



# Electrical Transmission & Distribution Partnership

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## OSHA Construction Outreach Training Course

## Insulate & Isolate Continuing Education

Presenter Guide

-2nd Quarter 2016

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## Introduction

This Insulate & Isolate Refresher course is designed to be a presenter lead process. The presenter may choose to augment the material with videos, handouts or other media to enhance the learning experience. The presenter may want to incorporate visual aids such as rubber gloves, sleeves, line hose etc. to enhance the presentation.

Using this material in combination with practical experience, good presentation skills and knowledge of adult learning techniques, the facilitator has a greater opportunity to effectively deliver the information.

Edgar Dale stated that 2 weeks after a learning event, adult learners remember:

- ✓ 10% of what they read
- ✓ 20% of what they hear
- ✓ 30% of what they see
- ✓ 50% of what they see and hear
- ✓ 70% of what they say
- ✓ 90% of what they say while performing a task

Microsoft® PowerPoint® combined with good instructional skills and instructor/student dialogue work strongly in the fifty to seventy percent range. PowerPoint® presents the information to the attendee and the instructor summarizes the content of the slides. It is critical to engage and involve the attendee in the process. Ask open-ended questions that will elicit conversation and discussion, but be cautious to maintain control of the discussion.

Conversation and scenarios are good, but can cause the discussion to run long. If it seems like the group is losing focus during the course, the facilitator can direct the group back on track by using comments like “This is a great discussion, but let’s get back to the subject at hand”.

Another tool is the “Parking Lot” which is simply a newsprint chart or dry erase board or note pad where the facilitator records questions that are not answered during the meeting and that may require more research. It is vital to capture any ongoing discussions or questions on the “Parking Lot” and follow up when the information is known.

This refresher is to be delivered in the second quarter of 2016. Delivery time is approximately 1 to 1.5 hours in one setting or divided-up into three, twenty to thirty minute settings. It is critical that the facilitator makes him or herself familiar with the material prior to delivery.

At the end of this document is the ET&D Partnership’s Insulate & Isolate Best Practice that the presenter can use in conjunction with the PowerPoint® presentation to augment the materials. In addition to the Best Practice handout, there is an accompanying handout from AB Chance that describes methods to inspect rubber-insulating gloves.

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Slide 1



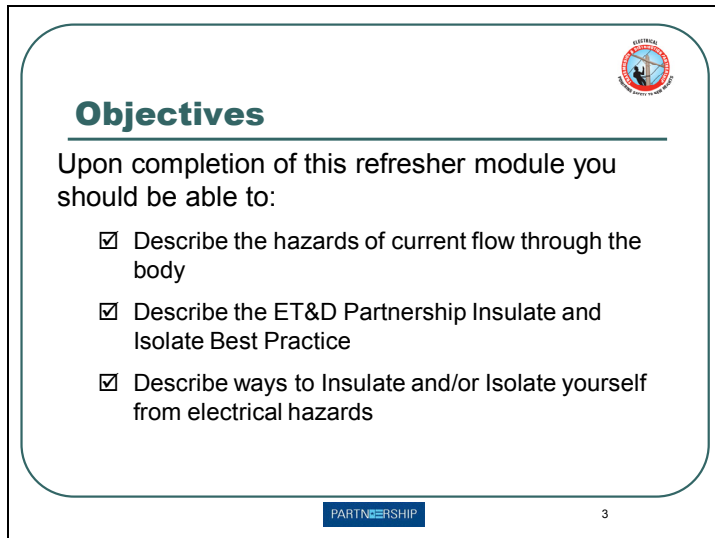
Introduce the module. Discuss that this presentation is intended to be a continuing education training topic related to certain aspects from the ET&D 10-Hour OSHA training class and/or The OSHA Partnership Best Practices.

Slide 2



Strong emphasis. There is always time to do it the right way the first time.

Slide 3



Slide 3 features a white background with a rounded rectangular border. In the top right corner, there is a circular logo with a red border and a blue center, containing a white figure. Below the logo, the word "Objectives" is written in a bold, dark blue font and underlined. The text "Upon completion of this refresher module you should be able to:" is positioned below the underlined title. A list of three objectives follows, each preceded by a checked checkbox symbol. At the bottom of the slide, there is a small blue rectangular box with the word "PARTNERSHIP" in white, and the number "3" to its right.

