

NFPA 70E

GUIDE TO POLICIES AND BEST PRACTICES





TABLE OF CONTENTS

OVERVIEW 2

Policies 3

Best Practices..... 5

SAMPLE POLICIES..... 8

NFPA 70E 8

Qualified Person 10

Energized Electrical Work 12

Establishing an Electrically Safe Work Condition – LOTO 14

Personal Protective Equipment (PPE)..... 15

NFPA 70E Training 19

Safe Work Practices 21

SAMPLE BEST PRACTICES 23

Job Briefings – Justified Energized Electrical Work 23

Lockout/Tagout 25

Use of Test Instruments (Such As Voltage Testing)..... 30

Temporary Power 32

OVERVIEW

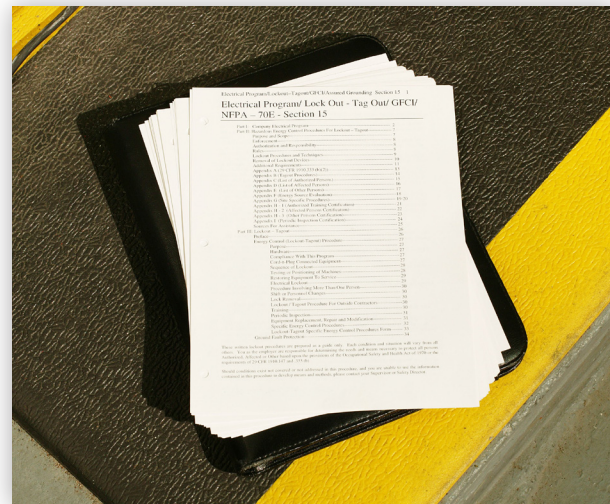
NFPA 70E Standard for Electrical Safety in the Workplace provides the guidelines by which employers can provide a safe work environment for their employees relative to the hazards associated with electrical energy. But, the existence of guidelines or rules alone will not prevent injury. There must be an understanding of the requirements and comprehensive compliance. This comes with management commitment and effectively communicating employee expectations. Employers must make employees aware of the company's commitment to the rules, their obligation as part of that and the practices to be used. To do this a company must establish written policies and best practices.

The following manual reviews the elements of policy and best practice development using NFPA 70E as an example. The basic policies and practices needed for NFPA 70E compliance are outlined here in the print version of the manual. The digital version of this manual includes the outline format as seen here, as well as a copy of the complete policy or best practice. This will enable companies to use the printed manual to effectively communicate NFPA 70E policies and procedures, then build upon them to create custom or additional safety policies and practices to establish a comprehensive program.



POLICIES

Policies are clear, simple statements of how a company will conduct its services, actions or business. They don't need to be long or complicated – a couple of sentences may be all that is needed for some policy areas. They reflect the values, approaches and commitments of the company and its culture. Typically, there will be an overarching policy then separate policies for different aspects of your program. For example, this manual begins with a policy on NFPA 70E compliance then address each of the aspects of the standard.



TO DEVELOP EFFECTIVE POLICIES:

- Include key stakeholders, management, employees and customers,
- Organize by brainstorming or small work group discussions
- Identify policies needed (Compare to templates available and what similar organizations have)
- Identify any unique elements of your company that need to be included in the policy
- Draft, refine and write the policies. Include a:
 - Title (name, version number and/or dates, and who authorized it)
 - Purpose statement (why the policy exists and what is to be achieved)
 - Description/Responsibilities (One or two sections outlining the details of the policy and what each needs to do)
- Have policies approved and endorsed by leadership (i.e. a Board, President or CEO)
- Promote policies, look for feedback and refine your policies as needed
- Ensure all employees sign off on policies when hired and any changes are made to a policy



BEST PRACTICES

Practices or procedures go hand-in-hand with policies. They are the detailed steps by which compliance is achieved. They should be “Best Practices” for your company. Typically, a “Best Practice” is considered to be a technique or method that has proven to be more effective at delivering a particular outcome than any other. They must take into consideration the nuances individual company cultures can have on the implementation of a practice. Each company must decide the specific elements of a practice which work best for it.

THE STEPS FOR DEVELOPING A BEST PRACTICE ARE AS FOLLOWS:

1. Identify problem areas
2. Identify other companies or industries that have similar processes
3. Identify the leaders in these areas
4. Survey companies for measures and practices and/or review accepted industry standards.
5. Determine which practices have proven results.
6. Implement the practices

TO ENSURE THE PRACTICES ADOPTED ARE A BEST PRACTICES FOR A COMPANY THE FOLLOWING QUESTIONS SHOULD BE USED.

