



Model Curriculum

QP Name: Wind Resource Assessor and Site Surveyor-Wind Power Plant

QP Code: SGJ/Q1202

QP Version: 2.0

NSQF Level: 5

Model Curriculum Version: 1.0

Skill Council for Green Jobs
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Training Parameters

Sector	Green Jobs
Sub-Sector	Renewable Energy
Occupation	Site Survey
Country	India
NSQF Level	5
Aligned to NCO/ISCO/ISIC Code	NCO-2015/2165.9900, Cartographers and Surveyors, Other
Minimum Educational Qualification & Experience	B.E./B.Tech (Electrical/ Mechanical/ Civil/ Electronics and Communication / Control & Instrumentation) Or Government recognised 3 years Diploma after class XII (Electrical/ Mechanical/ Civil/Electronics & Communication / Control & Instrumentation), with 2 years of relevant work experience
Pre-Requisite License or Training	NA
Minimum Job Entry Age	21 Years
Last Reviewed On	
Next Review Date	
NSQC Approval Date	25 th Nov 2021
Version	
Model Curriculum Creation Date	
Model Curriculum Valid Up to Date	
Model Curriculum Version	1.0
Minimum Duration of the Course	120 hours +100 hours (Optional OJT)
Maximum Duration of the Course	120 hours +100 hours (Optional OJT)

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills.

- Conduct site survey for wind power plant
- Perform basic health and safety practices at project site (Ground and Height)
- Communicate, develop interpersonal skills and develop sensitization towards gender and person with disability

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Bridge Module					
Introduction to Wind Power Sector <i>Module 1 (Bridge Module)</i>	12:00	00:00	-	-	12:00
SGJ/N1204: Conduct site survey for wind power plant NOS Version No. 2.0 NSQF Level 5					
Module 2: Conduct site survey for wind power plant	30:00	30:00		<i>50 Hours Recommended OJT/On Site Training</i>	60:00
SGJ/N1201: Perform basic health and safety practices at project site (Ground and Height) NOS Version No. 2.0 NSQF Level 4					
Module 3: Perform basic health and safety practices at project site (Ground and Height)	06:00	24:00	-	<i>50 Hours Recommended</i>	30:00



				<i>OJT/On Site Training</i>	
SGJ/N0120 – Work effectively with others NOS Version No. 4.0 NSQF Level 4					
Module 4: Effective and Efficient Working Practices	06:00	12:00	-	-	18:00
Total Duration	58:00	62:00	-	-	120:00 + 100 Hours optional OJT



Module Details

Module 1: Introduction to Wind Power Sector

Mapped to Bridge Module

Terminal Outcomes:

- Provide overview of wind energy sector in India
- Explain the working principles of wind energy power plant and identify its key components
- Explain specification, functioning, maintenance requirements, warranties and handling procedures of wind power plant components

Duration: 12:00	Duration: 00:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Identify different types of Wind technology and overview of Wind energy sector in India • Understand key insights in the sector through various market research reports and magazines. • Identify 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. • Identify various ways to optimise material, energy/electricity consumption across processes and follow specified process for waste disposal. 	
Classroom Aids:	
Whiteboard and Markers; Chart paper and sketch pens; LCD Projector and Laptop for presentations	
Tools, Equipment and Other Requirements	
PCs/Laptops; Internet with Wi-Fi (Min 2 Mbps Dedicated) ; Documents of standard operating procedures, code of conduct, checklists, schedules, tools and equipment, status report	



Module 2: Conduct site survey for wind power plant

Mapped to SGJ/N1204

Terminal Outcomes:

- Explain to collect data on local weather conditions and analyse detailed project site conditions
- Explain to prepare a survey plan of the land proposed for the site, along with a contour map
- Explain to conduct route and field survey along with assessing feasibility for power evacuation
- Explain to analyse wind resource data, verify wind potential and prepare detailed site survey report

