

Job Ready Assessment Blueprint

Wind Turbine Maintenance Technician



Test Code: 2150 / Version: 01

General Assessment Information

Blueprint Contents

General Assessment Information	Sample Written Items
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Specific Competencies Covered in the Test	Sample Performance Job

Test Type: The Wind Turbine Maintenance Technician industry-based credential is included in NOCTI’s Job Ready assessment battery. Job Ready assessments measure technical skills at the occupational level and include items which gauge factual and theoretical knowledge. Job Ready assessments typically offer both a written and performance component and can be used at the secondary and post-secondary levels. Job Ready assessments can be delivered in an online or paper/pencil format.

Revision Team: The assessment content is based on input from secondary, post-secondary, and business/industry representatives from Canada and also the states of California, Indiana, Oklahoma, and Pennsylvania.



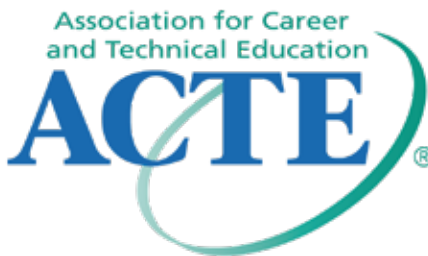
47.9999- Mechanic and Repair Technologies/Technicians, Other



Career Cluster 1- Agriculture, Food, and Natural Resources



49-9081.00- Wind Turbine Service Technicians



The Association for Career and Technical Education (ACTE), the leading professional organization for career and technical educators, commends all students who participate in career and technical education programs and choose to validate their educational attainment through rigorous technical assessments. In taking this assessment you demonstrate to your school, your parents and guardians, your future employers and yourself that you understand the concepts and knowledge needed to succeed in the workplace. Good Luck!



In the lower division baccalaureate/associate degree category, 3 semester hours in Wind Turbine Maintenance Technician

Written Assessment

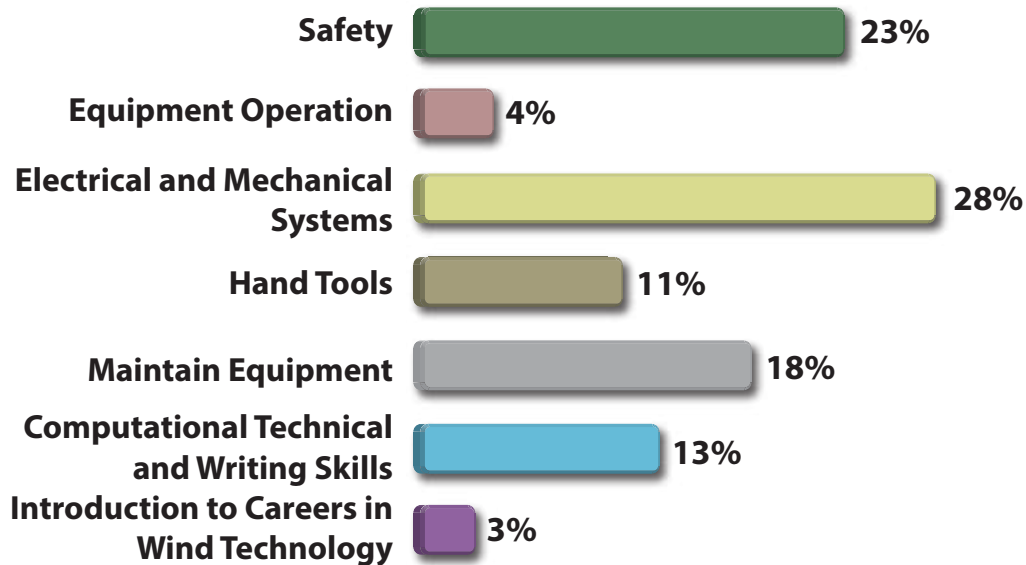
NOCTI written assessments consist of questions to measure an individual's factual theoretical knowledge.

Administration Time: 3 hours

Number of Questions: 164

Number of Sessions: This assessment may be administered in one, two, or three sessions.

Areas Covered



Specific Standards and Competencies Included in this Assessment

Safety

- Follow OSHA safety procedures for tower rescue for specific types of towers (tower rescue, fall arrest, personal protective equipment and rigging)
- NFPA 70-e for workplace electrical safety (arc flash)
- Identify safety hazards at a wind park (mechanical safety, static electricity, where NOT to work)
- Identify weather hazards including wind, lightning, ice, rain, etc.
- Know when to wear appropriate personal protective safety equipment (climbing gear, hard hat, gloves, safety glasses, steel-toed shoes, etc.)
- Properly use hand and power tools
- Properly handle, store, monitor and dispose of hazardous materials and substances
- Explain use of lock-out/tag-out practices and devices used by wind farm technicians

Equipment Operation

- Describe and identify parts of wind turbine site and plant
- Perform rigging and proper use of crane signals to lift equipment