- Can the conditions needed for adoption be adequately defined?
- Are the practices feasible to perform?
- Are they currently being done by others?
- Can all comply?
- Can the benefits be clearly and quantitatively defined?

A BEST PRACTICE SHOULD INCLUDE:

- Title (name, version number and/or dates, and who authorized it)
- Statement (Identifies what the practice addresses)
- Description (Offers detailed procedures of the practice)
- Benefits (Identifies the positive outcomes of the practice)
- References (lists any references used in development of the practice or that offer additional information on the practice)

TITLE: NFPA 70E POLICY

PURPOSE: Ensures management buy-in to ensure that employees perform electrical work in a safe, healthful and productive manner in compliance with NFPA 70E. Identify and clarify company requirements and expectations for electrical work to be performed in accordance with the current edition of NFPA 70E. (Choose an implementation date. This will give you time to update your written programs and provide all necessary retraining on changes in the standard.)

DESCRIPTION:

All work shall be performed in accordance with company policies and procedures

The company intends to follow all

- applicable requirements found in OSHA regulations
- consensus standards such as NFPA 70E, The Standard for Electrical Safety in the Workplace
- best practices as identified within the electrical industry.

Only qualified persons shall perform justified energized electrical work and they shall be provided with

- initial training,
- evaluations, field audits
- proper Personal Protective Equipment (PPE) and
- any other required training to successfully complete his or her task including specialized and refresher training

Management and employees are responsible for safety. The company shall implement and enforce all applicable requirements contained in NFPA 70E.

Nonconforming employees and supervisors will be subject to disciplinary action and possible dismissal.



RESPONSIBILITIES:

Employer will

- provide a practical safe working area for employees relative to the hazards arising from the use of electricity
- provide all the training required by NFPA 70E and OSHA regulations
- provide specific Personal Protective Equipment, (PPE) to personnel exposed to electrical hazards and ensure that it is in an acceptable condition and being worn by all workers when necessary.
- create rules and policies that affect workers and ensure all are adhered to.



Employees will

- abide by all the rules and regulations created and provided for their protection.
- wear all PPE provided by the employer.
- be familiar with and implement all safe work practices developed and implemented for their own safety.
- take responsibility for their own actions and strive to keep the workplace free from any additional hazards.



Customers should

- follow all applicable NFPA 70E and OSHA regulations
- ensure any employer, contractor and worker that performs work on their facility be provided with all known information necessary to stay safe.
- make known any specific hazards that may be present in the workplace that could affect a worker.

TITLE: QUALIFIED PERSON POLICY

PURPOSE: Justified energized work, use of test instruments, performing shock risk assessments and arc flash risk assessments as well as other tasks requiring special skills and knowledge shall be performed only by a qualified person. This policy mandates that in all cases before work is assigned, qualified status is established, the employer will determine that a person has demonstrated skills and knowledge in the construction and operation of equipment or a specific work method before work begins.

Note: NFPA 70E Qualified Person. One who has demonstrated skills and knowledge related to the construction and operation of electrical equipment and installations and has received safety training to identify the hazards and reduce the associated risk.

DESCRIPTION:

Qualified persons shall be familiar with:

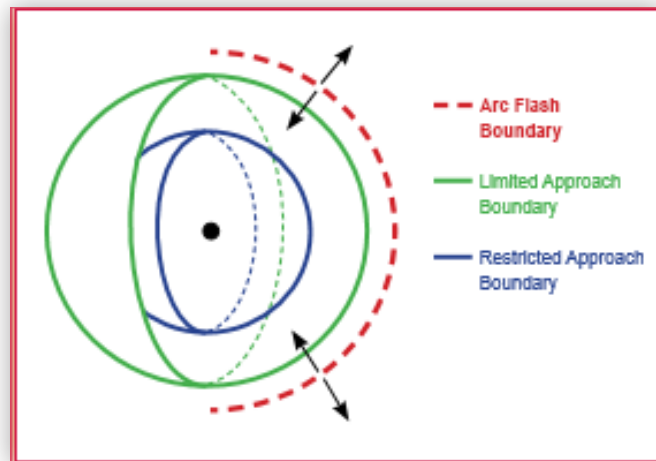
- the proper use of the special precautionary techniques,
- personal protective equipment, including arc-flash, insulating and shielding materials and insulated tools and test equipment.

