

### **POLICY**

E & B Oilfield Services Inc. has implemented this policy to ensure no employee is exposed to electrical hazards in the workplace. Kirk Duncan is the supervisor responsible for ensuring the following policy for controls, training, personal protective equipment (PPE), and safe work practices is enforced.

### **RESPONSIBILITIES**

Electrical safety is a responsibility shared between the Company and its employees.

#### **Employer Responsibilities**

E & B Oilfield Services Inc. is responsible for:

- Ensuring that only qualified employees perform electrical work on de-energized equipment that has been locked-tagged out
- Training employees in how to perform a job hazard analysis
- Responding quickly to eliminate workplace hazards
- Ensuring all equipment is kept in good repair
- Ensuring employees follow safe job procedures
- Reviewing job hazard analysis whenever there is a significant change to any element of the job or there has been an injury or illness

#### **Safety Committee Responsibilities**

It is the responsibility of the safety committee to:

- Assist in ensuring lockout/tagout is followed when necessary
- Assist in training employees to recognize and control workplace hazards
- Monitor the workplace for hazards
- Encourage employees to report hazards
- Implement appropriate controls
- Ensure corrective action is taken promptly

#### **Employee Responsibilities**

All employees are expected to:

- Perform electrical work on de-energized equipment that has been locked-tagged out only if qualified
- Qualified employees are responsible for maintaining qualifications
- Follow safe job procedures
- Report hazards to a supervisor immediately

## **TRAINING**

Kirk Duncan will ensure all employees exposed to work involving electrical systems or energized parts will be trained in and familiar with the safety-related work practices required by OSHA regulation and the National Fire Protection Association (NFPA) 70E that pertain to their respective job assignments.

Kirk Duncan will ensure that all employees exposed to work involving electrical systems will be trained in, and familiar with, the following:

- The requirements of NFPA 70E Standards for Electrical Safety in the Workplace.
- The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment.
- The skills and techniques necessary to determine the nominal voltage of exposed live parts.
- The clearance distances specified in §1910.333(c) and the corresponding voltages to which the qualified employee will be exposed.

The training required will be of the classroom or on-the-job type. The degree of training provided will be determined by the risk to the employee based upon the NFPA 70E - Standards for Electrical Safety in the Workplace.

- The training requirements apply to employees who face a risk of electric shock that is not reduced to a safe level by the electrical installation requirements.
- Other employees who also may reasonably be expected to face comparable risk of injury due to electric shock or other electrical hazards will also be trained.
- Employees will be trained in and familiar with the safety-related work practices required that pertain to their respective job assignments.
- Employees who are not qualified employees will also be trained in and familiar with any electrically related safety practices not specifically addressed by regulations, but which are necessary for their safety.

Qualified employees (i.e., those permitted to work on or near exposed energized parts) will, at a minimum, be trained in and familiar with the following:

- The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment.
- The skills and techniques necessary to determine the nominal voltage of exposed live parts.
- The specified clearance distances and the corresponding voltages to which the qualified employee will be exposed.
- Qualified employees whose work on energized equipment involves either direct contact or contact by means of tools or materials will also have the required training.

## **SAFE PRACTICES**

- Only qualified employees are authorized to perform work, service, or maintenance on energized electrical parts or systems at E & B Oilfield Services Inc.
- Non-qualified employees are prohibited by Company Policy from working on or near exposed energized electrical circuits or systems. If a work task requires unqualified employees, any exposed electrical systems will be de-energized, and lockout/tagout procedures adhered to per Company Policy before unqualified employees are allowed access to the work areas. Non-qualified employees will be trained in the recognition and avoidance of electrical hazards in the work area.
- Safe work practices will be employed to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts when work is performed near or on equipment or circuits that are or may be energized. The specific safe work practices will be consistent with the nature and extent of the associated electrical hazards.
- Live parts to which an employee may be exposed will be de-energized before the employee works on or near them, unless Kirk Duncan can demonstrate that de-energizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations. Live parts that operate at less than 50 volts to ground need not be de-energized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.
- Live parts of electrical equipment operating at 50 volts or more will be guarded against accidental contact by cabinets or other forms of enclosures that only qualified employees will be able to access. Other examples might include:
  - Enclosing in a room or vault.
  - Screens or partitions.
  - Elevations of at least eight (8) ft.
- Entrances to rooms and other guarded locations containing live parts will be marked with conspicuous warning signs forbidding unqualified employees to enter.
- If the exposed live parts are not de-energized for reasons of increased or additional hazards or infeasibility, other safe work practices will be used to protect employees who may be exposed to the electrical hazards involved. Such work practices will protect employees against contact with energized circuit parts directly with any part of their body or indirectly through some other conductive object. The work practices that are used will be suitable for the conditions under which the work is to be performed and for the voltage level of the exposed electric conductors or circuit parts.
- NFPA 70E and OSHA require employers to prove that working in a de-energized state creates more or worse hazards or is not practical because of equipment design or operational limitations. Examples include working on life-support systems; emergency alarm systems; ventilation equipment for hazardous locations; work on circuits that are part of a continuous process that cannot be completely shut down.
- All electrical conductors and equipment will be acceptable, certified, listed, labeled, or otherwise determined to be safe by a qualified testing laboratory.
- Electrical equipment will be free from recognized hazards that are likely to cause death or serious physical harm to employees.
- Electrical equipment will not be used unless the manufacturer's name, trademark, or other descriptive marking is placed on the equipment providing voltage, current, wattage, or other ratings, as necessary. The marking will be of sufficient durability to withstand the environment involved.

