrosion of metal components, deterioration, splits and cracks timber components, imbalance, loose rungs, missing/ unfixed nuts or bolts, etc. **Set up**: firm/level base, clip/lash down, leaning at the correct angle, appropriate load as per capacity, etc. PC15. lift, carry and transport heavy objects & tools safely using correct procedures from storage to workplace and vice versa PC16. inspect power plant and its equipment routinely for any signs of oil, water and/or steam 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. apply good housekeeping practices at all times **Good housekeeping practices**: clean/tidy work areas, removal/disposal of waste products, protect surfaces PC20. identify common hazard signs displayed in various areas **Various areas**: on chemical containers; equipment; packages; inside buildings; in open areas and public spaces, etc. PC21. retrieve and/or point out documents that refer to health and safety in the workplace **Documents**: fire notices, accident reports, safety instructions for equipment and procedures, company notices and documents, legal documents (e.g. government notices) PC22. inform relevant authorities about any abnormal situation/behavior of any equipment/system promptly
Fire safety	The user/individual on the job should be able to: PC23. use the various appropriate fire extinguishers on different types of fires correctly **Types of fires**: Class A: e.g. ordinary solid combustibles, such as wood, paper, cloth, plastic, charcoal, etc.; Class B: flammable liquids; Class C: e.g. combustible gases, such as gasoline, propane, diesel fuel, tar, cooking oil, and similar substances; Class D: combustible chemicals and metals such as magnesium, titanium, and sodium (These fires burn at extremely high temperatures and require special suppression agents) These categories of fires become Class A, B, C and D fires when the electrical equipment that initiated the fire is no longer receiving electricity; Class E: e.g. electrical equipment such as appliances, wiring, breaker panels, etc. PC24. demonstrate rescue techniques applied during fire hazard PC25. demonstrate good housekeeping in order to prevent fire hazards PC26. demonstrate the correct use of a fire extinguisher

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Emergencies, rescue and first-aid procedures	The user/individual on the job should be able to: PC27. demonstrate how to free a person from electrocution PC28. administer appropriate first aid to victims where required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc. PC29. demonstrate basic techniques of bandaging PC30. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments PC31. perform and organize loss minimization or rescue activity during an accident in real or simulated environments PC32. 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 PC33. demonstrate the artificial respiration and the CPR Process PC34. participate in emergency procedures **Emergency procedures**: raising alarm, safe/efficient, evacuation, correct means of escape, correct assembly point, roll call, correct return to work PC35. complete a written accident/incident report or dictate a report to another person, and send report to person responsible **Incident Report includes details of**: name, date/time of incident, date/time of report, location, environment conditions, persons involved, sequence of events, injuries sustained, damage sustained, actions taken, witnesses, supervisor/manager notified PC36. demonstrate correct method to move injured people and others during an emergency
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. names (and job titles if applicable), and where to find, all the people responsible for health and safety in a workplace. KA2. names and location of documents that refer to health and safety in the workplace.
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. meaning of “hazards” and “risks” KB2. health and safety hazards commonly present in the work environment and related precautions KB3. possible causes of risk, hazard or accident in the workplace and why risk and/or accidents are possible KB4. possible causes of risk and accident **Possible causes of risk and accident**: physical actions; not following instructions; inattention; sickness and incapacity (such as drunkenness); health hazards (such as untreated injuries and contagious illness); not taking safety precautions KB5. methods of accident prevention **Methods of accident prevention**: training in health and safety