A person shall be considered qualified on equipment, installations, systems and tasks for which they have training and experience. Such persons may be unqualified for other equipment, installations, systems and tasks.

An employee undergoing on-the-job training such as an apprentice electrician and who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person shall be considered to be a qualified person for the performance of those duties.

Qualified person(s) permitted to work within the Limited Approach Boundary (see NFPA 70E) of exposed live parts operating at 50 volts or more shall, at a minimum, be additionally trained in all of the following:

- skills and techniques necessary to distinguish exposed energized parts from other parts of electrical equipment.
- skills and techniques necessary to determine the nominal voltage (see definitions section) of exposed live parts.
- approach distances (limited and restricted approach) and the corresponding voltages as determined by NFPA 70E.
- decision-making process necessary to:
 - perform the job safety planning
 - identify electrical hazards
 - assess the associated risk
 - select the appropriate risk control method



TITLE: ENERGIZED ELECTRICAL WORK POLICY

PURPOSE: Prohibit energized electrical work unless justified, signed off on by an authorized management representative when an energized electrical work permit is required in accordance with this policy and determined to capable of being performed safely.

DESCRIPTION:

All energized electrical work on systems of 50 volts or more must be justified in accordance with NFPA 70E and OSHA as follows:

- it can be demonstrated de-energizing will cause additional or increased hazards.
- de-energizing is infeasible due to equipment design or operational limitations.

All energized electrical work on systems of 50 volts or more requires:

- an Energized Electrical Work Permit signed off by all responsible parties prior to work commencing unless work to be performed meets the exemption criteria established in NFPA 70E.
- completion of a job safety meeting/briefing prior to beginning all projects involving exposure to electrical hazards and document the meeting, with a copy provided to their foreman. A job briefing will also be completed even when working alone.
- For voltages of less than 50 volts, the decision to de-energize should include consideration of the capacity of the source and any overcurrent protection between the energy source and the worker.



Examples of justification to work energized is when de-energizing:

- would interrupt life support equipment
- would deactivate emergency alarm systems, and
- would cause shutdown of hazardous location ventilation equipment.
- is infeasible due to equipment design or operational limitations including performing diagnostics and testing (e.g., start-up or troubleshooting) that can only be performed energized
- work is needed on circuits that form an integral part of a continuous process that would otherwise need to be completely shut down in order to permit work

NORMAL OPERATING CONDITION

Normal operation of electric equipment is permitted where a normal operating condition exists. A normal operating condition exists when all of the following conditions are satisfied:

- The equipment is properly installed.
- The equipment is properly maintained.
- The equipment is used in accordance with instructions included in the listing and labeling and in accordance with manufacturer's instructions.
- The equipment doors are closed and secured.
- All equipment covers are in place and secured.
- There is no evidence of impending failure.



TITLE: ESTABLISHING AN ELECTRICALLY SAFE WORK CONDITION – LOTO POLICY

PURPOSE: Lockout/Tagout shall be performed as part of the company's procedures to ensure that all energized electrical conductors and circuit parts are put into an Electrically Safe Work Condition (ESWC) before an employee performs work, where; an employee is to be within the limited approach boundary or the employee interacts with equipment where conductors or circuit parts are not exposed but an increased likelihood of injury from an exposure to an arc flash hazard exists. See NFPA 70E for examples of activities that could pose an arc flash hazard.

DESCRIPTION:

All employees shall be trained and have a copy of the company Lockout/Tagout Program. All qualified employees shall implement the LOTO program and verify an ESWC.

Employees shall ensure the following steps are observed to achieve an Electrically Safe Work Condition:

- Determine all possible sources of electrical supply
- Interrupt load current and open disconnecting device
- Verify blades are fully open, draw out type circuit breakers fully withdrawn and disconnected
- Release stored electrical energy
- Release or block stored mechanical energy
- Apply lockout/tagout
- Use adequately rated test instrument to verify de-energization
- Apply temporary protective grounding equipment as needed

Note: Employers and employees should refer to the company written program on lockout/tagout for detailed procedures. The NECA Guide to Lockout/Tagout offers sample programs for Simple and Complex Lockout/Tagout.



TITLE: PERSONAL PROTECTIVE EQUIPMENT (PPE) POLICY

PURPOSE: Each qualified employee shall be provided with personal protective equipment, voltage-rated tools and appropriate test instruments to safely complete all tasks. If an employee needs additional tools or personal protective equipment, they shall obtain them according to company procedures.

