



Westlake Contractor Site Orientation – 2016

This presentation is one of three steps you will take to complete our safety compliance requirements.



Project Manager

The **Project Manager** is the Primary liaison between Energizer and the contractor for matters involving Safety Health and Environmental Affairs.



Any time you have questions or concerns related to safety contact your Project Manager directly.

Parking

The front parking lot is reserved for visitors. Contractor's should park company vehicles (service trucks) in the spaces located behind our shipping dock. Automobiles may be parked in the 'employee' parking lot ("main" parking lot).



Emergency Eye Wash Stations are located throughout the facility



Emergency showers are located throughout the facility



Smoking is permitted only in designated areas your Energizer contact can direct you to the location



Self service café is available – Unless otherwise instructed by your Energizer contact, this is the only area you should use for eating/drinking



Separate restroom facilities are located throughout the facility

Facility Safety Information

- **Report all emergencies by calling x7800**
 - Medical emergencies
 - Chemical spills
 - Non-life threatening fires (incipient stage)
- Fire System Pull Stations will evacuate both buildings and place a call to the fire department. The Fire System should be used only in the event of a fire

EMERGENCY SIGNAL -



Normal business hours from 6:30 – 3:30 pm

BE ON ALERT FOR POSSIBLE BUILDING EVACUATION

Evacuation after hours: exit the building and walk to the back of the facility to report to the security guard.



EVACUATION SIGNAL -



Automated Fire Detection System

- Senses smoke, heat, sprinkler water flow or manual pull station activation

Evacuate through nearest emergency exit:

- **Get away from the building**, cross entrance roadway at minimum
- If in the building *after* 6:30 pm, evacuate through nearest exit, using caution
- Meet guard in south east corner of Employee Parking lot
- Do not walk through the building to guard station
- Do not re-enter the building until the all clear has been given by the fire department or designated building personnel (Incident Commander)

INTRUDER SIGNAL -



Activated:

- If an intruder attempts to or gains access to the building
- If possible, a verbal announcement detailing whereabouts of the intruder will be given

How should your respond?

- Self evacuation OR shelter in place

Since no two intruder events are the same it's not possible to recommend which action is best for any individual.

If you decide to **Self Evacuate** –

- Leave the building, head west and report to the YMCA

If you decide to **Shelter in Place** –

- Find a room in the area with a lockable door
- Lock the door behind you
- Barricade door if possible
- Shut off lights
- Get low
- Shut off cell phone

Await for law enforcement personnel to clear the building. Law enforcement personnel will open a door with a key or a battering ram.

DO NOT OPEN DOOR FOR ANYONE VERBALLY IDENTIFYING THEMSELVES AS POLICE. THEY MAY BE THE INTRUDER.



Safety Glasses / Hearing Protection



Safety glasses are required anytime you leave a main hallway and enter any area that is not an office or public area such as the cafeteria.

Safety glasses must meet national standards and side shields are required.

If you do not have a pair of safety glasses notify your Project Manager.



Hearing protection is required when exposed to noise levels above 85 decibels

Tools that are equipped with lasers must NOT have a rating higher than a Class II. This includes, but is not limited to, pointers and leveling devices.



Tools and equipment must be in good condition and meet all safety requirements



Personal Protective Equipment (PPE)

Personal Protective Equipment must be in good condition and meet all safety requirements

PPE includes all types of equipment used to increase individual safety while performing a potentially hazardous task.



Facility Safety Information

- **Contractor Storage**
 - Energizer may provide areas for storing material & equipment. Each contractor must provide a means to secure such items.
- **Flammable Liquids**
 - Must be stored in an approved container at a safe distance from buildings and must have the approval of the EHI Environmental Coordinator prior to storing.
- **Gasoline or Diesel Engines**
 - Are not permitted to be used in the facility without proper approval (contact your Project Manager).
- **Overhead Work**
 - Is not permitted in occupied areas over EHI employees or other contractors without proper approval (contact your Project Manager).



All Trades and Service Technicians including welders, roofers, painters, construction HVAC, movers, system installers, equipment service technicians, etc. **ARE REQUIRED TO FOLLOW OSHA AND ENERGIZER SAFETY GUIDELINES AND REQUIREMENTS.**



Facility Safety Instructions

- **Guards and Safety Devices**
 - DO NOT OPERATE EQUIPMENT WITHOUT GUARDS IN PLACE. DO NOT OPERATE EQUIPMENT WITH SAFETY DEVICES BYPASSED
- **Working on Moving Equipment**
 - Work on equipment that is moving is STRICTLY PROHIBITED
- **Working on Energized Equipment**
 - You must meet LOTO requirements before work can begin
- **Ladders**
 - Conductive ladders are prohibited from Energizer property. Fiberglass or wood ladders will be used
- **Scaffolding**
 - The use of scaffolding must comply with all standards set forth in OSHA



Facility Safety Information

Roof work requires *fall protection* and a *Hazardous Work Permit* if working within 6ft of the edge of the roof



Torch or any other **open flame** work requires a *Hazardous Work Permit*



Work in a **confined space** requires a *Hazardous Work Permit*

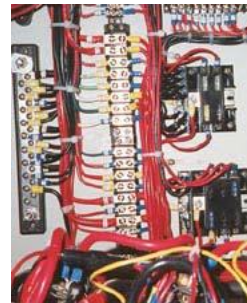
Opening equipment that contains pressurized materials requires a *Hazardous Work Permit*



Moving radioactive material requires a *Hazardous Work Permit*



Operating equipment around power lines requires a *Hazardous Work Permit*



Working on or near **electrical systems** the system must be at *Zero Energy*



Excavating & Trenching requires a *Hazardous Work Permit*

HAZARDOUS CHEMICALS

The Safety Data Sheet, must be prepared and furnished by you and reviewed with the Project Manager for any chemical you would like to bring into our facility.

