



Model Curriculum

Attendant Sub-Station(66/11, 33/11 KV)- Power Distribution (also known as Switch Board Operator)

SECTOR: POWER
SUB-SECTOR: DISTRIBUTION
OCCUPATION: Technician
REF ID: PSS/Q3002, Version1.0
NSQF LEVEL: 3



  

**Certificate
COMPLIANCE TO
QUALIFICATION PACK- NATIONAL OCCUPATIONAL
STANDARDS**

is hereby issued by the
POWER SECTOR SKILL COUNCIL

for
MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/ Qualification Pack: **'Attendant Sub Station (66/11, 33/11 kV) - Power Distribution'** QP No. **PSS / Q 3002**

Date of Issuance : October 10th 2016
Valid Upto : October 9th 2018

***Valid up to the next review date of the Qualification Pack or the
**Valid up to' date mentioned above (whichever is earlier)*


Authorised Signatory
(Power Sector Skill Council)



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

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Attendant Sub-Station (66/11, 33/11 KV)-Power Distribution”, in the “Power” Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	Attendant Sub-Station (66/11, 33/11 KV)- Power Distribution		
Qualification Pack Name & Reference ID. ID	Attendant Sub-Station (66/11, 33/11 KV)- Power Distribution, PSS/Q3002		
Version No.	1.0	Version Update Date	19-07-2018
Pre-requisites to Training	ITI in Electrician Trade		
Training Outcomes	<p>After completing this programme, participants will be able to:</p> <ul style="list-style-type: none"> • Gain Familiarity with Power system:overview especially Distribution Sector. Understand basics of electricity terms used while carrying activities at substation as a role of Attendant Sub-Station(Power Distribution) • Carry out inspection timely of substation equipment: All equipment’s installed in switchyard as well as in control room of a substation • Operating all types of switchgears: Familiarity with switchgear equipment’s and their operation • Recording parameters, power flow and load management:: Recording meter readings, preparing log sheet, load shedding, give shutdown for O&M • Use basic health and safety practices for power related work:includes procedure & practices to follow to maintain healthy, safe & secure work environment covering safety of self, others, assets, and the environment • Work Effectively with others:covering basic etiquette and competencies to demonstrate in their behaviour and interaction with others at workplace 		