DESCRIPTION:

Employees that regularly perform justified energized work shall wear arc-rated clothing appropriate for the duties performed.

Arc-rated protective clothing that is compliant with NFPA 70E will be provided by the company.

ANSI approved safety glasses in addition to all other required PPE shall be worn as primary protection for all tasks as needed for hazards present, while inside the arc flash boundary and as required by company policy.

Protective equipment is to be maintained in a safe, reliable condition per the manufacturer's recommendations.

Protective equipment and tools shall be visually inspected before use.



If there is any doubt concerning the safety of the equipment or tool the employee should contact their supervisor.

The supervisor will determine if the item should be taken out of service or subject to examination by a suitably trained third party person and retested if necessary.

Annual visual examination by a suitably trained person will be conducted to determine the suitability of the tool for further service.

Gloves shall be tested every 6 months. If an electrical retest is required by national regulation or by manufacturer specifications or in case of doubt after visual examination, the routine test(s) as prescribed by the manufacturer shall apply.

Insulating equipment will be cleaned as needed to remove foreign substances. Cleaning of the equipment is to be done according to the manufacturer's recommendations.



Insulating equipment is to be stored in such a location and in such a manner as to protect it from light, temperature extremes, excessive humidity, ozone, and other injurious substances and conditions. Equipment should not be stored in a vehicle for an extended period of time during the summer months.

Leather protectors shall be worn over rubber insulating gloves,

Care of Insulating blankets, covers, line hose, gloves, and sleeves made of rubber shall meet the following specifications:

- Insulating equipment shall be inspected for damage before each day's use and immediately following any incident that can reasonably be suspected of having caused damage.
- An inflation test for gloves for possible tears or punctures shall be performed.

Insulating equipment with any of the following defects shall not be used:

- A hole, tear, puncture, or cut;
- Ozone cutting or ozone checking (the cutting action produced by ozone on rubber under mechanical stress into a series of interlacing cracks);
- An embedded foreign object
- Any of the following texture changes: swelling, softening, hardening, or becoming sticky or inelastic
- Any other defect that damages the insulating properties.

Employees may not use insulating equipment failing to pass inspections or electrical tests.



Failed equipment shall be taken out of service and destroyed by the supervisor after it fails the test.

Insulating equipment found to have other defects that might affect its insulating properties shall be removed from service and returned for repair, testing or replacement.

Only manufacturer qualified repairs will be performed.

Rubber gloves shall be tested every six months.

Rubber insulating gloves are not permitted to be repaired – they SHALL be replaced.



TITLE: NFPA 70E TRAINING POLICY

PURPOSE: Employees shall receive all required training in accordance with NFPA 70E to effectively implement all safe work practices necessary to work safely and avoid injury.

DESCRIPTION:

NFPA 70E training requirements referenced in this policy apply to employees exposed to an electrical hazard when the risk associated with that hazard is not reduced to a safe level by the applicable electrical installation requirements.

Employees shall be trained:

- to understand the specific hazards associated with electrical energy.
- in safety-related work practices and procedural requirements to protect them from electrical hazards associated with their respective job or task assignments.
- to identify and understand the relationship between electrical hazards and possible injury

Training shall be classroom, on-the-job, or a combination of the two as determined by the risk to the employee.



Employees exposed to shock hazards shall be trained in methods of safe release of victims from contact with exposed energized electrical conductors or circuit parts.

Refresher training shall occur annually.

Employees responsible for responding to medical emergencies shall be trained in

- first aid and emergency procedures
- cardiopulmonary resuscitation, (CPR)
- use of an automated external defibrillator, (AED)*
- training must occur at a frequency that satisfies the requirements of the certifying body

Employers shall verify at least annually that employee training required by this section is current.

Training shall be documented.

Retraining in safety-related work practice and applicable changes to NFPA 70E shall be performed at least every three years.

* This training only needed if an employer's emergency response plan includes the use of this device.



TITLE: SAFE WORK PRACTICES – POLICY

PURPOSE: All employees will be required to follow the practices below to provide a safe work environment.

DESCRIPTION:

In accordance with this COMPANY policy, electrical work and repairs on systems and components 50 volts or more shall ALWAYS be completed with the equipment in an electrically safe work condition

- If work has to be done with the equipment energized through justification, the qualified person doing the work shall secure a signed Energized Electrical Work Permit, where required prior to starting the job.
- Electrical testing and troubleshooting will be permitted without an Energized Electrical work Permit In accordance with NFPA 70E.
- All qualified persons and other affected personnel will be trained on any new equipment on the proper procedure of de-energizing and verifying absence of voltage.



