2.5-day Investigating & Documenting Power & Communication Utility Employee Accidents

Day 1 (8am – 5pm)

Introduction

How to determine compliance with codes and standards

- NESC vs. NEC & OSHA
- Required Inspections
- Which NESC edition applies
- Old vs. new NESC clearance system
- Standard vs. nonstandard clearances
- Effect of temperature, wind, and ice loading on clearances
- Examples of conductor movement

Case Studies: Using codes, regulations, and standards

Accident #1—Dump truck on power plant site

- Responsibilities of Utilities
  - Applicable NESC edition
  - Required vertical clearance
- Responsibilities of contractor
  - OSHA regulations
  - State regulations
- Utility policies & procedures

Accident #1A—Crane in substation

- Required vertical clearance in substation
- Responsibilities of crane operators
- OSHA regulations
- Insulating or grounding nearby lines

Lunch

Accident #1B—Backhoe vs crane

- Responsibilities of equipment operators
- OSHA regulations

Electrical work accidents

- Electricians
  - OSHA 29CFR1910 Subpt S & 1926 Subpt K
  - NFPA70E
- Power line workers
  - OSHA 29CFR1910, 269 & 1926 Subpt V
  - NESC Sec. 41, 42 & 44
- Communication line workers
  - OSHA 29CFR1910.268
  - NESC Sec. 41, 42 & 43
- Using the Employee Misconduct defense

Requirements for Safety Signs

- NESC Rules requiring safety signs
- Applicable ANSI standards
- Attributes of good safety signs

Day 2 (8am – 5pm)

Using OSHA regulations and ANSI standards for multiemployer work sites to analyze employer responsibilities

- How OSHA views the responsibilities of multiple employers
- OSHA Directives to compliance officers
- How to meet OSHA regulations using ANSI A10.33

Electrical installations

- Operation of fuses, breakers, reclosers

Using injury information

- Electricity transmission injuries
- Arc flash injuries
- Ventricular fibrillation
- Blunt trauma
- Using injuries to analyze position/actions of injured

Documenting & preserving evidence

- Matching evidence marks
- Measurements
- Photographs vs. videos
- Accident report check list
- Accident site investigation & analysis tools

Lunch

Documenting & preserving evidence (cont.)

Recreating accident conditions and clearances with photos and measurements using antenna removal accident

- NEC antenna requirements
- NESC antenna clearance requirements
- Wind displacement of conductors
- Sag & tension effects

Case Studies cont.

- Scaffold accidents
- Ladder accidents
- Trenching accidents
- Off-road vehicle accidents
- Airplane & helicopter accidents
- Substation accidents

Day 3 (8am – 11am)

Putting it all together

Participants will be split into groups to investigate & develop conclusions & recommendations concerning an actual accident

Investigation of line worker injury on pole

- Groups will receive limited information like that received when called to an accident
  - Develop list of information needed from each party
  - Present results to whole class

Conclusions and recommendations

- Groups will receive pertinent information about accident & parties that was gained during the actual accident investigation
  - Develop conclusions as to responsibilities of parties
    - Power utility
    - Utility contractor
    - Contractor employees
  - Develop recommendations for future changes to utility policy (if any)
  - Present results to whole class

Roundtable discussion of issues and techniques presented in course

Adjourn

3.5-day Investigating & Documenting Power & Communication Utility Employee Accidents

Day 1 (8am – 5pm)

Introduction

How to use codes and standards

- NESC vs. NEC & OSHA
- Required Inspections
- Which NESC edition applies
- Old vs. new NESC clearance system
- Standard vs. nonstandard clearances
- Effect of temperature, wind, and ice loading on clearances
- Examples of conductor movement

Case Studies: Using codes, regulations, and standards

Accident #1—Dump truck on power plant site

- Responsibilities of Utilities
  - Applicable NESC edition
  - Required vertical clearance
- Responsibilities of contractor
  - OSHA regulations
  - State regulations
- Utility policies & procedures

