

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR POWER SECTOR

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- Attendant Sub-Station (66/11, 33/11 KV)- Power Distribution

SECTOR: Power

SUB-SECTOR:Distribution

OCCUPATION:Technician

REFERENCE ID: PSS/Q3002

ALIGNED TO: NCO-2004/NIL

Attendant Sub-Station (66/11, 33/11 KV)- Power Distribution works in shifts and remains present 24X7 to monitor and record power flow of each feeder emanate from station on an hourly basis, looks after all technical activity viz operation of switchgears, arrange shut down, PTW etc. for repair of various equipment installed in the switchyard of the station for healthy state.

Brief Job Description: Substation attendant maintains all indoor and outdoor equipment in good operating condition. He prepares daily log sheet on an hourly basis to note down all electrical parameters, energy readings, etc. He maintains general diary for all activities being carried out for repair and maintenance, and issues PTW to give the shutdown to O&M staff and similarly restores the supply after getting clearance from them. He also coordinates with system control, load dispatch center for load flow management and conducts periodical shedding if required.

Personal Attributes: Attendant Sub-Station (66/11, 33/11 KV)- Power Distribution should have proficiency in switchgears operation and knowledge of indoor and outdoor equipment of substation as well as data logging. The candidate should have the ability to communicate, read, write, work late hours, pacify and guide the team

Job Details

Qualifications Pack Code	PSS/ Q 3002		
Job Role	Attendant Sub-Station (66/11, 33/11 KV)- Power Distribution		
Credits(NSQF)	TBD	Version number	1.0
Sector	Power	Drafted on	04/11/2015
Sub-sector	Distribution	Last reviewed on	19/07/2016
Occupation	Technician	Next review date	19/07/2018
NSQC Clearance Date	Not Applicable		

Job Role	Attendant Sub-Station (66/11, 33/11 KV)- Power Distribution Also known as Switch Board Operator (SBO)
Role Description	Attendant Sub-Station (66/11, 33/11 KV) - Power Distribution inspects and operates all equipment's installed in the substation. He prepares a daily log sheet on an hourly basis to record all electrical parameters, energy readings, temperature, weather conditions etc. He also arranges PTW and shut down for maintenance of lines and sub station
NSQF level	3
Minimum Educational Qualifications	ITI in Electrician trade
Maximum Educational Qualifications	Not Applicable
Training (Suggested but not mandatory)	Not Applicable
Minimum Job Entry Age	20 Years
Experience	1 year as apprentice
Applicable National Occupational Standards (NOS)	Compulsory: <ol style="list-style-type: none"> PSS/N3003 (Inspection, testing and operation of substation equipment) PSS/N3004 (Recording line parameters, power flow and load management) PSS/N2001 (Use basic health and safety practices as the workplace) PSS/ N1336 (Work effectively with others) Optional: Not Applicable
Performance Criteria	As described in the relevant OS units

Definitions

Keywords /Terms	Description
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.
Vertical	Vertical may exist within a sub-sector representing different domain areas or the client industries served by the industry.
Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
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 OS.
Sub-functions	Sub-functions are sub-activities essential achieving the objectives of the function.
Job role	Job role defines unique set of functions that together form a unique employment opportunity in an organization.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve consistently while carrying out a function at the workplace. Occupational Standards as set of competencies is applicable both in Indian and overreaching global contexts.
Performance Criteria	Performance Criteria defined for a task are statements that together specify the standard of performance while carrying out the task.
National Occupational Standards (NOS)	NOS are Occupational Standards which apply uniquely in Indian context.
Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack.
Qualifications Pack(QP)	Qualifications Pack comprises set of OS, together with the educational, training and other criteria that are required to perform a job role satisfactorily at workplace. A Qualifications Pack is assigned a unique qualification pack code for clear identification.
Knowledge and Understanding	Knowledge and Understanding are statements which together as a set specify the technical, generic, professional and organization specific knowledge that an individual needs to possess in order to perform and meet the required standards consistently.
Organizational Context	Organizational Context includes the way the organization is structured and how it operates. It includes elements of operational knowledge contents defined in relation to functioning of an organization that a skilled professional need to possess specific to its precise areas of responsibility.
Technical Knowledge	Technical Knowledge is the specific domain knowledge needed to accomplish the task in combination with other competencies. It is usually coined with specifically designated roles and responsibilities.

