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**Summary of Electrical Utility Construction, Training, and Safety Expertise**

As a high-voltage electric utility expert witness, I offer a unique perspective from over 35 years of expansive experience in this specialized industry. The breadth of my experience spans from working in the field as a certified Journeyman Lineman through upper-level field leadership, to upper-level operational management, and as Director of Safety and Training. I know the work, and I know the workforce. This diverse background allows me to understand the circumstances of a case and formulate expert opinions by evaluating facts from varying viewpoints. Counsel has utilized my expertise representing the company as a subject matter expert and providing depositions numerous times, in multiple states.

My expertise is high-voltage electric construction, workplace safety, safe work methods, federal and state OSHA compliance, technical instruction, and training. I have vast experience completing incident and accident investigations, root-cause-analysis, and incident reconstruction for crane tip-overs, underground utility dig-ins for gas and electric, property damage, crew-caused circuit interruptions, improper wiring claims, wire pulling mishaps, unplanned outages, electrical contact, electrical shock, burns, and electrocution.

Extensive training experience and skill create an advantage when explaining complex subjects with easy-to-understand reports and educating the trier of fact, court, and jury.

Now available for private clients, I provide expert opinion, expert testimony, accident investigation, accident recreation, root-cause-analysis, and consulting services for Plaintiffs, and Defense, locally or globally.

**Areas of Expertise**

- High Voltage Electrical Safety and Training

- Electrical Utility Safety
- Electrical Utility Construction
- Construction and Workplace Safety
- Safety Management Systems
- Electrical Contact, Arc Flash, Shock, and Electrocutation
- Electrical Grounding, Bonding, and Application (Equal Potential Zone)
- OSHA Training and Safety Compliance (Federal and State Programs)
- OSHA Citation Mitigation and Management
- OSHA ET&D Strategic Partnership Best Practices
- Training Compliance and Analysis
- Incident and Accident Investigation and Reconstruction
- Expert Witness Deposition
- TapRooT™ Root Cause Analysis
- Leadership Development
- Safety and Operational Culture Assessment and Improvement Strategy
- Safety Program and Policy Development
- Pandemic Management
- Custom Curriculum Design for the Adult Learner
- Live-Line Work Methods
- Falls From Height
- Fall Protection (Fall Prevention, Personal Fall Arrest Systems, Inspections)
- Working at Heights
- Aerial Lift Equipment
- Energy Based Job-Hazard Assessment and Management
- Pre-Job Briefing
- Human Performance Analysis
- Crane Operation, Certification, Qualification, and Critical Lift Planning
- Crane Proof and Trial Lift Testing
- Crane Tip and Electrical Contact
- Rigging
- Wire Stringing Techniques
- Lockout/Tagout
- Rough Terrain and Standard Forklift
- Trenching and Excavation
- Enclosed Space Safety
- Slips, Trips, and Falls
- Digger/Derrick Operation
- Backhoe and Excavator Operation
- Wildfire Policy Development and Prevention
- Heat Illness Prevention
- Dig-In Prevention
- Underground Electrical and Fiber Optic Cable Installation and Dig-In

- Overhead Distribution 4-34.5kV
- Overhead Sub-Transmission and Transmission 69-500kV
- Underground Distribution 4-14.4kV
- Underground Sub-Transmission and Transmission 69kV & 230kV
- Substations to 500kV
- Engaging, Inspirational, and Motivational Public Speaking Presentations
- Rescue: Pole, Tower, Enclosed Space, and Bucket Truck
- Ability to Explain Complex Subjects in a Comprehensible Manner
- Qualified Observer Commitment and Requirements

