



Electrical Transmission and Distribution Construction Contractors and Trade Association OSHA Partnership Best Practices

Purpose:

As a “Best Practice Committee” we believe that properly executed Insulate and Isolate (I&I) techniques allow a line worker to safely work on and around energized equipment and conductors. The employer must ensure that each employee who performs energized line work is ‘qualified’ through training and experience to perform the work assigned.

It is understood by this committee that when speaking of “Best Practices Insulate and Isolate techniques,” the “best practice” is much more than simply the application of rubber/plastic isolating goods or rules regarding personal protective equipment (PPE). The I&I best practice consists of multiple dynamic comprehensive facets that include but are not limited to consistent training, auditing, discipline, job safety analysis, and I&I field criteria that may show specific insulating goods application; they also demonstrate and reinforce the I&I concepts that an end user of I&I best practices would show the desired behavior on the job.

Definition of “Best Practice”:

We define a “Best Practice” as a process or method that can be applied through out the electrical industry that will assist the ET&D Partnership companies in reducing the frequency of incidents.

Guidelines for identifying a “Best Practice”:

1. Is this feasible for line workers to perform?
2. Is this currently being done in the industry?
3. Could this be implemented?
4. Can all partners comply with this best practice?
5. Is it repeatable?
6. Is it objectively measurable?



BEST PRACTICE

SUBJECT: ADMINISTRATIVE CONTROLS

PRACTICE STATEMENT: Injuries to personnel from improper job planning and risk assessment.

PRACTICE DESCRIPTION: Identify type and quantity of Insulate and Isolate components

- A. Pre-planning to begin at the pre-bid meeting.
- B. Preliminary job site analysis.
- C. Contractor shall request information from the Host Employer so that the Contractor may be able to conduct adequate risk assessments prior to beginning operations.
- D. Line work on conductors or equipment shall be performed when they are de-energized or a portion is de-energized and grounded when possible.

BENEFITS:

- Eliminate injuries resulting from improper planning by ensuring key job hazards are identified and controlled and provide support to contractors in obtaining needed information for effective risk assessments.

REFERENCES:

National Electric Safety Code (NESC, ANSI C2 – Part 4)



BEST PRACTICE

SUBJECT: PRE-USE INSPECTION OF RUBBER PROTECTIVE EQUIPMENT

PRACTICE STATEMENT: Protocols related to the effective inspection of insulating protective equipment.

PRACTICE DESCRIPTION:

All rubber protective equipment shall be inspected prior to each use. All rubber/plastic insulating equipment shall be inspected for any damage, wear or contamination that would compromise its ability to insulate or isolate the linemen from different potentials. Applicable service dates shall be observed. If upon inspection insulating protective equipment is found to be defective the equipment shall be identified and removed from service.

BENEFITS:

- Provides for uniform inspection guidelines that can be applied industry wide

REFERENCES:

ASTM F478 – 1999 Standard Specification for In-Service Care of Insulating Line Hose and Covers

ASTM F479 – 2001 Standard Specification for In-Service Care of Insulating Blankets

ASTM F496 – 2002 Standard Specification for In-Service Care of Insulating Gloves and Sleeves

ASTM F1236 – 2001 Standard Guide for Visual Inspection of Electrical Protective Rubber Products

National Electric Safety Code (NEC, ANSI C2 – Part 4)

Frequently Asked Questions
Pre-Use Inspection of Rubber Goods

1. Who does this inspection?
 - A qualified crew member shall perform a pre-use inspection prior to each time insulating rubber goods are used.
2. Why are there two dates on insulating rubber goods?
 - One is the test date, and where applicable there will be an issue date.
3. Which date should I use?
 - This will depend on the contractor and state that you are working in. If you are not sure you should ask your supervisor.



BEST PRACTICE

SUBJECT: JOB BRIEFINGS

PRACTICE STATEMENT: Provides a uniform methodology and outlines key components of job briefings.

PRACTICE DESCRIPTION: The Person In Charge (or a designated representative) shall document the basic job steps, anticipated hazards, and actions taken to control/eliminate hazards by doing the following:

- A. Define routine and critical tasks.
- B. Identify roles & responsibilities.
- C. Existing characteristics and conditions (provided by host)
- D. Identify hazards.
- E. Determine risk mitigation.
- F. Documentation shall include I & I to be used.
- G. Personal Protective Equipment to be used.
- H. Emergency response information.

NOTES:

- Job briefings needs to be updated and documented when changes to the scope of work are identified.
- The Person In Charge does not have to complete the job briefing however he/she must be present during the delivery to ensure proper completion

All crewmembers shall participate in a documented job briefing. Job briefings are to be held at the start of the work shift, as work tasks or changes in working conditions occur that differ from original briefing, and as additional personnel including guests arrive at the job site. These job briefings shall include the components of a Hazard Analysis or use your company specific hazard analysis program associated with the work steps, hazards associated with the work step, and ways to eliminate or control the hazards. The job briefing form shall have a provision for each employee to sign to verify they have participated in the job briefing. Each ET&D Partnership company's shall establish a review process to ensure that the documented job briefing process is effective and the known characteristics and conditions are being communicated.

BENEFITS:

- Provides for essential job safety planning guidelines and lists key elements.
- Enhances compliance with OSHA regulatory requirements.

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- Incorporates use of a specific hazards identification process in the job planning process that will provide for enhanced controls for risks.
- Proper pre-planning reduces the risk of injury.
- Ensures employees receive information about the known characteristics and conditions of the system they are working.
- The process and required documentation enhances inclusion and participation of job team members in the safety planning processes associated with the job.

REFERENCES: National Electric Safety Code (NESC, ANSI C2 – Part 4)



Frequently Asked Questions **Job Briefings**

1. Do I have to document a Job Briefing when the tasks are repetitive?
 - Yes all Job Briefings shall be documented. The job briefing form shall have a provision for each employee to sign to verify that they understand the job briefing. If during the course of performing the planned task, conditions change that will affect the safety of the personnel, a new Job Briefing shall be conducted and documented (original document may be amended to reflect content of the new Job Briefing).

2. Do I need to do separate Job Briefings for repetitive tasks?
 - Yes a Job Briefing shall be held each day at the beginning of each shift. If during the course of performing the task the conditions change that will affect the safety of the personnel a new Job Briefing shall be conducted and documented.

3. Must I sign the Job Briefing?
 - Yes, to verify presence at the Job Briefing. When an individual signs the Job Briefing they are acknowledging that they have been informed of the pertinent information related to the specific work task or assignment.

4. Must the Foreman lead the Job Briefing?
 - The Supervisor is always in control of job briefings however, participation by everyone is encouraged.

5. Can the form be “passed around” and everyone just look at it?
 - No. Verbal communication must take place – speaking and listening. Crewmembers are encouraged to ask questions and make suggestions.

6. Where should the Job Briefing be conducted?
 - The task specific job briefing shall be conducted at the location where the task is going to be performed.



Frequently Asked Questions **Job Briefings(cont.)**

7. Must I do a Job Briefing if I'm working alone, and shall it be documented?
 - Yes, in order to insure that hazards have been properly identified and that the countermeasures will be effective. This Job Briefing shall also be documented.

8. What should be done if someone who was not at the Job Briefing shows up such as an engineer, new crew member, property owner, OSHA?
 - Communicate with crew the necessary steps they must take in order to maintain personnel safety. Brief the new arrival, as necessary, with regard to the Job Briefing. Request the new arrivals signature indicating their presence and their understanding of the hazards and countermeasures.

9. Where should the Job Briefing be kept?
 - A current Job Briefing shall be kept with the crew, at the jobsite.

10. Do I need to do a Job Hazard Analysis (JHA) for every job?
 - Yes. Job briefings shall include the components of a Job Hazard Analysis or use your company specific hazard analysis program associated with the work steps, hazards associated with the work step, and ways to eliminate or control the hazards. The JHA may be included with the Job Briefing document or the JHA may be a separate document.