- Sufficient access and working space will be provided and maintained about all electric equipment to permit ready and safe operation and maintenance of such equipment.
- When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, will be guarded.
- Equipment intended to break current will have an interrupting rating at system voltage sufficient for the current that will be interrupted.
- By partitions or screens, only qualified employees will have access to the space within reach of the live parts. Any openings in such partitions or screens will be so sized and located that people are not likely to come into accidental contact with the live parts or to bring conducting objects into contact with them.
- The employer will establish and implement an assured equipment grounding conductor program on construction sites covering all cord sets, receptacles which are not a part of the building or structure, and equipment connected by cord and plug which are available for use or used by employees.
- Barriers or other means of guarding will be provided to ensure that workspace for electrical equipment will not be used as a passageway during periods when energized parts of electrical equipment are exposed.
- Worn or frayed electric cords or cables will not be used.
- Extension cords will not be fastened with staples, hung from nails, or suspended by wire.

### **Work Activities Specific for up to 600V**

- The qualified person shall use appropriately rated voltage sensing device and other direct reading instruments only on low voltage (i.e. DMM is used =<600 V) circuits. When determining the appropriate voltage sensing device, the qualified person shall consider both the static voltage and the spike voltage that could be encountered while performing the task. The appropriately rated (i.e. IEC) device shall then be used to complete the activity. Do not use direct reading instruments when the voltage range is unknown.
- Qualified persons shall not attach clips or clamps to energized buses because of potential arc flash.
- Do not modify or defeat over-current protection of circuits and conductors, even temporarily, unless permitted by a specific and documented safety risk assessment (SRA).
- Do not replace fuses when either side is energized

### **De-Energized Electrical Equipment**

- All de-energized exposed parts will be treated as live throughout the work process.
- Conductors and parts of electric equipment that have been de-energized but have not been locked out or tagged will be treated as energized parts.
- While any employee is exposed to contact with parts of fixed electric equipment or circuits which have been de-energized, the circuits energizing the parts will be locked out or tagged or both.

### **LockoutTagout Procedures**

Kirk Duncan will maintain a written copy of these procedures and will make them available for inspection by employees and by the Assistant Secretary of Labor and the authorized representatives.

De-energizing equipment:

- Safe procedures for de-energizing circuits and equipment will be determined before circuits or equipment are de-energized.

- The circuits and equipment to be worked on will be disconnected from all electric energy sources. Control circuit devices, such as push buttons, selector switches, and interlocks, may not be used as the sole means for de-energizing circuits or equipment. Interlocks for electric equipment may not be used as a substitute for lockout and tagging procedures.
- Stored electric energy which might endanger employees will be released. Capacitors will be discharged, and high capacitance elements will be short-circuited and grounded, if the stored electric energy might endanger employees.
- Stored non-electrical energy in devices that will reenergize electric circuit parts will be blocked or relieved to the extent that the circuit parts will not be accidentally energized by the device.