### **Training & Certifications**

- California-Nevada Joint Apprentice Training Committee | Journeyman Lineman Certificate of Completion
- COYNE Basic Life Support/First Aid Instructor Trainer Authorization (Train the Trainer Gold Card)
- EICA (Electrical Industry Certification Association) Authorized Crane and Digger/Derrick Practical Examiner
- Managing non-profit organizations | University of Riverside
- Crew Leadership Authorized Trainer | Northwest Lineman College
- One-Day Grounding and Bonding Authorized Trainer | Northwest Lineman College
- TransBanker Authorized Trainer | Northwest Lineman College
- OSHA EM385 Fall Protection for the Competent Person | University of California San Diego
- OSHA Authorized Construction Trainer | University of California San Diego | Construction Outreach 10 Hour Course
- OSHA Authorized Construction Trainer | University of California San Diego | Construction Outreach 30 Hour Leadership Course
- OSHA Strategic Partnership Authorized Trainer Electrical Transmission and Distribution Construction Outreach (AKA ET&D 10 Hour)
- OSHA Strategic Partnership Authorized Trainer *Safety Leadership In Action (SLIA)* (AKA ET&D 20-Hour Leadership)
- Quanta Energized Services Certificate of Completion *Equipotential Bonding and Grounding*
- Quanta Services Certificate of Completion | *Qualified Rigger Trainer*
- Quanta Services Certificate of Completion | *Qualified Signal Person Trainer*
- California - Nevada JATC Certificate of Completion *Line Construction Foreman Course*
- Quanta Aviation *H1 Helicopter Qualification*
- Quanta Services *Certificate of Completion Quanta Project Management Train the Champion*
- Certificate of Completion Sologic *Root Cause Analysis - Investigation Basics*

- Certificate of Completion Texas A&M Engineering *Advanced Accident Investigation*
- Caterpillar Safety Services *Presentation Skills*
- Certificate of Completion Northwestern Energy *Human Improvement Performance*
- Certificate of Training *TapRoot Incident & Root Cause Analysis Course*
- Adams-Hoefer-Holwadel, LLC “*How To Avoid The Highlight Reel*” (*Deposition and Testimony Training*)
- Quanta Services “Certificate Of Achievement” *Specialty Trainer Enrichment Course*
- Northwest Lineman College *Instructional Methods & Techniques Certification*
- University of California, San Diego *OSHA 502 - Update for Construction Industry Outreach Trainers*
- OSHA Strategic Partnership Certificate of Achievement OSHA 10-Hour ET&D Course
- OSHA Strategic Partnership Certificate of Achievement OSHA 20 Hour ET&D Supervisory Leadership Skills Outreach Train-the-Trainer Course
- SOLOGIC Certificate of Completion *Sologic Root Cause Analysis Analyst Level I: Facilitator*
- Quanta Services Certificate of Completion *Privacy and Data Protections*
- Northwest Lineman College Certificate of Completion *Energy in the Workplace: STKY and the Energy Wheel*
- Northwest Lineman College Certificate of Completion *Quanta Crew Leadership Trainer Certification*

## **Professional Experience**

### **High Voltage Safety and Training**

#### **President**

**2024 to present**

Safety, training, and expert witness services, specializing in the high-voltage electrical utility industry.

- *Leading The Field*: leadership training for field personnel
- *The Laws of EPZ*: Equal-potential zone (EPZ) grounding, bonding, and application training
- *Beyond Wheel Chocks*: High voltage hazard identification training for the safety professional
- *Perfecting Pre-Job Briefings*: Critical communication and energy-based hazard identification training for effective tailboards
- Engaging, educational, and inspirational speaker events
- OSHA citation management and mitigation consultation
- Safety management systems consulting

- Expert witness document review, opinion, reports, and testimony (Plaintiff and Defendant)
- COYNE First Aid/CPR/AED Train the Trainer (Gold Card)

**PAR Electrical Contractors, Inc (formerly PAR Electrical Contractors Inc.)  
Director of Safety and Training  
2018 - 2021**

In 2021, PAR Electrical Contractors Inc. separated into two regional companies; PAR Western Line Contractors, LLC in the western region of the United States, and PAR Electrical Contractors, LLC in the east.

Responsible for safety, training, employee health management, fire mitigation, and helicopter operations.