BEST PRACTICE

SUBJECT: QUALIFIED OBSERVER

PRACTICE STATEMENT: Identify and utilize qualified observer for critical tasks.

PRACTICE DESCRIPTION: A member of the crew shall be identified to act as an observer to ensure clearances are maintained, PPE, and effective cover-up is installed. The observer shall be capable of the identifying nominal voltages, energized components, minimum approach distances, and proper safe work practices while crewmembers are working on energized lines.

NOTE: This section is not intended to mandate staffing requirements.

A. The term “effective cover up” is used to describe the installation of phase-to-phase rated insulating protective cover on energized conductors and/or equipment of different potentials when the lineman is within reaching distance or in areas extended by handling conductive objects.

B. The term “extended reach” is used to describe being within five feet of energized conductors and/or equipment or having a conductive object within five feet of energized conductors and/or equipment.

BENEFITS:

- Eliminate injuries from unrecognized hazards or changes in conditions.
- Clarify duties and provides guidance as to when observers are beneficial.
- Provides guidance on observer qualifications.

Frequently Asked Questions
Qualified Observer

1. What qualifications does the Qualified Observer need?
 - The observer shall be capable of identifying nominal voltages, energized components, minimum approach distances, and proper safe work practices while crewmembers are working on energized lines, give warning, and are able to initiate the emergency action plan.
2. Is a Qualified Observer needed for every task?
 - No, only during critical tasks as defined in the job briefing process.
3. Who may be a Qualified Observer?
 - Anyone crew member who meets the criteria of a qualified observer.
4. While personnel are performing critical tasks that would require a Qualified Observer, can the Qualified Observer have other duties?
 - No. While performing the functions of a qualified observer, the qualified observer shall not perform other tasks.



BEST PRACTICE

SUBJECT: INSULATE & ISOLATE SAFETY PERFORMANCE CHECK

PRACTICE STATEMENT: Review of qualification, and/or performance criteria to ensure compliance with Isolate and Insulate procedures.

PRACTICE DESCRIPTION: A safety review process shall be in place that will be performed by a competent person. Included in the review process will be assurances that the company safety rules and proper cover up procedures are being followed. Additionally, documentation such as Job Briefing forms and Job Safety Analysis forms shall be reviewed.

BENEFITS:

- Routine auditing provides for performance and regulatory assurance for critical control techniques
- Effective auditing will enable enhanced and consistent performance

Frequently Asked Questions
Insulate and Isolate Performance Check

1. Who can be a “competent person”?
 - A person designated by the employer who has the ability – by reason of training and/or experience – to identify existing and predictable hazards in the workplace and has the authority to take quick, prompt and effective action.



BEST PRACTICE

SUBJECT: CRADLE-TO-CRADLE USE OF INSULATING RUBBER GLOVES AND SLEEVES

PRACTICE STATEMENT: Protocols related to effective use of insulating rubber gloves and sleeves.

PRACTICE DESCRIPTION:

1. When employees are working on energized circuits or equipment using the rubber glove method, rubber protective-insulating gloves and sleeves rated for the exposure of the highest nominal voltage shall be worn cradle-to-cradle when working from an aerial platform.
 - a. Rubber protective insulating sleeves are not required when employees are working circuits with a potential of 600 volts or less if there is no upper arm exposure and the worker will not encroach the 5-foot primary zone.
 - b. The term “effective cover up” is used to describe the installation of phase-to-phase rated insulating protective cover on energized conductors and/or equipment of different potentials when the lineman is within reaching distance or in areas extended by handling conductive objects.
 - c. The term “extended reach” is used to describe being within five feet of energized conductors and/or equipment or having a conductive object within five feet of energized conductors and/or equipment.
2. Electrical class rating of the insulating rubber sleeves shall meet or exceed the electrical class rating of the insulating rubber gloves when working on primary conductors.
3. Company policies shall apply when the above conditions cannot be met. Alternative work methods ensuring worker safety shall be identified, communicated to all affected workers, implemented and documented as part of the Job Briefing process.

BENEFITS:

- Provides specific use requirements that are proven methods for reducing electrical contact injuries and fatalities.
- Provides for uniform use guidelines that can be applied industry wide.

Frequently Asked Questions
Cradle to Cradle Gloves & Sleeves

1. Can I swing the bucket out of the energized zone and remove Gloves and Sleeves in order to smoke, dip, etc.?
 - The bucket must be repositioned to the cradle or lowered to its lowest possible elevation before gloves and sleeves may be removed.

2. Are there examples when gloves and sleeves are required, when working in a bucket (cradle to cradle) when can I remove rubber gloves and sleeves while in the bucket?
 - When the bucket has been repositioned to the cradle or lowered to its lowest possible elevation.
 - When the circuit has been deenergized, grounded and an EPZ has been established.
 - Refer to company policies for specific work procedures.

3. When ascending to perform work on a transmission line with energized under build, do I need gloves and sleeves while moving past the energized under build?
 - No, as long as the 5 ft. primary zone is not encroached.



BEST PRACTICE

SUBJECT: LOCK-TO-LOCK USE OF INSULATING RUBBER GLOVES AND SLEEVES

PRACTICE STATEMENT: Protocols related to effective use of insulating rubber gloves and sleeves.

PRACTICE DESCRIPTION:

1. When employees are working on energized circuits or equipment using the rubber glove method, rubber protective-insulating gloves and sleeves rated for the exposure of the highest nominal voltage shall be worn “lock to lock” when employees are working energized URD equipment.

The term “Lock-to-Lock” is used to describe the utilization of rubber gloves and sleeves, when required, prior to the time the pad mounted equipment is unlocked until work is complete and the pad mounted equipment is relocked. Additionally, rubber gloves and sleeves shall be worn when working on or within the extended reach of the conductor or piece of equipment. The term “extended reach” is used to describe being within five feet of energized conductors and/or equipment or having a conductive object within five feet of energized conductors and/or equipment.

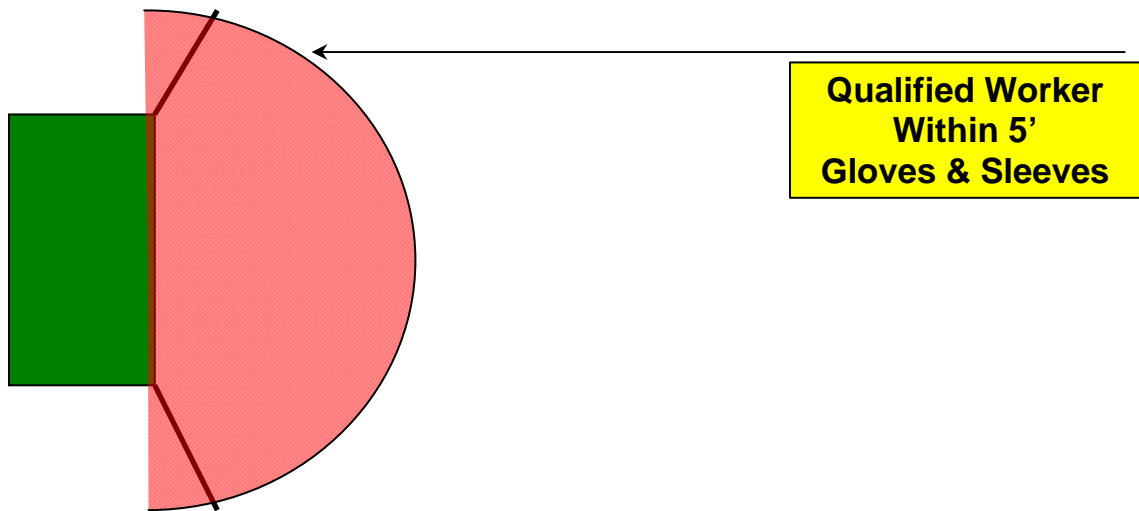
2. Electrical class rating of the insulating rubber sleeves shall meet or exceed the electrical class rating of the insulating rubber gloves.
3. Company policies shall apply when the above conditions cannot be met. Alternative work methods ensuring worker safety shall be identified, communicated to all affected workers, implemented and documented as part of the Job Briefing process.