**Objectives**

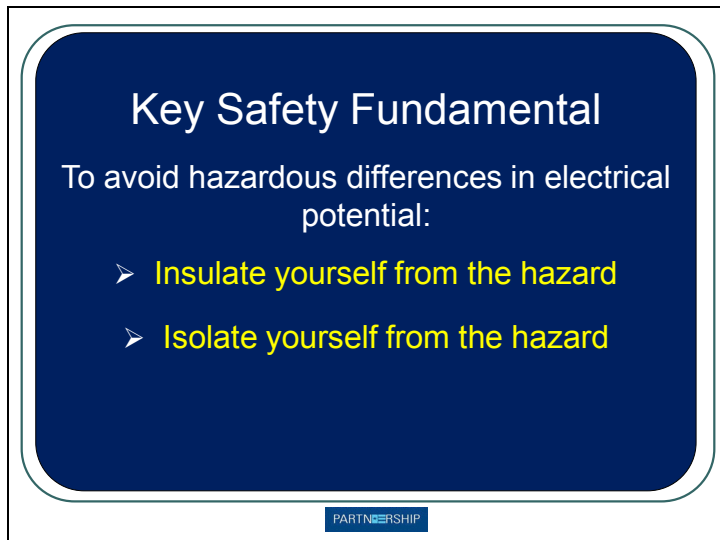
Upon completion of this refresher module you should be able to:

- ☑ Describe the hazards of current flow through the body
- ☑ Describe the ET&D Partnership Insulate and Isolate Best Practice
- ☑ Describe ways to Insulate and/or Isolate yourself from electrical hazards

PARTNERSHIP 3

Discuss the objectives of this course.

Slide 4



Slide 4 has a dark blue background with a white rounded rectangular border. The title "Key Safety Fundamental" is centered at the top in a white, bold font. Below the title, the text "To avoid hazardous differences in electrical potential:" is written in white. Two bullet points follow, each starting with a white right-pointing arrowhead and containing the text "Insulate yourself from the hazard" and "Isolate yourself from the hazard" respectively, both in a yellow font. At the bottom of the slide, there is a small blue rectangular box with the word "PARTNERSHIP" in white.

**Key Safety Fundamental**

To avoid hazardous differences in electrical potential:

- Insulate yourself from the hazard
- Isolate yourself from the hazard

PARTNERSHIP

Explain that the first quarter 2016 topic was grounding and bonding. This second quarter topic is about insulate and isolate and references the ET&D Insulate & Isolate Best Practice. Explain that these methods are intended to provide information that may help employees exposed to protect themselves from hazardous differenced in electrical potential.

Slide 5

**Facts**

Each year workers are killed or seriously injured due to current flow through their body

**Electricity's Effects**

Current (Milliamperes)	Effect
1000	Will light 100-watt bulb
900	Severe burns
300	Breathing stops
200	Heart stops beating
90	Suffocation possible
60	Muscle contraction
30	Cannot let go
20	GFCI will trip
10	Mild shock
5	Threshold of sensation
2	Milliamperes
1	Milliamperes

PARTNERSHIP 5

Explain how increasing levels of current flow through the human body can have devastating results. As little as 1/10 of an ampere or 100 milliamperes can cause the heart to stop or go out of its normal rhythm.

Slide 6

**Insulate Defined**

The IEEE defines Insulated as:

- Separated from other conducting surfaces by a dielectric substance or air space permanently offering a high resistance to the passage of current

PARTNERSHIP 6

The Institute of Electrical and Electronics Engineers (IEEE, pronounced I triple E) is a professional association formed in 1963 from the amalgamation of the American Institute of Electrical Engineers and the Institute of Radio Engineers. Today, it is the world's largest association of technical professionals with more than 400,000 members in chapters around the world.


Explain that insulated (from the IEEE dictionary) means: Separated from other conducting surfaces by a dielectric substance or air space permanently offering a high resistance to the passage of current and to disruptive discharge through the substance or space.