- I returned to the role of Director of Safety and Training when the previous Director was removed from the position.
- On January 1, 2021, PAR Electrical Contractors Inc. completed a divisive merger (separation of regions) resulting in a new business entity.
- Responsible for safety, training, employee health management, wildfire mitigation, and helicopter operations.
- Led a team of one Director of Training and four Technical Trainers; one Director of Safety and seven Safety Managers and multiple Safety and Training Advisors in seven divisions and five states. The team achieved the lowest OSHA recordable and DART rates in company history and established a regional training model adopted by Quanta Services West.
- Started a regional trainer model to provide industry-leading trainers as needed by geographical location.
- Designated a Director of Training to oversee the training model and develop trainers. This model included multiple technical trainers for power and cranes and rigging. The model proved very effective and has been adopted by Quanta Services West.
- Oversaw the standardization and updated the Cornerstone Learning Management System allowing accurate and automated training record retention and online training.
- Member of the ET&D OSHA strategic partnership, Task Team II (training curriculum development)
- Delivered Quanta Services Three and one-half day *Equi-Potential Bonding and Grounding* class
- Contributing author and committee member California Safety Manual Code of Safe Work Practices, Accident Prevention Rules (aka "The Red Book")
- Provided direction and update to the corporate Origami brand behavioral-based safety observation platform. Provide custom-designed status reporting to corporate and clients.

- Successfully adopted and implemented a managed F/R clothing program achieving 20% cost savings. This program has been adopted by Quanta Services West
- Developed operating budget and annual safety targets
- Developed, implemented, and trained all field employees in a comprehensive wildfire prevention and management program
- Oversee, direct, and approve incident and accident investigations and reports
- Created "*Frontline Focus*" to aid communication to the field. Custom-designed safety and leadership educational videos sent directly to the field leaders via text message, written communication directly to email
- Provided oversight and managed workers' compensation, client, and general public claims
- Created the successful annual "*Building Better Habits*" campaign developed to focus on a single topic such as driving issues, wildfire prevention, safe driving habits, heat illness awareness, and others for 30 consecutive days
- Successfully managed the COVID-19 pandemic without widespread infection all while maintaining a fully staffed essential employee base
- Assisted in the development of the 3-tiered safety and training advisor Career Progression Program
- Implemented and trained Quanta Services *The Capacity Model* program

**PAR Electrical Contractors, Inc.**

**Director of Training (National)**

**2014 - 2018**

Responsible for ensuring training requirements were met for up to 5,000 employees throughout the United States including Hawaii.

- Delivered the *Stepping Up To Supervision* program to approximately 1,300 field leaders
- Part of the development team for the corporate *Fall Protection Program*
- Developed and delivered the *Understanding Policy* training program to approximately 900 employees. Focus on the *Corporate Safety Management System, Fall Protection, Vehicle Use, F/R, and Corporate Safety Manual* policies
- Designed and delivered the *Safe Following Distance* program to approximately 2,400 employees
- Integrated the State of California *Sexual Harassment Prevention for Non-Supervisory Employees*, and *Sexual Harassment Prevention for Supervisors Training* throughout all divisions
- Developed and delivered *MAD+5* program to non-qualified electrical workers
- Trained hundreds of employees and multiple trainers in COYNE First Aid/CPR/AED
- Trained hundreds of linemen and multiple trainers in pole, tower, bucket truck, and enclosed space rescue