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	procedures; using health and safety procedures; use of equipment and working practices (such as safe carrying procedures); safety notices, advice; instruction from colleagues and supervisors KB6. safe working practices when working with tools and machines KB7. safe working practices while working at various hazardous sites KB8. where to find all the general health and safety equipment in the workplace KB9. various dangers associated with the use of electrical equipment KB10. positive isolation of electrical equipment and system KB11. safe handling and disposal of hazardous power plant wastes KB12. use of emission and pollution control devices and measures taken to control pollution KB13. various safety procedures and equipment used to work at heights, trenches and confined places KB14. safe working practices specific to working with electrical equipment & system e.g. lock out/ tag out, PTW, etc. KB15. preventative and remedial actions to be taken in the case of exposure to toxic materials **Exposure:** ingested, contact with skin, inhaled **Preventative action**: ventilation, masks, protective clothing/ equipment); **Remedial action:** immediate first aid, report to supervisor **Toxic materials:** solvents, flux, lead KB16. importance of using protective clothing/equipment and other insulated work gear while handling electrical system and equipment KB17. precautionary activities taken to prevent fire accident KB18. various causes of fire **Causes of fires**: heating of metal; spontaneous ignition; sparking; electrical heating; loose fires (smoking, welding, etc.); chemical fires; etc. KB19. techniques of using the different fire extinguishers KB20. different methods of extinguishing fire KB21. different materials used for extinguishing fire **Materials**: sand, water, foam, CO2, dry powder KB22. emergency rescue techniques applied during a fire hazard KB23. various types of safety signs and what they mean KB24. appropriate basic first aid treatment relevant to the condition e.g. shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries KB25. content of written accident report KB26. potential injuries and ill health associated with incorrect manual handing KB27. safe lifting, carrying and transporting practices KB28. personal safety, health and dignity issues relating to the movement of a person by others KB29. potential impact to a person who is moved incorrectly
Skills (S) [Optional]	

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A. Core Skills/ Generic Skills	**Reading and Writing Skills**
	The user/individual on the job needs to know and understand how to: SA1. read and comprehend basic content to read labels, charts, signages SA2. read and comprehend basic English to read manuals of operations SA3. read and write an accident/incident report in local language or English
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA4. question coworkers appropriately in order to clarify instructions and other issues SA5. give clear instructions to coworkers, subordinates others
	Decision Making
	The user/individual on the job needs to know and understand how to: SA6. make appropriate decisions pertaining to the concerned area of work with respect to intended work objective, span of authority, responsibility, laid down procedure and guidelines
B. Professional Skills	**Plan and Organize**
	The user/individual on the job needs to know and understand how to: SB1. plan and organize their own work schedule, work area, tools, equipment and materials to maintain decorum and for improved productivity
	Working with others
	The user/individual on the job needs to know and understand how to: SB2. remain congenial while discussing and debating issues with co-workers SB3. follow appropriate protocols for communication based on situation, hierarchy, organizational culture and practice SB4. ask for, provide and receive required assistance where possible to ensure achievement of work related objectives SB5. thank coworkers for any assistance received SB6. offer appropriate respect based on mutuality and respect for fellow worksmanship and authority
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB7. think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s) SB8. identify immediate or temporary solutions to resolve delays SB9. identify sources of support that can be availed of for problem solving for various kind of problems SB10. seek appropriate assistance from other sources to resolve problems SB11. report problems that you cannot resolve to appropriate authority
	Analytical Thinking

