

TVPPA Lineman Apprenticeship Program

// Self-Study Modules

Unit 1
Unit 2
Unit 3
Unit 4

// Skills Labs

Pre-Apprentice Assessment
Digger Derrick Training
Fundamentals Lab 1
Construction Lab 2
Operations Lab 3
Underground Lab 4
Troubleshooting Lab 5

// Final Exam

// Self-Study Modules

<p style="text-align: center;">Unit 1</p> <p>// <u>Lesson</u></p> <ol style="list-style-type: none"> 1. Electricity A Necessity for Modern Life 2. Basic Tools and Equipment for Line Work 3. Line Work Communications 4. Working Safely 5. Ropes Knots Splices and Gear 6. Basic Electricity 7. Simple Ways of Making Electricity 8. Mathematics Review 9. More Mathematics 10. Introduction to DC Fundamental 	<p style="text-align: center;">Unit 2</p> <p>// <u>Lesson</u></p> <ol style="list-style-type: none"> 1. Electricity Generation and Transmission 2. Mathematics Formula Review 3. Trigonometry and Vectors 4. Alternating Current and Circuits w Resistance 5. Electric Current 6. Inductance in AC Circuits 7. Capacitors In AC Circuits 8. Series Circuits Resistance Inductive Reactance 9. Protective Grounding 10. The Use of Hot Line Tools
<p style="text-align: center;">Unit 3</p> <p>// <u>Lesson</u></p> <ol style="list-style-type: none"> 1. Mathematics Formula Review 2. Safety Review 3. Electricity Distribution 4. AC Parallel Circuits 5. Three Phase Systems 6. AC Instruments and Meters 7. Measuring Electricity 8. Distribution and Transmission Poles 9. Stringing and Sagging Operations 10. Transformers 	<p style="text-align: center;">Unit 4</p> <p>// <u>Lesson</u></p> <ol style="list-style-type: none"> 1. Safety Review 2. Line Conductors and Connections 3. Underground Distribution Systems 4. Maintenance of Transmission Lines 5. Transformer Connections and Special Applications 6. System Operations 7. System Protection 8. Work Procedures 9. Insulators 10. Substations and Operations

// Skills Lab

Pre-Apprentice Assessment

The TVPPA Pre-Apprentice Assessment workshop is a 6.5 day class designed to help determine whether an employee or potential employee is suited for the demanding role of lineworker apprentice. Candidates are assessed on their ability to learn the various aspects of linework, especially climbing. Individual sessions focus on the hazards of electricity, grounding and rigging.

Participants stay physically and mentally challenged for the duration of the course. In addition to classroom discussion and hands-on exercises, students are assigned homework and tested extensively.

- Work site safety inspection
- Fitting, care, and inspection of climbing tools
- Gaff sharpening
- Inspection and testing of poles and worksite hazards
- All climbing requires the use of fall protection equipment
- Knots to be taught: A bowline, clove hitch, half hitch, timber hitch, square, and bowline on a bight.
- Pole top rescue @ 10' & 40' level
- Safe and proper climbing techniques
- Proper handline use and make-up for storage
- Introduction to rigging
- Hanging cross arms @ 10' level.
- Student to provide 10' of ½ diameter rope for knot tying
- Safety, the #1 priority!
- PPE and tool inspections required daily
- All climbing tasks and exercises are demonstrated by Instructor
- Climbing will be done on 40' and 90' poles.

Managers receive documentation of student's performance over the course of the workshop with instructor comments and evaluation of the student's potential to perform linework under stress, their capacity to learn and how well they follow orders. In addition, students may take behavior and values profiles and managers will receive reports on each individual's results and how closely they align with top performing linemen.

Digger Derrick Training

The purpose of this training is to insure the safe and responsible operation of a Digger Derrick truck. With this training the intended outcome is for all those that are using these devices acquire the knowledge and skills to operate the equipment safely and productively.

// Digger-Derrick Field Exercises

Each participant shall perform the following exercises to the satisfaction of the evaluator.