This course encompasses 4 out of 4 National Occupational Standards (NOS) of “Attendant sub-station (66/11, 33/11 KV)-Power Distribution” Qualification Pack issued by “Power Sector Skill Council”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	Introduction Theory Duration (hh:mm) 08:00 Practical Duration (hh:mm) 00:00 Corresponding NOS Code PSS/N3003	<ul style="list-style-type: none"> Power sector scenario including generation, transmission, and distribution scenario of India. Functions of Power Distribution Companies Elements of power systems, transmission, distribution and generations. Familiarization with distribution network from substation to end consumer 	
2	Organizational context Theory Duration (hh:mm) 04:00 Practical Duration (hh:mm) 00:00 Corresponding NOS Code	<ul style="list-style-type: none"> Organization structure and reporting levels Duties and responsibilities of Technician (Distribution transformer repair) and career progression Relevant Legislation, Electricity act 2003, CERC, SERC. 	
3	Basic Of Electricity Theory Duration (hh:mm) 12:00 Practical Duration (hh:mm) 04:00 Corresponding NOS Code PSS/N 3003	<ul style="list-style-type: none"> Basic fundamentals of Electricals Transformer Fundamentals Under-standing of schematic drawings of various equipment's used in distribution substation, Single line diagrams and layout plans 	Voltmeter, Ammeter, Wattmeter, basic components, etc.
	Inspection and Operation of Substation Equipment Theory Duration (hh:mm) 32:00 Practical Duration (hh:mm) 110:00 Corresponding NOS Code	<ul style="list-style-type: none"> Understanding various equipment's in a distribution substation including Distribution Transformer, Lightning arrester, current transformer, voltage transformer, Inspection and operation of outdoor and indoor equipment of substation Preparing details for inspection and maintenance Preparing details for inspection of Switch yard and Control room Operational on switchgear Maintain test Result, repairs, and maintenance of all equipment Perform routine operational work 	Screw driver, combination plier, phase tester, digital multimeter, clip on meter, etc.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	PSS/N 3003	<ul style="list-style-type: none"> and troubleshooting, Identify faulty equipment and safe isolation Ensure circuit breaker, CT's, PT's and CVT's operation Perform activities related to capacitor bank, lightning arrestor functions, switchyard illumination Check status for relays, fuse, battery for proper functioning Be aware of earth connection 	
5	<p>Recording of line parameters, power flow and load management</p> <p>Theory Duration (hh:mm) 27:00</p> <p>Practical Duration (hh:mm) 52:00</p> <p>Corresponding NOS Code PSS/N 3004</p>	<ul style="list-style-type: none"> Record all line parameters and energy reading Hourly reading various line parameters Arrange load management by changeover, backfeed the incoming and outgoing supply, carry out load shedding Arrangement of planned shutdown to O&M staff, issue PTW and isolate the equipment from power supply Establish hot line contact with power system control, load dispatch center Maintain records of test results, repairs and maintenance for all equipment's Perform routine operation and report troubleshooting of all substation equipment's Identify faulty equipment and safe isolation w/o disturbing of other equipments. 	
6	<p>Use Basic Health & Safety practices with power related work</p> <p>Theory Duration (hh:mm) 16:00</p> <p>Practical Duration (hh:mm) 48:00</p> <p>Corresponding NOS Code PSS/N 2001</p>	<ul style="list-style-type: none"> To understand basic health and safety practices covering CEA safety regulations 2010, issue of permit to work etc. To study uses of PPE equipment's during at work site e.g. safety helmet, belt, shoes, protective glasses, earth rod, etc. Retrieve and point out documentation that refers to safety, health policy and standard Information to relevant authority for any abnormal situation/ behaviour of any equipment's Good housekeeping practises and disposal of waste Identify common hazard 	Safety Helmet, Gloves, rubber mat, ladder, neon tester, fire extinguisher, First aid Kit, etc.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<p>Storage of flammable materials and oils safely</p> <ul style="list-style-type: none"> • Possible causes of risk or accident • Safe working practises when working with tools and machines • Electrical safe working procedures such as Tag out, Lockout, Permit to work • Recognize any abnormalities in system installed , alarms, noticing parameters • Fire safety, causes and precautionary activities. Use of appropriate fire extinguishers on different types of fires • Demonstrate rescue techniques applied during fire hazard, correct method to move injured people during emergency • Various types of safety signs and what they mean • Lift, carry and transport heavy objects, and tools, safely, using correct procedures from storage to workplace and vice versa • Administer appropriate first aid to victims , bandaging heart attack, CPR, etc. • Demonstrate how to free a person from electrocution • Respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments • Inform relevant authority about any abnormal situation • Complete written accident report or dictate a report, send report to concern person responsible 	
8	<p>Working effectively with others</p> <p>Theory Duration (hh:mm) 21:00</p> <p>Practical Duration (hh:mm) 16:00</p> <p>Corresponding NOS Code PSS/N 1336</p>	<ul style="list-style-type: none"> • Working effectively in a team. • Demonstrate good interpersonal relation, discipline behaviour, developing a positive attitude and building self-confidence. • Receiving information and instruction from supervisor and fellow workers, pass on information • Assist others to maximize effectiveness • Problem escalation • Demonstrate responsible, disciplined behavior's at workplace • Display appropriate communication 	

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		etiquette while working <ul style="list-style-type: none"> • Communication And Writing Skills and their importance • Basic Computer application 	
	Total Duration Theory Duration 120:00 Practical Duration 230:00	Unique Equipment Required: Voltmeter, Ammeter, Wattmeter, basic components, Screw driver, combination plier, phase tester, digital multimeter, clip on meter, etc. ,first aid kit, etc.	

Grand Total Course Duration: **350Hours, 0 Minutes**

(This syllabus/ curriculum has been approved by **POWER SECTOR SKILL COUNCIL**)

Trainer Prerequisites for Job role: “Attendant Sub-Station(66/11, 33/11KV)-Power Distribution” mapped to Qualification Pack: “PSSC/Q 3002, v1.0”

Sr. No.	Area	Details
1	Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “PSS/Q 3002
2	Personal Attributes	Aptitude for conducting training, and pre/ post work to ensure competent, employable candidates at the end of the training. Strong communication skills, interpersonal skills, ability to work as part of a team; a passion for quality and for developing others; well-organised and focused, eager to learn and keep oneself updated with the latest in the mentioned field.
3	Minimum Educational Qualifications	ITI Electrician(Minimum) but preferably B.Tech(Electrical),3 year Diploma Electrical Engineering,
4a	Domain Certification	Certified for Job Role: “Attendant Sub-Station(66/11, 33/11 KV)- Power Distribution” mapped to QP: “PSSC/Q 3002 v1.0”. Minimum accepted score as per PSSC guidelines- 70%
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “SSC/Q3002”. Minimum accepted score as per PSSC guidelines – 70%.
5	Experience	Engineer B.Tech. (Electrical) with at least 1-year relevant experience in power distribution either in the Power Distribution utility or with the turnkey /EPC contractors of the power distribution companies carrying out the work of erection of power distribution lines and sub stations etc. 3 years Diploma in Electrical Engineering with at least 2-3 years’ relevant experience in power distribution either in the Power Distribution utility or with the turnkey /EPC contractors of the power distribution companies carrying out the work of erection of power distribution lines and sub stations etc. ITI Electrician with at least five-year relevant experience in power distribution either in the Power Distribution utility or with the turnkey /EPC contractors of the power distribution companies carrying out the work of erection of power distribution lines and sub stations etc.