Slide 7

## Insulate Defined

OSHA defines Insulated as:

- Material relied upon to insulate the conductor from other conductors or conducting parts or from ground



**PARTNERSHIP** 7

Explain that insulated (from 29 CFR Subpart V, §1926.968) means: Insulation (cable). Material relied upon to insulate the conductor from other conductors or conducting parts or from ground

Note: When any object is said to be insulated, it is understood to be insulated in a manner suitable for the conditions to which it is subjected. Otherwise, within the purpose of this definition, it is uninsulated. Insulating covering of conductors is one means for making the conductors insulated.


Slide 8

## ET&D Best Practice

Rubber gloves can provide insulation from energized parts

When using the Rubber Glove method:


- The worker always wears insulated rubber gloves and sleeves when working on energized conductors or equipment



**PARTNERSHIP** 8

Explain that when working on primary conductors utilizing the “Gloving Method”, the line worker has a double insulation system built into the safe work practices with a “Best Practices” system.






## Insulate Defined

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The “back-up” systems to a lineman’s insulated rubber gloves are:

- An insulated fiberglass boom
- An insulated platform
- Insulated covering material



PARTNERSHIP      9

Explain that the ET&D Insulate & Isolate Best Practice States the following:

Insulate:

When working on primary conductors utilizing the “Gloving Method”, the line worker has a double insulation system built into the safe work practices with a “Best Practices” system. The worker always wears insulated rubber gloves and sleeves when working on energized conductors or equipment. Rubber gloves and sleeves are a lineman’s first and foremost defense against electrocution. For this reason, rubber gloves and sleeves must always be tested/inspected before use. The “back-up” systems to a lineman’s insulated rubber gloves are:


- ✓ When working out of a bucket, with an insulated fiberglass boom.
- ✓ An insulated platform (baker board).
- ✓ Insulated covering material (line hose, hoods, rubber blankets, etc.) used for insulating adjacent phased or grounds not being worked on in the workers M.A.D. zone (also referred to as “extended reach”)

Slide 10

**Methods to “Insulate”**

Insulating equipment insulates the worker from the energized part

- ✓ Rubber Gloves & Sleeves
- ✓ Line cover
- ✓ Insulating Booms
- ✓ Live-line Tools



PARTNERSHIP 10

Explain that if properly performed Insulate & Isolate (I&I) techniques used in conjunction with the necessary insulating Personal Protective Equipment and other safe work practices will allow a line worker to safely work on and around energized equipment and conductors.

Slide 11

**Rubber Gloves**

Rubber gloves and sleeves are a lineman’s first and foremost defense against electrocution



**For this reason rubber gloves and sleeves must be physically and visually inspected before use!**



PARTNERSHIP 11


① Explain that inspecting the leather protectors is equally as important as inspecting the rubber gloves. Protectors that may contain embedded splinters or metal slivers can damage the rubber glove. In addition, protectors that are soaked or impregnated with a petroleum product can cause damage as well.

Explain that when inspecting rubber gloves and sleeves one must look for any/all the following possible issues:

- ✓ Holes
- ✓ Tears
- ✓ Cuts
- ✓ Punctures
- ✓ Ozone Damage
- ✓ Cracking
- ✓ Current inspection date
- ✓ Deformation
- ✓ Cracking

Any condition that may cause suspicion of the insulating value of the gloves or sleeves.

Slide 12




## Insulating Equipment

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Secure the work area

Remove all hazards


Protect workers from those that cannot be removed



PARTNERSHIP12

Explain that protective cover should be installed to provide protection from accidental contact. All the areas that the conductor tails could contact are protected by line cover material.

Slide 13



## Dielectric Test

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Equipment Type	Inspection Schedule
<b>Rubber Glove</b>	Before first issue then Semi Annually
<b>Rubber Sleeve</b>	Before first issue then Annually
<b>Rubber Blanket</b>	Before first issue then Annually
<b>Rubber Hose, Hoods etc.</b>	Suspect insulating value

These are the minimum requirements required by OSHA. Company policy, client and/or contract requirements may mandate shorter inspection cycles

PARTNERSHIP13

Explain that these are the minimum requirements required by OSHA. Company policy, client, and/or contract requirements may exceed these inspection cycles. Explain that if there is any reason to be suspect that the insulating ability of any rubber protective equipment is suspect, remove the equipment from service, and have it dielectrically tested.