- Trained hundreds of employees in the OSHA *Electrical Construction Industry Outreach* course (AKA: ET&D 10 Hour)
- Trained hundreds of employees in the OSHA *Safety Leadership In Action* program (AKA: ET&D 20 Hour)
- Trained all field employees in the OSHA Strategic Partnership's Best Practices including *Cradle-to-Cradle Use of Rubber Gloves and Sleeves; Administrative Controls and Information Transfer; I&I Techniques for the Live-Line Tool Method on Distribution; I&I Techniques for the Rubber Glove Method, Job Briefings, Lock to Lock Use of Insulating Rubber Gloves and Sleeves; Pre-Use Inspection of Insulating Protective Equipment and Insulating Personal Protective Equipment; Qualified Observer, and Safety at Heights*
- Participating member of the Electrical Transmission and Distribution OSHA Strategic Partnership - Task Team II (Training Curriculum Development).
- Participated as subject matter expert and contributor for the quarterly refresher training program
- Developed and delivered *Active Shooter Awareness* training and drills at twelve divisional offices, two substations, the corporate office, three vendor offices, and three subsidiary offices
- Developed and delivered *Enclosed Spaces* training program
- Developed and delivered *Insulated Work Platform Safety*
- Trained hundreds of line workers in the Northwest Lineman College *One-Day Grounding and Bonding* program

**PAR Electrical Contractors Inc.  
Director of Safety and Training  
2012 - 2014**

Responsible for safety and training for four Safety Managers, one Technical Trainer, and numerous Safety Coordinators in seven divisions and six states.

- Successfully managed safety and training compliance at close-out of the San Diego Gas & Electric Sunrise Powerlink project located within the Cleveland National Forest
- Established Emergency Medical Technician Manager resulting in eliminating heat-illness cases through active health and heat management techniques
- Provided leadership over a wildfire management team of one Fire Marshall, one Fire Marshall consultant, numerous type 6 fire-engine teams, and "fire watch" personnel
- Conceptualized and developed the *Safety Pro Training Academy* for non-qualified electrical workers
- Provided safety oversight for up to 34 active helicopters and multiple landing zone locations
- Provided site-specific training
- Achieved OSHA Authorized Trainer status

- Provided OSHA Strategic Partnership ET&D training to employees and subcontractors
- Provided OSHA Strategic Partnership *Best Practices* training to employees and subcontractors
- Provided rigging training, including helicopter, to employees and subcontractors
- Provided *Signal Person* training to employees and subcontractors
- Provided *Quanta Project Management* Training to Leadership in all divisions and Hawaii
- Developed and provided Leadership Training in all continental divisions and Hawaii
- Company claims management

**Northwest Lineman College (NLC)**  
**Director of the Lineworker Certification Program**  
**2008 - 2011**

Responsible for managing the college *Power Delivery Program*, an accredited four-year lineworker apprentice program utilized by electrical utilities, cooperatives, and contractors throughout the United States. This includes budgeting, cost management, exam integrity, accurate record keeping, sales, profit and loss, and enrollment.

- Developed hands-on registered apprentice training delivered at NLC campuses in Idaho, California, and Texas
- Managed and provided on-site trainers for electrical utilities
- Provided subject matter opinion for curriculum development
- Review and edit curriculum
- Provided opinion for the development of the Ox Block rope snatch-block with integrated friction bar
- Managed IACET (International Accreditors for Continuing Education and Training) accreditation program and company audit
- Oversaw the print shop and all curriculum and printed media production
- Integrated the ability to personalize the curriculum to each enrolled student
- Created and designed a unique commemorative coin and accompanying graduate certificate holder
- Oversight of Power Delivery Program administration
- Assist clients with achieving Department of Labor-certified lineworker apprentice programs



**PAR Electrical Contractors Inc. (Vacaville, CA)**  
**Superintendent**  
**2007 - 2008**

Responsible for the operational management of the northern region of the state of California from approximately Bakersfield north. I provided overall management for work performed on Pacific Gas & Electric, The City of Ukiah, Hetch Hetchy, and the Chevron refinery properties.