BENEFITS:

- Provides specific use requirements that are proven methods for reducing electrical contact injuries and fatalities.
- Provides for uniform use guidelines that can be applied industry wide.

Frequently Asked Questions
Lock-to-Lock

1. If I'm walking past the back of a open pad mounted transformer, do I need rubber insulating gloves and sleeves?
 - No, there is no exposure as long as the employee does not touch the cabinet.



2. Can insulating rubber gloves and sleeves be removed when terminating primary cable?
 - After secondary bushings and primary terminations have been effectively covered and the cable being terminated has been tested & grounded and the cable has been pulled beyond the face of the transformer, rubber gloves and sleeves may be removed.
3. Can I pull elbows by hand if I wear insulating rubber gloves and sleeves?
 - No. Fiberglass work sticks of six foot length (minimum) shall be used for switching in URD pad mount transformers.
4. Do I need to wear rubber gloves and sleeves to unlock and open the padmount equipment when work to be performed is to be done with live line tools?
 - Yes. Rubber gloves and sleeves shall be worn when unlocking, opening, and closing the padmount equipment regardless of the work practice to be conducted.



BEST PRACTICE: INSULATE & ISOLATE

SUBJECT: I&I TECHNIQUES FOR THE LIVE LINE TOOL METHOD ON DISTRIBUTION

PRACTICE STATEMENT: The effective use of Isolate and Insulate equipment and procedures to provide the necessary level of safety when performing Live Line Tool work on energized lines & equipment.

The employer must ensure that any employee who performs energized line work is qualified (See 29 CFR 1910.269) through training and experience to perform the work assigned.

PRACTICE DESCRIPTION: Properly performed Insulate and Isolate (I&I) techniques used in conjunction with the necessary insulating live line tools allows qualified personnel to safely work on and around energized equipment and conductors.

I&I Definitions:

1. **Insulated:** (1) The use of IPE to protect the line worker while gloving energized lines/equipment.
2. **Insulating Personal Protective Equipment (IPPE):** Rubber Gloves and Sleeves.
3. **Insulating Protective Equipment (IPE):** rubber blankets, rubber line hose, rubber hoods, plastic covers, etc.
4. **Isolate:** (A) Physically separated, electrically and mechanically, from all sources of electrical energy. Such separation may not eliminate the effects of induction. (B) Not readily accessible to persons unless special means for access are used.
5. **Minimum Approach Distance (M.A.D.):** The distances set forth in 29 CFR 1910.269. This distance is measured from the end of the line workers reach or from the end of any conductive object being handled by the line worker.
6. **Second points of contact:** Accidental/inadvertent contact made between energized conductors or equipment and pathways to ground, which allows for current to pass through the body. Such contact can be made by the workers body or through a conductive tool/object.

I&I Best Practice: Energized Primary Live Line Tool Method

1. Only workers who are qualified shall be permitted to work within M.A.D. using this best practice.
2. When working from an aerial lift/structure the 'IPPE for the Live Line Tool Method on Distribution Lines' Best Practice shall be observed.



3. Before getting into a position where the qualified line worker can reach into, extend any conductive object into, or extend any other part of the body into the M.A.D., approved and properly rated IPE/IPPE for the voltage to be worked shall be used to insulate/isolate energized conductors and/or other conductive parts at a different potential.
4. For URD equipment the criteria for the 'Lock to Lock' Best Practice shall be observed.
5. Approved IPE shall be installed in the order of 'nearest first' and removed in the reverse order.
 - a. Energized or de-energized part(s) may have to be temporarily covered in order to install IPE on all parts necessary to insulate/isolate the part that is to be worked on.
 - b. The part to be worked shall only be uncovered after all IPE has been installed in the work zone that will allow no contact with conductors or equipment at a different potential.
 - c. IPE shall be installed/removed in such a manner so that the worker is not exposed to contact from energized conductors or second points of contact.
 - d. The line worker shall **NEVER** turn their back on exposed energized conductors or second points of contact within M.A.D.

BENEFITS:

- Eliminate contact injuries.
- Eliminate electric arc flash injuries.
- Safely working on energized circuits and maintaining the reliability of the electrical system.

REFERENCES:

- **NJATC** – Effective Cover Up; interactive training.
- **NECA** – Safety Risk Management for the Electrical T&D Line Construction
- **IBEW** – Ten States Safety Manual
- **OSHA** – 1910.269, 1926.950; subpart V
- **ASTM** – F 968-93
- **ET&D Partnership** – Existing Best Practices
- **WISHA-296-45** – Electrical Workers
- **IEEE 100** – The Authoritative Dictionary of IEEE Standards Terms (seventh edition)



Q&A:

1. What training and skills must a qualified person (qualified line worker) possess?

A: OSHA 29 CFR 1910.269(a)(2)(i) states:

Employees shall be trained in and familiar with the safety-related work practices, safety procedures, and other safety requirements in this section that pertain to their respective job assignments. Employees shall also be trained in and familiar with any other safety practices, including applicable emergency procedures (such as pole top and manhole rescue), that are not specifically addressed by this section but that are related to their work and are necessary for their safety.

OSHA 29 CFR 1910.269(a)(2)(ii) qualified persons shall also be trained and competent in:

- The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment,
- The skills and techniques necessary to determine the nominal voltage of exposed live parts,
- The minimum approach distances specified in this section corresponding to the voltages to which the qualified employee will be exposed, and
- The proper use [and selection] of the special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools for working on or near exposed energized parts of electric equipment.

Note: For the purposes of this section, a person must have this training in order to be considered a qualified person.

2. Does M.A.D. apply when using a live line tool?

A: YES.

3. What voltage separates distribution voltage from transmission voltage?

A: According to the definition set forth by IEEE 100 7th Edition: Electric power lines which distribute power from a main source substation to consumers, usually at a voltage of 34.5KV or less.

4. I am performing “Hot stick” work and need to encroach M.A.D. and perform a task by hand. What position do I need to be in to don my rubber insulating gloves and sleeves?

A. Performing “Hot Stick” work method does not require the use of rubber insulating gloves or gloves and sleeves. If during this operation a task requires the worker to enter into M.A.D, rubber insulating gloves and /or gloves and sleeves shall be donned prior to encroaching the applicable M.A.D. The worker shall maintain or move to a safe position so not to encroach M.A.D. during the donning of the PPE.



BEST PRACTICE

SUBJECT: Rubber Insulating PPE for the Live Line Tool Method on Distribution Lines

PRACTICE STATEMENT: USE OF RUBBER INSULATING GLOVES AND SLEEVES WHILE PERFORMING DISTRIBUTION POWERLINE TASKS VIA THE LIVE LINE TOOL METHOD.

PRACTICE DESCRIPTION:

A. When working primary voltages aloft:

For the purpose of this document M.A.D. is defined as the Minimum Approach Distance defined by applicable Federal, State or Local regulation. M.A.D. may also be known as “Primary Contact Zone”, “Minimum Working Distance”, “Within Reach”, “Extended Reach”, etc.

This Best Practice only applies to those applications where power-line workers are utilizing the “live line tool work method” aka – “hot sticking.” Workers using the “live line tool work method” (“hot sticking”) use insulating tools designed and intended for use while working on energized equipment and/or conductors. Workers using the “live line tool work method” are not permitted to make direct contact with energized equipment and/or conductors with their hands and are not permitted to be in a position where the worker can reach into, extend any conductive object into, or extend any other part of the body into the M.A.D. as prescribed in applicable Federal, State and Local Regulatory Standards.