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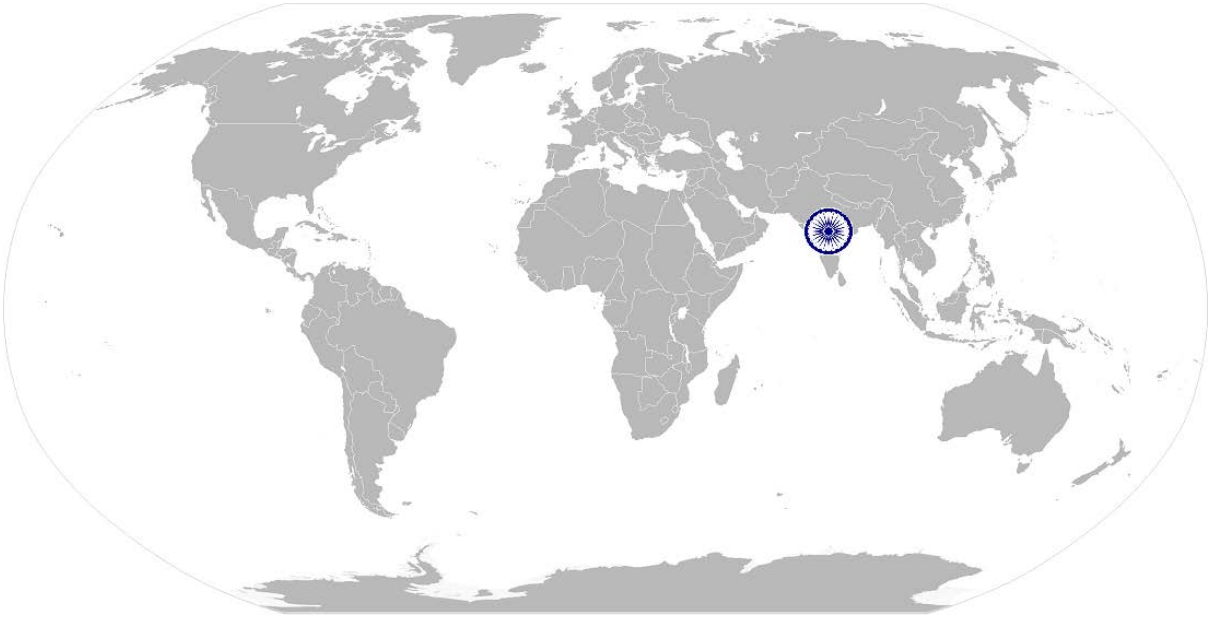
	The user/individual on the job needs to know and understand how to: SB12. identify cause and effect relations in their area of work SB13. use cause and effect relations to anticipate potential problems and their solution



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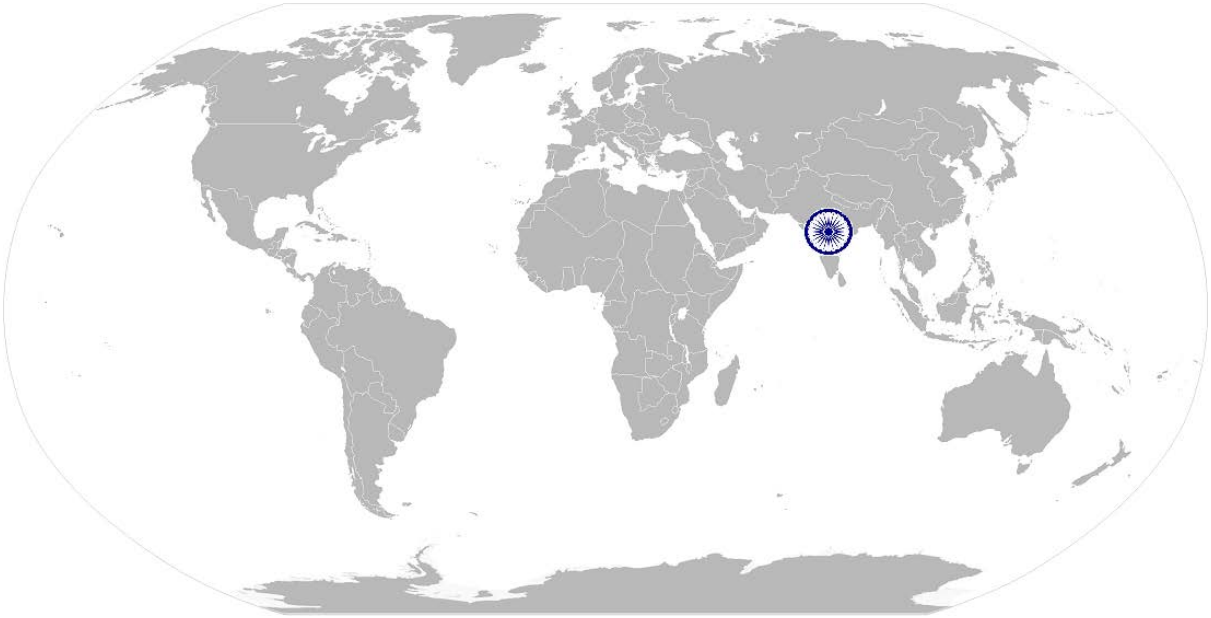
NOS Version Control

