

Model Curriculum

O&M Electrical & Instrumentation Technician – Wind Power Plant

SECTOR: GREEN JOBS
SUB-SECTOR: RENEWABLE ENERGY
OCCUPATION: Operation and Management
REF ID: SGJ/Q1503, V1.0
NSQF LEVEL: 4



Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

SKILL COUNCIL FOR GREEN JOBS

for the

MODEL CURRICULUM

Complying to National Occupational Standards of Job Role/

Qualification Pack: **O&M Electrical & Instrumentation Technician – Wind Power Plant**
QP No. **'SGJ/Q1503 NSQF Level 4'**

Date of Issuance: **February 5th, 2018**

Valid up to: **September 30th, 2019**

* Valid up to the next review date of the Qualification Pack



Authorised Signatory
(Skill Council for Green Jobs)

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O&M Electrical & Instrumentation Technician – Wind Power Plant

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “O&M Electrical & Instrumentation Technician – Wind Power Plant”, in the “Green Jobs” Sector/Industry and aims at building the following key competencies amongst the learner.

Program Name	O&M Electrical & Instrumentation Technician – Wind Power Plant		
Qualification Pack Name & Reference ID.	SGJ/Q1503, v1.0		
Version No.	1.0	Version Update Date	01 st Feb 2018
Pre-requisites to Training	Class 12 th Pass, Preferably		
Training Outcomes	After completing this programme, participants will be able to: <ul style="list-style-type: none"> • Carry out operation of electrical & instrumentation systems of wind power plant • Carry out maintenance of electrical & instrumentation systems of wind power plant • Perform basic health and safety practices at project site (Ground and Height) • SGJ/N0120 Work effectively with others 		

This course encompasses 4 out of 4 National Occupational Standards (NOS) of “O&M Electrical & Instrumentation Technician – Wind Power Plant” Qualification Pack issued by “Skill Council for Green Jobs”.

S. No	Module	Key Learning Outcomes	Equipment Required
1.	Introduction to Wind Power Sector Theory Duration (hh:mm) 18:00 Practical Duration (hh:mm) 6:00 Introduction Module	<ul style="list-style-type: none"> • identify different types of Wind technology and overview of Wind power sector in India • understand the various market research reports and industrial magazines present in the market • identify the different types of wind power plant, its components and working principles • understand basics of electrical concepts like voltage, current, power, energy, etc. • explain the benefits of wind energy over conventional sources of energy • Basics concept of project development • describe the typical specifications, functioning, operating principle, maintenance requirements, warranties, and safe operating & handling procedures of different Wind power plant components like Generators issues, Blades, towers, motors, monitoring system and other components 	
2.	Carry out operation of electrical & instrumentation systems of wind power plant Theory Duration (hh:mm) 12:00 Practical Duration (hh:mm) 40:00 Corresponding NOS Code SGJ/N1505	<ul style="list-style-type: none"> • select the appropriate PPE (Personal Protective Equipment) to carry out the specific activity • identify the design drawing and specification of equipment for inspection • carry out scheduled & preventive inspections of electrical/instrumentation components & equipment • verify and record the running parameters of WTG, transformer and switchgear with design document • monitor the working efficiency of WTG and associated wind power plant equipment • identify the location the conduit, cables & other undergoing devices prior to performing maintenance work • check all the intersections & joints (termination) in the line and cable for faults like loose joint, short circuit, open circuit etc. • assist the plant engineer in undertaking breakdown maintenance, if required • arrange for tools to carry out online testing of WTG and components 	

		<ul style="list-style-type: none"> acquire required approvals and permit to work (PTW) from the concerned authority perform visual inspection of the surroundings and the electrical component and record any defects measure and record performance parameters like voltage, current, frequency parameters, WTG temperature, etc. measure and record for performance parameters of transformer like input voltage/ output voltage, frequency, phase sequence, etc. maintain log of all performance parameters of switchgear prepare report and submit to site in-charge/plant head for further action 	
3.	<p>Carry out maintenance of electrical & instrumentation systems of wind power plant</p> <p>Theory Duration (hh:mm) 12:00</p> <p>Practical Duration (hh:mm) 40:00</p> <p>Corresponding NOS Code SGJ/N1506</p>	<ul style="list-style-type: none"> select the appropriate PPE to carry out the specific activity ensure that power supply is isolated prior to carrying out work acquire required approvals and permit to work (PTW) from the concerned authority perform visual inspection of the electrical and instrumentation systems and record any defects measure and record all parameters of WTG and associated components like continuity, earthing resistance, etc. report to the supervisor in case of any deviations from standard values acquire required approvals and permit to work (PTW) from the concerned authority arrange for tools and replacement equipment from the supervisor if required carry out repair or replacement of faulty equipment's/components of WTG, transformer, switchgear etc. as per standard operating procedures conduct readiness test on post replacement of equipment 	
4.	<p>Perform basic health and safety practices at project site (Ground and Height)</p> <p>Theory Duration (hh:mm) 12:00</p> <p>Practical Duration (hh:mm) 42:00</p>	<ul style="list-style-type: none"> select the relevant protective clothing/equipment for specific tasks and work state the name and location of relevant documents and people responsible for health and safety in the at project site identify possible causes of risk at project site and their mitigation measures identify and follow warning signs on site establish safe working procedures at project site 	Site visit for practical learning

