

Model Curriculum

Construction Technician (Mechanical) - Wind Power Plant

SECTOR: GREEN JOBS
SUB-SECTOR: RENEWABLE ENERGY
OCCUPATION: Installation and Commissioning
REF ID: SGJ/Q1401, V1.0
NSQF LEVEL: 4

 Skill India विद्यया ऋषिः - कुशलं विद्यया	 SCGJ SKILL COUNCIL FOR GREEN JOBS	 N-S-D-C National Skill Development Corporation Transforming the skill landscape
<h2>Certificate</h2>		
<h3>CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS</h3>		
is hereby issued by the		
SKILL COUNCIL FOR GREEN JOBS		
for the		
MODEL CURRICULUM		
Complying to National Occupational Standards of Job Role/ Qualification Pack: 'Construction Technician (Mechanical) - Wind Power Plant' QP No. 'SGJ/Q14,01 NSQF Level 4'		
Date of Issuance:	February 5 th , 2018	 Authorised Signatory (Skill Council for Green Jobs)
Valid up to:	September 30 th , 2019	
* Valid up to the next review date of the Qualification Pack		

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Construction Technician (Mechanical) - Wind Power Plant

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Construction Technician (Mechanical) - Wind Power Plant”, in the “Green Jobs” Sector/Industry and aims at building the following key competencies amongst the learner.

Program Name	Construction Technician (Mechanical) - Wind Power Plant		
Qualification Pack Name & Reference ID.	SGJ/Q1401, v1.0		
Version No.	1.0	Version Update Date	01 st Feb 2018
Pre-requisites to Training	Class 12th pass, preferably		
Training Outcomes	After completing this programme, participants will be able to: <ul style="list-style-type: none">• Carry out the installation of mechanical components of wind power plant• Perform testing and commissioning of mechanical components of wind power plant• Perform basic health and safety practices at project site• Work effectively with others		

This course encompasses 4 out of 4 National Occupational Standards (NOS) of “Construction Technician (Mechanical) - Wind Power Plant” Qualification Pack issued by “Skill Council for Green Jobs”.

S. No	Module	Key Learning Outcomes	Equipment Required
1.	<p>Introduction to Wind Power Sector</p> <p>Theory Duration (hh:mm) 18:00</p> <p>Practical Duration (hh:mm) 6:00</p> <p>Introduction Module</p>	<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 • describe the typical specifications, functioning, operating principle, maintenance requirements, warranties, and safe operating & handling procedures of different Wind power plant components like Blades, towers, motors, monitoring system and other components 	
2.	<p>Carry out installation of mechanical components 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/N1401</p>	<ul style="list-style-type: none"> • select the appropriate PPE (Personal Protective Equipment) to carry out the specific activity • identify the relevant technical drawings and schematic drawing • prepare site for erection of mechanical components • assist seniors at site in materials planning and handling • conduct route survey for each WTG base point • arrange all tools, tackles, equipment and associated components • carry out the erection of the tower shells as per standard operating procedures • carry out torqueing of the joints to ensure optimum tightness • carry out the correct placement of the nacelle assembly at the top of the tower shell • carry out the proper alignment of the nacelle assembly with the centre of tower foundation • carry out fixing of nacelle assembly with the tower shell using nuts and bolts • carry out the assembly of blades with turbine hub using cranes • carry out proper alignment of blades with the turbine hub 	

		<ul style="list-style-type: none"> carry out proper fixing of the turbine hub with the blades with the nacelle assembly carry out alignment of turbine hub gearbox assembly with the turbine generator gearbox assembly install anemometer as per schematic drawing 	
3.	<p>Perform testing and commissioning of mechanical components 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/N1402</p>	<ul style="list-style-type: none"> select the appropriate PPE (Personal Protective Equipment) to carry out the specific activity assess the work area and prepare for carrying out testing and commissioning identify required approvals and permit to work (PTW) from the concerned authority arrange for the relevant tools for carrying out the testing and commissioning of WTG visually inspect each mechanical equipment carry out visual inspection of WTG to ensure absence of damage, defects or any signs of deterioration check and ensure tightness and torqueing of all joints in the wind turbine tower as per design specifications check and ensure the greasing and lubrication of all joints in the turbine hub as per design specifications check and ensure the alignment of blades with rotor shaft as per design specification check and ensure the alignment of WTG with shell foundation as per design specification carry out the greasing and lubrication of WTG gear box as per design carry out the calibration of all relevant control and monitoring equipment as per design specifications and ensure their proper functioning assist in the commissioning of WTG as per standard operating procedures record and document all readings as per relevant industry standards 	
4.	<p>Perform basic health and safety practices at power project site (Ground and Height)</p> <p>Theory Duration (hh:mm) 12:00</p> <p>Practical Duration (hh:mm)</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 project site identify possible causes of risk at project site and their mitigation measures identify and follow warning signs on site 	Site visit for practical learning

