Electrical Contractor Safety Manual

Template -- customize all bracketed and shaded fields for your company

Manual identification

Company name: _____ Manual date: _____

Headquarters address: _____ Manual version: _____

Safety officer: _____ Direct line: _____

HR / compliance contact: _____ Emergency line: _____

This Safety Manual is the primary reference for all electrical safety requirements, procedures, and standards at this company. All employees are required to read, understand, and comply with the contents of this manual. Questions should be directed to the Safety Officer.

Chapter 1 -- General safety rules

The following rules apply to all employees, at all times, on all job sites. These rules are non-negotiable and violations are subject to immediate disciplinary action.

- Report to work fit for duty. Working under the influence of alcohol or drugs is prohibited.
- Wear required PPE at all times in designated hazard areas. No exceptions.
- Follow all OSHA standards, company procedures, and supervisor instructions.
- Never bypass or defeat safety devices, guards, interlocks, or warning systems.
- Stop work immediately if an unsafe condition is identified. Report it before continuing.
- Keep work areas clean and free of slip, trip, and fall hazards at all times.
- Perform a pre-task hazard analysis before starting any new task or entering a new work area.
- Know the location of the nearest first aid kit, eyewash station, and emergency exit.
- All electrical incidents and near-misses must be reported to the supervisor same shift.
- Do not perform work outside your training and qualification level. Ask for help.

Chapter 2 -- Electrical hazard recognition

All qualified electrical workers must be able to identify and assess the following categories of electrical hazard before beginning work:

Shock and electrocution hazards

Electrical shock results from current passing through the human body. As little as 50-100mA can cause ventricular fibrillation. Factors determining severity include: current magnitude, path through the body, duration of exposure, and the body's electrical resistance (reduced by moisture). All conductors at 50V or greater must be treated as energized until proven de-energized.

Arc flash hazards

An arc flash is a rapid release of energy caused by an electrical fault between energized conductors or from a conductor to ground. Arc flash can produce temperatures exceeding 35,000 degrees Fahrenheit and blast pressures capable of causing fatal burns and injuries. Arc flash risk assessment per NFPA 70E is required before any work within the arc flash boundary of equipment operating at 50V or greater.

Voltage classes and corresponding hazard levels

Voltage Class	Voltage Range	Primary Hazards
Low voltage	50V -- 1,000V	Shock, electrocution, arc flash (Cat 1-2 typical)
Medium voltage	1kV -- 69kV	Electrocution, severe arc flash (Cat 3-4+), blast

High voltage	> 69kV	Electrocution, catastrophic arc flash, blast, RF
< 50V	Below 50V	Shock hazard generally reduced; assess per conditions

Chapter 3 -- Personal protective equipment

PPE must be selected based on a job hazard analysis and, for arc flash, an incident energy analysis or arc flash PPE category determination per NFPA 70E. PPE is the last line of defense -- engineering and administrative controls must be implemented first wherever feasible.

Minimum PPE for all electrical work (50V or greater)

- Safety glasses with side shields meeting ANSI Z87.1 (all electrical work)
- Insulated tools rated for the voltage class being worked on (all electrical work)
- Rubber insulating gloves with leather protectors -- class selected per voltage present
- Flame-resistant (FR) or arc-rated clothing -- no synthetic fabrics (melts on skin)
- Hard hat (Class E -- rated for up to 20,000V) on all construction and outdoor sites
- Hearing protection within the arc flash boundary of equipment above 125A available fault current
- Arc-rated face shield or arc flash suit hood when working within the arc flash boundary

Rubber insulating glove inspection and care

Gloves must be inspected before each use by inflating them and checking for holes, cracks, embedded objects, or degradation. Any glove showing defects must be removed from service immediately. Gloves must be stored in a protective bag, away from heat, UV light, and ozone sources. Gloves must be retested by an approved lab at intervals not exceeding 6 months per OSHA 29 CFR 1910.137(b)(2)(ii).

Arc-rated clothing requirements

Arc-rated (AR) or flame-resistant (FR) clothing must meet NFPA 70E and ASTM F1506. The arc thermal performance value (ATPV) or energy breakopen threshold (Ebt) of the clothing must meet or exceed the calculated incident energy at the working distance. Layering of AR/FR garments is permitted to achieve higher arc ratings. Clothing must be inspected regularly and laundered per manufacturer instructions.

Chapter 4 -- Lockout / Tagout procedures

This chapter implements the company LOTO program in compliance with OSHA 29 CFR 1910.147 and NFPA 70E Article 120. LOTO is required before any servicing or maintenance of equipment where the unexpected energization, startup, or release of stored energy could cause injury.

LOTO sequence -- step by step

- Step 1 -- Notify: Inform all affected employees that equipment will be shut down.
- Step 2 -- Identify: Locate and identify all energy isolation points for all energy types present.
- Step 3 -- Shut down: Stop equipment using the established normal stopping procedure.
- Step 4 -- Isolate: Open, close, or block each energy isolating device.
- Step 5 -- Apply locks: Each authorized worker applies their own personal lock and tag to each isolating point. Locks must be individually keyed -- master keys are not permitted during active LOTO.
- Step 6 -- Release stored energy: Bleed pneumatic/hydraulic lines, discharge capacitors, block gravity loads, release spring tension.
- Step 7 -- Verify: Test with a calibrated voltage tester on the line and load side of the isolation point. Attempt to start equipment to confirm de-energized state.

LOTO restoration sequence

- Ensure all tools, materials, and workers are clear of the equipment.
- Remove all LOTO devices -- each worker removes only their own lock.
- Notify all affected employees before re-energizing.