Duration: 30:00	Duration: 30:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain how to analyse project site conditions. • Explain how to collect data on local weather conditions such as temperature range, flooding (in case of onshore), wind speed, humidity, wind direction, pressure, rainfall and assess its impact on wind energy generation. • Explain how to assess the ground water availability and quality, load bearing capacities, pH levels and seismic risk. • Identify location for Power Curve test. • Discuss to ensure installation of meteorological mast (met mast) at site. • Discuss and analyse the wind data collected from met mast for estimating wind potential. • Explain how to prepare a detailed survey plan of the land proposed for installation of wind power plant with elevations and topography with the help of software like Windographer, WASP, Wind Sim, Google Earth, Global Mapper. • Explain to calculate the exact land area of the proposed site where installation is to be commenced. • Discuss how to prepare contour map of proposed wind plant site. • Explain how to conduct field surveys and provide site ranking. 	<ul style="list-style-type: none"> • Analyse detailed site information. • Demonstrate how to analyse the daily, monthly and annual wind resource data of project site to evaluate the potential for wind energy generation. • Analyse the pre-site selection baseline data for project execution suitability. • Demonstrate how to verify the wind potential with other resources such as NREL/ATLAS. • Demonstrate how to prepare contour map of proposed wind plant site. • Demonstrate how to carry out route survey. • Demonstrate how to prepare detailed site survey report using GPS/DGPS and wind data analysis software. • Demonstrate how to assess grid availability for power evacuation including nearest substation and transmission line capacity. • Demonstrate how to ensure compliance with applicable environmental, waste management and disposal regulations.



<ul style="list-style-type: none">• Identify position of WTG, substation, transmission line, transformers, etc.• Identify accessibility of the site i.e., its connectivity to various transport mechanisms including rail, road, connecting roads etc.• Discuss how to conduct route survey.• Identify soil type and its strength.• Explain state/central law of land leasing and purchase.• Discuss how to assess grid availability for power evacuation including nearest substation and transmission line capacity.• Identify the relevant grid authority.• Discuss how to check the feasibility of point of power evacuation.• Explain how to validate collected wind data from site.	
Classroom Aids:	
Laptop, white board, marker, projector	
Tools, Equipment and Other Requirements	
Wind Sim, Google Earth, Global Mapper, Multimeter, Megger, Hydrometer, Magnetic Flux Meter, Anemometer, Tool kit Box/bag portable, Electrical Symbol and Accessories Charts	



Module 3: Perform basic health and safety practices at project site (Ground and Height)

Mapped to SGJ/N1201

Terminal Outcomes:

- Explain how to ensure safe working practices at project site
- Explain about the concerned documentation and people responsible for health and safety at project site
- Explain about the methods for accident preparation and how to inform appropriate authorities, in case of abnormal situation at project site
- Explain about implementing good housekeeping practices including appropriate waste disposal strategies as per organisational norms

Duration: 10:00	Duration: 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the importance of selecting the relevant protective clothing/equipment for specific tasks and work. • Discuss about relevant documents and people responsible for health and safety at project site. • Identify possible causes of risk at project site and their mitigation measures. • Explain how to identify and follow warning signs on site. • Discuss how to establish safe working procedures at the project site. • Discuss how to ensure safe working practices when working at heights, confined areas and trenches. • Identify methods of accident prevention in the work environment. • Discuss how to 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. • Explain how to apply good housekeeping practices at all times by removal/disposal of waste products. • Explain how to promptly inform relevant authorities about any 	<ul style="list-style-type: none"> • Demonstrate how to use appropriate Personal Protective Equipment (PPE) while performing work. • Employ appropriate techniques while handling tools and equipment to ensure safety of self and others. • Demonstrate how to properly work while sitting or lifting heavy materials as per standards ergonomic principles to avoid injury. • Perform the steps to clean and disinfect material, tools, equipment and other supplies before starting work and after completing the job. • Demonstrate how to participate in emergency and evacuation drills to be able to take necessary action in case of accidents, fires and natural calamities • Demonstrate correct techniques to move an injured person during an emergency. • Demonstrate how to use appropriate fire extinguishers for different types of fire at workplace. • Show how to provide first aid to a victim in case of exposed wounds, cuts, burns, choking, electric shock,



<p>abnormal situation/behavior of any equipment/system.</p> <ul style="list-style-type: none">• Exhibit the use of various appropriate fire extinguishers on different types of fires.• Identify rescue techniques applied during fire hazard.• Explain how to administer appropriate first aid to victims were required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc.• Discuss how to respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments.• Explain how to report the accident to the relevant authority in the prescribed format.	<p>poisoning, or any other situation such as a cardiac arrest.</p> <ul style="list-style-type: none">• Demonstrate how to dispose hazardous waste as per organisational norms.
Classroom Aids:	
Whiteboard and Markers; Chart paper and sketch pens; LCD Projector and Laptop for presentations	
Tools, Equipment and Other Requirements	
Safety tool kits (including gloves, mask, boots, safety harness etc.), first aid kit	