NOS Code	PSS / N 2001		
Credits (NSQF)	TBD	Version number	1.0
Industry	Power	Drafted on	26/03/15
Industry Sub-sector	Generation, Transmission, Distribution, Renewable energy, Equipment manufacturing	Last reviewed on	26/03/15
		Next review date	26/03/17

National Occupational Standard



Overview

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

CSC/ N 1336: Work effectively with others

National Occupational Standard

Unit Code	**CSC / N 1336**
Unit Title (Task)	**Work effectively with others**
Description	This unit covers basic etiquette and competencies that a candidate is required to possess and demonstrate in their behavior and interactions with others at the workplace. These cover areas such as communication etiquette, discipline, listening, handling conflict and grievances.
Scope	This unit/task covers the following: • Working with others

Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria**
Working with others	The user/individual on the job should be able to: PC1. accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required PC2. accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt PC3. give information to others clearly, at a pace and in a manner that helps them to understand PC4. display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible PC5. consult with and assist others to maximize effectiveness and efficiency in carrying out tasks PC6. display appropriate communication etiquette while working **Communication etiquette:** do not use abusive language; use appropriate titles and terms of respect; do not eat or chew while talking (vice versa)etc. PC7. display active listening skills while interacting with others at work PC8. use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism PC9. demonstrate responsible and disciplined behaviors at the workplace **Disciplined behaviors:** e.g. punctuality; completing tasks as per given time and standards; not gossiping and idling time; eliminating waste, honesty, etc. PC10. escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict

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

CSC/ N 1336: Work effectively with others

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

CSC/ N 1336: Work effectively with others

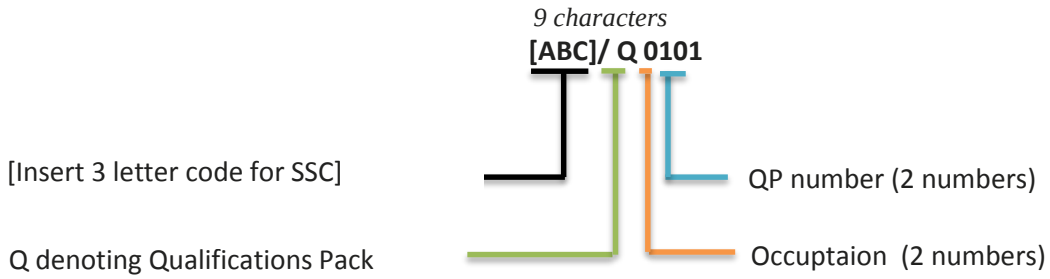
NOS Version Control

NOS Code	CSC / N 1336		
Credits(NSQF)	TBD	Version number	1.0
Industry	Power	Drafted on	26/03/15
Industry Sub-sector	Generation, Transmission, Distribution, Renewable Energy, Power Equipment Manufacturing	Last reviewed on	26/03/15
		Next review date	26/03/17

Annexure

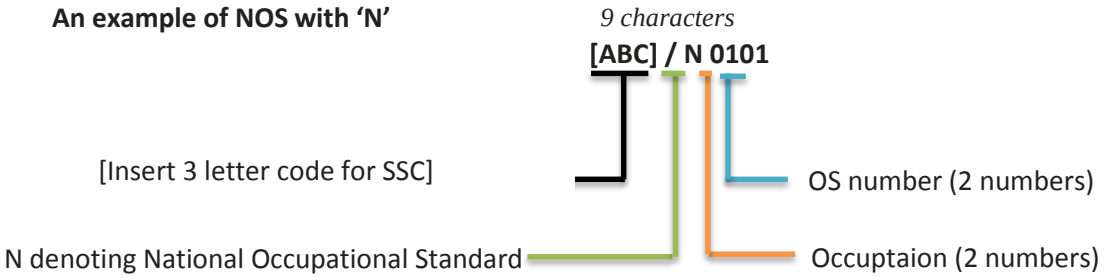
Nomenclature for QP and NOS

Qualifications Pack



Occupational Standard

An example of NOS with 'N'