- Provided oversight for several substation projects
- Provided bid estimate and managed a successful distribution project for the City of Ukiah
- Oversight of 500kV tower enhancement project
- Oversight of 115kV transmission tower raising project
- Oversight of Hetch Hetchy transmission installation and wire-stringing operations
- Provided oversight and project management for an engineer, procure, and construct 500 wood transmission pole replacement project
- Responsible for ensuring safety and training compliance was achieved
- Managed claims
- Managed labor relations

**Southern California Edison**  
**Project Manager**  
**2005 - 2007**

Initially, I was hired as the primary liaison between utility and contractors for the 5.5-billion-dollar Tehachapi Renewable Transmission Project (TRTP). Contractors were unable to meet the needs of Engineer, Procure, and Construct (EPC), my role then became Project Manager for substations.

Responsible for:

- General substation construction oversight
- Contract and bid development and review
- Facilitating job walk meetings
- Quality control
- Change-order review and approval
- Contractor management
- Inspection
- Compliance with California Public Utilities Commission (CPUC) General Orders 95 and 128
- Job-site safety
- Proving systems
- Substations to 500kV
- Lineman rodeo judge, pole-top rescue, and injured care

**City of Riverside California**  
**Public Utilities**  
**Project Manager (Contract)**  
**2003 - 2005**

Directly responsible for managing the relocation of the overhead, and underground transmission and distribution system. The relocation efforts were to accommodate the 315-million-dollar California Department of Transportation 60/91/215 freeway interchange expansion project.

- Primary liaison between the electrical department, engineering, contractors, and public
- Responsible for proposal, contract development, and review
- Project safety oversight
- Quality control and assurance
- Transmission and distribution outage coordination
- As-built documentation and accuracy
- Change order approval
- Project close-out
- Creation of request for information (RFI) documentation
- Contract development
- Bid assessment
- Technical and engineering recommendation
- Change in scope management
- Developed innovative splice-less 1750 kcmil copper cable installation process for 69kV underground circuit
- Ensure contractors comply with safety and environmental requirements
- Ensure contractors construct to California Public Utilities Commission General Orders 95 and 128 and city construction standards
- Multiple agency interactions including civil and road construction compliance
- Direct customer interaction and satisfaction

**Sturgeon Electric**  
**District Manager**  
**2001 - 2003**

Responsible for all operations within the state of California.

- Budget development and cost-tracking management
- New business development
- Claims management
- Safety and training oversight

- Project estimation review and management
- Resource and equipment management
- As a turn-around manager, regained a presence on Pacific Gas & Electric and San Diego Gas and Electric property after previously being removed
- Managed the Southern California Edison sourcing agreement including pole replacement and WCD project
- The existing company safety record and Experience Modifier Rate (EMR) precluded bidding on certain facilities; within fourteen months rates improved dramatically and the company achieved over 365 days without a lost time incident
- Managed labor relations
- The company returned a profit for the first time in many years. This was a direct result of proactive project and safety management
- Served on the IBEW/NECA Joint Safety Committee
- Promoted, established, and created continuing education requirements for Journeyman Lineman and Foreman

**PAR Electrical Contractors, Inc. Fontana California**  
**Division Manager**  
**1999 - 2001**

Responsible for operations of the largest division within the company. Service territory included all Southern California Edison property and multiple city and municipal electrical utilities in Southern California.

- Managed estimating and contracts, safety, quality control, client and labor relations
- Established operating budget, divisional goals, profit and loss, and business development
- Managed human capital, equipment resources, and real estate (yard securement)
- Began the "Construction Coordinator" group and classification within the local industry
- Initiated the design and utility services group within the company which later blossomed into two separate operating units (ULMS Utility Line Management Services Inc.), and QUES (Quanta Utility Engineering Services)
- Initiated and began the civil services (underground electrical utility construction) group within the company
- Was recognized by the company President as managing the division with the largest revenue, highest profit margin, and best safety record within the entire company

**California-Nevada J.A.T.C (Joint Apprentice Training Committee) Riverside, California**

**Lead Instructor, Director, Executive Director**

**1996 - 1999**

I began training apprentices in 1989 on a volunteer basis while still an apprentice. In 1996 I was asked to become a full-time instructor. In 1997, I was asked to become the Director and eventually, Executive Director. Throughout my career, I have continued to train apprentices at the J.A.T.C. I am currently "on call" if needed to cover for an absent instructor.

