ARC FLASH SAFETY PLANNING

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Pertinent Laws, Rules, Codes & Standards

- Occupational Safety and Health Administration (OSHA)
  - 29 CFR Part 1910, Subpart S – February 14, 2007
  - References Significant Portions of NFPA 70E
- National Fire Protection Association
  - NFPA 70 – 2017 National Electrical Code (NEC)
  - NFPA 70E – 2018 Standard for Electrical Safety in the Workplace

Definitions

- Electrically Safe Work Condition (ESWC): A state in which an electrical conductor or circuit part has been disconnected from energized parts, locked/tagged in accordance with established standards, tested to verify the absence of voltage, and if necessary, temporarily grounded for personnel protection.

- Energized Work: Work on electrical conductors or circuit parts that have not been disconnected from energized parts.

    - Energized work shall be permitted where the employer can demonstrate that de-energizing introduces additional hazards or increased risk. **Cost and schedule are usually not considered as legitimate justification by OSHA**.
    - Energized work shall be permitted where the employer can demonstrate that the task to be performed is infeasible in a de-energized state due to equipment design or operational limitations.

Responsibilities

- Employer: The employer is responsible for establishing, documenting and implementing the safety-related work practices and procedures required by NFPA 70E.

- Employee: The employee is responsible for complying with the safety-related work practices and procedures provided by the Employer.

- Priority: Hazard elimination shall be the first priority in the implementation of safety-related work practices.

Principles of Work Practices

- Establishing an Electrically Safe Work Condition
- Plan all Tasks
- Anticipate Unexpected Events
- Identify the Hazard and Minimize the Risk
- Protect the Employee
- Use Correct Tools
- Ensure Employee Qualifications and Abilities
- Inspect and Maintain Electrical Equipment

Elements of an Arc Flash Safety Plan

- Documented Training and Awareness (Presentation 2)
- Risk Assessments
  - Shock Risk Assessment
  - Arc Flash Assessment
- Job Safety Plan
- Job Briefing
- Energized Electrical Work Permit

Risk Assessment – Shock Risk Assessment

- Identifies Shock Hazards
- Estimates the likelihood of occurrence of injury or damage to health.
- Determines if additional protective measures are required, such as Personal Protection Equipment to protect against the shock hazard.
- The voltage to which personnel will be exposed.
- The Boundary Requirements
  - Limited Approach Boundary
  - Restricted Approach Boundary

Risk Assessment – Arc Flash Assessment

- Identifies Arc Flash Hazards
- Estimates the likelihood of occurrence of injury or damage to health.
- Determines if additional protective measures are required, such as Personal Protection Equipment to protect against the shock hazard.
- The electrical equipment, including its designed overcurrent protection devices and operating times, operating condition and condition of maintenance.
- The Boundary Requirements
    - Arc Flash Boundary

Job Safety Plan & Briefing

- Job Safety Plan
  - Completed by a qualified Person
  - Documented
  - Job Description and Individual Tasks
  - Identifies Electrical Hazards Associated
  - A Shock Risk Assessment
  - An Arc Flash Risk Assessment
  - Work Procedures, Special Precautions and Energy Source Controls
- Job Briefing: Meeting covering the job safety plan and the energized electrical work permit.

Energized Electrical Work Permit

- Required when work on energized equipment is performed as permitted by NFPA 70E 130.2(A).

- Permit Includes:

  - Description of the Circuit and Equipment
  - Description of the Work Performed
  - Justification Why Work Must be Performed Energized
  - Description of Safe Work Practices
  - Results of Shock Risk Assessment
  - Results of Arc Flash Risk Assessment
  - Means Employed to Restrict Assess to Unqualified Persons from Work Area
  - Evidence of Completed Job Briefing including Job-Specific Hazards
  - Energized Work Approval with Signature(s) by Responsible Manager, Safety Officer or Owner.

Energized Electrical Work Permit (cont.)

- Exemption to Work Permit: Electrical work shall be permitted without an energized work permit if a qualified person is provided with and uses appropriate safe work practices and PPE in accordance with NFPA-70E under the following conditions:
  - Testing, Measuring or Voltage Measurement
  - Thermography, Ultrasound or Visual Inspections, if the Restricted Approach Boundary is not crossed.
  - Access to and egress from an area with energized electrical equipment if no electrical work is performed and the Restricted Approach Boundary is not crossed.