Slide 14




## Live Line Tools

Minimum approach distance must be maintained


- ✓ The worker's hand
- ✓ The hot end of the stick



 14


Explain that the key to live line tools is the minimum approach distance, cleanliness and tested tools. The minimum approach distance shall always be observed. Live line tools are built to a standard of 100,000 volts per foot of fiberglass stick. The OSHA standards require that all sticks pass a wet test.

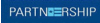
Slide 15



## Live Line Tools


Live-line tools shall be removed from service every 2 years for examination, cleaning, repair, and testing as needed



 15

Explain that all live line tools must be checked for proper test date, physical wear, and be wiped down prior to use.

Slide 16




## Live Line Tools

Each live-line tool shall be wiped clean and visually inspected for defects before use each day

Would you do hot work with dirty sticks?

Is an insulated boom any different?




**PARTNERSHIP** 16



Trigger the animation and this picture will appear.

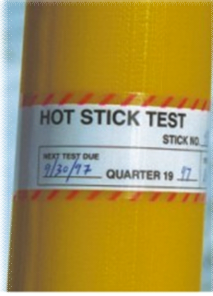
Slide 17



## Live Line Tools

Test the tool's integrity along its entire working length

If the tool is made of fiberglass-reinforced plastic, test its integrity under wet conditions



**PARTNERSHIP** 17


Explain that Live-line tools used for primary employee protection shall be removed from service every 2 years, and whenever required under paragraph (b)(2) of this section, for examination, cleaning, repair, and testing as follows:

Each tool shall be thoroughly examined for defects.

If a defect or contamination that could adversely affect the insulating qualities or mechanical integrity of the live-line tool is found, the tool shall be repaired and refinished or shall be permanently removed from service.

**Second Point of Contact**

If any part of a boom can contact an energized phase, cover the phase




**PARTNERSHIP** 18

This is a great example of covering the area below the bucket. Booms should not contact energized parts.

**Second Point of Contact**

Eliminate second point of contact hazards



**!**

- Cross arm not covered*
- Workers not wearing sleeves*
- Minimum approach distance violation on tie wire*

**PARTNERSHIP** 19



① Explain that in this picture there are numerous safety concerns. The cross arm is not covered. The arm represents a second point of contact. Neither line worker is wearing rubber-insulating sleeves. In addition, the tie wire represents a minimum approach distance problem between the exposed phase and the lineman's body.

The ET&D Best Practice states in regards to Worker Positioning for I&I Techniques:

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 extended reach until it is covered. For determining correct position, an employee can use their rubber-gloved hand as a measuring device. **An employee shall NEVER turn his or her back on an uncovered energized conductor or any energized part of equipment when they are within extended reach of that equipment.**

**Second Point of Contact**

Secure work area both above and BELOW the work area



PARTNERSHIP

20

Explain that no part of an insulated boom should ever contact an exposed energized part. Unless the insulated boom is equipped with an operable leakage monitor there is nothing to indicate that the boom may be leaking current to ground. This is why no one should contact any equipment that has the possibility to become energized.


**Isolate**



PARTNERSHIP

21


Explain that the following section will discuss “Isolate”.




### Generally Speaking

You may consider a system, circuit, and/or apparatus isolated when it is removed from **normal** sources of potential

Remember, the key word here is **normal** source


 22


Explain that even though switches may be opened, jumpers may be lifted, and breakers may be open, none of these will prevent induced voltages from parallel or adjacent energized lines, equipment failure, and/or a lightning strike.

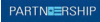


### Isolate Defined

Physically separated, electrically and mechanically, from all sources of electrical energy


 *Such separation may not eliminate the effects of electrical induction!*



 23


Explain that according to the IEEE isolated means: (A) Physically separated, electrically and mechanically, from all sources of electrical energy. Such separation may not eliminate the effects of electrical induction.






### Isolate Defined

Not readily accessible to persons unless special means for access are used




**PARTNERSHIP** 24

Explain that according to the IEEE another aspect of “isolated” means: Not readily accessible to persons unless special means for access are used. In this picture, the two fences (inner and outer) are there to isolate employees on the outside of the fence from contacting people or equipment on the inside of the fence. The dedicated access/egress path shown in the picture limits the entry/exit points.




### Primary Voltage Rule

Never work on more than one phase at a time  
Includes the neutral



Therefore, if you are not working on a adjacent phase or conductor, it should be covered by approved insulating material



**PARTNERSHIP** 25

The ET&D Best Practice defines Isolate as:

A primary rule of line work is that a line worker never works on more than one phase at a time (neutral included). Therefore if you are not working on an adjacent phase or conductor, it should be covered by approved insulating material (line hose, rubber blankets, etc.).