- Managed 501 (c)(3) not for profit organization
- Responsible for course scheduling, budget development and management, apprentice dispatch and guidance, progress review, discipline and advancement
- Wrote the Journeyman Lineman exam for IBEW Local 1245
- Established fall protection training when harness requirements became mandatory
- Delivered monthly apprenticeship reports at local union meetings
- Established rubber gloving rules and training requirements when standards changed to allow rubber glove techniques from 7,500 volts to 21kV
- Delivered status reports to the IBEW/NECA (International Brotherhood of Electrical Workers and National Electrical Contractors Association) training committee
- Lead *Climbing Class* instructor
- Lead *Work Methods* instructor
- Lead *Rubber Gloving Techniques* instructor
- Lead *"Hot Stick"* (live-line tools) instructor
- Lead *Rigging* instructor
- Lead *Grounding and Bonding* instructor
- Lead *Transformer Vectoring and Connection* instructor
- Replaced annual interview and indenture process with quarterly process
- Established a "climbing yard" at the Lake Elsinore training facility
- Negotiated the sale of the Lake Elsinore training facility and the purchase of the current Riverside training facility
- Drafted the layout of the training yard for wood pole climbing, underground distribution, and overhead distribution and transmission training exercises including rescue training
- Received committee approval and appropriated funds to develop the current facility in Riverside
- Established a leased training center in northern California
- Active curriculum subject matter expert for the NJATC (National Joint Apprenticeship Training Committee) curriculum development group
- Completed the NJATC National Training Institute 4-year trainer program
- Member of Northwest Lineman College Technical Advisory Committee

**IBEW (International Brotherhood of Electrical Workers)  
States of California, Nevada, and Alaska  
Apprentice, Journeyman Lineman, Foreman, and General Foreman  
1989 - 1996**

Successfully performed various duties required of each classification of the IBEW/NECA collective bargaining unit agreement

- Received position number one out of approximately four hundred apprentice applicants
- Upon graduation, achieved the "Top Gun" award for excellence in field and educational performance
- Member of IBEW safety committee
- Member of IBEW collective bargaining agreement contract negotiations committee
- IBEW Steward
- Served as Sergeant of Arms during local union meetings
- Job estimating and project management
- Worked with various contractors as an apprentice, Journeyman Lineman, Foreman, General Foreman, and Superintendent
- Warner Electric | California - Apprentice Lineman
- Pouk & Steinle Inc. | California - Apprentice Lineman, Journeyman Lineman, Foreman, General Foreman
- Henkels & McCoy | California - Apprentice Lineman
- Harrel's High Voltage | California - Apprentice Lineman
- International Line Builders | California - Apprentice Lineman, Journeyman Lineman, Foreman
- Vista Electric | Alaska - Journeyman Lineman, Foreman, Superintendent
- Overhead distribution to 4-21kV
- Underground distribution to 4-12kV
- Overhead sub-transmission to 69kV
- Underground sub-transmission to 69kV
- Overhead Transmission to 500kV
- Substation complete build and modification to 500kV
- Overhead and underground fiber-optic installation

**Education**

California – Nevada JATC and Santiago Canyon College  
Journeyman Lineman Certification  
Qualified Electrical Worker

University of California, Riverside  
Non-Profit Management Certificate

Board of Certified Safety Professionals (BCSP)  
Safety Management Specialist (SMS)  
Completion June 2024