It is not intended nor required that the Strategic Partnership *Cradle-to-Cradle Rubber Glove Work Method Best Practice* be applicable when power-line workers are using the “live line tool work method”. The *Cradle-to-Cradle Rubber Glove Work Method Best Practice* applies only when work is to be done utilizing the “rubber glove work method”. When a task requires the worker to reach into, extend any conductive object into, or extend any other part of the body into M.A.D. while using the “live line tool work method,” the use of rubber insulating gloves and/or rubber insulating gloves and sleeves rated the voltage are required to be used as described in this Best Practice”.

Donning of such PPE shall be done in a safe location so that M.A.D. requirements are not violated. This may include repositioning of the aerial lift to its cradled position. It should be noted however, incident investigations have revealed M.A.D. violations have occurred during “live line tool work method” operations. The intent of this Best Practice is to eliminate both M.A.D. encroachment violations and subsequent injuries.

Approved June 3, 2008

Effective Date: December 31, 2008

Live Line Tool Method

1. Rubber insulating gloves and sleeves are not required when working from a position where the worker cannot reach into, extend any conductive object into, or extend any other part of the body into the M.A.D. while using fiberglass insulating live line tools (“hot stick” method).
2. Before getting into a position where the worker can reach into, extend any conductive object into, or extend any other part of the body into the M.A.D., approved protective equipment shall be used to insulate and/or isolate energized conductors and/or parts.
3. Rubber insulating gloves shall be worn when tasks require the worker to reach into, extend any conductive object into, or extend any other part of the body into the M.A.D. when there is no upper arm exposure, even when proper cover is utilized.
4. Insulating rubber gloves and sleeves shall be worn when tasks require the worker be in a position where the worker can reach into, extend any conductive object into, or extend any other part of the body into the M.A.D. when all the above precautions have been taken and upper arm exposure still exists.

BENEFITS:

- Provides specific use requirements that are proven methods for reducing electrical contact injuries and fatalities.
- Provides for uniform use guidelines that can be applied industry wide.

Approved June 3, 2008

Effective Date: December 31, 2008

Frequently Asked Questions
Rubber Insulated PPE and the Live Line Tool Method

FAQ: When operating GOAB switches from the ground do I need gloves and sleeves?

A: No, just rubber insulating gloves are required.

FAQ: What is “upper arm” exposure?

A: When working within reach or the extended reach of the M.A.D. of energized conductors or parts, the area on the arms not protected by rubber insulating gloves that would be covered by rubber insulating sleeves.

FAQ: I’m wearing rubber insulating gloves and the conductor is covered, do I need rubber insulating sleeves?

A: No, if no upper arm exposure. Yes, if upper arm exposure exists.

Insulating rubber gloves and sleeves shall be worn when tasks require the worker to enter the M.A.D. and there is the potential of upper arm exposure regardless of the whether the conductors and equipment are covered. Covering of conductors and equipment add an additional barrier or safe guard but is not considered the primary form of protection for the worker.

FAQ: I am performing “hot stick” work and need to encroach M.A.D. and perform a task by hand. What position do I need to be in to don my rubber insulating gloves or gloves and sleeves?

A: Performing “hot stick” work method does not require the use of rubber insulating gloves or gloves and sleeves. If during this operation a task requires the worker to enter into the M.A.D., rubber insulating gloves and/or gloves and sleeves shall be donned prior to encroaching the applicable M.A.D. The worker shall maintain or move to a safe position so not to encroach M.A.D. during the donning of the PPE.

Frequently Asked Questions
Rubber Insulated PPE and the Live Line Tool Method

General Use of Insulating Rubber Gloves and Sleeves

Note: Although rubber insulating gloves and sleeves are not normally required when utilizing “hot sticking” work method the following is provided for informational purposes only.

1. Insulating Rubber gloves shall never be worn inside out or without leather protectors. They shall be exchanged at any time they become damaged or the employee to whom they are assigned becomes suspicious of their condition.
2. Leather protectors or overgloves shall not be worn except over insulating rubber gloves.
3. Insulating rubber gloves and sleeves rated at the highest nominal anticipated voltage shall be worn any time required by supervision.
4. Dielectric testing dates of insulating rubber gloves and sleeves shall be current.
5. Insulating rubber gloves and sleeves shall be visually inspected and gloves shall be air tested before each use.



BEST PRACTICE: SAFETY AT HEIGHTS

INTRODUCTION:

The Partnership is committed to the practice of Safety at Heights wherever the potential exists for personnel falling from heights. A series of Best Practices will be developed that will address fall hazards associated with the Electric Transmission and Distribution industry. Best Practices will address fall hazards associated with, but not limited to, aerial tasks performed while working on wood/steel poles, metal/lattice structures, transformers, vehicles and associated equipment. The Best Practices will utilize fall protection hierarchy of fall hazard elimination or control of the fall hazard. The following shall be considered in designing a fall protection solution: elimination or substitution, passive fall protection, fall restraint, fall arrest and administrative controls. First consideration shall be given to the elimination of fall hazards. Where elimination of the fall hazard is not practical effective control of the fall hazard shall be used at all times.

SUBJECT: FALL PROTECTION WHEN PERFORMING AERIAL WORK ON LATTICE STRUCTURES

PRACTICE STATEMENT: Fall Protection Equipment (FPE) shall be used when ascending, while in the working position, when changing positions, descending, and/or performing rescue operations while on a lattice structure.

PRACTICE DESCRIPTION: Fall hazards associated with aerial work performed on lattice structures shall be assessed, and fall hazard mitigation plans developed.

- Climbers shall be competent in the application of all necessary fall protection methods used for the fall hazard mitigation of the tasks that will be performed on a given lattice structure.
- A Fall Hazard Analysis (FHA) shall be completed. As a function of the planning/job site analysis, the following information should be obtained and included with the FHA:
 - Identify tasks to be performed on given lattice structures.
 - Client/Owner Fall Protection policies, procedures and hazard analysis documentation as applicable.
 - Identify suitable anchorage points that are going to be used for the task to be performed on any given lattice structure.
 - Employers shall address rescue considerations and develop appropriate procedures that will allow successful performance of a given rescue technique for varied field conditions.
 - Determine/Identify necessary FPE and/or Work Positioning Equipment (WPE).
 - Determine climber qualification in the use of FPE and/or WPE.
- FPE/WPE shall be inspected and used in accordance with the manufacturer's instructions and guidelines.



- Company policies shall apply when the conditions of this Best Practice cannot be met. Alternative work methods ensuring climber safety shall be identified, communicated to all affected climbers, implemented, and documented as part of the job briefing process.
- Lattice structure climbers shall be trained and competent in the care, use, and inspection of the equipment used to conform to this Best Practice. Climbers must be trained in the selection and safe use of the equipment/system. Training shall only be conducted by qualified trainers.
- Visual inspections shall be performed prior to, and during climbing, to ensure that the structure is in acceptable condition for the safe execution of the tasks to be performed.
- This Best Practice applies to all climbers including those that perform rescue on lattice structures. Rescue application should be predetermined as early as possible, but no later than during the pre-job briefing, based on rescue needs such as timeliness and consideration given to the characteristics of the structure that rescue is being performed on.

BENEFITS: To eliminate injuries and fatalities associated with falls from lattice structures.

REFERENCE:

ANSI Z359.2 – 2007

CSA Z259.14-01

29 CFR 1910.66 App C

29 CFR 1926.500 – 503

BLM 1292-1

Best practices utilized by OSP members for lattice structures.

IEEE 1307 – IEEE Standard for Fall Protection for Utility Work

Example FHA attached

DEFINITIONS AND CONSIDERATIONS:

- **Anchorage** — A secure point of attachment on the lattice structure to which the fall protection system is connected.
- **Fall Protection Equipment (FPE)** — Any equipment, device or system that prevents accidental falls from elevations or that mitigates the effect of such fall.
- **Personal Fall Arrest System (PFAS)** — A system used to arrest a fall from a working level. It consists of an anchorage point, connectors, body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these.
- **Work Positioning Equipment (WPE)** — Equipment used to support a climber on the lattice structure so that the climber’s hands are free when he or she reaches the work position. A safety strap (skid), a lineman’s body belt, and/or a lineman’s harness constitute WPE.
- **Fall Hazard Analysis (FHA)** — Analysis conducted to identify the integrity of the structure. Identify the fall hazards based on the type of structure and tasks to be performed on given structure, as well as equipment and procedures necessary to control the fall hazards.