If the contractor company will need to store chemicals on-site an Energizer file number is required, and the chemical will be added to ENR's chemical data base. All chemicals must clearly display a GHS hazard label.



‘Check all chemicals, do not assume a chemical is safe, *check it out.*’

Facility Safety Instructions

The contractor must advise the Project Manager of any unique hazards and job requirements.

You are required to provide and apply proper PPE for the work you will be performing.

You will now be meeting with your Project Manager to discuss the safety information presented here and in our House Rules





Westlake House Rules for Contractors



Injuries and Illnesses

(Ref: CSCP “Accidents and First Aid”)

1. Contractors / Contractor’s Employee(s) must report work related injuries and illnesses, unsafe conditions, and near misses, immediately to their ECR.
2. In the event of serious injury requiring immediate medical attention, contact Security at ext.7800. The facility medical emergency response team can be summoned in addition to local paramedics.
3. Universal Precautions shall be observed by all contractors to prevent the contact with blood or other potentially infectious materials.

Safety and Health Rules

1. Failure to comply with safety and health rules can lead to disciplinary action up to and including termination of contract.



House Rules – General Policies

Parking

1. The parking lot in front of the building is reserved for visitors.
2. Contractors should park company vehicles (i.e. service trucks) in the spaces located on the South side of the facility near the Contractor's entrance. If parking is unavailable at this location, permission to park elsewhere must be obtained from the Contractor's EHI representative. The Contractor and his employees may park their personal automobiles in the "employees' parking lot."

Security badges

1. Must be worn and displayed at all times so they can be seen readily.
2. EHI will issue Facility badges to Contractor employees and Subcontractor employees. Badges must be appropriately worn at all times while on company property.



House Rules – General Policies

Working Hours

1. EHI and the Contractor must agree on the Contractor's regular working hours.
2. EHI must know and approve of overtime work on weekends, and 2nd or 3rd shifts.
3. A separate list of employees working outside of regular hours must be submitted if requested by EHI and/or if personnel differ from those already submitted by the Contractor.

Storage of Equipment and Materials

1. EHI may provide areas for storing material and equipment. Each Contractor and Subcontractor must protect his/her own materials, equipment, tools, etc. from theft and vandalism.
 - a) The Contractor must cover and protect the facility, and everything located on the construction site or marshalling yards that will be built into the facility, from weather and other damage.
 - b) The EHI designated engineer must agree with the way the Contractor covers and protects these items.
 - c) The Contractor also must provide proper security for those items when EHI does not.



House Rules – General Policies

No Smoking

(Ref: CSCP “Smoking and Open Flames”)

1. Smoking is not permitted in the facility.
2. Smoking is permitted in designated areas outside of the facility

No Alcoholic Beverages or illegal drugs

(Ref: CSCP “Substance Abuse Screening and Background Check)

1. Any Contractor employee taking medication that affects reaction and judgment or causes drowsiness should advise his or her supervisor.

Contractors entrance

1. Contractors must enter the facility through the entrance on the South side of the building (Columbia Road entrance) adjacent to the Receiving docks.
2. The contractor/contractor’s employee(s) will sign a log book and will receive a Contractor’s Badge after completing the sign-in.
3. Your Contractor badge must be worn at all times while in the facility and should be located on the individual so that it is readily visible.
4. The Visitor’s Entrance (lobby) to the facility is to be used for business purposes only.
5. Contractors should bring materials into the facility through the Receiving area ONLY and not through the lobby.



House Rules – General Policies

Rules of Conduct

(Ref: CSCP “Rules of Conduct”)

1. No running

- a) It is also important to stay in designated walkways in the facility. Do not take short cuts or go through restricted areas (offices, laboratories, etc.) to save time. Walk at all times.

2. Obey all warning and safety signs.

- a) Safety signs are posted only when a hazard exists. Any Contractor or Contractor’s Employee who has questions about the hazard should contact his/her EHI representative.

3. No eating or drinking or food preparation in restricted areas.

- a) Snacks and beverages may be consumed in areas of the facility where the potential for contamination or other safety and health rules do not prohibit it.
- b) Permanently restricted areas are posted.
- c) Use good judgment in other areas. If in doubt, consult your EHI representative.
- d) Food or beverage preparation is prohibited except in the cafeteria area.



Facility Services

1. Sprinklers, hydrants, or fire fighting systems should be cut off only when absolutely necessary.
 - a) The Contractor must coordinate cut-offs with EHI well in advance so that EHI's insurance company and local fire department can be alerted.
2. The Contractor is not permitted to dispose of any waste in EHI's storm or sanitary sewer systems.
3. The Contractor must store flammable liquids in an approved container at a safe distance from buildings, must identify contents, and obtain approval from the EHI Environmental Coordinator.
 - a) Liquid storage areas must be diked or otherwise confined to control leaks or accidental spills.
4. No operation of gasoline or diesel engines is permitted in EHI occupied areas without specific written approval. Propane forklifts may be used only in areas approved by EHI.



Work in EHI Occupied Areas

1. **Absolutely no overhead work is permitted in EHI occupied areas over EHI employees.**
 - a) With prior EMB approval, the Contractor should schedule this work on weekends, holidays, or other non-productive periods.
 - b) Areas under the work must be barricaded
2. **The Contractor must not block emergency exits or aisle ways leading to emergency exits.**
 - a) Fire lanes and access to fire fighting equipment must be kept clear.