### **Professional Organizations & Society's**

- IBEW Member 1989 to Present
- Board of Certified Safety Professionals

### **General Presentations**

- “You Don’t Know Jack” Interacting with parents and loved ones affected by suicide. IBEW Local 47 Union Stewards Conference 8 June 2024, San Diego, CA
- Department of Energy Human Performance Improvement
- OSHA Standards Employee *Silica Training*
- JJ Keller *Forklift Training*
- *Stepping Up To Supervision - Leadership Training*
- *Understanding Policy*
- *Quanta Equipotential Bonding and Grounding*
- *Northwest Lineman College Grounding and Bonding*
- *COYNE First Aid/CPR/AED*
- *IBEW/NECA Foremanship*
- *IBEW/NECA Helicopter Safety*
- *IBEW/NECA Helicopter Safety Train the Trainer*
- *M.A.D.+5 for the non-qualified electrical worker*
- *Crane and Digger/Derrick training for EICA Crane and Digger/Derrick certification*
- *Quanta Certified Rigger*
- *Quanta Certified Signal Person*
- *Insulated Platform Certification*
- *JATC Grounding and Bonding*
- *OSHA 10-Hour Construction*
- *OSHA 30-Hour Leadership*
- *OSHA ET&D 10-Hour Construction Outreach*
- *OSHA ET&D 10-Hour Construction Outreach Partnership Train-the-Trainer*
- *OSHA ET&D 20-Hour SLIA (Safety Leadership In Action)*
- *OSHA ET&D 20-Hour SLIA (Safety Leadership In Action) Train-the-Trainer*
- *Active Shooter Awareness Course and Drill*
- *Fiber-Optic Installation Fundamentals*
- *Fiber-Optic Splicing Fundamentals*
- *Splicing And Terminating Underground Cable*
- *Inspection of Rubber Insulating Goods*
- *Inspection and Documentation of Fall Protection Equipment*
- *Inspection of Live-Line Tools and Equipment*
- *Developing Adult-Learner Curriculum*

- *Developing Effective Lesson Plans for the Adult Learner*
- *Job Hazard Analysis*
- *Job Hazard Analysis Using the Energy Wheel*

### **Year I NJATC Power Lineman Apprenticeship Curriculum**

- Understanding Your Apprenticeship and Responsibilities
- The Attributes of an IBEW/NECA Apprenticeship
- The IBEW and Its History
- NECA's Structure and Heritage
- Your Job and The Future It Holds
- Attitudes
- Tool Identification
- Use and Care of Hand Tools
- Introduction to OSHA
- Electrical Hazard Awareness
- Energized and Non-Energized Parts
- Flagging, Signs, and Barricades
- Climbing Equipment, Inspection and Care
- Fall Protection
- Climber Cutouts
- Climbing Poles
- Marketing
- Communications
- Shock, Arc, and Blast
- Rubber Gloves and Sleeves, Care and Use
- Protective Line Devices, Care and Use
- Pole Top Rescue
- Bucket Rescue
- Working in Confined Spaces/Vault Rescue
- Safety Meetings
- First Aid, Safety, and Health
- Hand Signals
- Powered Equipment
- Wood Poles – Inspection and Maintenance
- Loading, Hauling, and Unloading Poles
- Digging Holes, Trenches, and Setting Poles
- Framing Wood Poles
- Tail-Board Discussions
- Addition and Subtraction of Whole Numbers
- Multiplication and Division of Whole Numbers
- Fractions
- Decimals
- Percentage
- The Structure of Matter
- Electron Theory



- Electrical Units
- Electrical Units II
- Sources and Effects of Electricity
- Ropes, Knots, Hitches, and Splices
- Wire Rope
- Slings
- Rigging Hardware
- Blocks
- Personal Protective Equipment
- Solving Equations
- Ohm's Law
- Power
- Ladders/Step Bolts
- Two-Way Radios
- Guy Types
- Guy Installations
- Guy Strength and Sizes
- Anchors
- Line Conductors
- Cross Arms and Attachments
- Insulators
- Resistance in Series Circuits
- Current in Series Circuits
- Voltage in Series Circuits
- Power in Series Circuits
- Mathematics For Parallel Circuits
- Voltage in Parallel Circuits
- Resistance in Parallel Circuits
- Current in Parallel Circuits
- Power in Parallel Circuits
- Principles of Magnetism
- Magnetic Induction
- Ratios and Proportions
- The Electric System
- Wire Sizes, Types, and Characteristics
- Stringing Wire
- Tying-In Conductors
- Overhead Service
- Tree Trimming
- Good Housekeeping
- Resistance in Combination Circuits
- Current in Combination Circuits
- Voltage in Combination Circuits
- Power in Combination Circuits
- Underground Systems