Module 4: Effective and Efficient Working Practices

Mapped to SGJ/N0120

Terminal Outcomes:

- Explain how to communicate effectively with others
- Discuss the importance of working in a collaborative manner
- Discuss how to respect diversity

Duration: 06:00	Duration: 12:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the legislation, standards, policies, and procedures to be followed at the workplace within one’s own scope of work. • Identify the different types of communication and the basic etiquette involving verbal and non-verbal communication. • Explain how to collect complete information and instructions from concerned authority/person. • Discuss the importance of communicating without any personal, gender, disability, caste, religion, colour, sexual orientation and culture biases. • Distinguish between different types of disabilities with their respective consideration and limitations. • Elaborate how to assist others in their tasks using a positive attitude to maximize effectiveness and efficiency at work. • Describe the communication etiquette to be followed at workplace. • Explain the importance of listening actively while interacting with others at work. • Outline basic characteristics that define responsible and disciplined behaviour at the workplace. • Discuss the need to attain common grounds with clients, team members, and other working personnel to enable smooth efficient workflow while considering and 	<ul style="list-style-type: none"> • Demonstrate how to communicate verbal, non-verbal and written information timely, accurately and clearly using an inclusive language that is gender, disability and culturally sensitive. • Show how to interact using appropriate behaviour and gestures/body language, taking gender and disability into consideration to depict equal treatment for all clients, colleagues and co-workers. • Outline various methods to escalate and report grievances and issues to concerned authority as per organizational procedure to resolve them and avoid conflict. • Demonstrate how to collaborate with others and participate in group activities and tasks.



<p>respecting the opinions, creativity, values, beliefs and perspectives of others.</p> <ul style="list-style-type: none">• Elaborate the need of ensuring a friendly, co-operative environment that is conducive to employees' sense of belonging at workplace while understanding and appreciating the differences among team members.	
Classroom Aids	
LCD Projector and Laptop for presentations	
Tools, Equipment and Other Requirements	
Short-answer and fill-in-the blank, rubrics and quizzes, charts	



Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
B.E/B. Tech		2		0		NA
M.E/M. Tech		1				

Trainer Certification	
Domain Certification	Platform Certification
Job Role: “Wind Resource Assessor and Site Surveyor-Wind Power Plant Level 5” “SGJ/Q1202” v1.0, Minimum accepted score is 70%	Job Role: “Trainer”, “MEP/Q2601” v1.0, Minimum accepted score is 80%



Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
B.E/B. Tech		3		0		NA
M.E/M. Tech		2				

Assessor Certification	
Domain Certification	Platform Certification
Job Role: ““Wind Resource Assessor and Site Surveyor-Wind Power Plant Level 5” “SGJ/Q1202” v1.0, Minimum accepted score is 70%	Job Role: “Assessor”, “MEP/Q2701” v1.0, Minimum accepted score is 80%



Assessment Strategy

1. Assessment System Overview:

- Batches assigned to the assessment agencies for conducting the assessment on SDSM/SIP or email
- Assessment agencies send the assessment confirmation to VTP/TC looping SSC
- Assessment agency deploys the ToA certified Assessor for executing the assessment
- SSC monitors the assessment process & records

2. Testing Environment:

- Confirm that the centre is available at the same address as mentioned on SDMS or SIP
- Check the duration of the training.
- Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
- Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
- Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
- Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
- Check the availability of the Lab Equipment for the particular Job Role.

3. Assessment Quality Assurance levels / Framework:

- Question papers created by the Subject Matter Experts (SME)
- Question papers created by the SME verified by the other subject Matter Experts
- Questions are mapped with NOS and PC
- Question papers are prepared considering that level 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management
- Assessor must be ToA certified & trainer must be ToT Certified
- Assessment agency must follow the assessment guidelines to conduct the assessment

4. Types of evidence or evidence-gathering protocol:

- Time-stamped & geotagged reporting of the assessor from assessment location
- Center photographs with signboards and scheme specific branding
- Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
- Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos

5. Method of verification or validation:

- Surprise visit to the assessment location
- Random audit of the batch
- Random audit of any candidate

6. Method for assessment documentation, archiving, and access

- Hard copies of the documents are stored
- Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage



- Soft copies of the documents & photographs of the assessment are stored in the Hard Drives



References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module. A set of terminal outcomes help to achieve the training outcome.



Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
SOP	Standard Operating Procedures