

Electric Power and Distribution

General Assessment Information

Blueprint Contents

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

Test Type: The Electric Power and Distribution assessment is included in NOCTI's Teacher assessment battery. Teacher assessments measure an individual's technical knowledge and skills in a proctored proficiency examination format. These assessments are used in a large number of states as part of the teacher licensing and/or certification process, assessing competency in all aspects of a particular industry. NOCTI Teacher tests typically offer both a written and performance component that must be administered at a NOCTI-approved Area Test Center. Teacher assessments can be delivered in an online or paper/pencil format.

Revision Team: The assessment content is based on input from subject matter experts representing the state of Kansas.



46.0303- Lineworker



Career Cluster 15-
Science, Technology,
Engineering,
and Mathematics



49-9051.00- Electrical
Power-Line Installers
and Repairers

Written Assessment

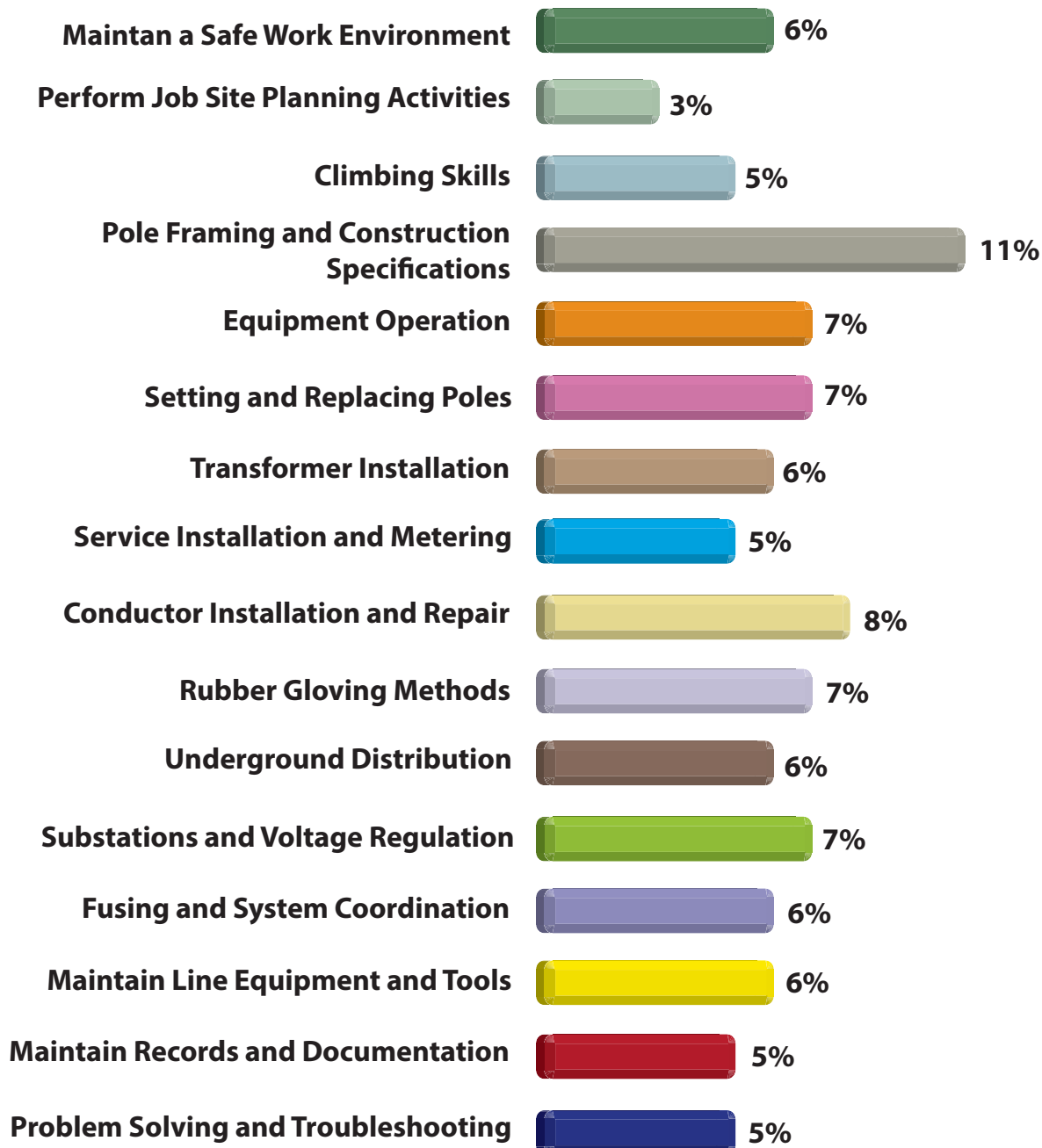
NOCTI written assessments consist of questions to measure an individual's factual theoretical knowledge.