Electrical and Mechanical Systems

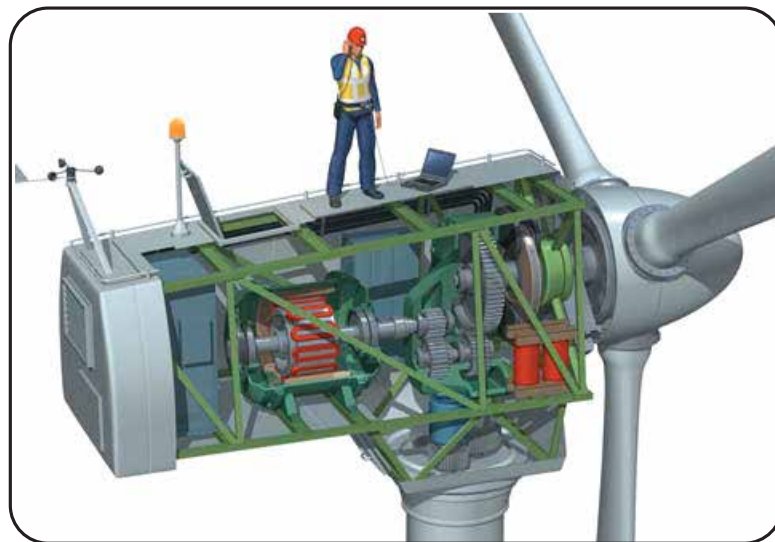
- Basic knowledge of electricity (AC/DC, Ohm's Law, 3-phase)
- Apply principles of basic fluid power and gear and hydraulic systems
- Describe the impact of heat generation on wind turbine equipment and materials
- Repair electrical (circuits) equipment
- Use computerized diagnostic to diagnose networks, resonance, phasors, capacitive and inductive, and circuit analysis
- Apply knowledge of transformers

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Specific Standards and Competencies (continued)

Electrical and Mechanical Systems continued:

- Interpret electrical and hydraulic (pitch system) schematics pertaining to different components of wind turbines
- Describe computerized control systems and power conversion units
- Use specialized tools (such as a multimeter and megohmmeter) for troubleshooting electrical circuits, motors and generators
- Repair hydraulic and mechanical equipment
- Describe basic programmable logic controllers and understand the type of equipment run by PLC
- Describe SCADA and server systems



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Specific Standards and Competencies (continued)

Hand Tools

- Apply working knowledge of all types of drills
- Identify and use nitrogen checking and filling kit
- Identify and use wrenches (including Allen, torque)
- Apply working knowledge of pneumatic tools
- Apply working knowledge of hydraulic tools
- Use basic hand tools (screwdrivers, pliers, wire cutters, wire strippers, wrenches)
- Apply hotwork principles

Maintain Equipment

- Maintain hand and power tools
- Perform torque checks on bolts using torque wrenches
- Change oil filters and grease bearings
- Describe types and specifications of fasteners and lubricants
- Describe operation of the different types of pumps
- Describe laser and mechanical alignment
- Perform equipment inspection

Computational Technical and Writing Skills

- Perform technical calculations
- Write field reports
- Describe data transfer
- Describe and apply team skills
- Obtain information from a technical manual

Introduction to Careers in Wind Technology

- Identify careers in wind technology
- Describe entry level requirements for a wind turbine technician

Sample Questions

Personal fall protection gear should be inspected

- A. once a month
- B. every 3 months
- C. every 6 months
- D. every time it is used

Hand signals when a crane is hoisting a load are made by the

- A. apprentice technician
- B. rigger
- C. crane operator
- D. engineer

In Ohm's Law, the letter I stands for

- A. amps
- B. volts
- C. ohms
- D. watts

Pneumatic tools require lubrication

- A. before each use
- B. after 40 hours of operation
- C. twice the manufacturer's recommendation
- D. according to manufacturer's instructions

Which bolt has higher tensile strength?

- A. grade 2
- B. grade 3
- C. grade 5
- D. grade 8

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Sample Questions (continued)

All hazardous waste containers must be

- A. made of clear materials
- B. recyclable plastic
- C. adequately labeled
- D. fire proof

The most widely used type of sealing device in hydraulic systems is the

- A. compression packings (V- and U-shaped)
- B. O-rings
- C. piston rings
- D. wiper rings

Generators in a wind turbine are generally cooled by

- A. friction
- B. synthetic grease
- C. water or air
- D. hydraulic oil

When storing a click-type torque wrench, where should it be set?

- A. 50 foot pounds
- B. last setting used
- C. set at zero
- D. half of last setting used

On a blueprint the scale is 3 inches to 1 foot. A 4-1/2 inch line on the blueprint should equal

- A. 1-1/2 feet
- B. 6-1/2 feet
- C. 22 feet
- D. 28 feet

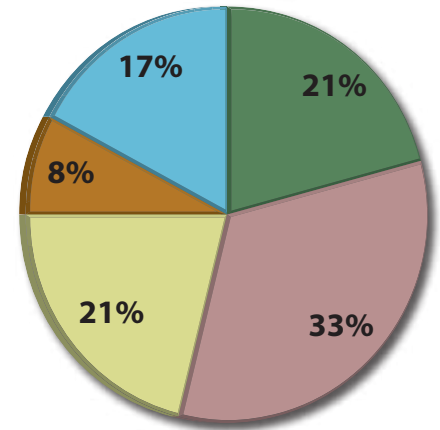
Performance Assessment

NOCTI performance assessments allow individuals to demonstrate their acquired skills by completing actual jobs using the tools, materials, machines, and equipment related to the technical area.

Administration Time: 2 hours

Number of Jobs: 5

Areas Covered:



21% Identification of Safety Equipment

Participants will identify climbing equipment, identify retired equipment, and identify retired scale reasons.

33% Demonstration of Safety Equipment and Climbing Technique

Participants will assemble and put on equipment, adjust harness, attach lanyards, demonstrate correct climb technique, correctly use anchor points and egress technique.

21% Connect a Start-Stop Switch to a Contactor and Start a Motor

Participants will wire the start-stop switch properly so that the motor works, disconnect and check the power, and then reverse the motor.

8% Identify Hand Tools and Fasteners

Participants will identify hand tools and fasteners.

17% Torque Testing

Participants will locate spec for torque, scale and use the correct torque, and check torque.