Penthouse Safety Policy

Penthouse Safety Policy

1. The penthouse safety policy is to be used as a guideline for outside contractors working in the penthouse or other remote locations of the building.
2. Certain rules specifically designed for penthouse purposes do not necessarily apply to all other remote areas since each area contains various conditions that are unique to that area itself.
3. Good judgment and common sense become key factors in providing a safe working environment.
 - a) Even though there may be certain minor exceptions to the policy outlined below, strict adherence to all applicable rules is mandatory.
4. Each person working in the penthouse shall know the location of:
 - a) Nearest telephone
 - b) Area light switches
 - c) Nearest fire extinguishers



Penthouse Safety Policy

Penthouse Safety Policy Continued:

5. When working in the penthouse:
 - a) Employees and contractors who perform work on equipment or repairs to the building in the penthouse area **must work in pairs**. They must **notify security** in what area of the penthouse or roof they will be working, and how long they will be in the area.
 - I. However, in instances where maintenance personnel are only entering the penthouse to observe or check an item, but will not be perform maintenance or repair, they do not have to be accompanied by a second person (i.e. reset a circuit breaker or walk through the main penthouse corridor for observation of the area).
 - II. The rule **requiring notification of security before entering** the area must be followed. The individual is also responsible for **notifying security when he/she leaves** the penthouse. If these conditions are not met, the security office will notify the supervisor in charge of maintenance to check the penthouse area for the individual.



Contractor Specific Rules

Contractor Specific Rules

(Ref: CSCP Contractor Safety Compliance Program)

Work Related to Various Industrial Trades

1. Any work performed that is required to follow OSHA and EHI safety guidelines must be practiced by the contractor.
2. Examples: electrical worker; one who performs service/troubleshooting, wiring, etc. internal to the electrical panel or wireway must comply with OSHA and EHI requirements for Electrical Workers. Other examples of trades people are Welders, Roofers, Painters, HVAC, System installers, Movers, etc

All Contractors are Required To:

1. Review EHI Contractor Safety Compliance Program
2. Review, understand and sign a Confidential Agreement
3. Submit Proof of Proper Insurance



Contractor Specific Rules Continued

Personal Protective Equipment

1. Must be supplied by contractor
2. Safety glasses with side shields are required in all laboratories, pilot lines, the machine shop, mechanical equipment rooms and areas under construction in and on EHI property.
3. Ear plus or muffs are required in areas where noise from equipment or surroundings exceeds 85 dbA. Areas where hearing protection is required are marked. **If the noise generated by the contractor's equipment causes the noise level in an area to exceed 85 dbA, hearing protection in that area is required.**

Eyewash station and safety shower

1. Know the location of the nearest eyewash station and safety shower in the area.
2. In the event of a chemical splash, flush eyes or body part for at least fifteen (15) minutes, then seek medical attention.



Contractor Specific Rules

Equipment and Tool Safety

1. It is the responsibility of the contractor/contractor's employee(s) to ensure that safety devices, on equipment and tools to be used that day, are working properly.
2. All portable hand tools and portable electrical tools such as drills motors, hand grinders, saws, extension cords, etc., are to be visually inspected by the user to assure that the tool is safe to use.

Operating Unguarded Equipment With Safety Devices Bypassed.

1. **DO NOT OPERATE EQUIPMENT WITHOUT GUARDS IN PLACE OR WITH SAFETY DEVICES BYPASSED.**
2. If it is necessary to operate unguarded, energized equipment, with safety devices bypassed or inoperable, written authorization in the form a "HAZARDOUS WORK PERMIT" must be obtained from and approved by EHI management



Contractor Specific Rules

Work on Moving or Energized Equipment (machinery)

1. Work on EHI equipment (machinery) that is moving or energized is **STRICTLY PROHIBITED**.
2. Work on a piece of equipment or machinery can be performed after all energy sources on that machine have been de-energized and locked and tagged using the “Lockout / Tagout” procedures for that piece of equipment.

Working on “De-Energized” Equipment (machinery)

1. When working on “De-Energized” equipment where stored energy in the form of air/water pressure, hydraulic, spring loaded, kinetic (such as fly wheels) electrical or radiation can cause an unexpected energy release Lockout / Tagout Procedures are required.
2. **If Lockout / Tagout is required during the work, Energizer requires a minimum of lock and tag be applied. We do not permit tags only. (Ref: 29 CFR 1910.147)**



Electrical Hazards

General Personal Requirements:

- 1. Alertness:** Employees shall be instructed to be alert at all times when they are working new live parts within the Limited Approach Boundary of energized electrical conductors or circuit parts or where other electrical hazards exist. Employees are not permitted to work within the Limited Approach Boundary on energized electrical conductors or circuit parts or where other electrical hazards exist while their alertness is recognizably impaired due to illness, fatigue, or other reasons.
- 2. Conductive Articles Being Worn:** Conductive articles of jewelry (including body piercing jewelry) and clothing (such as watchbands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, metal headgear, metal frame glasses) shall not be worn within the restricted approach boundary or where they present an electrical contact hazard with exposed energized electrical conductors or circuit parts.
- 3. Clothing Not Permitted:** Clothing made from flammable synthetic materials that melt at temperatures below 315°C (690°F) such as acetate, acrylic, nylon, polyester, polyethylene, polypropylene, and spandex, either alone or in blends shall not be used.
- 4. Emergency Procedures:** Employees shall be trained in safe methods of release of victims from contact with exposed energized conductors or circuit parts.
- 5. Eye Protection:** Employees shall wear protective equipment for the eyes to prevent injury from electric arcs, flashes, or from flying objects resulting from an electrical explosion. Eye protection shall not have exposed metal parts.