Administration Time: 3 hours

Number of Questions: 176

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

Areas Covered



Specific Standards and Competencies Included in this Assessment

Maintain a Safe Work Environment

- Demonstrate safe work procedures and responsibilities, including complying with safety procedures and participating in safety meetings
- Perform inspection and maintenance of equipment and vehicles
- Demonstrate appropriate use of tools

Perform Job Site Planning Activities

- Determine job site requirements
- Perform job site protection activities for worker and public safety

Climbing Skills

- Demonstrate proper use and inspection of climbing gear
- Perform basic climbing skills of poles and towers, including pole-top rescue
- Demonstrate proper use and maintenance of climbing tools and equipment

Pole Framing and Construction Specifications

- Recognize, load, transport, and use pole hardware and materials
- Demonstrate pole framing on the ground
- Demonstrate installing pole and equipment grounds
- Perform installation of guy assemblies, cross arms, and insulators
- Demonstrate proper application of attaching a tying-in conductor

Equipment Operation

- Safely perform traffic control and emergency procedures
- Safely operate digger-derrick vehicle
- Demonstrate safe working operation of an aerial platform



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Specific Standards and Competencies (continued)

Setting and Replacing Poles

- Demonstrate worksite recognition and safe work practices
- Perform proper vehicle placement and grounding methods
- Perform proper rigging and setting of poles
- Utilize temporary pole supports

Transformer Installation

- Install and properly wire transformers
- Maintain and troubleshoot transformers and transformer connections
- Demonstrate proper transformer and sizing applications

Service Installation and Metering

- Perform grounding and safe work procedures
- Explain meter application and proper meter reading

Conductor Installation and Repair

- Perform splicing, stringing conductors, dead-ending, and operate hoists
- Safely tie in conductor, carry out hotline re-conductoring, and complete sag charts and tables
- Safely perform grounding practices
- Demonstrate safe work practices for conductor installation and repair

Rubber Gloving Methods

- Demonstrate proper use and care of rubber gloves and sleeves
- Demonstrate proper bucket truck operation while working on energized lines

Underground Distribution

- Identify and demonstrate knowledge of underground distribution equipment and safe practices while trenching
- Identify underground safety hazards
- Demonstrate knowledge of UD systems and installation
- Demonstrate installation of a padmount transformer, troubleshooting, and fault location

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Specific Standards and Competencies (continued)

Substations and Voltage Regulation

- Demonstrate knowledge of substation components and their functions (e.g., voltage regulators, capacitors)
- Demonstrate knowledge of substation design for various applications
- Follow safe practices when performing work in substations (including use of proper PPE)

Fusing and System Coordination

- Demonstrate knowledge of system/fault surges, and over-current/over-voltage protection
- Demonstrate knowledge of oil-circuit reclosers
- Demonstrate knowledge of system application and fusing coordination

Maintain Line Equipment and Tools

- Inspect and maintain tools (including hand tools and hot tools)
- Inspect and maintain equipment components (e.g., regulators, reclosers, capacitors, conductors)

Maintain Records and Documentation

- Maintain daily vehicle inspection records
- Maintain personal protective equipment (PPE) inspection records
- Maintain special equipment and accident reports

Problem Solving and Troubleshooting

- Analyze situations and information, consider alternate solutions
- Apply rules and principles to a process to draw conclusions



Sample Questions

After restoring power to a transformer, what should be done before closing the customer's disconnect?

- A. check the voltage
- B. call the dispatcher
- C. notify the customer
- D. check the load

Using Ohm's Law, what is the formula for calculating watts?

- A. $R \times I = \text{watts}$
- B. $I \times E = \text{watts}$
- C. $E \times P = \text{watts}$
- D. $R^2 \times I = \text{watts}$

A load-break elbow is identified by

- A. a red band
- B. a blue band
- C. a white band
- D. no band

Live line tools carried on utility vehicles should be stored

- A. upright
- B. in a dry tube and/or tool bag
- C. laying flat
- D. attached to the boom

Use a _____ grip to pull a 3/8-inch guy strand.

- A. Kellom
- B. bulldog
- C. smooth
- D. hot

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: 1 hour and 32 minutes

Number of Jobs: 7

Areas Covered:

17% Hurtman Rescue Using a Handline

Demonstrate climbing skills, use of handline, knot tying skills, position of the victim, and time to complete Job 1.

14% Transformer Connections

Demonstrate transformer connections, neatness, identification of voltages, wild leg connection, and time to complete Job 2.

8% Material and Tool Identification

Demonstrate accuracy identifying materials, time to complete Section 1 of Job 3, accuracy identifying tools, and time to complete Section 2 of Job 3.

8% Tool Identification and Use

Demonstrate accuracy of matching four groups of tools, and time to complete Job 4.

5% Knot Tying

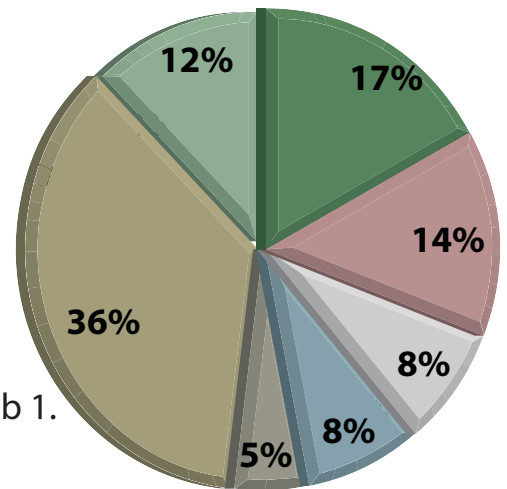
Demonstrate knot tying, and time to complete Job 5.

36% Truck Operation

Demonstrate truck grounding, use of controls, location of boom, and awareness of surroundings at three separate stations, and time to complete Job 6.

12% Meter Installation

Perform a voltage check; source side, customer's breakers, source-load side check, voltage check; load side, safety equipment safe performance, and time to complete Job 7.



Sample Job

Hurtman Rescue Using a Handline

Maximum Time: 5 minutes

Participant Activity: Participant will put on his/her climbing gear, ascend the pole, safety off and, using the handline with three (3) half hitches, will safely and gently lower the victim to the ground.