- Excavation and Shoring
- Laying Conduit
- Manhole Construction
- Cable Types
- Pulling Cable
- Planning and Design For Underground Systems
- Baskets, Aerial Lifts, Aerial Platforms
- Grounding and Protective Grounds
- Taking a Line Out of Service
- Lock-Out Tag-Out

## **Year II NJATC Power Lineman Apprentice Curriculum**

- Sexual Harassment
- Preventing Sexual Harassment
- Becoming Familiar With the IBEW Constitution
- Understanding Your Local Union By-Laws
- Parliamentary Procedure and How It Works
- Introduction to 1910.269
- Hazardous Communication
- Theory Review – DC
- Polarity and Voltage Across a Load
- Introduction to Transformers
- Wire Resistance
- Voltage Drop
- Principles of Generation
- Fundamentals of AC
- Square Root
- Test Instruments/Metering Devices
- Test Instruments/Metering Devices II
- Distribution Circuits
- Principles of Three Phase AC
- Introduction to Inductance
- Transformer Types/Nameplates
- Transformer Polarity/Connections
- Transformers – Completely Self Protected (CSP)
- Installing Transformers
- Transformers – Single-Phase Connections
- Transformers – Three-Phase Voltages
- Theory of Three-Phase Connections
- Transformers – Three-Phase Connection Types
- Transformer Connections I
- Transformer Connections II
- Line Sketching

- Angles
- Right Triangles
- Vectors
- Introduction to Blueprints
- Blueprint Fundamentals
- Blueprint Symbols, Conventions, and Abbreviations
- Reading Electrical Drawings and Diagrams
- Introduction to Using a Transit
- Reading Maps, Plans, and Profiles
- Staking Sheets and Stakes
- Construction Standards/NESC
- Pole Top Construction
- Conductor Clearances
- Conductor Joints
- Cable Types and Sizes Cables and Wiring, Terminations
- Fault Indicators
- Locating Faults and Restoring Service
- Explosives
- Testing Insulators – Megger
- Cable Terminations Cables and Wiring, Terminations
- Cable Splicing I Cables and Wiring, Terminations
- Cable Splicing II Cables and Wiring, Terminations
- Cable Splicing III Cables and Wiring, Terminations
- Mobile Cranes
- Boom Capacities and Load Charts
- Practical Applications – Vectors – Rigging
- Practical Applications – Vectors – Transformers
- Lifting and Digging Operations
- Hot Line Tools: Introduction, Identification and Care
- Tower Footings
- Tower Erection
- Joining High-Line Conductors
- Sagging Conductors
- Dampers, Hold Down Weights, and Armor Rods
- The Circle
- Power of Numbers
- Metrics
- Volume and Area
- Street Lighting
- Street Lighting II
- Street Lighting III
- Street Lighting IV
- Underground Cable Installation
- Traffic Signals I
- Traffic Signals II

- Paralleling Transformers
- Demand Factors
- Overvoltage Protection
- Application of Standards
- Communication II
- Phasing and Tying-in circuits
- Overload Capabilities of Electrical Equipment
- Phase Sequence – Rotation Meters
- Backfeed
- Almost a Journeyman

### **Year III NJATC Power Lineman Apprentice Curriculum**

- Testing Ground Resistance
- Maximeters
- Review of Alternating Current
- Alternating Current
- Inductance
- Capacitors
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- Substation Equipment Identification
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- Testing for Line Faults
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- Troubleshooting URD Systems
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- Power Harmonics
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- Blue Print of the 90's
- Labor Management/LMCCs
- An Introduction to the COMET
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- NEBF Information Sheet
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