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The following acronyms/codes have been used in the nomenclature above:

Sub-sector	Range of Occupation numbers
Generation	01-10
Transmission	01-10
Distribution	01-10
Renewable Energy	01-10
Power Equipment Manufacturing	01-10

Sequence	Description	Example
Three letters	Power	PSS
Slash	/	/
Next letter	Whether **Q**P or **N**OS	N
Next two numbers	Occupation code	01
Next two numbers	OS number	01

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Senior Lineman Distribution

Qualification Pack PSS/ Q 0103

Sector Skill Council Power

Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC
3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria
5. To pass the Qualification Pack, every trainee should score a minimum of 70% in every NOS
6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack

				Mark Allocation	
		Total Mark (600)	**Out of**	**Theory**	**Skills Practical**
PSS/ N 0109: Inspection of Power Distribution Substation, Lines and Components	PC1. work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines	**100**	3	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		3	1	2
	PC3. work following laid down procedures and instructions		2	1	1
	PC4. ensure that all tools, equipment, etc. are in a safe and usable condition and are kept at secured location		1	0	1
	PC5. ensure work area is clean and safe from hazards before and after the job is completed		1	0	1
	PC6. prepare and maintain the work area as per procedure or operation specification		2	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		3	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		3	1	2
	PC9. inspect insulators including substation, bus support, suspension, etc. using safe and correct methods		3	1	2
	PC10. inspect any steel superstructures where applicable		3	1	2
	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		3	1	2
	PC12. inspect communication equipment, back-up battery systems, control house, etc. as per required and approved procedures		3	1	2
	PC13. inspect for physical security including locks on switches, enclosures, and gates, fences, gates, and warning signs (including washouts) to identify risks		3	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		3	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		2	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		2	0	2

	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		2	0	2
	PC18. carry out battery and battery-charger tests accurately and safely		2	0	2
	PC19. follow and develop plans and schedule inspections of distribution lines including regular periodic and special routines such as pre-monsoon inspection		2	0	2
	PC20. identify various types of circuits and its components accurately		1	0	1
	PC21. identify and acquire correct tools, equipment and instruments required for Distribution line assessment and inspection		1	0	1
	PC22. ensure the tools and equipment is well maintained, calibrated and approved for use		1	0	1
	PC23. access and survey area in accordance with established procedures		2	1	1
	PC24. assess components of distribution line for damage or risk for damage through visual, sensory and instrument methods		1	0	1
	PC25. carry out pole to pole inspection using patrolling as per job requirement, safely and efficiently		3	1	2
	PC26. assess and confirm condition of pole structure based on Distribution line standards		3	1	2
	PC27. check guys for damage, distance to primary conductor or equipment, insulator condition accurately		3	1	2
	PC28. check pole top assemblies for damage, safely and as per required and approved procedures		4	1	3
	PC29. perform load checks to identify imbalanced and overloaded circuits accurately and safely		3	1	2

	PC30. assist engineer in testing cable integrity and designation by using methods such as ultra-low frequency (ULF), very low frequency (VLF)		2	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		3	1	2
	PC32. identify hazards of trimming trees such as limits of approach, public safety and step and touch potential		2	0	1
	PC33. conduct site inspection for emergency cases following established procedures		3	1	2
	PC34. observe and follow safety procedures		3	1	2
	PC35. document and record findings clearly, accurately and in required detail using correct forms and formats if any		1	0	1
	PC36. prepare recommendations for corrective and preventive maintenance based on the findings of the inspection		2	0	2
	PC37. clean and test Distribution line tools according to standard procedures		2	1	1
	PC38. inspect, repair and replace distribution line tools and equipment, if necessary after use		2	1	1
	PC39. restore system to normal operating status by using switching procedures where disconnected		2	1	1
	PC40. record details of inspection accurately and clearly in required ledgers, forms and formats as per required and approved procedures		2	1	1
	PC41. make correct and required recommendations for repair and maintenance where risks, faults or damage recorded		3	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	0	2
	PC43. leave the work area in a safe and tidy condition on completion of the		1	0	1