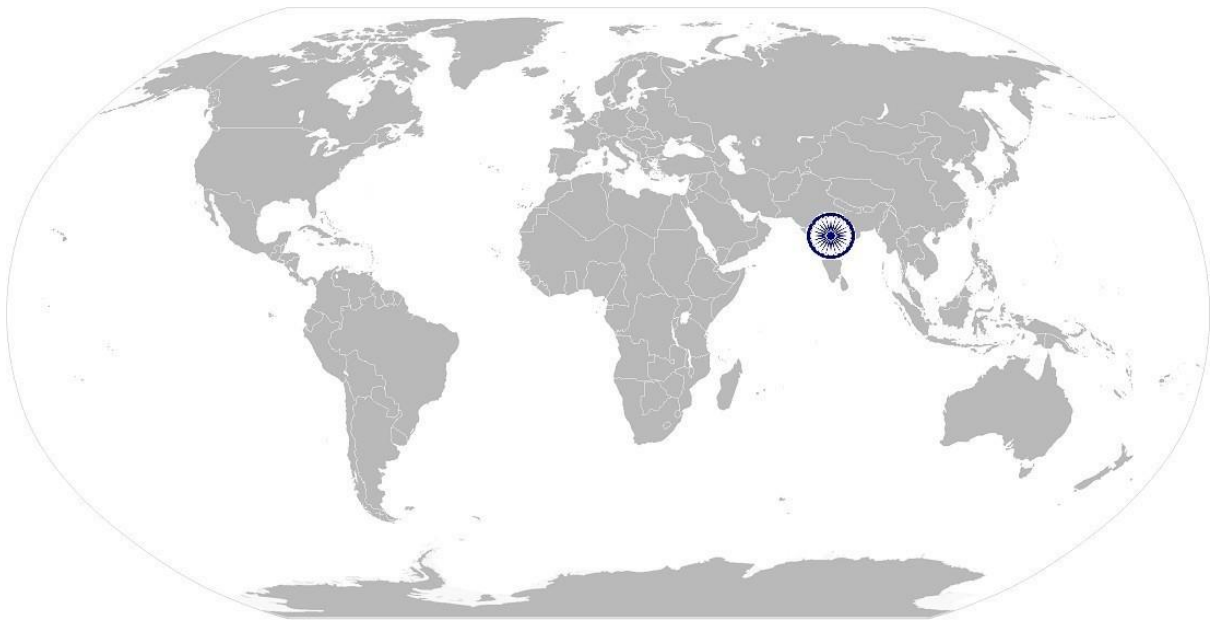
Acronyms

Core Skills/Generic Skills	Core Skills or Generic Skills as set are group of skills. It is key to working in today's world. These skills are typically needed in any work environment. In the context of the OS, these include mainly communication related skills that are applicable to most job roles.
Keywords /Terms	Description
A	Ampere
AAC	All Aluminium Conductor
ABC	Aerial Bunched Conductor
AC	Alternating Current
ACB	Air Circuit Breaker
ACSR	Aluminium Conductor Steel Reinforced (Steel Cored Aluminium Conductor)
AT&C	Aggregate Technical & Commercial Losses
BDV	Breakdown Voltage
BIS	Bureau of Indian Standards
CBIP	Central Board of Irrigation and Power
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
CGRF	Consumer Grievance Redressal Forum
CPRI	Central Power Research Institute
CT	Current Transformer
DC	Direct Current
DISCOM	Distribution Company
DP	Di-Pole (Double Pole)
DT	Distribution Transformer
E/F	Earth Fault
ELCB	Earth Leakage Circuit Breaker
FRLS	Fire Resistant Low Smoke Cable
GI	Galvanised Iron
HSV	Highest System Voltage
HT	High Tension
HTME	High Tension Metering Equipment
HV	High Voltage
HVDS	High Voltage Distribution System
Hz	Hertz (Unit of Frequency)
I	Current
IE Act	Indian Electricity Act 2003
IS	Indian Standard

KV	Kilo Volt
KVA	Kilo Volt Ampere
KVAh	Kilo Volt Ampere hour
KVAR	Kilo Volt Ampere Reactive
KW	Kilo Watt
KWh	Kilo Watt hour
LA	Lightening Arrestor
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LT	Low Tension
LV	Low Voltage
MCB	Miniature Circuit Breaker
MD	Maximum Demand
MVA	Mega Volt Ampere
MW	Mega Watt
MWh	Mega Watt hour
N	Neutral
OCB	Oil Circuit Breaker
O/C	Over Current
O/H	Over Head
O&M	Operation & Maintenance
OPGW	Optical Ground Wire
P	Phase / Power
PCC	Prestressed Cement Concrete Pole
PF	Power Factor
PILCA	Paper Insulated Lead Covered Armored Cable
PSU	Public Sector Undertaking
PT	Potential Transformer
PV	Photo-Voltaic
PVC	Poly Vinyl Chloride cable
REC	Rural Electrification Corporation
RMU	Ring Main Unit
SCADA	Supervisory Control and Data Acquisition
SEB	State Electricity Board
SERC	State Electricity Regulatory Commission
SMS	Short Message Service
T&D	Transmission and Distribution

T/F	Transformer
TTB	Test Terminal Block
ULF	Ultra Low Frequency
UV	Ultra Violet
V	Voltage
VF	Voltage Factor
VLF	Very Low Frequency
VT	Voltage Transformer
XLPE	Cross Linked Poly Ethylene Cable

National Occupational Standard



Overview

The substation attendant looks after entire equipment's installed in the substation for healthy network operation. He is proficient in operation of all types of switch gears installed in the station. Responsible for healthy state of station and for conducting load shedding in co-ordination with system control and load dispatch centre. He is to remain available 24X7 hours in the substation and must always be alert and in healthy state.

PSS/N3003

Inspection and operation of substation equipment

National Occupational Standard	Unit Code	PSS/N3003
	Unit Title (Task)	Inspection and operation of substation equipment
	Description	The substation attendant inspects all the equipment installed in the switchyard as well as in the control room of a substation. Proficient in operation of all types of switchgears. Capable to handle load management and continuity of supply. This also covers daily, monthly, quarterly and annual inspection and maintenance including Preventive Maintenance as well as Break down Maintenance to superiors as per approved inspection schedule of equipment. Also to conduct load shedding.
	Scope	This unit/task covers the following: <ul style="list-style-type: none"> inspection and operation of outdoor and indoor equipment of substation.
	Performance Criteria(PC) w.r.t. the Scope	
	Element	Performance Criteria
	Inspection and operation of outdoor and indoor equipment of substation	<p>The user/individual on the job needs to:</p> <p>PC1. prepare the details for inspection and maintenance of substation equipment as per approved schedule</p> <p>PC2. raise and maintain job cards of each equipment</p> <p>PC3. arrange planning of shutdown for planned maintenance, also cover preventive maintenance and break down maintenance of all equipment</p> <p>PC4. maintain records of test results, repairs, and maintenance of all equipment</p> <p>PC5. perform routine operation and report troubleshooting of all substation equipment's</p> <p>PC6. identify faulty equipment and safe isolation without disturbing of other equipment</p> <p>PC7. ensure safety chart, first aid box, switchgear handles, fire extinguishers, pipes and discharge rod are placed at proper location</p> <p>PC8. ensure CEA, SERC regulations of performance standards are being complied with</p> <p>PC9. ensure all types of circuit breakers, switchgears and isolators are properly functioning</p> <p>PC10. ensure proper functioning of power transformer functions including operation of tap changers</p> <p>PC11. check CT's PT's and CVT's are operational and properly functioning</p> <p>PC12. be aware of significance of earth connection</p> <p>PC13. perform activities related to Capacitor bank functions</p> <p>PC14. perform activities related to lightening arrestors (LA) functions</p> <p>PC15. check hot spots by thermo-vision camera</p> <p>PC16. check switchyard illumination and replacement of fused bulbs</p> <p>PC17. check status of relays O/C & E/F their settings, flag etc.</p> <p>PC18. ensure status of HRC fuse (PT and CT) is of correct rating</p> <p>PC19. check battery and battery charger and reporting to superiors if not functioning properly</p>

PSS/N3003

Inspection and operation of substation equipment

Knowledge and Understanding (K)	
A. Organizational Context	<p>The user/individual on the job needs to know and understand:</p> <ul style="list-style-type: none"> KA1. relevant standards, working procedures and policies of organization KA2. CEA Regulations, SERC performance standard regulations and IE Act 2003 KA3. main purpose and object of organization KA4. department structure KA5. reporting structure KA6. conditions and terms of own employment KA7. own job role and responsibilities KA8. sources of information KA9. knowledge of work area KA10. working safely KA11. cleanness of working area KA12. interpersonal relations
B. Technical Knowledge	<p>The individual on the job needs to know and understand:</p> <ul style="list-style-type: none"> KB1. power system: How power flows, Generation, Transmission and distribution number of bays, number of incoming and outgoing feeders, load management through single or double bus, substation network, ring system, back feed etc. KB2. line components towers, poles, single circuit, double circuit, overhead, underground conductors and cables KB3. substation equipment, current rating of feeder, load management in coordination with system control department, LDC KB4. gantry structure, structure lay out, types of porcelain insulators, overhead conductors, clamps used in station KB5. operating principle of Power Transformer, its main component, auxiliary components and accessories. Difference between Power and Distribution T/R KB6. operating principle of switch gears (CB), how it operates under fault current, benefits of operating medium of OCB, MOCB, ACB, SF₆, Vacuum circuit breakers KB7. instrument transformers like CTs, PTs, and CVTs KB8. control panel and it's in built measuring instruments, accessories like heater, lamp, door switch, HRC fuse, relays, auxiliary, ICT's etc. KB9. battery panel, trickle charging, battery status, electrolyte level, specific gravity of electrolyte, safety measures in repair and maintenance, ventilation etc. KB10. tripping mechanism short circuit, earth fault, over current, low frequency etc. and resetting of relays

PSS/N3003

Inspection and operation of substation equipment

	KB11. lightening arrestors (LA) functioning KB12. types of earthing used in grid station, its significance, why earth connection with each equipment's KB13. shunt capacitor bank, its function to improve pf, switching operation KB14. complete tools, tackles and safety gadgets required in grid station KB15. approved maintenance procedures and regulation KB16. how to take safety precautions as per safety manual KB17. how to keep records of all equipment like name plate, ratings, pre- commission test report and manuals KB18. the importance of reporting problems to junior engineer, officer incharge
Skills (S)	
A. Core Skills/ Generic Skills	Writing Skills
	The user/ individual on the job needs to know and understand how to: SA1. communicate effectively in writing as per requirement of site work SA2. write the information communicated by the engineer or in-charge of work SA3. write properly about the technical problems and other conditions of site SA4. note down of observations, critical points and location of site related work
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA5. read and understand written sentences and paragraphs in work related documents SA6. write and use metric system for all measurements SA7. interpret the process required for performing of work SA8. read, interpret and understand the rules and method stated in the documents SA9. read equipment manuals and understand the equipment operation and process requirement
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA10. discuss task lists, schedules and activities with the Engineer SA11. effectively communicate with the team/group members SA12. listen the information given by the junior engineer SA13. communicate clearly with the team and other staff
B. Professional Skills	Decision Making
	The user/individual on the job needs to know and understand how to: SB1. make judgments and decisions appropriately SB2. identify complex problems and review related information to develop and evaluate SB3. follow organization rule based decision making process SB4. take decision with systematic course of actions and/or response
	Plan and Organize
	The user/individual on the job needs to know and understand: SB5. planning and organization of tasks to meet deadlines

PSS/N3003

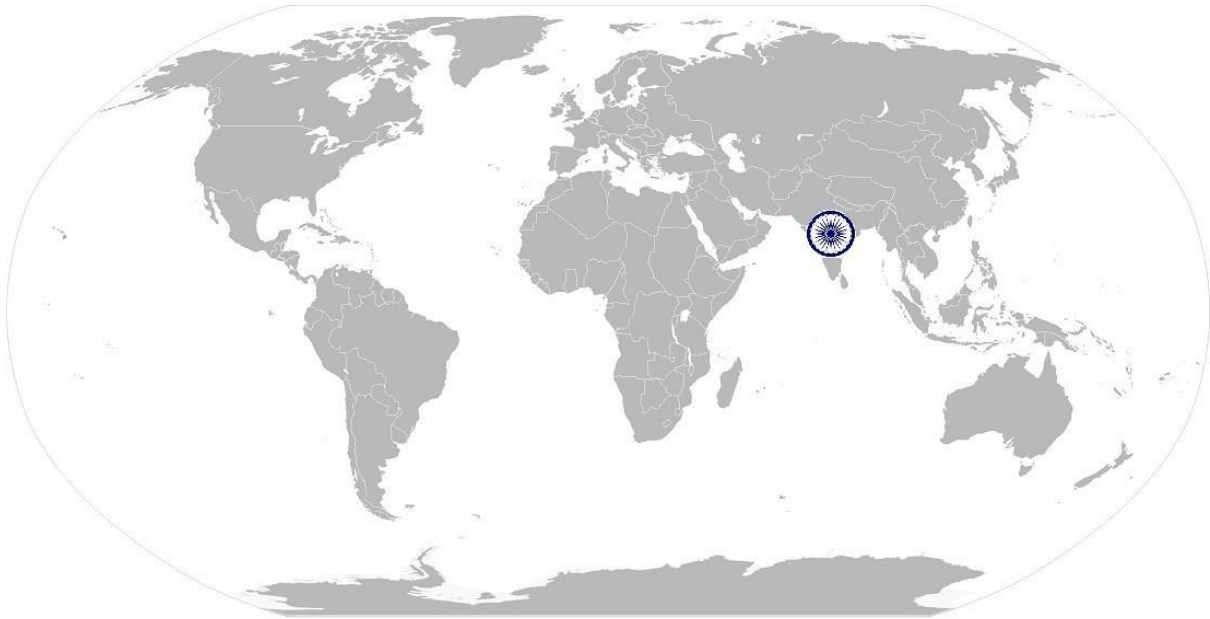
Inspection and operation of substation equipment

	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB6. build customer relationships and use customer centric approach
	Problem Solving
	The user/individual on the job needs to know and understand how to : SB7. take help from the junior engineer to solve the problems SB8. monitor, solve problems and take corrective action with individuals and organizations SB9. analyse problems and changes in conditions, operations, and the environment to solve problems
	Analytical thinking
	The user/individual on the job needs to know and understand how to: SB10. analyze the problem seen in the equipment and take help from JE
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB11. critically evaluate operation parameters in relation to grid station features intended

NOS Version Control

NOS Code	PSS/N3003		
Credits (NSQF)	TBD	Version number	1.0
Industry	Power	Drafted on	04/11/2015
Industry Sub-sector	Distribution	Last reviewed on	19/07/2016
Occupation	Technician	Next review date	19/07/2018

National Occupational Standard



Overview

This unit is about substation activities for healthy network operation. He prepares a daily log sheet on an hourly basis to record all electrical parameters of load flow, energy readings, temperature, weather conditions etc. He conducts load shedding in co-ordination with system control and load dispatch centre. He maintains general diary to keeps the records of all activities carried out in the testing, repair, maintenance and operational work in daily routine.

PSS/N 3004

Recording of line parameters, power flow and load management of substation

National Occupational Standard	Unit Code	PSS/N3004
	Unit Title (Task)	Recording of line parameters, power flow and load management of substation
	Description	.He records meter reading on log sheet on hourly basis and maintains general diary for all activities carried out in the substation. Conducts load shedding in consultation with load dispatch centre or network control department of utility by switching 'OFF' the particular feeder. Gives the shutdown of particular feeder or equipment to O&M officials for repair and maintenance
	Scope	This unit/task covers the following: <ul style="list-style-type: none"> hourly reading of various line parameters including current, voltage , energy for all incoming and outgoing feeders
	Performance Criteria(PC) w.r.t. the Scope	
	Element	Performance Criteria
	Hourly reading of various line parameters including current, voltage , energy for all incoming and outgoing feeders	<p>The user/individual on the job needs to:</p> <p>PC1. record all line parameters and energy reading of each feeder on hourly basis in log sheet</p> <p>PC2. arrange planned shutdown to O&M staff, issue PTW and isolate the equipment from power supply to take up for test, repair and maintenance</p> <p>PC3. arrange load management by changes over, back feed the incoming and outgoing supply of substation, carry out load shedding</p> <p>PC4. establish hot line contact with Power system control, load dispatch centre for approval on emergency operation, power outage, power failure due to fault and related activities</p> <p>PC5. prepare the detail for inspection and maintenance of substation equipment as per approved schedule</p> <p>PC6. arrange planning of shutdown for planned maintenance, also cover Preventive Maintenance and Break down Maintenance of all equipment</p> <p>PC7. maintain records of test results, repairs, and maintenance of all equipment</p> <p>PC8. perform routine operation and report troubleshooting of all substation equipment's</p> <p>PC9. identify faulty equipment and safe isolation without disturbing of other equipment</p>
Knowledge and Understanding (K)		

PSS/N 3004

Recording of line parameters, power flow and load management of substation

A. Organizational Context	<p>The user/individual on the job needs to know and understand:</p> <ul style="list-style-type: none"> KA1. relevant standards, working procedures and policies of organization KA2. CEA Regulations, SERC performance standard regulations and IE Act 2003 KA3. main purpose and object of organization KA4. department structure KA5. reporting structure KA6. conditions and terms of own employment KA7. own job role and responsibilities KA8. sources of information KA9. knowledge of work area KA10. working safely KA11. cleanness of working area KA12. interpersonal relations
B. Technical Knowledge	<p>The individual on the job needs to know and understand:</p> <ul style="list-style-type: none"> KB1. power system: How power flows, Generation, Transmission and distribution number of bays, number of incoming and outgoing feeders, load management through single or double bus, substation network, ring system, back feed etc. KB2. line components towers, poles, single circuit, double circuit, overhead, underground conductors and cables KB3. substation equipment, current rating of feeder, load management in coordination with system control department, LDC KB4. gantry structure, structure lay out, types of porcelain insulators, overhead conductors, clamps used in station KB5. operating principle of Power Transformer, its main component, auxiliary components and accessories. Difference between Power and Distribution T/R KB6. operating principle of switch gears (CB), how it operates under fault current, benefits of operating medium of OCB, MOCB, ACB, SF₆, Vacuum circuit breakers KB7. instrument transformers like CT's, PT's, and CVT's KB8. control panel and it's in built measuring instruments, accessories like heater, lamp, door switch, HRC fuse, relays, auxiliary, ICT's etc. KB9. battery panel, trickle charging, battery status, electrolyte level, specific gravity of electrolyte, safety measures in repair and maintenance, ventilation etc. KB10. lightening arrestors (LA) functioning KB11. types of earthing used in grid station, its significance, why earth connection with each equipment's KB12. shunt capacitor bank, its function to improve pf, switching operation, repair, replacement and maintenance KB13. complete tools, tackles and safety gadgets required in grid station KB14. approved maintenance procedures and regulation KB15. standard procedure to avail planned shutdown, issue PTW and earth & isolate the equipment from power supply, placing 'Do not operate' tags on handles, control panels, back up supply clearance and power restoration process

PSS/N 3004

Recording of line parameters, power flow and load management of substation

	KB16. how to take safety precautions as per safety manual KB17. how to keep records of all equipment like name plate, pre- commission test report and manuals KB18. the importance of reporting problem to junior engineer, officer incharge
Skills (S)	
A. Core Skills/ Generic Skills	Writing Skills
	The user/ individual on the job needs to know and understand how to: SA1. communicate effectively in writing as per requirement of site work SA2. write the information communicated by the engineer or in-charge of work SA3. write properly about the technical problems and other conditions of site SA4. note down of observations, critical points and location of site related work
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA5. read and understand written sentences and paragraphs in work related documents SA6. write and use metric system for all measurements SA7. interpret the process required for performing of work SA8. read, interpret and understand the rules and method stated in the documents SA9. read equipment manuals and understand the equipment operation and process requirement
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA10. discuss task lists, schedules and activities with the Engineer SA11. effectively communicate with the team/group members SA12. listen the information given by the junior engineer SA13. communicate clearly with the team and other staff
B. Professional Skills	Decision Making
	The user/individual on the job needs to know and understand how to: SB1. make judgments and decisions appropriately SB2. identify complex problems and reviewing related information to develop and evaluate SB3. follow organization rule based decision making process SB4. take decisions with systematic course of actions and/or response
	Plan and Organize
	The user/individual on the job needs to know and understand: SB5. planning and organization of tasks to meet deadlines
	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB6. build customer relationships and use customer centric approach
	Problem Solving

PSS/N 3004

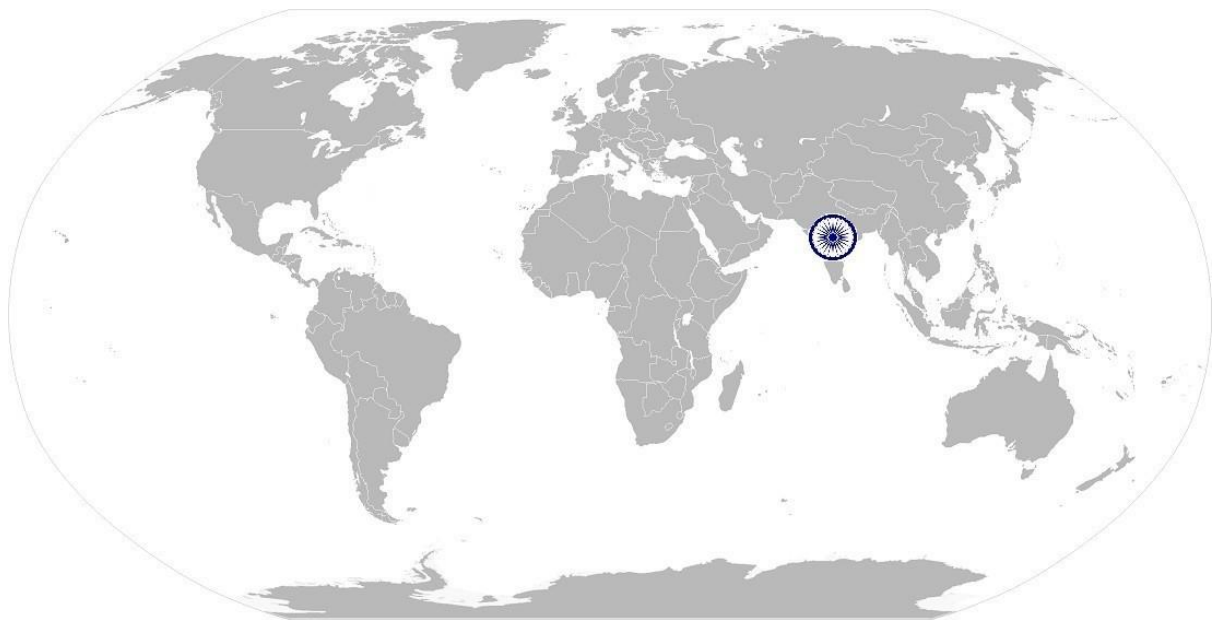
Recording of line parameters, power flow and load management of substation

	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB7. identify problems and review related information to develop and evaluate options and implement solutions</p> <p>SB8. take help from the junior engineer to solve the problems</p> <p>SB9. monitor solving problems and take corrective action with individuals and organizations</p> <p>SB10. analyse problems and changes in conditions, operations, and the environment to solve problems</p>
	Analytical thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB11. analyze the problem seen in the equipment</p> <p>SB12. collect the information and technical data and take help from JE</p>
	Critical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB13. critically evaluate operation parameters in relation to grid station features intended</p>

NOS Version Control

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Industry Sub-sector	Distribution	Last reviewed on	19/07/2016
Occupation	Technician	Next review date	19/07/2018

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.

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

National Occupational Standard

Unit Code	PSS/N2001
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. It covers responsibilities towards self, others, assets and the environment. .
Scope	This unit/task covers the following: <ul style="list-style-type: none"> • 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	<p>The user/individual on the job needs to:</p> <p>PC1. use protective clothing/equipment for specific tasks and work conditions.</p> <p>PC2. state the name and location of people responsible for health and safety in the workplace</p> <p>PC3. state the names and location of documents that refer to health and safety in the workplace</p> <p>PC4. identify job-site hazardous work and state possible causes of risk or accident in the workplace</p> <p>PC5. follow electrical safe working procedures such as Tag out/Lock out and display PTW (Permit To Work),</p> <p>PC6. follow warning signs (danger, out of service, etc.) while working with electrical systems</p> <p>PC7. use standard safe working practices when working at heights, confined areas and trenches</p> <p>PC8. test any electrical equipment and system using insulated testing devices before touching them</p> <p>PC9. ensure positive isolation of electrical equipment & system as per given standards</p> <p>PC10. recognize any abnormalities in electrical equipment or system installed alarm annunciation and/or noticing parameters from gauge/ indicator installed</p> <p>PC11. carry out safe working practices while dealing with hazards to ensure the safety of self and others</p> <p>PC12. state methods of accident prevention in the work environment of the job role</p> <p>PC13. state location of general health and safety equipment in the workplace</p> <p>PC14. inspect for faults, set up and safely use of scaffolds and elevated platforms and ladder</p> <p>PC15. lift, carry and transport heavy objects & tools safely using correct procedures from storage to workplace and vice versa</p> <p>PC16. inspect Grid station and its equipment routinely for any signs of oil and water leakage</p> <p>PC17. store flammable materials and machine lubricating oil safely and correctly</p> <p>PC18. check that the emission and pollution control devices are working properly in</p>

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

	<p>line with environmental policy standards</p> <p>PC19. apply good housekeeping practices at all times</p> <p>PC20. identify common hazard signs displayed in various areas</p> <p>PC21. retrieve and/or point out documents that refer to health and safety in the workplace</p> <p>PC22. inform relevant authorities about any abnormal situation/behavior of any equipment/system promptly</p>
Fire safety	<p>The user/individual on the job needs to:</p> <p>PC23. use the various appropriate fire extinguishers on different types of fires correctly</p> <p>PC24. distinguish types of fire</p> <p>PC25. demonstrate rescue techniques applied during fire hazard</p> <p>PC26. demonstrate good housekeeping in order to prevent fire hazards</p> <p>PC27. demonstrate the correct use of a fire extinguisher</p>
Emergencies, rescue and first-aid procedures	<p>The user/individual on the job needs to:</p> <p>PC28. demonstrate how to free a person from electrocution</p> <p>PC29. administer appropriate first aid to victims where required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc.</p> <p>PC30. demonstrate basic techniques of bandaging</p> <p>PC31. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments</p> <p>PC32. perform and organize loss minimization or rescue activity during an accident in real or simulated environments</p> <p>PC33. 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</p> <p>PC34. demonstrate the artificial respiration and the CPR Process</p> <p>PC35. participate in emergency procedures Emergency procedures: raising alarm, safe/efficient, evacuation, correct means of escape, correct assembly point, roll call, correct return to work</p> <p>PC36. complete a written accident/incident report or dictate a report to another person, and send report to person responsible</p> <p>PC37. demonstrate correct method to move injured people and others during an emergency</p>
Knowledge and Understanding (K)	
A. Organizational Context	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. names (and job titles if applicable), and where to find, all the people responsible for health and safety in a workplace.</p> <p>KA2. names and location of documents that refer to health and safety in the workplace.</p>