Annexure: Assessment Criteria

Assessment Criteria	
Job Role	Attendant Sub-Station(66/11,33/11 KV) Power Distribution
Qualification Pack	PSSC/Q 3002, v1.0
Sector Skill Council	Power

Sr. No.	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 centre (as per assessment criteria below) .
4	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre 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 Outcome	Assessment Criteria	Total Mark (600)	Out Of	Marks Allocation	
				Theory	Skills Practical
1. PSS/ N 3003 Inspection, testing and operation of substation equipment	PC1 Prepare the detail for inspection and maintenance of substation equipment as per approved schedule	100	5	2	3
	PC 2 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
	PC4maintain records of test results, repairs, and maintenance of all equipment		5	2	2
	PC5. perform routine operation and report trouble shooting of all substationequipments.		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, fireextinguishers, ppe's and dischargerod are placed at proper location.		5	1	4
	PC8 ensure CEA, SERCregulations of performancestandards are being compiled with		5	1	4
	PC9 ensure all types of circuit breakers, witchgears and isolators are properly functioning		4	2	2
	PC10Ensure proper functioning of powertransformer functions including operation of tap chnagers		4	1	3
	PC11 check CT's PT's andCVT's are operational and properly functioning		4	1	3
	PC12be aware of significance of earth connection.		4	1	3
	PC13. Perform activities related to Capacitor bankfunctions.		4	1	3
	PC14. apply knowledge of lightening arrestors (LA) functions.		4	1	3
	PC15. checking of 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

Assessable Outcome	Assessment Criteria	Total Mark (600)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC19 apply knowledge of battery and battery charger		6	2	5
	Total		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 change over, 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 to 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 equipments.		7	2	5
	PC9. identify faulty equipment and safe isolation without disturbing of other equipment		10	2	8
	Total		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 workconditions.	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		2	0	2

Assessable Outcome	Assessment Criteria	Total Mark (600)	Out Of	Marks Allocation	
				Theory	Skills Practical
	workplace				
	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 Parameters: temperature, pressure, flow& current		3	1	2
	PC11. carry out safe working practices while dealing with hazards to ensure the safety of self and 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 ladder Faults		2	0	2
	PC15.. lift, carry and transport heavy objects & tools safely using correct procedures from storage to workplace and vice versa		2	1	1
	PC16 inspect grid station and its equipment routinely for any signs of oil, water and/or steam leakage		2	0	2
	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		3	1	2
	PC19 apply good housekeeping practices at all times		3	1	2

Assessable Outcome	Assessment Criteria	Total Mark (600)	Out Of	Marks Allocation	
				Theory	Skills Practical
	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		2	1	1
	PC24 . distinguish types of fire		3	1	2
	PC25 demonstrate rescue techniques applied during fire hazard		3	1	2
	PC26 demonstrate good housekeeping in order to prevent fire hazards		3	1	2
	PC27 demonstrate the correct use of a fire extinguisher.		3	1	2
	PC28 demonstrate how to free a person from electrocution		3	1	2
	PC29 administer appropriate first aid to victims where required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc.		3	0	3
	PC30 demonstrate basic techniques of bandaging		3	1	2
	PC31 respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments		3	1	2
	PC32 perform and organize loss minimization or rescue activity during an accident in real or simulated environments		3	1	2
	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		3	1	2
	PC34 demonstrate the artificial respiration and the CPR process		3	1	2
	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		3	1	2
	PC36 complete a written accident/incident report or dictate a report to another person, and send report to person responsible		3	1	2
	PC 37 demonstrate correct method to		3	1	2

Assessable Outcome	Assessment Criteria	Total Mark (600)	Out Of	Marks Allocation	
				Theory	Skills Practical
	move injured people and others during an emergency				
	Total		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 context of local situations, opportunities and constraints.	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
	PC8use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism		10	3	7
	PC9demonstrate 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.		10	3	7
	PC10escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict		10	3	7
	Total		100	30	70



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