Application of locks and tags includes:

- A lock and a tag will be placed on each disconnecting means used to de-energize circuits and equipment on which work is to be performed. The lock will be attached so as to prevent employees from operating the disconnecting means unless they resort to undue force or the use of tools.
- Each tag will contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.
- If a lock cannot be applied, or if Kirk Duncan can demonstrate that tagging procedures will provide a level of safety equivalent to that obtained by the use of a lock, a tag may be used without a lock.
- A tag used without a lock will be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by use of a lock. Examples of additional safety measures include the removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device.
- A lock may be placed without a tag only under the following conditions: only one circuit or piece of equipment is de-energized; the lockout period does not extend beyond the work shift; employees exposed to the hazards associated with reenergizing the circuit or equipment are familiar with this procedure.
- Verification of de-energized condition requirements will be met before any circuits or equipment can be considered and worked as de-energized.
- A qualified employee will operate the equipment operating controls or otherwise verify that the equipment cannot be restarted.
- A qualified employee will use test equipment to test the circuit elements and electrical parts of equipment that employees will be exposed to and will verify that the circuit elements and equipment parts are de-energized. The test will also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage backed even though specific parts of the circuit have been de-energized and presumed to be safe. If the circuit to be tested is over 600 volts, nominal, the test equipment will be checked for proper operation immediately after this test.
- Reenergizing equipment requirements will be met before circuits or equipment are reenergized, even temporarily.
- A qualified employee will conduct tests and visual inspections to verify that all tools, electrical jumpers, shorts, grounds, or other devices have been removed, so that the circuits and equipment can be safely energized.
- Employees exposed to the hazards associated with reenergizing the circuit or equipment will be warned to stay clear of circuits and equipment.
- Each lock and tag will be removed by the employee who applied it or under his or her direct supervision. However, if this employee is absent from the workplace, then the lock or tag may be removed by a qualified employee designated to perform this task provided that: Kirk Duncan

ensures that the employee who applied the lock or tag is not available at the workplace. Kirk Duncan will also ensure that the employee is aware that the lock or tag has been removed before he or she resumes work at that workplace.

- There will be a visual determination that all employees are clear of the circuits and equipment.

### **Energized Electrical Equipment**

Only qualified employees may work on electric circuit parts or equipment that has not been de-energized under the previously stated procedures. Such employees will be capable of working safely on energized circuits and will be familiar with the proper use of special precautionary techniques, PPE, insulating and shielding materials, and insulated tools.

- If work is to be performed under or near overhead lines, the lines will be de-energized and grounded, or other protective measures will be provided before work is started. If the lines are to be de-energized, arrangements will be made with the employee or organization that operates or controls the electric circuits involved to de-energize and ground them. If protective measures, such as guarding, isolating, or insulating, are provided, these precautions will prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.
- Qualified employees installing insulating devices on overhead power transmission or distribution lines should refer to § 1910.269 for specific work practices, as this type of work is not covered by § 1910.332 through § 1910.335, and unqualified employees are prohibited from performing this type of work.
- When an unqualified employee is working in an elevated position near overhead lines, the location will be such that the employee and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the following distances:
  - For voltages to ground 50kV or below – ten (10) ft.
  - For voltages to ground over 50kV – ten (10) ft. plus four (4) inches for every 10kV over 50kV.
- When an unqualified employee is working on the ground in the vicinity of overhead lines, the employee may not bring any conductive object closer to unguarded, energized overhead lines than the distances given above. For voltages normally encountered with overhead power line, objects which do not have an insulating rating for the voltage involved are considered to be conductive.
- When a qualified employee is working in the vicinity of overhead lines, whether in an elevated position or on the ground, the employee may not approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in Table S-5 unless:
  - The employee is insulated from the energized part (gloves, with sleeves, if necessary, rated for the voltage involved are considered to be insulation of the employee from the energized part on which work is performed).
  - The energized part is insulated both from all other conductive objects at a different potential and from the employee.
  - The employee is insulated from all conductive objects at a potential different from that of the energized part.

**Table S-5 - Approach Distances for Qualified Employees - Alternating Currents**

Voltage range (phase to phase)	Minimum approach distance
300V and less	Avoid contact
Over 300V, not over 750V	1 ft. 0 inches
Over 750V, not over 2kV	1 ft. 6 inches
Over 2kV, not over 15kV	2 ft. 0 inches
Over 15kV, not over 37kV	3 ft. 0 inches
Over 37kV, not over 87.5kV	3 ft. 6 inches
Over 87.5kV, not over 121kV	4 ft. 0 inches
Over 121kV, not over 140kV	4 ft. 6 inches

- Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines will be operated so that a clearance of ten (10) ft. is maintained. If the voltage is higher than 50kV, the clearance will be increased four (4) inches for every 10kV over that voltage. However, under any of the following conditions, the clearance may be reduced.
- If the vehicle is in transit with its structure lowered, the clearance may be reduced to four (4) ft. If the voltage is higher than 50kV, the clearance will be increased four (4) inches for every ten (10) kV over that voltage.
- If insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.
- If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified employee, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in Table S-5.
- Employees standing on the ground will not contact the vehicle or mechanical equipment or any of its attachments, unless:
  - The employee is using protective equipment rated for the voltage.
  - The equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than permitted below.
- If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, employees working on the ground near the point of grounding may not stand at the grounding location whenever there is a possibility of overhead line contact.
- Additional precautions, such as the use of barricades or insulation, will be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few ft. or more outward from the grounding point.

**Illumination**

- Employees may not enter spaces containing exposed energized parts, unless illumination is provided that enables the employees to perform the work safely.
- Where lack of illumination or an obstruction precludes observation of the work to be performed, employees may not perform tasks near exposed energized parts.
- Employees may not reach blindly into areas which may contain energized parts.

**Confined Spaces**

- When an employee works in a confined or enclosed space (such as a manhole or vault) that contains exposed energized parts, E & B Oilfield Services Inc. will provide protective shields,

protective barriers, or insulating materials as needed, and the employee will use them to avoid accidental contact with these parts.

- Doors, hinged panels, and the like will be secured to prevent their swinging into an employee and causing the employee to contact exposed energized parts.

### **PPE**

- Face shields, aprons, and rubber gloves will be provided for employees handling acids or batteries.
- Facilities for quick drenching of the eyes and body will be provided within 25 ft. (7.62 m) of battery handling areas.
- In work areas where the exact location of underground electric powerlines is unknown, employees using jackhammers, bars, or other hand tools that may contact a line will be provided with insulated protective gloves.

### **Conductive Materials and Equipment**

Conductive materials and equipment that are in contact with any part of an employee's body will be handled in a manner that prevents them from contacting exposed energized conductors or circuit parts.

- If an employee will handle long-dimensional conductive objects (such as ducts and pipes) in areas with exposed live parts, Kirk Duncan will institute work practices (such as the use of insulation, guarding, and material handling techniques) which will minimize the hazard.

### **Portable Ladders**

Portable ladders will have non-conductive siderails if they are used where the employee or the ladder will contact exposed energized parts.

### **Conductive Apparel**

Conductive articles of jewelry and clothing, such as watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear, may not be worn if they might contact exposed energized parts. However, such articles may be worn if they are rendered nonconductive by covering, wrapping, or other insulating means.

### **Housekeeping**

- Where live parts present an electrical contact hazard, employees may not perform housekeeping duties at such close distances to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided.
- Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and silicon carbide, as well as conductive liquid solutions) may not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.
- Working spaces, walkways, and similar locations will be kept clear of cords so as not to create a hazard to employees.

### **Interlocks**

Only a qualified employee following the requirements of this section may defeat an electrical safety interlock, and then only temporarily while he or she is working on the equipment. The interlock system will be returned to its operable condition when this work is completed.

## Utilities Grounding and De-energization

E & B Oilfield Services Inc. has designated Kirk Duncan to communicate with the system operator to de-energize certain sections of line or equipment that will be worked on. When multiple employees are working on the same lines or equipment, each employee will coordinate their activities. Activities will include ensuring all means through which known sources of electricity may be supplied are open, that network protectors are maintained to immediately trip open if closed when a primary conductor is de-energized, and that all manual overrides are disabled.

All electric energy sources (e.g., switches, disconnectors, jumpers, and taps) that are supplied to lines and equipment will be de-energized.

All electric energy sources will be made inoperable unless the design does not permit, in which case tagging will be in place to indicate employees are working.

Temporary protective grounds will be placed in a manner that E & B Oilfield Services Inc. can demonstrate employees will not be exposed to hazardous differences in electric potential. Guidelines on how the employer can establish the equipotential zone can be found in CFR 1910.269 Appendix C.

The American Society for Testing and Materials Standard Specifications for Temporary Protective Grounds to Be Used on De-Energized Electric Power Lines and Equipment, ASTM F855-09, provides guidelines for protective grounding equipment. These include that grounding equipment will be capable of conducting the maximum fault current that will flow at the point of grounding until the fault can be cleared, as well as having an ampacity greater than or equal to No. 2 AWG copper. IEEE also provides guidelines for selecting and installing protective grounding equipment in 1048-2003.