- Restore energy sources in the correct sequence.
- Document LOTO activity in the job record.

Company LOTO procedure document reference:

Chapter 5 -- Arc flash protection

Arc flash protection is required for all qualified persons working on or near exposed energized electrical conductors or circuit parts operating at 50V or greater. The arc flash program follows NFPA 70E Article 130.

Arc flash risk assessment requirements

Before any employee approaches within the arc flash boundary, a risk assessment must confirm: the arc flash boundary distance, the incident energy at the working distance, and the PPE category or minimum arc rating required. For systems with available fault current exceeding 10kA or nominal voltages above 600V, a site-specific incident energy analysis (per IEEE 1584) is required.

Arc flash boundary distances

The arc flash boundary is the distance at which incident energy equals 1.2 cal/cm2 (second-degree burn threshold). No unprotected person may enter the arc flash boundary. The boundary must be established by incident energy analysis or by using the arc flash PPE category tables in NFPA 70E 130.7(C)(15). Boundary distances must be marked or communicated during pre-job briefings.

Equipment labeling

All electrical equipment operating at 50V or greater, except cord-connected equipment, must be field-marked with arc flash hazard information per NFPA 70E 130.5(H). Labels must include: nominal system voltage, arc flash boundary, available incident energy, minimum PPE required, and working distance. Labels must be kept legible and replaced when damaged.

Chapter 6 -- Working safely with electrical systems

Energized work permit requirements

Work on energized electrical conductors or circuit parts is prohibited unless de-energizing creates a greater hazard or is infeasible. When justified, an Energized Electrical Work Permit must be completed per NFPA 70E 130.2(B). The permit must be reviewed by the Safety Officer and approved in writing by management before work begins. A second qualified worker must be present at all times during energized work.

Working in wet or damp locations

Additional precautions are required in wet or damp environments: GFCI protection on all 120V circuits; dry, insulated work surfaces; rubber insulating gloves upgraded one class above minimum requirement; enhanced inspection of all insulating tools and PPE for moisture or damage before use.

Confined space electrical work

Electrical work in permit-required confined spaces requires compliance with OSHA 29 CFR 1910.146 (general industry) or 1926 Subpart AA (construction) in addition to all electrical safety requirements. Atmospheric testing, attendant requirements, entry permit, and rescue procedures must be in place before entry.

Chapter 7 -- Tools, ladders, and elevated work

Insulated tool requirements

All hand tools used within the restricted approach boundary of exposed energized electrical parts must be insulated for the voltage class present. Tools must meet ASTM F1505 and bear the appropriate voltage rating marking. Inspect tools before each use for cuts, cracks, or damaged insulation. Damaged insulated tools must be removed from service immediately.

Ladder safety

Non-conductive (fiberglass) ladders are required for all electrical work where contact with energized parts is possible. Aluminum and wooden ladders are prohibited near exposed energized conductors. Ladders must be inspected before each use; defective ladders must be tagged out of service. Extension ladders must be secured at the top and set at a 4:1 angle. Three points of contact must be maintained while climbing.

Fall protection

Fall protection is required for all work at heights of 6 feet or more above a lower level on construction sites (OSHA 1926.501) and 4 feet in general industry (OSHA 1910.23). Acceptable systems include guardrails, personal fall arrest systems, or safety nets. Aerial lifts must not be moved horizontally with workers in the bucket unless rated for that operation.

Chapter 8 -- Emergency procedures

Electrical contact emergency response

If a worker contacts energized electrical equipment: (1) Do NOT touch the victim -- you may become a victim yourself. (2) Disconnect power immediately if safely possible. (3) Call 911. (4) If trained and power is confirmed off, begin CPR if the victim is unresponsive and not breathing. (5) All electrical contact incidents require immediate medical evaluation even if the victim appears uninjured.

Company emergency contact (24-hr): _____

Nearest hospital / urgent care to primary service area: _____

Arc flash injury response

Arc flash burns require immediate medical attention. Do not attempt to remove clothing that is adhered to skin. Cool burns with cool (not cold) water only if less than 10% body surface area is affected. Call 911 for all significant arc flash injuries. Secure the scene and preserve evidence for the incident investigation.

Chapter 9 -- Incident investigation and reporting

All electrical incidents -- including near-misses -- must be investigated to identify root causes and prevent recurrence. Investigation must begin within 24 hours of any recordable incident. The investigation shall address: direct cause, contributing factors, root causes, and corrective actions with assigned owners and target dates.

Regulatory reporting requirements:

- Fatalities: report to OSHA within 8 hours
- Inpatient hospitalization of 1 or more workers: report within 24 hours
- Loss of an eye or amputation: report within 24 hours
- OSHA Form 300 entry: within 7 calendar days of learning of a recordable injury

OSHA 300 log administrator: _____

OSHA area office contact: _____

Chapter 10 -- Training records and documentation

Training records must be maintained for each employee and must include: employee name, training topic, date completed, trainer name, and result. Records must be retained for the duration of employment plus 3 years. OSHA Form 300 logs must be retained for 5 years. Incident investigation reports must be retained for 5 years.

Training records maintained by: _____

Training records storage location: _____

Employee acknowledgment

By signing below, I acknowledge that I have received, read, and understand the contents of this Electrical Contractor Safety Manual. I agree to comply with all policies, procedures, and requirements described herein. I understand that violations of safety rules may result in disciplinary action up to and including termination.

Employee name (print): _____

Employee signature: Date:

Job title: _____

Department / crew: _____

Safety officer / supervisor signature: Date: