

# ELECTRICAL SAFETY PRACTICAL SKILLS

Review current OSHA standards that apply to your facility and the effects of the NFPA 70E standards on your high voltage areas.

*Keep yourself and your environment safe with proper personal protective clothing during grounding and switching electrical equipment. Learn the electrical hazards in switch gear rooms as well as, safe switching procedures and documentation of electrical equipment.*

This instructor-led course includes student hands-on participation and learning on a portable 480 volt, cubical style breaker and working assembly. Proper PPE, 40 cal/cm<sup>2</sup> arc flash suit with head covering and Class 2 voltage rated gloves is donned to work with live line tools, such as 4 foot and 8 foot shotguns and non-contact voltage sensing devices.

Training also includes inspecting, sizing and installing grounding jumpers and multi head clusters.

## CLASS FORMAT:

Lab + classroom

The participant is able to “learn-by-doing” in the course; this knowledge can be transferred to the workplace.

## STANDARD CLASS SIZE:

NTT recommends a class of 12 participants to obtain the best results.

## NTT PROVIDES:

- 1-day hands-on instruction
- Textbook, “Industrial High Voltage Electrical Safety Supplement”
- Classroom consumables
- Completion certificates
- Shipping and all instructor fees and travel expenses

## CLIENT PROVIDES:

- Classroom, with easy access, of 750 square feet or greater
- Projection screen, white board and/or flip chart(s)
- A dock facility and/or a forklift to unload the training equipment
- Pallet jack may be needed to move the crate around after it has been unloaded
- The equipment should be placed in the training room for the NTT instructor to test and set up prior to course start

## SHIPPING

1 crate at 54” x 38” x 74” (1,000 lbs.)



# ELECTRICAL SAFETY PRACTICAL SKILLS

## THE DEFINITION OF A QUALIFIED PERSON FROM NFPA 70E:

A Qualified Person shall be trained and knowledgeable of the construction and operation of equipment or a specific work method, and be trained to recognize and avoid the electrical hazards that might be present with respect to that equipment or work method. Such persons shall also be familiar with the proper use of the special precautionary techniques, personal protective equipment, including arc flash, insulating and shielding materials, insulated tools and test equipment. Such persons permitted to work within the Limited Approach Boundary of exposed live parts operating at 50 volts or more shall, at a minimum, be additionally trained in all of the following:

- The skills and techniques necessary to distinguish exposed energized parts from other parts of electrical equipment.
- The skills and techniques necessary to determine the nominal voltage of exposed live parts.
- Approach distances and the corresponding voltages to which the Qualified Person will be exposed.
- The decision-making process necessary to determine the degree and extent of the hazard and the personal protective equipment and job planning necessary to perform the task safely.

## COURSE AGENDA | 1-Day Lab + Classroom

### TRAINING REQUIREMENTS FOR EMPLOYEES WORKING ON HIGH VOLTAGE SYSTEMS AND EQUIPMENT

- Training requirements for over 1000 volts
- Qualified person vs. licensed person vs. experience
- What is "high voltage"
- Retraining of employees to ensure compliance
- Supervisor's duties in the overall training requirements

### OSHA 1910.269 AND 1910.331-335

- Determine when OSHA considers a facility a utility under 1910.269
- Applying NFPA 70E to high voltage systems

## ELECTRICAL HAZARDS IN SWITCH GEAR ROOMS

- Required guarding and labeling of high voltage enclosures and rooms
- Hazards of opening enclosures to check components

## MINIMUM APPROACH FOR OVER 600 VOLTS

- Shock and flash boundaries for over 600 volts
- Evaluations of posted arc flash labels
- How to determine boundaries if no label is applied

## SAFE ELECTRICAL WORK PRACTICES FOR HIGH VOLTAGE SYSTEMS AND EQUIPMENT

- Applying 1910.331-335 to over 600 volts
- Comparing job plans to job briefings to ensure safety
- Utilizing energized electrical permits

## SAFE SWITCHING PROCEDURES AND DOCUMENTATION OF ELECTRICAL EQUIPMENT

- Switching procedure vs. LOTO procedures
- When is personnel protective grounding mandated
- Safe procedures for re-energizing equipment
- Removing and re-installing (racking in and out) of draw out type circuit breakers
- Using visual indicators to ensure position of breaker in cubicle

## APPLYING THE TWO-PERSON RULE

- When does OSHA mandate having a safety watch/work person
- Advantages of always having someone to stand by

## PROPER PPE FOR SWITCHING AND CLEARANCE DUTIES

- ATPV switching jackets and hoods rated 40 cal/cm<sup>2</sup> and higher
- Requirements when sharing PPE
- Field verification of functionality and protection
- Protection from occupational diseases

## SELECTING AND USING TEST EQUIPMENT TO ENSURE ABSENCE OF VOLTAGE

- Use and care of proximity testers
- Three point test method

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## COURSE AGENDA | 1-Day Lab + Classroom, continued

### HOW TO INSPECT AND TEST PROTECTIVE EQUIPMENT

- Visual inspection of PPE and test equipment
- Field testing test equipment to ensure proper function
- Documenting the test results
- Mandated testing intervals and recertification of PPE and test equipment

### PROPER SIZING, INSPECTING AND INSTALLING OF GROUNDING CLUSTERS

- Reviewing the various styles of grounding heads
- Using the right tool for the right job
- Personnel grounding conductor sizing for fault current
- How to install grounding clusters
- Testing and maintenance requirements for personnel grounding sets

### CARE AND PROPER BODY POSITIONING WHEN HANDLING LIVE LINE TOOLS, INCLUDING HOT STICKS

- Proper use of hot sticks
- Proper cleaning and storing of test equipment and PPE
- Body English for switching
- Reviewing/updating the job plan and procedures for maximum safety

# ELECTRICAL SAFETY PRACTICAL SKILLS



Students practice voltage testing, proper barricading techniques, and installing grounds and grounding clusters, on the NTT designed hands-on training equipment. This specially designed equipment allows students to remove and re-install (rack in and out) draw out type circuit breakers. It incorporates a visual indicator to ensure proper position of the breaker in the cubicle. Students wear proper PPE for these tasks and utilize live line tools.



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