Grounds are permitted to be removed temporarily during tests. If this happens, each employee will:

- Use insulated equipment
- Isolate themselves from any hazards
- Use any other means necessary to protect themselves in case the previously grounded lines and equipment become energized

## ELECTRICAL EMERGENCY RESPONSE STRATEGIES

Electrical emergencies pose significant risks in the workplace, including electric shock, arc flash, burns, and fire. A well-structured emergency response strategy is essential to protect workers and minimize damage. This section outlines key components of an effective electrical emergency response plan, aligned with OSHA standards.

### Access to First Aid

Immediate medical response is critical in electrical emergencies. OSHA requires employers to ensure that medical personnel are readily available for advice and consultation.

Key practices include:

- **First Aid Training:** Employees, especially those working with or near electrical systems, should be trained in CPR and basic first aid. Training should include how to respond to electrical burns, cardiac arrest, and shock.
- **First Aid Kits:** Kits must be easily accessible, clearly marked, and regularly inspected. They should include burn dressings, sterile gauze, antiseptics, and automated external defibrillators (AEDs).

- **Emergency Contact Protocols:** A list of emergency contacts, including local emergency services and on-site medical personnel, should be posted in visible locations.

### Access to Emergency Equipment

Proper emergency equipment can prevent injuries and save lives during electrical incidents. OSHA mandates that employers provide and maintain appropriate protective equipment.

- **Personal Protective Equipment (PPE):** Workers must have access to insulated gloves, arc-rated clothing, face shields, and dielectric footwear. PPE should be inspected before each use.
- **Fire Extinguishers:** Class C fire extinguishers (for electrical fires) must be available in areas with electrical equipment. Employees should be trained in their use.
- **Emergency Shutoff Devices:** Clearly labeled and easily accessible shut-off switches or circuit breakers should be installed to quickly de-energize equipment in an emergency.

### Emergency Action Plans (EAP)

An Emergency Action Plan is a written document required by 29 CFR 1910.38 that outlines procedures for reporting emergencies, evacuating personnel, and accounting for all employees after an evacuation.

- **Evacuation Routes and Assembly Points:** Clearly marked evacuation routes and designated assembly areas must be established and communicated to all employees.
- **Roles and Responsibilities:** Assign emergency response roles, such as evacuation coordinators, first aid responders, and fire wardens.
- **Drills and Training:** Conduct regular emergency drills to ensure all employees understand procedures and can respond quickly and safely.

### Hazard Identification and Risk Assessment

Before an emergency occurs, employers must identify potential electrical hazards and assess the risks.

- **Job Hazard Analysis (JHA):** Conduct JHAs for tasks involving electrical systems to identify risks and determine appropriate controls.
- **Labeling and Signage:** Use standardized labels and warning signs to indicate high-voltage areas, arc flash boundaries, and PPE requirements.
- **Lockout/Tagout (LOTO):** Implement LOTO procedures to ensure equipment is de-energized and cannot be restarted during maintenance or emergencies. LOTO is considered a first line of defense, if not feasible only perform energized electrical work with an approved energized electrical work permit.

### Communication and Coordination

Effective communication is vital during an emergency.

- **Alarm Systems:** Install audible and visual alarms to alert workers of electrical hazards or the need to evacuate.
- **Two-Way Communication:** Equip emergency response teams with radios or other communication devices to coordinate actions during an incident.
- **Coordination with Local Authorities:** Establish relationships with local fire departments, emergency medical services, and utility companies to ensure a coordinated response.

### Post-Incident Response and Reporting

After an electrical emergency, a structured response helps prevent recurrence and supports recovery.

- **Incident Investigation:** Conduct a thorough investigation to determine the root cause and implement corrective actions.
- **Medical Follow-Up:** Ensure affected workers receive appropriate medical evaluation and treatment.
- **Documentation and Reporting:** Maintain records of the incident, response actions, and any injuries, as required by OSHA.

### Continuous Improvement

Emergency response strategies should be reviewed and updated regularly.

- **Audit and Review:** Periodically audit emergency procedures and equipment to ensure compliance and effectiveness.
- **Feedback Mechanisms:** Encourage employee feedback after drills or real incidents to identify areas for improvement.
- **Training Updates:** Refresh training programs to reflect changes in equipment, procedures, or regulations.