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

B. Technical Knowledge	<p>The individual on the job needs to know and understand:</p> <p>KB1. meaning of “hazards” and “risks”</p> <p>KB2. health and safety hazards commonly present in the work environment and related precautions</p> <p>KB3. possible causes of risk, hazard or accident in the workplace and why risk and/or accidents are possible</p> <p>KB4. possible causes of risk and accident</p> <p>KB5. methods of accident prevention</p> <p>KB6. safe working practices when working with tools and machines</p> <p>KB7. safe working practices while working at various hazardous sites</p> <p>KB8. where to find all the general health and safety equipment in the workplace</p> <p>KB9. various dangers associated with the use of electrical equipment</p> <p>KB10. positive isolation of electrical equipment and system</p> <p>KB11. safe handling and disposal of hazardous power plant wastes</p> <p>KB12. use of emission and pollution control devices and measures taken to control pollution</p> <p>KB13. various safety procedures and equipment used to work at heights, trenches and confined places</p> <p>KB14. safe working practices specific to working with electrical equipment & system e.g. lock out/ tag out, PTW, etc.</p> <p>KB15. preventative and remedial actions to be taken in the case of exposure to toxic materials</p> <p>KB16. importance of using protective clothing/equipment and other insulated work gear while handling electrical system and equipment</p> <p>KB17. precautionary activities taken to prevent fire accident</p> <p>KB18. various causes of fire</p> <p>KB19. techniques of using the different fire extinguishers</p> <p>KB20. different methods of extinguishing fire</p> <p>KB21. different materials used for extinguishing fire</p> <p>KB22. emergency rescue techniques applied during a fire hazard</p> <p>KB23. various types of safety signs and what they mean</p> <p>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</p>
Skills (S)	
A. Core Skills/ Generic Skills	Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. note the information communicated by the officer incharge.</p> <p>SA2. note down observations (if any) related to the operation/maintenance.</p>
	Reading Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA3. read and interpret the process required for different types of manuals for maintenance.</p> <p>SA4. read and interpret the flowchart of all parts of an assembly.</p> <p>SA5. read manuals and documents to understand the product-details & how they</p>

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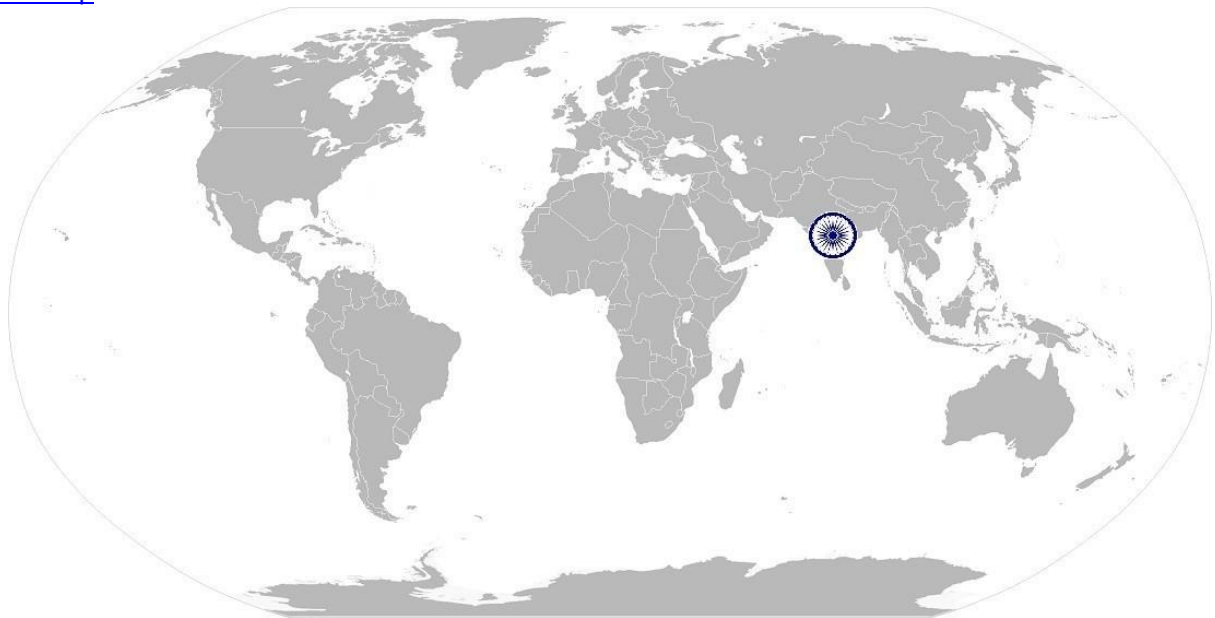
	can be used.
	Oral Communication (Listening and Speaking skills)
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA6. discuss task lists, schedules and activities with the colleague/supervisor.</p> <p>SA7. effectively communicate with the team members.</p> <p>SA8. attentively listen and comprehend the information given by the colleague/supervisor/contractor.</p> <p>SA9. communicate clearly with the colleague on the issues faced during query/fault.</p>
B. Professional Skills	Decision Making
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. follow colleague/contractor rule-based decision making process.</p> <p>SB2. take decisions with systematic course of actions and/or response.</p>
	Plan and Organize
	<p>The user/individual on the job needs to know and understand:</p> <p>SB3. planning and organization of tasks to meet deadlines.</p>
	Customer Centricity
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB4. build customer relationships and use customer centric approach.</p>
	Problem Solving
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB5. seek and comprehend operation related inputs for clarification</p> <p>SB6. find ways of modifying difficult operating stages to make it operation friendly</p>
	Analytical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB7. work systematically and logically to resolve the issues and identify causation and anticipate unexpected results.</p> <p>SB8. quick approach and solution towards faults repairing.</p>
	Critical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB9. critically evaluate operation parameters in relation to system normality</p> <p>SB10. develop a holistic and comprehensive profile of grid station on segregated discrete process stages of blank forming processes</p>

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

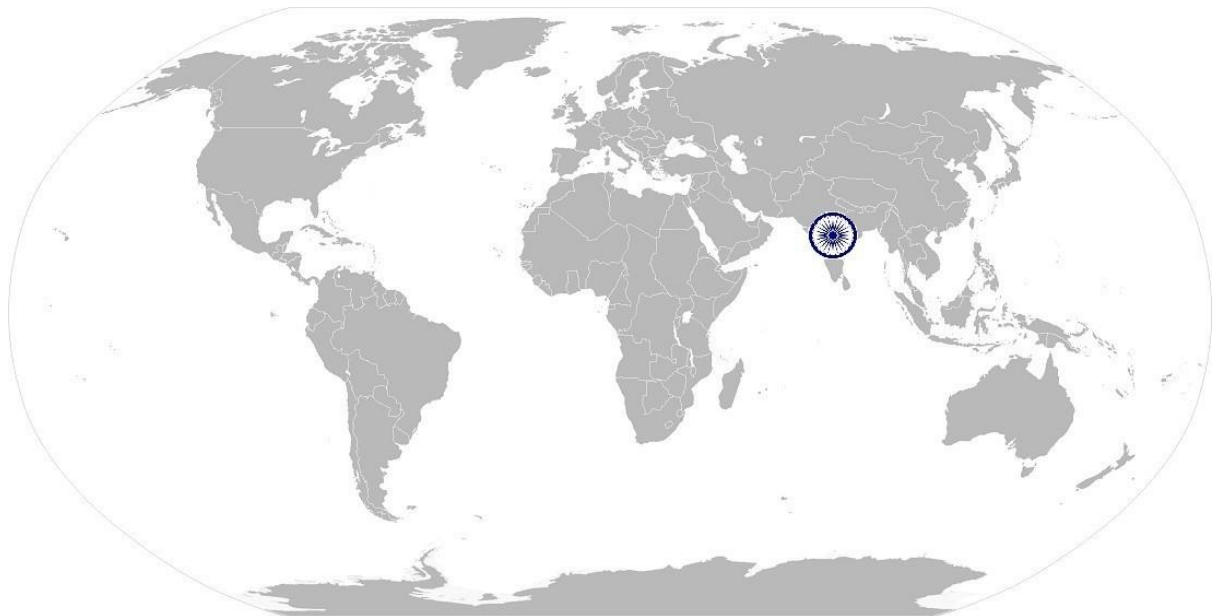
NOS Version Control

NOS Code	PSS/N2001		
Credits (NSQF)	TBD	Version number	1.0
Industry	Power	Drafted on	04/06/2016
Industry Sub-sector	Generation, Transmission & Distribution	Last reviewed on	19/07/2016
Occupation	Technician	Next review date	19/07/2018

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National Occupational Standard



Overview

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

PSS/N1336

Work effectively with others

National Occupational Standard

Unit Code	PSS/N1336
Unit Title (Task)	Work effectively with others
Description	<p>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.</p> <p>These cover areas such as communication etiquette, discipline, listening, handling conflict and grievances.</p>
Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> working with others
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Working with others	<p>The user/individual on the job should be able to:</p> <p>PC1. accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required</p> <p>PC2. accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt</p> <p>PC3. give information to others clearly, at a pace and in a manner that helps them to understand</p> <p>PC4. display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible</p> <p>PC5. consult with and assist others to maximize effectiveness and efficiency in carrying out tasks</p> <p>PC6. display appropriate communication etiquette while working</p> <p>PC7. display active listening skills while interacting with others at work</p> <p>PC8. use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism</p> <p>PC9. demonstrate responsible and disciplined behavior at the workplace</p> <p>PC10. escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict</p>
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. legislation, standards, policies, and procedures followed in the organisation relevant to own employment and performance conditions</p> <p>KA2. reporting structure, inter-dependent functions, lines and procedures in the work area</p> <p>KA3. relevant people and their responsibilities within the work area</p> <p>KA4. escalation matrix and procedures for reporting work and employment related issues</p>

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Work effectively with others

B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <ul style="list-style-type: none"> 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. how to express and address grievances appropriately and effectively KB17. importance and ways of managing interpersonal conflict effectively
Skills (S) (Optional)	
A. Core Skills/ Generic Skills	Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SA1. note the information communicated by the officer incharge. SA2. note down observations (if any) related to the operation/maintenance.
	Reading Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SA3. read and interpret the process required for different types of manuals SA4. read and interpret the flowchart of all parts of an assembly. SA5. read manuals and documents to understand the product-details & how they can be used.
	Oral Communication (Listening and Speaking skills)
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SA6. discuss task lists, schedules and activities with the colleague/supervisor. SA7. effectively communicate with the team members. SA8. attentively listen and comprehend the information given by the colleague/supervisor/contractor. SA9. communicate clearly with the colleague on the issues faced during query/fault.
B. Professional Skills	Decision Making
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SB11. follow colleague/contractor rule-based decision making process.

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Work effectively with others

	SB12. take decisions with systematic course of actions and/or response.
	Plan and Organize
	The user/individual on the job needs to know and understand: SB13. planning and organization of tasks to meet deadlines.
	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB14. build customer relationships and use customer centric approach.
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB15. seek and comprehend operation related inputs for clarification find ways of modifying difficult operating stages to make it operation friendly
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB16. work systematically and logically to resolve the issues and identify causation and anticipate unexpected results. Quick approach and solution towards faults repairing.
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB17. critically evaluate operation parameters in relation to system normality develop a holistic and comprehensive profile of grid station on segregated discrete process stages of blank forming processes

NOS Version Control

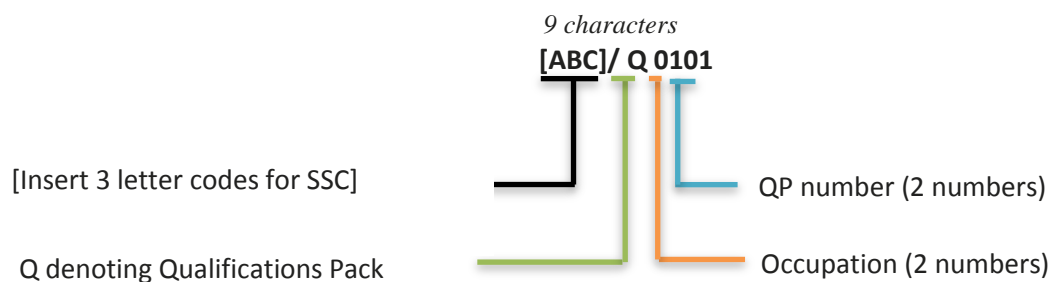
NOS Code	PSS/N1336		
Credits (NSQF)	TBD	Version number	1.0
Industry	Power	Drafted on	04/06/2016
Industry Sub-sector	Generation, Transmission & Distribution	Last reviewed on	19/07/2016
Occupation	Technician	Next review date	19/07/2018

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Annexure

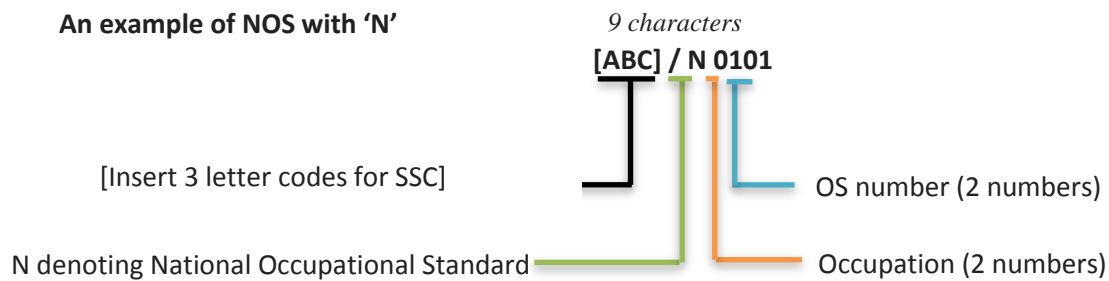
Nomenclature for QP and NOS

Qualifications Pack



Occupational Standard

An example of NOS with 'N'



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

Sub-sector	Range of Occupation numbers
[Insert Name of Sub-sector1, Font: Calibri (Body), size 11, Bold]	[Insert range]
[Insert Name of Sub-sector2, Font: Calibri (Body), size 11, Bold]	[Insert range]
[Insert Name of Sub-sector3, Font: Calibri (Body), size 11, Bold]	[Insert range]
[Insert Name of Sub-sector4, Font: Calibri (Body), size 11, Bold]	[Insert range]
...	...