Continued:

The extent of this covering is defined as Extended Reach. Extended reach is a minimum safe work distance determined by a phase-to-phase voltage range.

When working with jumpers, tools, chains, conduit or cable slings etc., the employee's reach is extended the full length of the equipment. When employees are handling any such equipment, they shall barricade, properly cover or maintain a safe working distance that will include any tools, material, or equipment that the worker may be holding.

- **SECONDARY EXTENDED REACH:** Secondary voltage is rated at 600 volts and below. Extended reach in this voltage range is the furthest distance that an employee can reach with either the rubber gloved hand, or tools held in that hand.
  
- **PRIMARY EXTENDED REACH:** Primary voltages typically range between 2.1kV and 35kV, which mandates a minimum safe work distance. This distance is measured from the furthest point an employee can reach to the nearest energized conductor or equipment plus the applicable Minimum Approach Distance (this is based on the voltage classification and phase to ground or phase to phase type of exposure).

When working with any tools or equipment, the employee's extended reach would be the workers reach plus the length of that tool or piece of equipment/material plus the applicable M.A.D. distance.

Slide 26



## Determine Minimum Approach

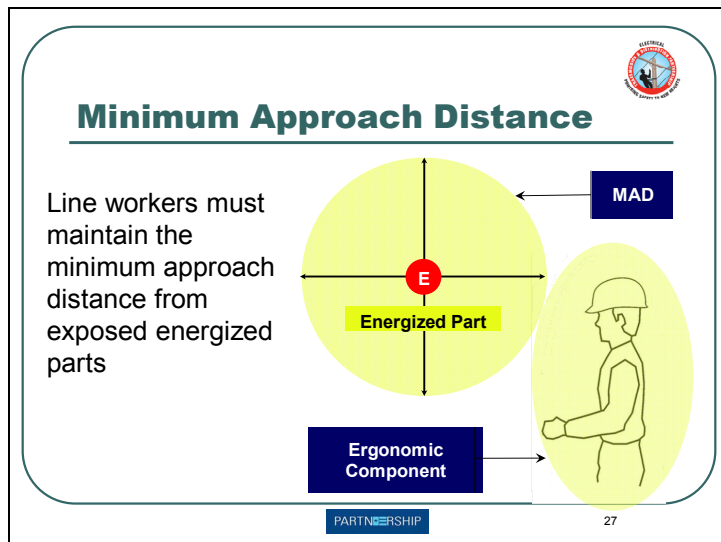
The employer must determine minimum approach distance

- ✓ Engineering analysis
- ✓ Customer requirements
- ✓ OSHA tables



PARTNERSHIP26

Explain that OSHA mandates that depending on the voltage involved, workers must maintain certain minimum approach distances from energized parts.



Explain that the ergonomic component of the minimum approach distance accounts for errors in maintaining the minimum approach distance (which might occur, for example, if an employee misjudges the length of a conductive object he or she is holding), and for errors in judging the minimum approach distance. The ergonomic component also accounts for inadvertent movements by the employee, such as slipping.

In contrast, the working position selected to properly maintain the minimum approach distance must account for all of an employee's reasonably likely movements and still permit the employee to adhere to the applicable minimum approach distance. Reasonably likely movements include an employee's adjustments to tools, equipment, and working positions and all movements needed to perform the work.

For example, the employee should be able to perform all of the following actions without straying into the minimum approach distance:

- ✓ Adjust his or her hardhat,
- ✓ Maneuver a tool onto an energized part with a reasonable amount of overreaching or under reaching,
- ✓ Reach for and handle tools, material, and equipment passed to him or her, and adjust tools, and replace components on them, when necessary during the work procedure.

The training of qualified employees required by the OSHA standard and the job planning and briefing must address selection of a proper working position.


Another point to discuss is the requirement that the employer ensures that workers do not work in a position that if the worker were to slip and/or fall they could contact an energized part.