Accident #1A—Crane in substation

- Required vertical clearance in substation
- Responsibilities of crane operators
- OSHA regulations
- Insulating or grounding nearby lines

Lunch

Accident #1B—Backhoe vs. crane

- Responsibilities of equipment operators
- OSHA regulations

Electrical work accidents

- Electricians
  - OSHA 29CFR1910 Subpt S & 1926 Subpt K
  - NFPA70E
- Power line workers
  - OSHA 29CFR1910, 269 & 1926 Subpt V
  - NESC Sec. 41, 42 & 44
- Communication line workers
  - OSHA 29CFR1910.268
  - NESC Sec. 41, 42 & 43

Using the Employee Misconduct Defense requirements as a tool to analyze the responsibilities of employers & employees

- Appropriate work rules addressing behavior and conditions
- Communication of work rules to employees
- Supervision of employees
- Enforcement of work rules

Day 2 (8am – 5pm)

Using OSHA regulations and ANSI standards for multiemployer work sites to analyze employer responsibilities

- How OSHA views the responsibilities of multiple employers
- OSHA Directives to compliance officers
- How to meet OSHA regulations using ANSI A10.33

Electrical installations

- Operation of fuses, breakers, reclosers
- Building wiring accidents
  - Fire
  - Explosions
  - Overcurrent protection
  - Requirements for hazardous areas

Using injury information

- Electrical phenomena
- Resistance to electrical flow through body
- Mechanisms of electrical injury
  - Electricity transmission injuries
  - Arc flash injuries
  - Ventricular fibrillation
- Effect of current flow on the heart
- Effect of current flow on extremeties
- Blunt trauma
- Using injuries to analyze position/actions of injured

Lunch

Requirements for Safety Signs

- NESC Rules requiring safety signs
- Applicable ANSI standards
- Attributes of good safety signs

Documenting and preserving evidence

- Matching evidence marks
- Measurements
- Photographs vs. videos
- Accident report check list
- Accident site investigation & analysis tools

Day 3 (8am – 5pm)

Documenting & preserving evidence (cont.)

Recreating accident conditions and clearances with photos and measurements using antenna removal accident

- NEC antenna requirements
- NESC antenna clearance requirements
- Wind displacement of conductors
- Sag and tension effects

OSHA investigations

- Accident investigation vs. general inspection
- Process of OSHA investigations
- Management interviews/rights
- Employee interviews/rights

Case Studies cont.

- Scaffold accidents
- Ladder accidents
- Off-road vehicle accidents
- Aircraft accidents & helicopter
- Trenching accidents
- Substation accidents

Lunch

How to train, instruct, supervise and discipline employees to assure compliance with safe work practices

- Human behavior and errors
- Remediation of errors
- Supervision
- Retraining
- Training responsibilities and requirements
- Developing training programs
- Personnel that should be trained
- Documenting training
- Evaluation of training

Introduction to Communication Case Study: Communication worker injured by contact with power lines on joint-use pole

- History of work at this site
- Details of accident
- Entities involved

OSHA and NESC work rules applicable to communication line work

- Communication operation, maintenance and construction
- National Electrical Safety Code Sections 41-43

Analysis of responsibilities of parties in Communication Case Study

- Power utility
- Communication utility
- Communication utility contractor
- Communication utility contractor employees

Comments on maintenance of appropriate records and control of evidence

Use of exhibits in reports, depositions and at trial – Discussion of examples

Preparation of fact witnesses and expert witnesses to effectively help managers, OSHA Hearing Examiners or other personnel understand the impact of utility standards and procedures on safety

Day 4 (8am – 11am)

Putting it all together

Participants will be split into groups to investigate & develop conclusions & recommendations concerning an actual accident

Investigation of line worker injury on pole

- Groups will receive limited information like that received when called to accident
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  - Present results to whole class

Conclusions and recommendations

- Groups will receive pertinent information about accident & parties that was gained during the actual accident investigation
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    - Contractor employees
  - Develop recommendations for future changes to utility policy (if any)
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Roundtable discussion of issues and techniques presented in course

Adjourn