Questions & Answers

1. Does this Best Practice apply to all climbers?

A: This Best Practice applies to all climbers of lattice structures.

2. What type of training is required?

A: Climber training in the selection and use of personal fall arrest systems is imperative. Before the equipment is used, climbers must be trained in the care, use and inspection of the equipment/system. This should include the following: Application limits; WPE, anchorage points, including determination of deceleration distance, and total fall distance to prevent striking a lower level; methods of use, inspection, and storage of the system and rescue procedures.

3. What type of fall protection is required?

A: All equipment identified in the FHA. The FHA must include plans to perform a rescue, as well as identify all rescue equipment to be readily available in the event of an emergency.

4. What are examples of climbing methods and suitable FPE to be used while climbing and working on lattice structure?

A: Full body harness with double (2) lanyards (with proper snap hooks)

- Rebar hooks and belay line with full body harness and double lanyards
- Temporary horizontal lifelines
- Self-retracting lifelines (SRL)
- Double safety's (skids) are acceptable when the safety is rigged such that a climber cannot fall more than two feet
- Vertical lifelines, rope grabs, body harnesses with frontal and dorsal D-rings.

5. What should be considered when selecting and use of anchor points?

A: The supervisor or person in charge of the work being performed will identify what structural members will be used as anchorage points and document those on the FHA.

- An anchor point utilized where the line passes over or around rough or sharp surfaces should be avoided or padded/protected.
- Horizontal lifeline systems may, depending on their geometry and angle of sag, be subjected to greater loads than the impact load imposed by the attached equipment. The use of these methods must be designed by a qualified person.
- The potential free fall distance when using PFAS should be kept to a minimum and shall not be in excess of six feet (1.8 m).



- The location of the anchor point should also consider the hazard of obstructions in the potential fall path of the climber. Consideration should be given to anchor points that minimize the possibilities of exaggerated swinging.

6. What is meant by the Work Positioning System limiting the fall to less than two feet?

A: WPE may be used when rigged such that a climber cannot fall more than two feet.

7. Must I maintain 100% fall protection when I pass over an obstruction or maneuver on lattice structures?

A: Yes, follow your employer's FHA.

8. What is meant by “visual” inspection?

A: All lattice structures shall be carefully inspected before climbing to ensure they are in safe condition for the work to be performed.

1. Verify step bolts are secure and in acceptable conditions.
2. Verify acceptable conditions of footers.
3. Verify steel members are secure on each end before applying or transferring weight.
4. Check for damage or distortion to the structure members.

9. Does fall protection have to be included in the “Pre-Job Briefing”?

A: Yes, fall protection should be planned and discussed during the job briefing. Visually determine the climbing route, review FHA documents, identify all potential hazards, and determine the control measures to be used.

10. Is a Fall Protection System required when transitioning from the lattice structure to and from another device being used on the structure (i.e., spacer buggy, dead end ladder, etc.)?

A: Yes, FPE shall be used continuously when transitioning to and from the structure and while on the devices.

11. Does this include transferring to and from helicopters and aerial lifts?

A: No, to be addressed in a separate best practice.

APPENDIX A: LATTICE STRUCTURE FALL HAZARD SAFETY ANALYSIS

Safety at Heights Best Practice – Lattice Structures

Supervisor: _____ Qualified Climbers: YES <input type="checkbox"/> NO <input type="checkbox"/> Personnel Trained in use of FP equipment: YES <input type="checkbox"/> NO <input type="checkbox"/> Location / WO#	Visual Inspection performed: YES <input type="checkbox"/> NO <input type="checkbox"/> Identified Anchorages: YES <input type="checkbox"/> NO <input type="checkbox"/>
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Task Description:

Examples of Lattice Structure Fall Protection Equipment to be available and/or Climbing Methods for consideration:

- Work Positioning Equipment (Harness/Body Belt & Safety)
- PFAS: Retractable Lanyard(s), Full Body Harness with Lanyard, Full Body Harness with Double Lanyard
- Horizontal Life Line W/PFAS(s), Vertical Life Line w/rope grabs
- Travel Restriction Equipment
- Three Points of Contact for Qualified Climbers
- Guard/Hand Rails, Safety Nets

Task Step	Fall Hazard Control Measures
Ascending	
Work Positioning	
Maneuvering	
Descending	
Rescue	



BEST PRACTICE: SAFETY AT HEIGHTS

INTRODUCTION:

The Partnership is committed to the practice of Safety at Heights wherever the potential exists for personnel falling from heights. A series of Best Practices will be developed that will address fall hazards associated with the Electric Transmission and Distribution industry. Best Practices will address fall hazards associated with, but not limited to, aerial tasks performed while working on wood/steel poles, metal/lattice structures, transformers, vehicles and associated equipment. The Best Practices will utilize fall protection hierarchy of fall hazard elimination or control of the fall hazard. The following shall be considered in designing a fall protection solution: elimination or substitution, passive fall protection, fall restraint, fall arrest and administrative controls. First consideration shall be given to the elimination of fall hazards. Where elimination of the fall hazard is not practical effective control of the fall hazard shall be used at all times.

SUBJECT: FALL PROTECTION WHEN PERFORMING AERIAL WORK ON WOOD POLES

PRACTICE STATEMENT: Fall Protection Equipment (FPE) shall be used when ascending, descending, changing position and when in the working position while on a wood pole.

PRACTICE DESCRIPTION: Wood Pole Fall Restriction Device shall be “engaged” ground-to-ground when ascending, descending, changing position and when in the working position.

- When in the working position, Work Positioning Equipment may be used when rigged such that an employee cannot fall more than two feet.
- When climbing wood poles that have pole steps or other obstructions the hitch hike climbing method, utilizing the Work Positioning Equipment, may be used to ascend or descend when rigged such that an employee cannot fall more than two feet.
- Wood pole climbers shall be trained and competent in the care, use and inspection of components used to conform to this Best Practice. Employers should obtain comprehensive training from the manufacturer as to the equipment’s proper use (to include “train the trainer”). Employees must be trained in the selection and safe use of the equipment/system. This should include the following: Application limits; techniques used for proper adjusting of the equipment, methods of use, inspection, storage of the device and a demonstration of competency of device usage. Training shall only be conducted by qualified trainers. Refresher training shall be provided that will maintain employee’s competency in the use of required equipment.



- Prior to climbing any wood pole, an inspection of the pole shall be conducted. All components of the Fall Protection Equipment shall be inspected by the climber (per manufacturers' specifications) to ensure the device is fit for use.
- This Best Practice applies to all climbers including those that perform pole top rescue on wood poles. Rescue application should be pre-determined (as early as possible, but no later than during the pre-job briefing) based on rescue needs such as timeliness and consideration given to the characteristics of the structure that rescue is being performed on. Employers shall address rescue considerations and develop appropriate procedures that will allow successful performance of a given rescue technique for varied field conditions. Climbers shall be qualified in the methods identified to be used for rescue.
- Company policies shall apply when the conditions of this Best Practice cannot be met. Alternative work methods ensuring worker safety shall be identified, communicated to all affected workers, implemented and documented as part of the job briefing process.

BENEFITS:

To eliminate injuries and fatalities associated with falls from Wood Poles.

REFERENCE:

ANSI Z359 - 2007

CSA Z259.14-01

29 CFR 1926.500 - 503

The Texas A&M University System;

Texas Engineering Extension Service; Engineering, Utilities and Public Works Training Institute

Best practices utilized by OSP members for climbing wood poles.