	inspection and testing activities				
	PC44. refer unresolved job related problems to appropriate personnel for support		1	0	2
	PC45. monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem		1	0	1
		Total	100	28	72
PSS/ N 0105: Repair and maintenance of Sub-station, Power Distribution Lines and components	PC1. work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines	**100**	3	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		3	1	2
	PC3. work following laid down procedures and instructions		2	1	1
	PC4. ensure that all tools, equipment, etc. are in a safe and usable condition and are kept at secured location		1	0	1
	PC5. ensure work area is clean and safe from hazards before and after the job is completed		1	0	1
	PC6. access and survey area in accordance with established procedures		3	1	2
	PC7. assess and confirm condition of pole structure and components based on Distribution line standards		4	2	2
	PC8. perform load checks to identify imbalanced and overloaded circuits		2	0	2
	PC9. identify hazards of trimming trees such as limits of approach, public safety and step and touch potential prior to commencing work		2	0	2
	PC10. conduct site inspection for emergency cases following established procedures		3	1	2
	PC11. identify various types of circuits		1	0	1
	PC12. identify and acquire correct tools, equipment and instruments required for Distribution line assessment and inspection		1	0	1

	PC13. ensure the tools and equipment is well maintained, calibrated and approved for use		1	0	1
	PC14. use Distribution line tools, equipment and hardware in line with job requirements for maintenance operations		2	1	1
	PC15. prepare and maintain the work area as per procedure or operation specification		2	1	1
	PC16. switch off, isolate, discharge and earth (side) line cables		2	0	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		3	1	2
	PC18. safely operate switchgears eg. on/off, earth, etc.		2	0	2
	PC19. perform off-line overhead line maintenance procedure according to job specifications and requirements		4	2	2
	PC20. perform off-line underground line maintenance procedure according to job specifications and requirements		4	2	2
	PC21. perform stay wire assembly as per requirements and specifications, safely and efficiently		4	2	2
	PC22. ensure lines are properly aligned by tightening appropriate nuts and bolts		2	0	2
	PC23. ensure proper clearance of lowest conductor from ground		2	0	2
	PC24. ensure guy insulators are of suitable capacity to the stay sets		2	0	2
	PC25. select and use test equipment such as tong testers/clip-on meter, meggers and voltmeters to verify fault and integrity		2	0	2
	PC26. sectionalize circuit to determine location of fault		2	0	2
	PC27. isolate fault, damage or hazard and restore power to customers using equipment such as switches		2	0	2
	PC28. repair conductor by splicing, jointing, using armor rods, line guards, vibration dampers		2	0	2

PC29. check work carried out by team members and ensure it is as per standard requirement		4	2	2
PC30. provide useful feedback regarding work matter to team members in a timely, polite and supportive manner		2	0	2
PC31. report trouble and required actions such as repairs or replacements, and estimated repair time to system authority		2	0	2
PC32. ensure pole dismantling and re-setting procedure is carried out as per standard procedure, where required		4	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	0	3
PC34. replace components such as transformers, disconnects, conductors, poles, switches, elbows and terminations and insulators safely and as per company procedure		3	1	2
PC35. replace other line components due to damage or unsuitability as per standard procedure, where required		3	1	2
PC36. make connections and energize replaced underground cables, as per standard procedures where required		4	2	2
PC37. restore system to normal operating status by using switching procedures		3	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	0	2
PC39. leave the work area in a safe and tidy condition on completion of the repair and maintenance activities		2	0	2
PC40. refer unresolved job related problems to appropriate personnel for support		2	0	2
PC41. monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem		2	0	2