Slide 28

**Ergonomic Component**

Employees should be able to perform all of the following actions without straying into the minimum approach distance:

- ✓ Adjust his or her hardhat
- ✓ Maneuver a tool onto an energized part with a reasonable amount of overreaching or under reaching
- ✓ Reach for and handle tools, material, and equipment passed to him or her
- ✓ Adjust tools, and replace components on them, when necessary during the work procedure



OSHA logo

PARTNERSHIP

28

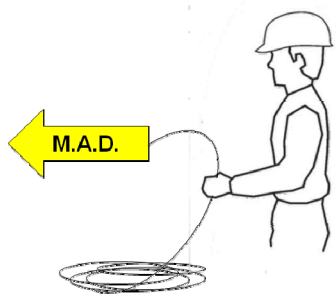
Explain that OSHA requires that the employer shall ensure that no employee approaches or takes any conductive object closer to exposed energized parts than the employer's established minimum approach distance, unless:

- The employee is insulated from the energized part
- The energized part is insulated from the employee and from any other conductive object at a different potential, or
- The employee is insulated from any other exposed conductive object in accordance with the requirements for live-line bare-hand work

Slide 29

**Conductive Objects**

Minimum Approach Distance starts at the end of a conductive object held in the hand




OSHA logo

PARTNERSHIP

29

Discuss that line cover must be installed in such a manner that all exposed energized parts are covered so that conductive objects held by the line worker cannot contact the energized part. Examples are line jumpers, guy wires, cross arms, armor rods etc.



## Review

To protect workers from hazardous differences in electrical potential:

- Insulate yourself from the hazard by using:
  - Cover up, Insulating Gloves & Sleeves, Live Line Tools, Insulated Booms

Isolate yourself from the hazard or Isolate the hazard from you by:

- Removing the energized part from normal sources of potential via Open Switches, Remove Jumpers, Open Breakers, Maintain Minimum Approach Distance, Limited Access (i.e. Barricade).

PARTNERSHIP 30

Review the key learning points.

Simply stated, this I&I best practice means that you may only have one conductor uncovered at any time. Examples of this are, but not limited to:

1. If an employee is working on B phase, the neutral, A and C phase, and all grounds in the M.A.D. zone (extended reach) must be covered with insulating cover approved for the given voltage classification.
2. If an employee is working on a ground or the neutral, all phases within extended reach (in the M.A.D. zone) must be covered with insulating cover approved for the given voltage classification.

NOTE: When isolating your work area, it is important to pay attention to your extended reach.

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## 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.

Properly performed Insulate and Isolate (I&I) techniques used in conjunction with the necessary insulating PPE will allow a line worker to safely work on, and around energized equipment and conductors.

#### **I&I Definitions:**

- Insulate:
  1. When working on primary conductors utilizing the “Gloving Method”, the line worker has a double insulation system built into the safe work practices with a “Best Practices” system. The worker always wears insulated rubber gloves and sleeves when working on energized conductors or equipment. Rubber gloves and sleeves are a lineman’s first and foremost defense against electrocution. For this reason, rubber gloves and sleeves must always be tested/inspected before use. The “back-up” systems to a lineman’s insulated rubber gloves are:
    - When working out of a bucket, with an insulated fiberglass boom.
    - An insulated platform (baker board).
    - Insulated covering material (line hose, hoods, rubber blankets, etc.) used for insulating adjacent phased or grounds not being worked on in the workers M.A.D. zone (also referred to as “extended reach”)
- Isolate:

A primary rule of line work is that a line worker never works on more than one phase at a time (neutral included). Therefore if you are not working on an adjacent phase or conductor, it should be covered by approved insulating material (line hose, rubber blankets, etc.). The extent of this covering is defined as **Extended Reach**. Extended reach is a minimum safe work distance determined by a phase-to-phase voltage range.

### **I&I Definitions (cont):**

- **EXTENDED REACH:** When working near energized conductors or equipment, it is important that a safe working distance be maintained. This distance is determined by the voltage as outlined in safe distance tables, also referred to as M.A.D. (minimum approach distance).

This distance is measured from the furthest point an employee can reach to the nearest energized conductor or equipment. This distance cannot be reduced unless:

1. The employee is insulated or guarded from the energized conductor or equipment by use of approved 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 is isolated, insulated, or guarded from any other conductive object(s).