	<p>Corresponding NOS Code SGJ/N1201</p>	<ul style="list-style-type: none"> ensure safe working practices when working at heights, confined areas and trenches identify methods of accident prevention in the work environment follow safe operating procedures for lifting, carrying and transporting heavy objects & tools inspect the at project site on a regular basis for any signs of spillage ensure safe storage of flammable materials and machine lubricating oil apply good housekeeping practices at all times by removal/disposal of waste products inform relevant authorities about any abnormal situation/behavior of any equipment/system promptly exhibit the use of various appropriate fire extinguishers on different types of fires correctly demonstrate rescue techniques applied during fire hazard administer appropriate first aid to victims were required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments participate in emergency procedures: raising alarm, safe/efficient, evacuation, correct means of escape, correct assembly point, roll call, correct return to work report the accident to the relevant authority in the prescribed format 	
5	<p>Work effectively with others</p> <p>Theory Duration (hh:mm) 6:00</p> <p>Practical Duration (hh:mm) 12:00</p> <p>Corresponding NOS Code SGJ/N0120</p>	<ul style="list-style-type: none"> accurately pass on information to the authorized persons who require it and within agreed timescale and confirm its receipt assist others in performing tasks in a positive manner where required and possible consult and assist others to maximize effectiveness and efficiency in carrying out tasks display appropriate communication etiquette while working display active listening skills while interacting with others at work demonstrate responsible and disciplined behaviours at the workplace 	

		<ul style="list-style-type: none"> • escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict • identify the need for common grounds with clients, team members, etc. and negotiate in an effective manner to achieve the same • consider and respect the opinions, creativity, values, beliefs and perspectives of others • ensure collaboration and group participation to achieve common goals • promote a friendly, co-operative environment that is conducive to employee's sense of belonging • facilitate an understanding and appreciation of the differences among team members 	
	Theory Duration (hh:mm) 60:00 Practical Duration (hh:mm) 140:00		

Grand Total Course Duration: 200 Hours, 0 Minutes

(This syllabus/ curriculum has been approved by [Skill Council for Green Jobs](#))

Trainer Prerequisites for Job role: “O&M Electrical & Instrumentation Technician – Wind Power Plant” mapped to Qualification Pack: “SGJ/Q1503, 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 “SGJ/Q1503, Version 1.0”.
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 /Diploma
4a	Domain Certification	Certified for Job Role: “O&M Electrical & Instrumentation Technician – Wind Power Plant” mapped to QP: “SGJ/Q1503, Version 1.0”. Minimum accepted score as per respective as per SCGJ guidelines is 80%.
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “MEP/Q0102” or equivalent. Minimum accepted score as per SSC guidelines is 80%.
5	Experience	ITI /Diploma+ Minimum 3 years of relevant industry experience or BE/B.Tech with Minimum 2 years of relevant industry experience and The education qualification can be relaxed in case of extraordinary relevant field experience.

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role O&M Electrical & Instrumentation Technician- Wind Power Plant

Qualification Pack SGJ/Q1503

Sector Skill Council Skill Council for Green Jobs

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. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criterion.
6. To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.
7. In case of *unsuccessful completion*, the trainee may seek reassessment on the Qualification Pack.

Compulsory NOS				Marks Allocation		
Total Marks:400						
Assessment outcomes	Assessment Criteria for outcomes	Total Marks	Out Of	Theory	Skills Practical	
SGJ /N1505 Carry out operation of electrical & instrumentation system of wind power plant	PC1. select the appropriate PPE to carry out the specific activity	100	6	4	2	
	PC2. identify the design drawing and specifications of equipment for inspection		6	4	2	
	PC3. carry out scheduled & preventive inspections of electrical/instrumentation components & equipment		10	2	8	
	PC4. verify and record the running parameters of WTG, transformer and switchgear with design document		7	1	6	
	PC5. monitor the working efficiency of WTG and associated wind power plant equipment		8	2	6	
	PC6. identify the location of the conduit, cables & other undergoing devices prior to performing maintenance work		6	2	4	
	PC7. check all the intersections & joints(termination) in the		6	2	4	