- Exercise #1 Pre-operational inspection & Pre-flight Operation
- Exercise #2 Hand Signals
- Exercise #3 Load Spotting and Landing
- Exercise #4 Load Control Obstacle Course
- Exercise #5 Digger Operation
- Exercise #6 Pole Setting

// Material Handling Aerial Device Field Exercises

Each participant shall perform the following exercises to the satisfaction of the evaluator.

- Exercise #1 Pre-operational inspection & Pre-flight Operation
- Exercise #2 Inspect and Don Fall Protection Equipment
- Exercise #3 Setting up and Leveling the Unit
- Exercise #4 Maneuvering the Platform
- Exercise #5 Operating the Material Handling Jib
- Exercise #6 Bucket Rescue
- Exercise #7 Bucket Self-Rescue

Lab 1: Fundamentals

- Safety, the #1 priority!
- PPE and Tool Inspections
- Proper procedures for grounding overhead lines
- Equal-Potential Grounding, single and three phase
- Rigging
- Pole Top Rescue @ 40' level
- The importance of climbing tools being readily available
- Installing and removing aluminum and copper ties
- Pole framing
- OSHA 1910.269
- Work Area Protection
- Knot tying

Lab 2: Construction

- Safety, the #1 priority!
- Job Briefings
- Overhead construction
- Rigging
- Proper installation and removal of double cross arms @ 40' level
- Installing and removing aluminum and copper ties
- Bucket Truck Rescue methods
- Guys and anchors
- Minimum approach distances and one potential
- Overhead conductor sagging methods
- Installation and removal of protective cover up
- Equal Potential Grounding Review (if time permits)
- Pole Top Rescue @ 40' level (if time permits)

Lab 3: Operations

- Safety
- Aerial lift inspection
- Arc flash hazards
- PPE inspections
- Bucket truck rescue
- Systems operations
- Three-phase transformer theory
- Insulation/isolation techniques

Lab 4: Underground

- Safety
- Underground System Design. Radial, Loop & Dual Feeds.
- Under-ground cable design, preparation/installation
- Locating/cable fault finding for underground cable
- Makeup & installation of: terminations/connectors such as elbows, elbow lightning arrestors and terminators. Pot-heads & splices and bushing well insert
- Makeup & Installation of URD Equipment to include: Transformers, Live & Dead Front, Switching cabinets, junction boxes
- Grounding of underground cable and pad mounted transformers
- URD operations and construction

- Identification of Live & dead-front URD pad-mounted transformers
- URD troubleshooting
- URD tagging/switching
- Testing
- Installation
- Fusing

Lab 5: Troubleshooting

- Safety
- Compliance
- Personal Protective Equipment
- Hot Line Tools
- OSHA/NFPA Standards
- Testing Line Voltage
- Substation
- Breakers
- O.C.R.'s
- Fuses
- Regulators
- Capacitors
- Relays
- Single Line Drawings and Components
- Troubleshooting Techniques
- Sectionalizer
- Faults
- Line Coordination

// Final Exam

The 2.5 day exam consists of a 110 question written test and a series of physical skills lab demonstrations. The written test includes questions covering objectives in Units 1-4 of the Lineman Apprenticeship Program. The skills lab demonstrations include objectives from Labs 1-5 and will vary for each final exam. Demonstration requirements will not be revealed for each exam until students are on the field. Scoring of the overall exam is weighted 40% for the written test and 60% for the skills lab demonstrations.

- Pole top rescue
- Bucket truck safety checks and pre-flight inspection
- Bucket truck rescue
- Inspection of personal protective equipment
- Proper conductor and hardware cover up techniques
- Proper technique while moving conductor from one structure to the next
- Proper procedure and checks to by-pass an OCR
- Transformer change out
- Personal protective grounding
- Bayonet fuses change out
- Personal protective grounding on a URD system
- Troubleshooting URD and distribution systems
- Transformer Connections
- Safe Work Practice