	<p>42:00</p> <p>Corresponding NOS Code SGJ/N1201</p>	<ul style="list-style-type: none"> • establish safe working procedures at the project site • 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 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 • competent, the user/ individual must be able to: • 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 	
<p>5</p>	<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 	

		<ul style="list-style-type: none"> • demonstrate responsible and disciplined behaviours at the workplace • 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: “Construction Technician (Mechanical) – Wind Power Plant” mapped to Qualification Pack: “SGJ/Q1401, 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/Q1401, 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	B.E / B.Tech
4a	Domain Certification	Certified for Job Role: “Construction Technician (Mechanical) – Wind Power Plant” mapped to QP: “SGJ/Q1401, 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	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 Construction Technician (Mechanical)- Wind Power Plant

Qualification Pack SGJ/Q1401

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				Theory	Skills Practical
Assessment outcomes	Assessment Criteria for outcomes	Total Marks	Out Of	Theory	Skills Practical
SGJ /N1401 Carry out installation of mechanical components of wind power plant	PC1. select the appropriate PPE to carry out the specific activity	100	4	1	3
	PC2. identify the relevant technical drawings and schematic drawing		5	2	3
	PC3. prepare site for erection of mechanical components		8	3	5
	PC4. assist seniors at site in materials planning and handling		7	3	4
	PC5. conduct route survey for each WTG base point		7	3	4
	PC6. arrange all tools, tackles, equipments and associated components		8	4	4
	PC7. carry out the erection of the tower shells as per standard operating procedures		7	1	6

	PC8. carry out torqueing of the joints to ensure optimum tightness		7	2	5
	PC9. carry out the correct placement of the nacelle assembly at the top of the tower shell		10	3	7
	PC10. carry out the proper alignment of the nacelle assembly with the centre of tower foundation		5	1	4
	PC11. carry out fixing of nacelle assembly with the tower shell using nuts and bolts		5	1	4
	PC12. carry out the assembly of blades with turbine hub using cranes		5	1	4
	PC13. carry out proper alignment of blades with the turbine hub		8	2	6
	PC14. carry out proper fixing of the turbine hub with the blades with the nacelle assembly		5	1	4
	PC15. carry out alignment of turbine hub gearbox assembly with the turbine generator gearbox assembly		5	2	3
	PC16. install anemometer as per schematic drawing		4	1	3
		TOTAL	100	31	69
SGJ /N1402 Perform testing and commissioning of mechanical components of wind power plant	PC1. select the appropriate PPE to carry out the specific activity	100	4	1	3
	PC2. assess the work area and prepare for carrying out testing and commissioning		7	2	5
	PC3. identify required approvals and permit to work from the concerned authority		8	3	5

	PC4. arrange for the relevant tools for carrying out the testing and commissioning of WTG		7	3	4
	PC5. visually inspect each mechanical equipment		10	5	5
	PC6. carry out visual inspection of WTG to ensure absence of damage, defects or any signs of deterioration		7	2	5
	PC7. check and ensure tightness and torquing of all joints in the wind turbine tower as per design specifications		7	2	5
	PC8. check and ensure the greasing and lubrication of all joints in the turbine hub as per design specifications		7	2	5
	PC9. check and ensure the alignment of blades with rotor shaft as per design specification		7	2	5
	PC10. check and ensure the alignment of WTG with shell foundation as per design specification		8	3	5
	PC11. carry out the greasing and lubrication of WTG gear box as per design		8	3	5
	PC12. carry out the calibration of all relevant control and monitoring equipment as per design specifications and ensure their proper functioning		10	4	6
	PC13. assist in the commissioning of WTG as per standard operating procedures		6	2	4

	PC14. record and document all readings as per relevant industry standards		4	1	3
		TOTAL	100	35	65
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 at the project site		5	1	4
	PC3. identify possible causes of risk 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 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 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 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