		Total	100	25	75
PSS/ N 0107: Operation and maintenance of 11/0.433 KV Distribution Substation	PC1. work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines	**100**	3	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		3	1	2
	PC3. work following laid down procedures and instructions		2	1	1
	PC4. ensure that all tools, equipment, power cables are in a safe and usable condition and are kept at secured location		2	0	2
	PC5. ensure work area is clean and safe from hazards before and after the job is completed		2	0	2
	PC6. inspect the component to check if it is as per specification and without defects		3	1	2
	PC7. identify job requirements for specific operations as per instructions given from valid sources		3	1	2
	PC8. identify various components of the power system		2	1	1
	PC9. ensure equipment and tools required for installation work are identified, acquired, calibrated, suitable and approved for use		2	0	2
	PC10. identify, estimate and acquire correct materials required for the Substation erection and installation work		2	0	2
	PC11. follow standard specifications and procedures for installing a pole mounted distribution transformer		5	2	3
	PC12. ensure poles set to proper depth, and properly aligned		2	0	2
	PC13. carry out erection of channel on the double pole for preparation of transformer bed as per requirement		5	2	3
	PC14. fix lightening arrester as per requirement and standard procedure		4	2	2
	PC15. install earth connection as per standard procedure		3	1	2

	PC16. install cross arm as per specifications and requirement		3	1	2
	PC17. provide anti-climbing device on poles		2	0	2
	PC18. arrange to lift the transformer and put it on the transformer bed in a safe and efficient manner		3	0	3
	PC19. fit the Gang operating (GO Switch) and dropout fuse as per standard procedure		5	2	3
	PC20. follow applicable construction standards eg. REC construction standards, for carrying out the erection procedures		4	2	2
	PC21. connect low voltage cables as per standard procedures in a safe and efficient manner		3	1	2
	PC22. carry out low voltage able joints as per standard procedures, safely and effectively		3	1	2
	PC23. perform post-installation procedures for ensuring clean and safe environment in the work and surrounding area		2	0	2
	PC24. check Oil level and ensure leakages are attended to and arrested		2	0	2
	PC25. check Oil BDV and acidity at regular intervals as per schedule and standard procedure		3	1	2
	PC26. checking for sludge, dust, dirt ,moisture ion in oil and address it effectively in a timely fashion		2	0	2
	PC27. clean bushings regularly and inspect for any cracks		2	0	2
	PC28. check, note and rectify dust & dirt deposition, salt or chemical deposition, cement or acid fumes depositions		2	0	2
	PC29. check tap position and gap of arching horn and tighten connection as requirement to address any issues		3	1	2
	PC30. check neutral grounding and ensure it is maintained as per standard		3	1	2
	PC31. periodically check for any loose connections of the terminations of HV & LV side		2	0	2

	PC32. examine the breather through color of silica gel , if pink heat it or replace if necessary		2	0	2
	PC33. ensure facility is locked and warning signs are displayed effectively		2	0	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	0	3
	PC35. leave the work area in a safe and tidy condition on completion of the substation construction and maintenance activities		2	0	2
	PC36. refer unresolved job related problems to appropriate personnel for support		2	0	2
	PC37. monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem		2	0	2
		Total	**100**	**23**	**77**
PSS/ N 0110: Supervise work and crew in power distribution installation and maintenance work	PC1. work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines	**100**	6	2	4
	PC2. work following laid down procedures and instructions		4	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		5	2	3
	PC4. ensure work area is clean and safe from hazards before and after the job is completed		4	1	3
	PC5. ensure self and all team members have completed necessary training in electrical safety and other mandatory trainings		4	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		5	2	3

	PC7. requisition necessary equipment, tools, materials or PPE gear from the store for carrying out work as per job and safety requirements		6	2	4
	PC8. explain to team members requirements of the job or task plan and clarify for shared understanding		5	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		6	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		6	2	4
	PC11. ensure time on the job is utilised properly to achieve optimum productivity and efficiency		5	2	3
	PC12. assist team members to develop their own knowledge, skills and abilities by providing timely and accurate guidance, feedback and responsibilities		5	1	4
	PC13. address low performance through training, informal and formal guidance, support from other supervisors, management and HR department		6	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		6	2	4
	PC15. address grievances and complaints promptly and as per organizational guidelines		6	2	4
	PC16. report incident and accidents as per organisational procedure in a timely fashion with necessary detail		6	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		5	1	4