Electrical Hazards

General Personal Requirements Cont.

6. **Face Protection:** Employees shall always wear eye protection under face shields or hoods.
7. **Foot Protection:** Employees shall wear electrical hazard or EH rated shoes. They shall maintain this footwear clean and free of any known defects.
8. **Housekeeping:** Employees shall maintain all tools and clothing in a clean and dirt free manner.

General Work Requirements:

1. **Attendants:** If signs and barricades do not provide sufficient warning and protection from electrical hazards, an attendant shall be stationed to warn and protect employees. An attendant shall remain in the area as long as there is a potential for employees to be exposed to the electrical hazards.
2. **Barricades:** Barricades shall be used in conjunction with safety signs where it is necessary to prevent or limit employee access to work areas containing energized conductors or circuit parts or potential energized conductors or circuit parts. Conductive barricades shall not be used where it might cause an electrical hazard. The barricades shall be placed no closer than the Limited Approach Boundary or Arc Flash Boundary, whichever is greater.
3. **Blind Reaching:** Employees shall be instructed not to reach blindly into areas that might contain exposed electrical conductors and circuit parts or potential energized electrical conductors or circuit parts where an electrical hazard exists.
4. **Changes in Scope:** Employees shall be instructed by their manager to be alert for changes in the job task or any task that could lead the person outside of the planned electrically safe work condition that could expose the person to additional hazards that were not part of the original plan



General Work Requirement Cont.

5. **Conductive Cleaning Materials:** Employees shall not use steel wool, metalized cloth, silicon carbide, water, aerosol cleaning fluids, or other electronically conductive cleaning materials inside the Limited Approach Boundary.
6. **Conductive Materials:** Conductive materials, tools, and equipment that are in contact with any part of an employee's body shall be handled in a manner that prevents accidental contact with energized electrical conductors or circuit parts. Such materials and equipment include, but are not limited to; long conductive objects such as ducts, pipes, tubes, conductive hose and rope, metal-lined rules and scales, steel tapes, pulling lines, metal scaffold parts, structural members and chains.
7. **Electrical Clearances:** Always assure that proper depth of working space is maintained and present when conducting voltage or amperage measurements on energized conductors or circuit parts. Working space required by other codes and standards shall not be used for storage. **This space shall be kept clear** to permit safe operation and maintenance of electrical equipment.
8. **Hazardous Classified Locations:** Electrical maintenance conducted in Hazardous or Classified Locations must always ensure that the form of construction, installation, and other maintenance activities being conducted on the equipment uses materials that are suitable for the Hazardous or Classified Location and that the classification is not compromised. All electrical troubleshooting conducted in Hazardous or Classified locations must always adhere to the pertinent JSHA and the procedures required for the area to ensure that the electrical activity does not introduce any additional hazards in itself. All tools and electronics (cell phones etc) shall be rated for the location.



General Work Requirement Cont.

8. **Housekeeping Duties:** Where energized electrical conductors or circuit parts present an electrical contact hazard, employees shall not perform housekeeping duties inside the Limited Approach Boundary.
9. **Illumination** – Employees shall not enter spaces containing electrical hazards unless illumination is provided that enables the employees to preform the work safely. Where there is lack of illumination or an obstruction precludes observation of the work to be performed, employees shall not perform any tasks within the Limited Approach Boundary of energized conductors or circuit parts where an electrical hazard exists.
10. **Qualified Person:** One who has demonstrated skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training to recognize and avoid the hazards involved. Employees who perform maintenance on electrical equipment and installations shall be qualified persons as identified under Electrically Qualified on page 2 of this document. They shall be trained in and familiar with the specific electrical maintenance procedures listed throughout this JSHA.
11. **Portable Ladders:** Portable ladders shall have nonconductive side rails if they are used where the employee or the ladder could contact exposed energized electrical conductors or circuit parts where an electrical hazard exists. Metal or aluminum ladders are not permitted in EHI facilities.
12. **Reclosing Circuits After Protective Device Operation:** After a circuit is de-energized by a circuit protective device, the circuit shall not be manually energized until it has been determined that the equipment and circuit can be safely energized. The repetitive manual reclosing of circuit breakers or re-energizing circuits through replaced fuses is prohibitive.



General Work Requirement Cont.

- 12. Routine Opening and Closing of Circuits:** Only loaded switches, circuit breakers, or other devices specifically designed as disconnecting means shall be used for the opening, reversing, or closing of circuits under load conditions. The routine operation for opening and closing circuits shall be considered, “Normal Operation” and adhere to the following:
- *Always properly interrupt the load.*
 - *Always assume a safe position when energizing or de-energizing an electrical enclosure.*
 - *Always, keep head and torso turned away from the disconnect when energizing or de-energizing.*
 - *Maintain solid balance and footing.*
 - *Position your body such that you are not in front of any part of the enclosure and the disconnect.*
 - *Energizer or de-energize by moving away from the enclosure and the disconnect.*
 - *Stay clear of the electric Arc Blast Zone.*



General Work Requirement Cont.

- 13. Safety Signs or Tags:** Safety signs, safety symbols or accident prevention tags shall be used where necessary to warn employees about electrical hazards that might endanger them.



NORMAL OPERATION OF ELECTRICAL EQUIPMENT:

Normal Operation of electrical equipment while the equipment is energized, shall ONLY be permitted where all of the following conditions are satisfied:

1. The equipment is properly installed in accordance with all applicable codes, standards, and manufacturers instructions,
2. The equipment is properly maintained in accordance with all applicable codes, standards, and manufacturers instructions,
3. The equipment doors are closed and secured properly,
4. All equipment covers are in place and properly secured,
5. There is no evidence of impending failure, meaning that there is no evidence of arcing, overheating, physical damage, loose parts, or impending failure.
6. The equipment is free from debris, or liquids that may affect proper operation or facilitate a shock or arc flash.



