

# Electrical Safety Subject Area

Changes and what it means to  
you the ESH Coordinator

# Content Page

The basic elements of an effective Electrical Safety Program are: ( I copied this from DOE Electrical Safety Handbook –Appendix A Model Electrical Safety Program)

- Management must have complete commitment to the program.
- Training must be effective for all degrees of hazard.
- Electrical work practices must be effective and safe.
- Electrical Safety Engineering support must be available.
- Oversight must be effective for all aspects of the Electrical Safety Program.

# Section 1. Implementing Electrical Safety

This Section is the biggest change:

- Added Line Management walkthroughs or field checks of electrical work to:
  - ensure workers are authorized
  - Verify procedure compliance
  - Verify PPE use

(from DOE *Special Operations Report 2006-1* – you know as *Lines of Inquiry*)

- List of electrical safety practices – you can use as inspection criteria and for toolbox talks (sample of items)
  - Inspecting cords & plugs
  - Don't reset circuit breakers
  - Relocatable power taps clear space about electrical equipment
  - If using flammables even occasionally - don't use electrical equipment capable of igniting them
  - Testing GFCI's is going to change to- test prior to use, if continuous use test per manufacturer's requirements (monthly)
  - Report all shocks to supervisor and go to clinic (Static shocks are not considered electrical shock)
- The rest of steps give motherhood responsibilities for different groups, i.e., electrical workers, engineers & designers, ungrounded electrical systems, safety engineers & ESH Coordinators, equipment inspections, and approaching overhead lines

# Section 2. Operating Electrical Equipment

- This was culled from the requirements in 1.5.0 and set on its own to differentiate from working on or near.
- You can find the information that applies for operating circuit breakers, fused switches, MCC starters and meter switches with enclosure covers on and all fasteners in place.

# Section 3. Working On or Near

More concise and gets to the heart of working energized.

Deleted the old “Class A, B, C, & D” hazard categories and replaced with NFPA 70E

Deleted “Generic” Energized Electrical Work Permit and replaced with “Testing, Troubleshooting, & Voltage Measuring” Electrical Work Permit to align with 70E requirements.

Did not make the requirements for working energized any easier- OSHA & 70E do not want people working “HOT”

# Section 4. PPE for Electrical Safety

Made into 2 sections – Shock Hazard and Arc-flash Hazard

- Shock
  - Limited Approach, Restricted Approach, Prohibited Approach boundaries
  - Do not wear conductive articles of clothing nor bring metal rulers or uninsulated tools near energized conductors
  - Rubber Gloves and insulating blankets must be used and maintained as per the exhibit
- Arc-flash
  - If Flash protection boundary is not posted on equipment – use table
  - Prior to operating or working on or near – warn personnel of the hazard and everyone in the boundary wear PPE
  - Minimum PPE is eye protection even if no arc-flash hazard
  - When required, long sleeve shirts must be buttoned at collars and sleeves.
  - ensure F/R clothes are not contaminated or damaged, Supervisors ensure that workers inspect F/R clothes prior to use
  - Verify insulating capabilities of equipment is retained

# Section 5. Design and Installation of Electrical Equipment

- Added corrective actions from assessments
- Electrical equipment and installations are acceptable to the Authority Having Jurisdiction
- Drawings and diagrams must be kept up-to-date
  - Pointed to the Engineering and Design Subject Area
- Arc-flash calculations are performed
- Spelled out clearances required for electrical equipment 600 V or less

# 6. Interlock Safety

- Pretty much the same as 1.5.3, except pointing to Laser Safety Subject Area and Appendix 3A of Radcon Manual which determine the design requirements for Interlock system.
- Also put in link to Means of Egress and Life Safety of Fire Safety Subject Area because of ORPS at JLAB.
- Interlock systems require independent review by a knowledgeable person (Dept/Div's that don't have a knowledgeable reviewer can contact the LESO)
- Control must be maintained over modifications to hardware, software, documentation, test procedures, test documentation, and changes throughout the life of the system
- Testing must be performed with proper PPE

# Exhibits

- Design Guide –old
- Electrical Safe Work Practices –old
- Engineered Voltage Monitoring Solutions for LOTO- new from LESC web site, provides a method of implementing LOTO without requiring the use of PPE
- Interlock safety for Protection of Personnel –old
- Broke-up PPE into 2 exhibits
  1. Operating
  2. Working on
- Review and Approval of Electrical Equipment and Installations – old EEI program
- Selection and use rubber gloves and insulating blankets –new
- Topics to be covered During Departmental Job-Specific Training – old to assist in the site specific training
- Work distances Table (Control Zones) – shock distances only, arc-flash distances based on H/R category not voltage