When working with jumpers, tools, chains, conduit or cable slings etc., the employee's reach is extended the full length of the equipment. When employees are handling any such equipment, they shall barricade, properly cover or maintain a safe working distance that will include any tools, material, or equipment that the worker may be holding.

- **SECONDARY EXTENDED REACH:** Secondary voltage is rated at 600 volts and below. Extended reach in this voltage range is the furthest distance that an employee can reach with either the rubber gloved hand, or tools held in that hand.
- **PRIMARY EXTENDED REACH:** Primary voltages typically range between 2.1kV and 35kV, which mandates a minimum safe work distance. This distance is measured from the furthest point an employee can reach to the nearest energized conductor or equipment plus the applicable Minimum Approach Distance (this is based on the voltage classification and phase to ground or phase to phase type of exposure).

When working with any tools or equipment, the employee's **extended reach** would be the workers reach plus the length of that tool or piece of equipment/material plus the applicable M.A.D. distance.



### **I&I Definitions (cont):**

Simply stated, this I&I best practice means that you may only have one conductor uncovered at any time. Examples of this are, but not limited to:

1. If an employee is working on B phase, the neutral, A and C phase, and all grounds in the **M.A.D. zone** (extended reach) must be covered with insulating cover approved for the given voltage classification.
2. If an employee is working on a ground or the neutral, all phases within **extended reach** (in the M.A.D. zone) must be covered with insulating cover approved for the given voltage classification.

NOTE: When isolating your work area, it is important to pay attention to your extended reach.

### ***Worker Positioning for I&I Techniques:***

1. 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 extended reach until it is covered. For determining correct position, an employee can use their rubber-gloved hand as a measuring device.

### **The following two principles should always be observed when covering conductors:**

1. Never be able to over-reach your rubber gloves. When an employee can reach out towards a conductor, and that conductor is closer than the cuff of the leather protectors one or more of the following may be occurring:
  - The employee may be standing too high on the pole.
  - The aerial lift device may be positioned too high.
  - The employee may be too close to the conductor.
2. The employee shall **NEVER** turn their back on an uncovered conductor or energized part of equipment.

Although qualified employees are allowed to apply rubber goods to energized conductors while positioned on a non-insulated structure, (i.e. poles) it remains, critical the employee does not touch any energized part with their rubber gloves. Therefore proper application technique is important as well as proper positioning technique.

After removing line hose from the hose bag (hose bags shall always be used for transporting line hose up and down the pole) the proper technique for applying a line hose involves grasping the top of the hose with both hands approximately 4 inches from the ends. The inside lip of the hose should be facing you. You should now bow the line hose towards you, and begin sliding it

on the conductor from above the conductor with a down ward pressure, being careful not to touch the conductor with your rubber gloves.

When more than one hose is going to be used, a line hose connector should be used to keep the two neighboring hoses from slipping apart. Connectors are easily installed by placing them over the ends of the two adjacent hoses.

A hood should be used to cover a post insulator. Hoods should be installed after the hoses have been installed on both sides of the insulator. To install a hood, grasp the hood by the back with one hand so that the opening of the hood is facing the employee. Reach under the covered phase and slide the hood onto the insulator.

When covering switches, lightning arresters, dead ends, or other odd shaped electrical items, a blanket(s) or other specialized electrically insulating device should be used. When installing a blanket, use it as a shield between you and whatever you are covering, and wrap the blanket around the object that you are covering. Plastic clothespins should be used to secure the blanket(s) on overhead objects, and URD equipment. When covering URD primary elbows, magnets may be attached to URD transformer cases to help hold a blanket in place.

***\*\*The techniques described are ones that could be used when working off the back of the pole on vertical construction. Adjustments would need to be made for techniques regarding different positioning with respect to differences in construction specifications however, the I&I concepts applied in differing scenarios would remain consistent with what has been previously stated.***

**Care, Maintenance and Use of I&I Equipment:**

1. Selection of properly rated I&I equipment for the voltage class.
2. Insulating Rubber goods vs. Plastic goods. (refer to ASTM F 968-93)
3. Proper inspection.
4. Proper storage and maintenance.
5. Considerations of rubber products vs. plastic.
6. Transportation of I&I equipment from the ground into the work area.
7. Removal of I&I equipment from the work area and transportation to the ground.
8. Re-inspection of I&I equipment prior to returning I&I equipment to its storage location.

**BENEFITS:**

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

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