IEEE 1307 –IEEE Standard for Fall Protection for Utility Work

DEFINITIONS AND CONSIDERATIONS:

- **Fall Protection Equipment (FPE)** – Any equipment, device or system that prevents an accidental fall from elevations or that mitigates the effect of such fall.
- **Wood Pole Fall Restriction Device** – A device that, when properly adjusted and combined with other subcomponents and elements, allows the climber to remain at his or her work position with both hands free and that performs a fall restriction function if the climber loses contact between his or her gaffs and the pole.
- **Work Positioning Equipment (WPE)** – Equipment used to support a worker on the pole so that the worker's hands are free when he or she reaches the work position. A pole strap, a lineman's body belt, and/or a lineman's harness and hooks/gaffs constitute Work Positioning Equipment.



Questions & Answers

1. What are examples of suitable Wood Pole Fall Restricting Devices used while climbing wood poles?

A: Buckingham Bucksqueeze, Miller Stop Fall, Jelco Pole Choker, Scepter Pole Shark, Bashlin Pole Lariat, etc. These and other devices are commercially available today. Other devices may become available.

2. Will using two skids (pole straps) satisfy this best practice?

A: NO. One device must be approved Fall Restricting Equipment (i.e., Buckingham Bucksqueeze, Miller Stop Fall, Jelco Pole Choker, Scepter Pole Shark, Bashlin Pole Lariat, etc.).

3. How do I pass over an obstruction on the pole?

A: The Work Positioning Equipment shall be installed over, an obstruction when ascending, prior to disengaging the Wood Pole Fall Restricting Device.

4. What does “Engaged” mean?

A: Engaged is defined as Wood Pole Fall Restricting Device being properly mounted on the wood pole and used as per manufacturer’s instructions at all times while the climber is ascending, descending, changing position and when in the working position while on a wood pole.

5. In the Practice Description, what is meant by “unless Work Positioning Equipment is rigged such that an employee cannot fall more than two feet”?

A: Work Positioning Equipment shall be installed over an obstruction on the pole (telephone attachment, steps, arms, braces, etc.). The distance between the work positioning equipment and the obstruction shall be kept to a minimum so that, it will not permit a worker to fall more than two feet.

6. What is meant by inspection?

A: All poles shall be carefully inspected before climbing to ensure they are in safe condition for climbing.

1. Examples of equipment inspection include but are not limited to:

- Manufacturers’ user instructions.
- Checking of tool holders & loops, snaps, stitching, straps, D rings, and buckles for excessive wear or damage.
- Identifying proper fit and condition of the fall protection equipment.



7. Should fall protection be included in the “Pre-Job Briefing”?

A: Yes, fall protection should be planned and discussed, including appropriate rescue methods that apply to the conditions presented in the field. (Visually determine the climbing route, identify all potential hazards, and determine the control measures to be used).

8. Is Fall Protection Equipment required when transitioning from the pole to another device (i.e. baker board, ladder, etc.)?

A: Yes. Fall Protection Equipment shall be continuous by design (100% fall protection is maintained) for the purpose of transitioning.

9. Is a fall restriction device required during a pole top rescue?

A: Yes, unless existing field conditions exist, that would impact the timeliness (or other critical criteria) of the rescue in such a way, that use of the device would make the rescue procedure ineffective. If an alternate method (due to field conditions) is to be utilized, it must be discussed and documented and assurances made that rescue personnel are qualified to perform the rescue technique defined in the daily pre-job briefing.



BEST PRACTICE: INSULATE & ISOLATE

SUBJECT: I&I TECHNIQUES FOR THE RUBBER GLOVE METHOD.

PRACTICE STATEMENT: The effective use of Isolate and Insulate equipment and procedures to provide the necessary level of safety when qualified line workers are working on energized lines & equipment.

The employer must ensure that any employee who performs energized line work is qualified (See 29 CFR 1910.269) through training and experience to perform the work assigned.

PRACTICE DESCRIPTION: Properly performed Insulate and Isolate (I&I) techniques used in conjunction with the necessary Insulating Personal Protective Equipment (IPPE) allows a qualified line worker to safely work on and around energized equipment and conductors.

I&I Definitions:

1. Insulated: (1) The use of IPE to protect the line worker while gloving energized lines/equipment.
2. Insulating Personal Protective Equipment (IPPE): Rubber Gloves and Sleeves.
3. Insulating Protective Equipment (IPE): rubber blankets, rubber line hose, rubber hoods, plastic covers, etc.
4. Isolate: (A) Physically separated, electrically and mechanically, from all sources of electrical energy. Such separation may not eliminate the effects of induction. (B) Not readily accessible to persons unless special means for access are used.
5. Minimum Approach Distance (M.A.D.): The distances set forth in 29 CFR 1910.269. This distance is measured from the end of the line workers reach or from the end of any conductive object being handled by the line worker.
6. Second points of contact: Accidental/inadvertent contact made between energized conductors or equipment and pathways to ground, which allows for current to pass through the body. Such contact can be made by the workers body or through a conductive tool/object.

I&I Best Practice: Energized Primary Rubber Gloving Method

1. Only qualified line workers shall be permitted to encroach M.A.D. using this Best Practice.
2. When working from an aerial lift the 'Cradle to Cradle' Best Practice shall be observed.



3. Before getting into a position where the qualified line worker can reach into, extend any conductive object into, or extend any other part of the body into the M.A.D., properly rated IPE/IPPE shall be used to insulate/isolate energized conductors and/or other conductive parts at a different potential.
4. For URD equipment the criteria for the 'Lock to Lock' Best Practice shall be observed.
5. Properly rated IPE shall be installed in the order of 'nearest first' and removed in the reverse order.
 - a. Energized or de-energized part(s) may have to be temporarily covered in order to install IPE on all parts necessary to insulate/isolate the part that is to be worked on.
 - b. The part to be worked shall only be uncovered after all IPE has been installed in the work zone that will allow no contact with conductors or equipment at a different potential.
 - c. IPE shall be installed/removed in such a manner so that the worker is not exposed to contact from energized conductors or second points of contact.
 - d. The line worker shall **NEVER** turn their back on exposed energized conductors or second points of contact within M.A.D.

BENEFITS:

- Eliminate contact injuries.
- Eliminate electric arc flash injuries.
- Safely working on energized circuits and maintaining the reliability of the electrical system.

REFERENCES:

- **NJATC** – Effective Cover Up; interactive training.
- **NECA** – Safety Risk Management for the Electrical T&D Line Construction
- **IBEW** – Ten States Safety Manual
- **OSHA** – 1910.269, 1926.950; subpart V
- **ASTM** – F 968-93
- **ET&D Partnership** – Existing Best Practices
- **WISHA-296-45** – Electrical Workers
- **IEEE 100** – The Authoritative Dictionary of IEEE Standards Terms (seventh edition)



Questions & Answers

1. What training and skills must a qualified person (qualified line worker) possess?

A: OSHA 29 CFR 1910.269(a)(2)(i) states:

Employees shall be trained in and familiar with the safety-related work practices, safety procedures, and other safety requirements in this section that pertain to their respective job assignments. Employees shall also be trained in and familiar with any other safety practices, including applicable emergency procedures (such as pole top and manhole rescue), that are not specifically addressed by this section but that are related to their work and are necessary for their safety.

OSHA 29 CFR 1910.269(a)(2)(ii) qualified persons shall also be trained and competent in:

- The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment,
- The skills and techniques necessary to determine the nominal voltage of exposed live parts,
- The minimum approach distances specified in this section corresponding to the voltages to which the qualified employee will be exposed, and
- The proper use [and selection] of the special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools for working on or near exposed energized parts of electric equipment.

Note: For the purposes of this section, a person must have this training in order to be considered a qualified person.

2. How much cover is required if you are working on the center phase of a 3 phase circuit on cross arms?

A: If an employee(s) is working on the center phase on all configurations, all conductors, equipment and paths to ground within **M.A.D.** [including extended reach] effective cover-up (IPE) must be installed for the given voltage being covered.