Energizer Electrical Work Requirements:

There are three types of electrical work that are permitted to be performed on energized electrical conductors and circuit parts by qualified personnel. This work includes:

- 1. Troubleshooting:** work performed on energized electrical conductors and circuit parts to determine the cause and location of a problem. Work done under this heading must be performed only with suitable test instruments.
- 2. Calibration:** Adjustments performed on electronic components with energized electrical conductors and circuit parts to cause a particular parameter to have a specific value or state.
- 3. Repair Work:** Removing, installing, modifying or repairing electrical components or wiring on energized electrical conductors or circuit parts. **Conducting repair work of any type in an electrical enclosure with energized electrical conductors and circuit parts requires a Hazardous Work Permit.**



Energizer Electrical Work Requirements Cont.

The following electrical work procedures are to be followed when electrical work is performed on energized electrical conductors and circuit parts or in the immediate vicinity of energized electrical conductors and circuit parts:

1. Electrical troubleshooting work may be performed on energized electrical conductors and circuit parts provided that only approved test instruments are used to perform the task and the proper procedures and personal PPE are applied in the troubleshooting process.
 - The operator or supervisor responsible for the equipment, system, and/or operation is to be notified, and approval to proceed granted, prior to the initiation of the troubleshooting work.
 - The operator is to be made aware that the troubleshooting work is to be conducted and the operator agrees not to operate the machine unless instructed to do so by the employee performing the troubleshooting task.
 - Each facility shall identify any specific troubleshooting activities which require a Hazardous Work Permit because of special hazardous conditions.



Energizer Electrical Work Requirements Cont.

2. Calibration work may be performed on energized electrical conductors and circuit parts provided that only approved test instruments are used to perform the task, there are documented procedures for the calibration, and personal PPE are applied in the calibration process.
 - Each type of calibration routine is to have at least a generic JSHA for the calibration being conducted.
 - The operator is to be made aware that the calibration work is to be conducted and the operator agrees not to operate the machine unless instructed to do so by the employee performing the calibration task.
 - Each facility shall identify any specific calibration activities which require a Hazardous Work Permit because of special hazardous conditions.
3. Repair work on energized electrical conductors or circuit parts of any kind is prohibited.
 - Conducting repair work of any type in an electrical enclosure with energized electrical conductors and circuit parts requires an Electrical Energized Hazardous Work Permit (Hot Work Permit).
 - Refer to the Energizer Safety and Health Manual, Hazardous Work Permit for Electrical Work On Energized Electrical Conductors And Circuit Parts in Section 12-D(Electrical Hot Work), for the Hazardous Work Procedures to follow.
4. Electrical work on energized electrical conductors or circuit parts of any kind on systems over 600 volts is prohibited.



Energizer Electrical Work Requirements Cont.

Energized Electrical Conductors and Circuit Parts Work = Electrical Hot (Energized) Work:

By definition, electrical “hot” or energized work is repair work on or in the immediate vicinity of energized electrical conductors or circuit parts. The immediate vicinity is defined as any energized electrical conductor or circuit part that is within the reach of the electrical worker when the work task is being performed. An electrical enclosure is considered “energized” if there are any energized electrical conductors or circuit parts inside the immediate enclosure. *This includes the line-side of conductors if the enclosure has a main disconnect integral to the enclosure.*

REPAIR WORK ON ENERGIZED ELECTRICAL CONDUCTORS OR CIRCUIT PARTS = ELECTRICAL HOT (ENERGIZED) WORK IS PROHIBITED



ESTABLISHING AN ELECTRICALLY SAFE CONDITION:

Verification Process for Voltage Testing Instruments being used to establish an Electrically Safe Condition:

Only contact voltage testing instruments are permitted for verification. Noncontact voltage detectors are not permitted to be used for the process of establishing an electrically safe condition. When contact test instruments are used to test for the absence of voltage on conductors or circuit parts (electrically safe condition), the following three-step voltage measurement process shall be adhered to:

1. **Check the Instrument:** The contact voltage measuring instrument is to be checked for operation on known energized conductors or circuit parts with the meter scale set in the position that will be used for the actual contact voltage measurement.
2. **Measure the circuit being verified:** Without the scale being adjusted, this same contact voltage measuring instrument is then used to verify the presence or absence of voltage in the circuit. Both phase to phase, and phase to ground measurements shall be performed in multi-phase circuits.
3. **Retest the instrument:** Again, without the scale being adjusted, the same contact voltage measuring instrument shall be re-tested on known energized conductors or circuit parts.



Establishing An Electrically Safe Condition Cont.

Process of Achieving an Electrically Safe Work Condition:

An electrically safe work condition shall be achieved and verified with the following process:

1. Verify the EHI Risk Category Classification for the arc-flash hazard and apply the required PPE as indicated by the arc flash label, or labels.
2. Determine all possible sources of electrical supply to the specific equipment. Check applicable up to date drawings and identification tags/labels. Always pay extra attention to yellow and orange wires indicating circuits with an alternate power source per the NFPA79.
3. Test each incoming energized conductor or circuit part, measuring phase to phase and phase to ground, in order to verify they are energized using an adequately rated contact voltage detector. This step is to verify that the source is energized before being interrupted in step 5, which will aid in the identification of the proper circuit. It is acceptable to also utilize this step in determining proper operation of the contact voltage tester.
4. If the incoming conductors or circuit part voltage cannot be verified per step #3 for all voltage sources, then a Hazardous Work Permit will be required before continuing in order to identify, mitigate, and document the hazards of this task. Once the Hazardous Work permit is completed, another known voltage source may be used to check for proper operation of the noncontact voltage tester.