	line and cable for faults like loose joint, short circuit, open circuit etc.				
	PC8. assist the plant engineer in undertaking breakdown maintenance, if required		8	3	5
	PC9. arrange for tools to carry out online testing of WTG and components		6	2	4
	PC10. acquire required approvals and permit to work (PTW) from the concerned authority		4	3	1
	PC11. perform visual inspection of the surroundings and the electrical component and record any defects		10	4	6
	PC12. measure and record performance parameters like voltage, current, frequency parameters, WTG temperature, etc.		6	4	2
	PC13. measure and record for performance parameters of transformer like input voltage/ output voltage, frequency, phase sequence, etc.		6	4	2
	PC14. maintain log of all performance parameters of switch gear		6	4	2
	PC15. prepare report and submit to site in-charge/plant head for further action		5	3	2
	TOTAL	TOTAL	100	44	56
SGJ /N1506 Perform maintenance of electrical & instrumentation systems of wind power plant	PC1. select the appropriate PPE to carry out the specific activity	100	4	1	3
	PC2. ensure that power supply is isolated prior to carrying out work		15	7	8
	PC3. acquire required approvals and permit to work (PTW) from the concerned authority		5	3	1
	PC4. perform visual inspection of the electrical and instrumentation systems and record any defects		15	6	9
	PC5. measure and record all parameters of WTG and associated components		15	6	9

	like continuity, earthing resistance, etc.				
	PC6. report to the supervisor in case of any deviations from standard values		8	3	5
	PC7. acquire required approvals and permit to work (PTW) from the concerned authority		6	3	3
	PC8. arrange for tools and replacement equipment from the supervisor if required		7	3	4
	PC9. carry out repair or replacement of faulty equipment's/components of WTG, transformer, switchgear etc. as per standard operating procedures		16	8	8
	PC10. conduct readiness test on post replacement of equipment		10	4	6
		TOTAL	100	44	56
SGJ/N1201 Perform basic health and safety practices at project site (Ground and Height)	PC1. select the relevant protective clothing/equipment for specific tasks and work	100	5	1	4
	PC2. state the name and location of relevant documents and people responsible for health and safety in the at project site		5	1	4
	PC3. identify possible causes of risk at at project site and their mitigation measures		6	2	4
	PC4. identify and follow warning signs on site		6	2	4
	PC5. establish safe working procedures at the at project site		5	2	3
	PC6. ensure safe working practices when working at heights, confined areas and trenches		6	2	4
	PC7. identify methods of accident prevention in the work environment		5	2	3
	PC8. follow safe operating procedures for lifting, carrying and transporting heavy objects & tools		5	1	4

	PC9. inspect the at project site on a regular basis for any signs of spillage		6	2	4
	PC10. ensure safe storage of flammable materials and machine lubricating oil		5	1	4
	PC11. apply good housekeeping practices at all times by removal/disposal of waste products		5	1	4
	PC12. inform relevant authorities about any abnormal situation/behavior of any equipment/system promptly		5	1	4
	PC13. exhibit the use of various appropriate fire extinguishers on different types of fires correctly		6	2	4
	PC14. demonstrate rescue techniques applied during fire hazard		6	2	4
	PC15. administer appropriate first aid to victims were required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc.		6	2	4
	PC16. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments		6	2	4
	PC17. participate in emergency procedures: raising alarm, safe/efficient, evacuation, correct means of escape, correct assembly point, roll call, correct return to work		6	2	4
	PC18. report the accident to the relevant authority in the prescribed format		6	2	4
		TOTAL	100	30	70
SGJ/N0120 Work effectively with others	PC1. accurately pass on information to the authorized persons who require it and within agreed timescale and confirm its receipt	50	4	2	2
	PC2. assist others in performing tasks in a positive manner where required and possible		4	2	2

	PC3. consult and assist others to maximize effectiveness and efficiency in carrying out tasks		4	2	2
	PC4. display appropriate communication etiquette while working		6	3	3
	PC5. display active listening skills while interacting with others at work		4	2	2
	PC6. demonstrate responsible and disciplined behaviors at the at project site		4	2	2
	PC7. escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict		3	1	2
	PC8. identify the need for common grounds with clients, team members, etc. and negotiate in an effective manner to achieve the same		3	1	2
	PC9. consider and respect the opinions, creativity, values, beliefs and perspectives of others		4	2	2
	PC10. ensure collaboration and group participation to achieve common goals		6	3	3
	PC11. promote a friendly, co-operative environment that is conducive to employee's sense of belonging		4	2	2
	PC12. facilitate an understanding and appreciation of the differences among team members		4	2	2
		TOTAL	50	24	26