- The term “effective cover-up” is used to describe the installation of phase-to-phase rated insulating protective cover on energized conductors and/or equipment of different potentials when the lineman is within reaching distance or in areas extended by handling conductive objects.
- The term “extended reach” is used to describe being within five feet of energized conductors and/or equipment or having a conductive object within five feet of energized conductors and/or equipment.



3. If I'm working on the neutral (or at the neutral position) what IPE is required?

A: If an employee(s) is working on a ground or the neutral, all energized phases within **M.A.D.** must be covered with properly rated IPE for the voltage being covered and insulated.

4. What IPPE is required for working on energized 'secondary voltage' circuits?

A: If working from an insulated aerial lift workers shall follow the 'Cradle to Cradle' Best Practice. If working from a structure, rubber protective insulating sleeves are not required when line workers are working circuits with a potential of 600 volts or less if there is no upper arm exposure and the worker will not encroach the **M.A.D.** to any primary conductors or equipment.

5. To work on de-energized parts, can a line worker remove their gloves and sleeves after everything is covered properly?

A: No. Unless an equipotential zone (EPZ) has been established, at the work location, for the protection of that worker, gloves & sleeves shall be worn.

6. How much cover is required when working with non-insulated tools?

A: When working with jumpers, tools, chains, conduit or cable slings, or other conductive devices, the employee's reach is extended the full length of that conductive device. When line workers are handling any such devices (including any tools, material or equipment that the worker may be holding) they shall properly install the properly rated IPE to the extent that all parts within the workers **M.A.D.** work area - that are at a different electrical potential than the part being worked - are insulated with IPE.

M.A.D. shall not be encroached unless:

1. The employee(s) is insulated or guarded from the energized conductor or equipment by use of properly rated IPE insulated rubber gloves/sleeves rated for the phase voltage involved.
2. The energized conductor or equipment is insulated or guarded by properly rated protective equipment.
3. The employee(s) is isolated, insulated or guarded from any other conductive object(s).

7. How should a line worker be positioned when installing IPE?

A: IPE should be installed from below the conductor(s). Correct positioning of the worker when applying rubber goods is of utmost importance. You cannot work near or adjacent to a conductor that is uncovered if it is within your **M.A.D.** until it is covered.



When an employee(s) are able to reach past the IPE, one or more of the following may be occurring:

- The employee(s) may be standing too high on the pole.
- The aerial lift device may be positioned too high or too close.
- The employee(s) may be too close to the conductor.

8. How does a line worker know if the IPE/IPPE is fit for service?

- A:
1. Selection of IPE/IPPE shall be for the circuit voltage class to be worked.
 2. All rubber/ plastic insulated equipment shall be inspected for any damage, wear or contamination that would compromise its ability to insulate or isolate the lineman from different potentials. Applicable service dates shall be observed. If upon inspection insulated protective equipment is found to be defective, the equipment shall be identified and removed from service.
 3. All rubber/ plastic insulated equipment shall be inspected immediately following any incident that could be suspected of having caused damage.

9. What voltage separates distribution voltage from transmission voltage?

A: According to the definition set forth by IEEE 100 7th Edition: Electric power lines which distribute power from a main source substation to consumers, usually at a voltage of 34.5KV or less.



BEST PRACTICE

SUBJECT: Rubber Insulating PPE for the Live Line Tool Method on Distribution Lines

PRACTICE STATEMENT: USE OF RUBBER INSULATING GLOVES AND SLEEVES WHILE PERFORMING DISTRIBUTION POWERLINE TASKS VIA THE LIVE LINE TOOL METHOD.

PRACTICE DESCRIPTION:

A. When working primary voltages aloft:

For the purpose of this document M.A.D. is defined as the Minimum Approach Distance defined by applicable Federal, State or Local regulation. M.A.D. may also be known as “Primary Contact Zone”, “Minimum Working Distance”, “Within Reach”, “Extended Reach”, etc.

This Best Practice only applies to those applications where power-line workers are utilizing the “live line tool work method” aka – “hot sticking.” Workers using the “live line tool work method” (“hot sticking”) use insulating tools designed and intended for use while working on energized equipment and/or conductors. Workers using the “live line tool work method” are not permitted to make direct contact with energized equipment and/or conductors with their hands and are not permitted to be in a position where the worker can reach into, extend any conductive object into, or extend any other part of the body into the M.A.D. as prescribed in applicable Federal, State and Local Regulatory Standards.

It is not intended nor required that the Strategic Partnership *Cradle-to-Cradle Rubber Glove Work Method Best Practice* be applicable when power-line workers are using the “live line tool work method”. The *Cradle-to-Cradle Rubber Glove Work Method Best Practice* applies only when work is to be done utilizing the “rubber glove work method”. When a task requires the worker to reach into, extend any conductive object into, or extend any other part of the body into M.A.D. while using the “live line tool work method,” the use of rubber insulating gloves and/or rubber insulating gloves and sleeves rated the voltage are required to be used as described in this Best Practice”.

Donning of such PPE shall be done in a safe location so that M.A.D. requirements are not violated. This may include repositioning of the aerial lift to its cradled position. It should be noted however, incident investigations have revealed M.A.D. violations have occurred during “live line tool work method” operations. The intent of this Best Practice is to eliminate both M.A.D. encroachment violations and subsequent injuries.

Approved June 3, 2008

Effective Date: December 31, 2008

Live Line Tool Method

1. Rubber insulating gloves and sleeves are not required when working from a position where the worker cannot reach into, extend any conductive object into, or extend any other part of the body into the M.A.D. while using fiberglass insulating live line tools (“hot stick” method).
2. Before getting into a position where the worker can reach into, extend any conductive object into, or extend any other part of the body into the M.A.D., approved protective equipment shall be used to insulate and/or isolate energized conductors and/or parts.
3. Rubber insulating gloves shall be worn when tasks require the worker to reach into, extend any conductive object into, or extend any other part of the body into the M.A.D. when there is no upper arm exposure, even when proper cover is utilized.
4. Insulating rubber gloves and sleeves shall be worn when tasks require the worker be in a position where the worker can reach into, extend any conductive object into, or extend any other part of the body into the M.A.D. when all the above precautions have been taken and upper arm exposure still exists.

BENEFITS:

- Provides specific use requirements that are proven methods for reducing electrical contact injuries and fatalities.
- Provides for uniform use guidelines that can be applied industry wide.

Approved June 3, 2008

Effective Date: December 31, 2008

Frequently Asked Questions
Rubber Insulated PPE and the Live Line Tool Method

FAQ: When operating GOAB switches from the ground do I need gloves and sleeves?

A: No, just rubber insulating gloves are required.

FAQ: What is “upper arm” exposure?

A: When working within reach or the extended reach of the M.A.D. of energized conductors or parts, the area on the arms not protected by rubber insulating gloves that would be covered by rubber insulating sleeves.

FAQ: I’m wearing rubber insulating gloves and the conductor is covered, do I need rubber insulating sleeves?

A: No, if no upper arm exposure. Yes, if upper arm exposure exists.

Insulating rubber gloves and sleeves shall be worn when tasks require the worker to enter the M.A.D. and there is the potential of upper arm exposure regardless of the whether the conductors and equipment are covered. Covering of conductors and equipment add an additional barrier or safe guard but is not considered the primary form of protection for the worker.

FAQ: I am performing “hot stick” work and need to encroach M.A.D. and perform a task by hand. What position do I need to be in to don my rubber insulating gloves or gloves and sleeves?

A: Performing “hot stick” work method does not require the use of rubber insulating gloves or gloves and sleeves. If during this operation a task requires the worker to enter into the M.A.D., rubber insulating gloves and/or gloves and sleeves shall be donned prior to encroaching the applicable M.A.D. The worker shall maintain or move to a safe position so not to encroach M.A.D. during the donning of the PPE.

Frequently Asked Questions
Rubber Insulated PPE and the Live Line Tool Method

General Use of Insulating Rubber Gloves and Sleeves

Note: Although rubber insulating gloves and sleeves are not normally required when utilizing “hot sticking” work method the following is provided for informational purposes only.