	PC18. refer unresolved job related problems to appropriate personnel for support		5	1	4
	PC19. monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem		5	1	4
		Total	**100**	**30**	**70**
PSS/ N 2001 (Use basic health and safety practices at the workplace)	PC1. use protective clothing/equipment for specific tasks and work conditions	**100**	3	0	3
	PC2. state the name and location of people responsible for health and safety in the workplace		2	0	2
	PC3. state the names and location of documents that refer to health and safety in the workplace		2	0	2
	PC4. identify job-site hazardous work and state possible causes of risk or accident in the workplace		3	1	2
	PC5. follow electrical safe working procedures such as Tag out/Lock out, PTW (Permit To Work),		3	1	2
	PC6. follow warning signs (danger, out of service, etc.) while working with electrical systems		3	1	2
	PC7. use standard safe working practices when working at heights, confined areas and trenches		3	1	2
	PC8. test any electrical equipment and system using insulated testing devices before touching them		3	1	2
	PC9. ensure positive isolation of electrical equipment & system as per given standards		3	1	2
	PC10. recognize any abnormalities in electrical equipment or system installed alarm annunciation and/or noticing parameters from gauge/ indicator installed		3	1	2
	PC11. carry out safe working practices while dealing with hazards to ensure the safety of self and others		3	1	2
	PC12. state methods of accident prevention in the work environment of the job role		2	0	2

	PC13. state location of general health and safety equipment in the workplace		2	0	2
	PC14. inspect for faults, set up and safely use of scaffolds and elevated platforms and ladders		2	0	2
	PC15. lift, carry and transport heavy objects & tools safely using correct procedures from storage to workplace and vice versa		3	1	2
	PC16. inspect power plant and its equipment routinely for any signs of oil, water and/or steam leakage		3	0	3
	PC17. store flammable materials and machine lubricating oil safely and correctly		2	0	2
	PC18. check that the emission and pollution control devices are working properly in line with environmental policy standards		5	2	3
	PC19. apply good housekeeping practices at all times		3	1	2
	PC20. identify common hazard signs displayed in various areas		2	0	2
	PC21. retrieve and/or point out documents that refer to health and safety in the workplace		2	0	2
	PC22. inform relevant authorities about any abnormal situation/behavior of any equipment/system promptly		3	0	3
	PC23. use the various appropriate fire extinguishers on different types of fires correctly		4	1	3
	PC25. demonstrate good housekeeping in order to prevent fire hazards		3	1	2
	PC26. demonstrate the correct use of a fire extinguisher		3	1	2
	PC27. demonstrate how to free a person from electrocution		3	1	2
	PC28. administer appropriate first aid to victims where required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc.		3	0	3
	PC29. demonstrate basic techniques of bandaging		3	1	2

	PC30. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments		3	1	2
	PC31. perform and organize loss minimization or rescue activity during an accident in real or simulated environments		3	1	2
	PC32. administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases		3	1	2
	PC33. demonstrate the artificial respiration and the CPR Process		3	1	2
	PC34. participate in emergency procedures		3	1	2
	PC35. complete a written accident/incident report or dictate a report to another person, and send report to person responsible		3	1	2
	PC36. demonstrate correct method to move injured people and others during an emergency		3	1	2
		Total	**100**	**24**	**76**
CSC/ N 1336 (Work effectively with others)	PC1. accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	**100**	10	3	7
	PC2. accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt		10	3	7
	PC3. give information to others clearly, at a pace and in a manner that helps them to understand		10	3	7
	PC4. display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible		10	3	7
	PC5. consult with and assist others to maximize effectiveness and efficiency in carrying out tasks		10	3	7
	PC6. display appropriate communication etiquette while working		10	3	7

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