Establishing An Electrically Safe Condition Cont.

5. After properly interrupting the load current, open the disconnection device(s) for each source. Always assume a safe position when de-energizing an electrical enclosure. Maintain solid balance and footing. Always, keep head and torso turned away from the disconnect when de-energizing and position your body such that you are not in front of any part of the enclosure or disconnect. De-energize the enclosure by moving away from the enclosure and the disconnect. Stay clear of the path of any potential Arc Blast, or Arc Blast created projectiles.
6. Wherever applicable, visually verify that all blades of the disconnecting devices are fully open or that drawout type circuit breakers are withdrawn to the fully disconnected position.
7. Apply lockout/tag devices in accordance with the EHI LOTO policy.
8. Use the same adequately rated contact voltage detector set to the same scale to test each incoming previously-energized conductor or circuit part to verify they are de-energized. Test each conductor or circuit part both phase-to-phase and phase-to-ground. Before and after each test, determine that the contact voltage detector is operating satisfactorily. Only contact voltage testing instruments are permitted for verification that each phase conductor or circuit part is de-energized. Noncontact voltage detectors are not permitted to be used for the process of establishing an electrically safe condition.
9. Where the possibility of induced voltages or stored electrical energy exists, the conductors or circuit parts in question shall be properly grounded before touching them.



General Test Instruments and Equipment

Test Instruments

1. Test Instruments, equipment, and their accessories shall be rated for circuits and equipment to which they will be connected.
2. All voltage and current instruments shall have a minimum rating of CAT III @ 600V.
3. Test Instruments, equipment, and their accessories shall be designed for the environment to which they will be exposed and the manner in which they will be used.
4. Only qualified persons shall perform testing work on or near live parts operating at 50 volts up to 600 volts AC.
5. Test instruments and equipment and all associated test leads, cables, power cords, probes, and connectors shall be visually inspected for external defects and damage before each use. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be removed from service, and no employee shall use it until repairs and tests necessary to render the equipment safe have been made.



General Test Instruments and Equipment Cont.

Solenoid Type Voltage Testers: Use of solenoid type voltage testers that activate a spring-loaded solenoid plunger is **prohibited**. These testers will draw a small arc when contact is made with the measured surface.

Probe Exposure: Only the minimum amount of lead should be exposed on contact type instruments. This minimizes the chance of accidentally causing a short circuit if the test lead contacts more than one conductor at a time.

Proximity Voltage Testers: The use of proximity type voltage testers are permitted for general diagnosis. Proximity type voltage testers are **not** permitted for establishing an electrically safe condition. Proximity type voltage testers must carry a CAT III rating @ 600V



GENERAL ELECTRICAL PPE:

Protective Clothing and Personal Protective Equipment for Application with a Flash Hazard Analysis:

Where it has been determined that work will be performed within the restricted approach boundary, the flash hazard analysis shall determine the incident energy exposure presented to the worker (in calories per square centimeter). This incident energy exposure level shall be based on the working distance of the employee's face and chest areas from a prospective arc source for the specific task to be performed. Flame Resistant (FR) or arc-rated Clothing (AR) and Personal Protective Equipment (PPE) shall be used by the employee based upon the incident energy exposure associated with the specific task.

- 1. Body Protection:** Employees shall wear clothing resistant to flash flame, and rated as such wherever there is a possible exposure to an electric arc flash above the level of 1.2 cal/cm^2 , which would cause a second degree burn. Under-layers shall be non-melting with the exception of the small amount of elastic used in waistbands and sock bands. Under-layers may very well increase the arc flash protection to the wearer, however, the arc flash rating of the clothing system shall not change unless all garments are specifically rated to be used together as a system.
- 2. Coverage:** All parts of the body inside the Arc-Flash Protection Boundary shall be protected. Shirt sleeves shall be fastened at the wrists and shirts shall be closed at the neck and tucked into pants or coveralls.
- 3. Fit, Movement and Visibility:** Tight-fitting clothing shall be avoided. Loose fitting clothing provides additional thermal insulation due to air spaces. AR apparel (FR apparel with the proper ATPV rating) shall fit properly such that it does not interfere with the work task. Arc Resistant clothing effectiveness is determined by an ATPV (Arc Thermal Protective Value).



GENERAL ELECTRICAL PPE:

Protective Clothing and Personal Protective Equipment for Application with a Flash Hazard Analysis Cont:

4. **Hand and Arm Protection:** Employees shall wear rubber insulating gloves with leather protectors where there is a danger of hand and arm injury from electric shock and burns due to contact with live parts. Gloves made from layers of flame resistant material provide the highest level of hand protection. Heavy-duty leather gloves also provide good protection. Where voltage-rated gloves are used, leather protectors shall be worn over the rubber gloves. The leather protectors also provide good arc-flash protection for the hands.
 - Rubber gloves with leather protectors **are** required to be worn for all voltage measurements and current measurements where the voltage is greater than 50 volts, or in the proximity of exposed voltages greater than 50 volts
 - Leather protectors shall be worn where required for arc flash protection and anytime the hands are inside the Arc Flash Protection Boundary
5. **Hearing Protection:** Employees shall wear hearing protection whenever working within the arc flash boundary.
6. **Foot Protection:** Leather, Electrical Hazard (EH) rated footwear shall be used to help protect against shock and arc flash hazards.
7. **Eye Protection:** Employees shall wear non-conductive safety glasses with side shields.