1. Insulating Rubber gloves shall never be worn inside out or without leather protectors. They shall be exchanged at any time they become damaged or the employee to whom they are assigned becomes suspicious of their condition.
2. Leather protectors or overgloves shall not be worn except over insulating rubber gloves.
3. Insulating rubber gloves and sleeves rated at the highest nominal anticipated voltage shall be worn any time required by supervision.
4. Dielectric testing dates of insulating rubber gloves and sleeves shall be current.
5. Insulating rubber gloves and sleeves shall be visually inspected and gloves shall be air tested before each use.



Subject: Best Practices Implementation Plan

What	Who	When	Where	How
Communicate BP to EEI members.	EEI	30 days from executive approval date *.	To all EEI members	Via EEI executive member.
Post BP on Partnership recognized websites.	TT4	30 days from executive approval date *.	Appropriate Websites	Electronically available to all partnership members.
Communicate BP to NECA Line Contractors and Chapters	NECA	30 days from executive approval date *.	To all NECA Line Contractors and Chapters	Via NECA executive member.
Communicate BP to Partnership members.	Partner Contractors	30 days from executive approval date *.	In House	Via Company Executive member.
Communicate BP to IBEW Outside Local Unions.	IBEW	30 days from executive approval date *.	To all IBEW Outside Local Unions	Via IBEW executive member.
Introduce BPs to Crews and capture questions and suggestions	District Managers/ Operations Managers/ Safety Supervisors	Within 60 days from the approval date *.	In the Field	Mandatory Safety Meeting
Include BP's in New Hire Orientation.	Respective Managers	Within 60 days from the approval date *.	At the new hire orientation.	Via New Hire Introduction Process

What	Who	When	Where	How	
Pre-requisite Training developed and delivered as necessary.	Qualified training personnel.	Within the time frame defined by the <u>effective date</u> ** set by the Executive Committee.	At necessary locations.	As directed by TT2, or Executive Committee.	
Field Implementation of Best Practices.	All Managers	Within the time frame defined by the <u>effective date</u> * * set by the Executive Committee.	In the Field	Mandatory Safety Meeting; Copy of BPs with Response to Questions and Suggestions Included and all necessary training as applicable to the given Best Practice.	
Best Practice implementation & verification.	Managers and Safety Personnel	Initial and Annually.	In the Field	BP implementation scorecard.	
Update Safety Manuals	Contract Member	ASAP	Within each Partner organization	By their own methods.	
Communicate Response about given Best Practice from Field Ops.	Respective Managers	Initial response ASAP when a Best Practice is accepted by the Executive Committee.	Managers' communication with field ops.	Task Team 3 representative	
Develop Response to Questions/Concerns and Suggestions.	Task Team 3	60 days from the time that questions and suggestions are received by TT 3.	OSP meetings	Response to the Steering Committee, and through OSP communication channels.	

* Approval Date: Date BP approved by the Executive Committee

** Effective Date: The date set by the Executive Committee that an approved Best Practice shall be initiated.



Best Practice Implementation Scorecard

Partnership Member / Company: _____ Date: _____

Best Practice Name: _____

Effective Date of Best Practice: _____

Implementation Schedule

Introduce Best Practice to supervision and crews. Capture questions and suggestions.

Completed in 60 days from effective date:

_____ % Total Completed

_____ # of Management _____ % Completed

_____ # of Supervision _____ % Completed

_____ # of Crew members _____ % Completed

Date to be completed if not 100% : _____

Introduce Best Practice in “New Hire” orientation package.

Completed in 60 days from effective date:

_____ % Total Completed

_____ # of Management _____ % Completed

_____ # of Supervision _____ % Completed

_____ # of Crew members _____ % Completed

Date to be completed if not 100% : _____

Develop and communicate response to questions and suggestions.

60 days from the time that questions and suggestions are received by TT 3.

_____ % Total Completed

_____ # of Management _____ % Completed

_____ # of Supervision _____ % Completed

_____ # of Crew members _____ % Completed



Date to be completed if not 100% : _____

Best Practice prerequisite training completed. (As defined by the Best Practice)

Within the time frame defined by the **effective date*** set by the Executive Committee.

_____ % Total Completed

_____ # of Management _____ % Completed

_____ # of Supervision _____ % Completed

_____ # of Crew members _____ % Completed

Date to be completed if not 100% : _____

Field Implementation of Best Practice

Within the time frame defined by the **effective date*** set by the Executive Committee.

_____ % Total Completed

_____ # of Management _____ % Completed

_____ # of Supervision _____ % Completed

_____ # of Crew members _____ % Completed

Date to be completed if not 100% : _____

Best Practice total compliance field audit.

_____ % Total Completed

_____ # of Management _____ % Completed

_____ # of Supervision _____ % Completed

_____ # of Crew members _____ % Completed

Date to be completed if not 100% : _____



BEST PRACTICE

SUBJECT: Information Transfer

PRACTICE STATEMENT: Ensure that existing characteristics and conditions of electric lines and equipment that are related to the safety of the work to be performed are communicated to the contractor. Ensure Contractor communicates to the Host Employer any unique hazardous conditions presented by the contractors work. Ensure the contractor communicates any unanticipated hazardous conditions found during work back to the Host.

PRACTICE DESCRIPTION: Contractor will ensure that the information (included but not necessarily limited too) listed on the attached form (or other types of records that provide to accomplish the objective of ‘information transfer’) has been collected from the Host employer and communicated to the person in charge of related tasks. The contractor must communicate, within two working days, hazardous conditions to the Host Employer unrelated to the original scope of work that were not communicated by the host during the information transfer and that will not be abated/corrected by the contractor. The form provided is an example of how to document this communication. If the contractors work creates a unique hazardous condition this must be communicated to the host employer.

BENEFITS: Ensures information related to safety of the work is being communicated between Host and Contractor

Frequently Asked Questions
Information Transfer

1. Do I have to use the forms provided?
 - No, you may create your own documentation.
2. Do I have to sign the forms?
 - If you communicate unanticipated hazards back to the Host Employer you should sign the form and ask for their signature.
3. Who keeps the form?
 - The form goes to your contact at the Host Employer. Each party should keep a copy for their records.
4. What if Host Employer refuses to sign the form?
 - Make a note on form of the decision to not sign, make a copy and leave one with Host and keep one for contractor records.



Information Transfer Form

Purpose: To ensure contractor request information from host employer

Nominal voltages of lines and equipment crews will be exposed to:

Assumed Maximum Switching Transient Voltage:

Nominal Voltage (kV)	Maximum per-unit Transient overvoltage

Minimum Approach Distances:

MAD for Qualified Electrical Employees From Uncovered Conductors, Phases, or Equipment		
Voltages Between Phases	Phase to Ground M.A.D.	Phase to Phase M.A.D.

Arc Flash Clothing Requirements:

Work Location (i.e. Overhead Distribution Lines)	Distance to Exposed Energized Parts (i.e. Less than 6 ft)	Hazard/risk Category FR Clothing Required (i.e. Cat 1 (4 cal/cm ²))

Presence of hazardous induced voltages: Yes No



Presence of Protective Grounds and Equipment Grounding Conductors: Yes <input type="checkbox"/> No <input type="checkbox"/>
The locations of circuits and equipment, including electric supply lines, communication lines, and fire-protective signaling circuits:

Known Conditions:

Condition of Grounds (i.e. Defective Substation grounds or grounding conductors, if known, are identified by the presence of a field tag, or in the Substation log book.):
Environmental Conditions Related to Safety (i.e. Any known environmental conditions related to safety are noted in the work package presented at the time of request for proposal.):
Conditions of Poles and Structures (typical pole tags and meanings any additional information needed):

Unanticipated hazardous conditions found during contractors work



If an alternate mode of communication used to transfer this information (text, phone call, verbally, etc.) the condition(s), date and name of person represented the host employer should be documented.

Contractor Employer: _____ Date: _____

Host Employer: _____ Date: _____