Sequence	Description	Example
Three letters	Industry name	[ABC, Font: Calibri (Body), size 11]
Slash	/	/
Next letter	Whether QP or NOS	N
Next two numbers	Occupation code	01
Next two numbers	OS number	01

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Attendant Sub-Station (66/11, 33/11 KV)- Power Distribution

Qualification Pack PSS/Q3002

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

Assessable outcomes	Assessment criteria for outcomes	Marks Allocation			
		Total Marks	Out Of	Theory	Skills Practical
1. PSS/ N 3003 Inspection, testing and operation of substation equipment	PC1. prepare the details for inspection and maintenance of substation equipment as per approved schedule	100	5	2	3
	PC2. raise and maintain job cards of each equipment		4	2	2
	PC3. arrange planning of shutdown for planned maintenance, also cover preventive maintenance and break down maintenance of all equipment		5	3	2
	PC4. maintain records of test results, repairs, and maintenance of all equipment		5	2	3
	PC5. perform routine operation and report troubleshooting of all substation equipment's		4	2	2

	PC6. identify faulty equipment and safe isolation without disturbing of other equipment		4	2	2
	PC7. ensure safety chart, first aid box, switchgear handles, fire extinguishers, pipes and discharge rod are placed at proper location		5	1	4
	PC8. ensure CEA, SERC regulations of performance standards are being complied with		5	1	4
	PC9. ensure all types of circuit breakers, switchgears and isolators are properly functioning		4	2	2
	PC10. ensure proper functioning of power transformer functions including operation of tap changers		4	1	3
	PC11. check CT's PT's and CVT's are operational and properly functioning		4	1	3
	PC12. be aware of significance of earth connection		4	1	3
	PC13. perform activities related to Capacitor bank functions		4	1	3
	PC14. perform activities related to lightening arrestors (LA) functions		4	1	3
	PC15. check hot spots by thermo-vision camera		8	2	6
	PC16. check switchyard illumination and replacement of fused bulbs		7	0	7
	PC17. check status of relays O/C & E/F their settings, flag etc.		7	0	7
	PC18. ensure status of HRC fuse (PT and CT) is of correct rating		9	4	6
	PC19. check battery and battery charger and reporting to superiors if not		6	2	5

	functioning properly				
			100	31	69
2. PSS/N 3004 Recording line parameters, power flow and load management	PC1. record all line parameters and energy reading of each feeder on hourly basis in log sheet	100	14	7	7
	PC2. arrange load management by changeover, back feed the incoming and outgoing supply of substation, carry out load shedding		14	6	8
	PC3. establish hot line contact with Power system control, load dispatch centre for approval on emergency operation, power outage, power failure due to fault and related activities		10	4	6
	PC4. prepare the detail for inspection and maintenance of substation equipment as per approved schedule		12	5	7
	PC5. arrange planned shutdown to O&M staff, issue PTW and isolate the equipment from power supply to take up for test, repair and maintenance		11	2	9
	PC6. arrange planning of shutdown for planned maintenance, also cover Preventive Maintenance and Break down Maintenance of all equipment		14	5	9
	PC7. maintain records of test results, repairs, and maintenance of all equipment		8	4	4
	PC8. perform routine operation and report troubleshooting of all substation equipment's		7	2	5
	PC9. identify faulty equipment and safe isolation without disturbing of other equipment		10	2	8
			100	37	63

3. PSS/N2001 Use basic health and safety practices with power related work	PC1.	use protective clothing/equipment for specific tasks and work conditions.	100	3	0	3
	PC1.	state the name and location of people responsible for health and safety in the workplace		2	0	2
	PC2.	state the names and location of documents that refer to health and safety in the workplace		2	0	2
	PC3.	identify job-site hazardous work and state possible causes of risk or accident in the workplace		3	1	2
	PC4.	follow electrical safe working procedures such as Tag out/Lock out and display PTW (Permit To Work),		3	1	2
	PC5.	follow warning signs (danger, out of service, etc.) while working with electrical systems		3	1	2
	PC6.	use standard safe working practices when working at heights, confined areas and trenches		3	1	2
	PC7.	test any electrical equipment and system using insulated testing devices before touching them		3	1	2
	PC8.	ensure positive isolation of electrical equipment & system as per given standards		3	1	2
	PC9.	recognize any abnormalities in electrical equipment or system installed alarm annunciation and/or noticing parameters from gauge/ indicator installed		3	1	2
	PC10.	carry out safe working practices while dealing with hazards to ensure the safety of self and others		3	1	2

	PC11. state methods of accident prevention in the work environment of the job role		2	0	2
	PC12. state location of general health and safety equipment in the workplace		2	0	2
	PC13. inspect for faults, set up and safely use of scaffolds and elevated platforms and ladder		2	0	2
	PC14. lift, carry and transport heavy objects & tools safely using correct procedures from storage to workplace and vice versa		2	1	1
	PC15. inspect Grid station and its equipment routinely for any signs of oil and water leakage		2	0	2
	PC16. store flammable materials and machine lubricating oil safely and correctly		2	0	2
	PC17. check that the emission and pollution control devices are working properly in line with environmental policy standards		3	1	2
	PC18. apply good housekeeping practices at all times		3	1	2
	PC19. identify common hazard signs displayed in various areas		2	0	2
	PC20. retrieve and/or point out documents that refer to health and safety in the workplace		2	0	2
	PC21. inform relevant authorities about any abnormal situation/behavior of any equipment/system promptly		3	0	3
	PC22. use the various appropriate fire extinguishers on different types of fires correctly		2	1	1

	PC23. distinguish types of fire		3	1	2
	PC24. demonstrate rescue techniques applied during fire hazard		3	1	2
	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 Emergency procedures: raising alarm, safe/efficient, evacuation, correct means of escape, correct assembly point, roll call, correct		3	1	2

	return to work				
	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
			100	24	76
4. PSS/N1336 Work effectively with others	PC1. accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	100	10	3	7
	PC1. accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt		10	3	7
	PC2. give information to others clearly, at a pace and in a manner that helps them to understand		10	3	7
	PC3. display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible		10	3	7
	PC4. consult with and assist others to maximize effectiveness and efficiency in carrying out tasks		10	3	7
	PC5. display appropriate communication etiquette while working		10	3	7
	PC6. display active listening skills while interacting with others at work		10	3	7
	PC7. use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism		10	3	7
	PC8. demonstrate responsible and disciplined behaviors at the workplace		10	3	7
	PC9. escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict		10	3	7
			100	30	70