GENERAL ELECTRICAL PPE:

Protective Clothing and Personal Protective Equipment for Application with a Flash Hazard Analysis Cont:

- 8. Head, Face, Neck, Chin Protection:** Employees shall wear nonconductive head protection where there is a danger of head injury from electric shock or burns due to contact with energized electrical conductors or circuit parts or flying objects resulting from an electrical explosion. Employees shall wear nonconductive protective equipment for the face, neck, and chin whenever there is a danger of injury from exposure to electric arcs or flashes or from flying objects resulting from an electrical explosion if employees use hair nets, beard nets, or any other coverings such as disposable coveralls (Tyvec coveralls, etc). These items must be arc rated.

*******IMPORTANT*******

1. Clothing consisting of fabrics, zipper tapes, and findings made from flammable synthetic materials that melt at temperatures below 315°C (690°F) such as acetate, acrylic, nylon, polyester, polyethylene, polypropylene, and spandex, either alone or in blends shall not be used or worn.
2. Conductive articles of jewelry(including body piercing jewelry) and clothing (such as watchbands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, metal headgear, or metal frame glasses) shall not be worn within the restricted approach boundary or where they present an electrical contact hazard with exposed energized electrical conductors or circuit parts.
3. Coveralls with a minimum arc-rating of 4 can be worn in lieu of arc-rated pants and shirt provided all other clothing is 100% cotton.
4. Heavy Duty leather gloves are to be made entirely of leather with a minimum thickness of .03(.7mm) inches with no lining or insulation.

NOTE – For a complete list of PPE and equipment standards, please refer to the REFERENCE MATERIAL page at the end of this document





Electrical Hazards

ELECTRICAL PPE MATRIX:

ELECTRICAL PPE	EHI MINIMUM ELECTRICALLY QUALIFIED PPE (formerly category 0) <1.2 CAL/CM ²	EHI RISK CATEGORY 1 WARNING Arc Flash and Shock Hazard Appropriate PPE Required 1.2 – 4 CAL/CM ²	EHI RISK CATEGORY 2 WARNING Arc Flash and Shock Hazard Appropriate PPE Required 4 – 8 CAL/CM ²	EHI RISK CATEGORY 3 WARNING Arc Flash and Shock Hazard Appropriate PPE Required 8 – 25 CAL/CM ²	EHI RISK CATEGORY 4 WARNING Arc Flash and Shock Hazard Appropriate PPE Required 25 – 40 CAL/CM ²	EHI EXTREME HAZARD DANGER Arc Flash and Shock Hazard Appropriate PPE Required > 40 CAL/CM ²
	EYE PROTECTION	✓	✓	✓	✓	✓
HEARING PRTECTION (EAR CANAL INSERTS)		✓	✓	✓	✓	✓
100% COTTON, EH, or NONFLAMABLE UNDERWEAR	✓	✓	✓	✓	✓	✓
LONG SLEEVE SHIRT(ARC RATED)	✓*	✓	✓	✓	✓	✓
LONG PANTS (ARC RATED)	✓*	✓	✓	✓	✓	✓
COVERALL (ARC RATED)					✓	✓
HARD HAT (ARC RATED)		✓	✓	✓	✓	✓
FACE SHIELD (ARC RATED)		✓	✓	✓		
BALACLAVA (ARC RATED)			✓			✓
RATED ELECTRICAL GLOVES WITH LEATHER PROTECTORS	✓	✓	✓	✓	✓	✓
ARC RATED SWITCH HOOD				✓	✓	✓
ARC RATED FLASH SUIT				✓	✓	✓
EH RATED HEAVY-DUTY LEATHER SHOES	✓	✓	✓	✓	✓	✓

Note: ✓* Denotes clothing with a minimum (AR) rating of 4 CAL/CM²



Electrical Hazards - References

- OSHA Occupational Safety and Health Administration CFR 1910.331 - .335
- NFPA 70 The National Electric Code 2014_Edition
- NFPA 70E The Standard for Electrical Safety Requirements for Employee Workplaces 2015 Edition
- NFPA 79 The Electrical Standard for Industrial Machinery 2015_Edition
- NFPA 70B Recommended Practice for Electrical Equipment Maintenance 2013 Edition
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- ANSI Z87.1 Practice for Occupational and Educational Eye and Face Protection, 2010
- ANSI Z89.1 Requirements for Protective Headwear for Industrial Workers, 2014
- ASTM D 120, Standard Specifications for Rubber Insulating Gloves, 2014
- ASTM F 479 Standard Specification for In-Service Care of Insulating Blankets 2011
- ASTM F 496, Standard Specifications for In-Service Care of Insulating Gloves and Sleeves, 2014
- ASTM F 696, Standard Specifications for In-Service Care of Insulating Gloves and Sleeves, 2011
- ASTM F 819-08 Standard Terminology Relating to Electrical Protective Equipment for Workers, 2015
- ASTM F 1116 Standard Test Method for Determining Dielectric Strength of Dielectric Footwear, 2014
- ASTM F 1117 Standard Specification for Dielectric Footwear, 2013
- ASTM F 2178 Standard Test Method for Determining the Arc Rating and Standard Specifications for Face Protective Products 2012
- ASTM F 2412 Standard Test Methods for Foot Protection, 2005, 11
- ASTM F 2413 Standard Specification for Performance Requirements for Foot Protection, 2011
- ASTM F 1506 Standard Specifications for Protective Wearing Apparel for Use by Electrical Workers When Exposed to Momentary Electric Arc and Related Thermal Hazards, 2010a
-
- IEEE The Other Electrical Hazard: Electric Arc Blast Burns by Ralph H. Lee
- IEEE Predicting Incident Energy to Better Manage the Electric Arc Hazard on 600 V Power Distribution Systems Paper No. PCIC-98-36
-
- NFPA Electrical Safety in the Workplace by Ray a. Jones, P.E. and Jane G. Jones
- McGraw Hill Electrical Safety Handbook – Second Edition by John Cadick, P.E. Mary Capelli-ScgellPfeffer, M.D., M.P.A., and Dennis Neitzel, CPE



Contractor Specific Rules

Chemical Hazards

1. Before starting any job, the contractor / contractor's employee(s) must understand the hazards associated with the chemicals that will be used. Any chemicals brought into the facility must be accompanied by an MSDS for the particular chemical. All chemicals must be reviewed through TIC, and EHI hazard label applied.
2. Westlake operates under the OSHA Laboratory Safety Standard for chemical hygiene. After handling chemicals, do not eat, drink or smoke until you have washed your hands.

Mechanical Hoist for Lifting

1. All contractors / contractor's employee(s) are encouraged to use a mechanical hoist for lifting.
2. All operators must be trained and licensed to operate mechanized lifts on EHI property.
3. Exceptions are those instances where, in the contractors / contractor's employee(s) good judgment, the object can be safely lifted without a hoist. If there is any doubt, a hoist should be used.
4. No one should lift over 75 pounds alone. Seek assistance even for lifts of less than 75 pounds, if needed.



Contractor Specific Rules

Handling pallets, With or Without a Load

1. All operators must be trained and licensed to operate mechanized lifts on EHI property.
2. Check for unsafe conditions such as broken boards, pulled nails, cracks, or any other defect.
3. Pallets should be stored flat.
4. Never lean pallets against an object by placing them on an edge.

Use of EHI Equipment and Tools is Prohibited

1. Unless otherwise covered under the “EHI Equipment Loan Agreement”.

Ladders

(Ref: CSCP “Ladders and Stairways”)

1. Conductive ladders are prohibited from EHI property. Ladders and the use of ladders must comply with OSHA regulations.



Contractor Specific Rules

Scaffolding

1. Contractor shall comply with all standards set forth in OSHA 1926.450 through 1926.453
2. Upright scaffolds shall be plumb, secure, and have firm footing. Scaffolds not tied to a structure must be no taller than 4 times the width of the shortest base dimension (including outriggers).
3. Platforms and planks shall be secured or cleated to the scaffold to prevent platform slippage.
4. Platforms shall be at least two planks wide and extend over the supporting surface or edges not less than 12 inches or more than 12 inches. A plank is defined to be at least 11 ½ inches wide.
5. A safe means shall be available for access to work platforms.
6. Scaffolds more than 10 feet above the ground must have guard rails and toe boards on all open sides and ends.
7. Scaffolds 4 to 10 feet in height, having a minimum dimension in either direction of less than 45 inches, shall have standard guard rails installed on all open sides and ends of the platform.



Welding Procedures

(Ref. CSCP “Cutting and Welding”)

1. The welding or metal cutting area must be well ventilated; however, strong drafts directed at the welding work should be prevented.
2. Never support welding or cutting work on compressed air cylinders or containers.
3. Never weld or cut in the vicinity of flammable gases or vapors.
4. Never weld a container or drum which held flammable solutions unless it has been thoroughly steam cleaned.
5. Never use pure oxygen to ventilate a welding area.
6. Never weld closed containers, vessels, tanks, or other hollow parts. Before heating, drill a hole in any suspiciously light part of metal or other materials. A hollow part with no vent hole can explode like a bomb upon heating.



Welding Procedures Cont.

7. Never weld on a concrete surface. Heated concrete can spall, fly and injure the welder.
8. Guard all mechanical transmission pans such as gears, shafts, and couplings which are exposed to welding heat.
9. When welding in confined spaces, such as manholes, take precautions to assure a safe exit. Station an attendant immediately outside the work area to assist as needed. Always leave oxygen and acetylene welding tanks outside of the confined space. (See Hazardous Work Permit for confined spaces.)
10. To prevent movement, securely block any heavy portable welding equipment mounted on wheels. The portable unit must have a charged fire extinguisher mounted to the frame.
11. Provide portable fireproof welding curtains to avoid eye injury to personnel in the area.
12. Remove flammable materials from the area and protect those that cannot be removed.
13. A fire watch, which meets EHI approval, must be maintained.



Wearing Hard Hats

1. Required in penthouse chases
2. Required in all posted areas
3. Required depending on activity as indicated by EHI representative
4. Required in barricaded areas when overhead work is being conducted.



Asbestos (29 CFR 1926.1101 and 1910.1001)

Confined Space Entry (29 CFR 1910.146)

Electrical Safety (29 CFR 1910 Subpart S and 1926 Subpart K and 1910.331-1910.333)

NFPA 79 Electrical Standards for Industrial Machinery

NFPA 70E Standard for Electrical Safety in the Workplace

Excavations / Trenching / Shoring (29 CFR 1926.650-.652, Subpart P)

Fall Protection (29 CFR 1910.66 and 1926.500-.503)

Fire Prevention and Protection (29 CFR 1910 Subpart L and 1926 Subpart F)

Hazardous Energy Control (Lockout / Tagout) (29 CFR 1910.147)

Hot work Permits (29 CFR 1910.252)

Identification of Hazardous Materials (29 CFR 1910.1200 and 1926.59)

Personal Protective Equipment (29 CFR 1910 Subpart I)

Respiratory Protection (29 CFR 1910.134 and 1926.103)

Scaffolds and Ladders (29 CFR Part 1926 Subpart L and 1910 subpart D)



QUESTIONS?