PART I: TO BE COMPLETED BY THE REQUESTER:

Job/Work Order Number _____

(1) Description of circuit/equipment/job location: _____

(2) Description of work to be done: _____

(3) Justification of why the circuit/equipment cannot be de-energized or the work deferred until the next scheduled outage: _____

Requester/Title _____ Date _____

PART II: TO BE COMPLETED BY THE ELECTRICALLY QUALIFIED PERSONS DOING THE WORK:

Check when complete ☐

(1) Detailed job description procedure to be used in performing the above detailed work: _____ ☐

(2) Description of the safe work practices to be employed: _____ ☐

(3) Results of the shock risk assessment: _____ ☐

(a) Voltage to which personnel will be exposed ☐

(b) Limited approach boundary ☐

(c) Restricted approach boundary ☐

(d) Necessary shock, personal, and other protective equipment to safely perform assigned task ☐

(4) Results of the arc flash risk assessment: _____ ☐

(a) Available incident energy at the working distance or arc flash PPE category ☐

(b) Necessary arc flash personal and other protective equipment to safely perform the assigned task ☐

(c) Arc flash boundary ☐

(5) Means employed to restrict the access of unqualified persons from the work area: _____ ☐

(6) Evidence of completion of a job briefing, including discussion of any job-related hazards: _____ ☐

(7) Do you agree the above-described work can be done safely? ☐ Yes ☐ No (If no, return to requester.) ☐

Date _____

Date _____

FILE ELECTRICALLY ENERGIZED:

Maintenance/Engineering Manager _____

Electrically Knowledgeable Person _____

Date _____

Site Safety Department for review and retention.

- Appropriate PPE (see Personal Protective Equipment section) shall be worn in accordance with the Shock and Arc Flash Risk Assessments, such as for tasks involving exposure to electrical hazards. ANSI-approved safety glasses will be worn while performing work inside the arc flash boundary
- All harnesses and lanyards worn inside the arc flash boundary must be arc rated.
- Insulated tools are to be used while working inside the restricted approach boundary.
- Electrical equipment doors must be kept shut and covers in place unless being serviced.
- Comply with COMPANY Lockout/Tagout (LOTO) policies and procedures
- Only qualified personnel will be permitted to perform energized work
- If an overcurrent protective device opens on other than an overload a qualified person shall troubleshoot the problem.
- No facial or body jewelry is permitted inside the restricted approach boundary.
- No metal jewelry is permitted inside the restricted approach boundary.
- No conductive articles will be in shirt pockets or worn inside the restricted approach boundary.



TITLE: JOB BRIEFINGS — JUSTIFIED ENERGIZED ELECTRICAL WORK - BEST PRACTICE

STATEMENT: Provide a systematic approach that outlines key components of job briefings where justified energized electrical work will be performed.

DESCRIPTION:

The employee in charge shall conduct a job briefing with all employees involved. This briefing shall address the energized electrical work permit and items below associated with the job.

- Define tasks to be performed, routine and critical tasks.
- Review risk assessment procedures (including distances of protection for Qualified and Unqualified workers)
 - Shock Risk Assessment
 - Arc Flash Risk Assessment
- Identify hazards
- Identify qualifications
- Identify Emergency Response Procedures
- Determine Personal Protective Equipment to be used.
- Determine tasks to be completed
- Determine risk mitigation procedures
- Coordinate with Host/Owner on conditions & procedures
- Review Lockout/Tagout requirements



All affected employees shall participate in the job briefing and document their participation.

Job briefings for tasks involving exposure to electrical hazards shall be conducted:

- at the start of each work shift,
- when job tasks change and
- when additional personnel are added to the work crew.

The form documenting this job briefing shall have the means for the employee to sign and verify in order for the employer to ensure employee compliance and participation.

BENEFITS:

- Ensures safety planning and assessments have been performed.
- Provides compliance with NFPA 70E Standard and OSHA Regulations.
- Details job planning process and incorporates risk managements procedures.
- Ensures qualified workers will be performing required tasks.
- Proper checklists and forms help to remind employees of non-routine activities.
- Enhances communication between host/owner and contractor/employer about any known hazards related to the work and the way to report any hazards identified during the course of the work.
- Maintains employer and employee communication and open dialogue.
- Identifies the roles and responsibilities of personnel involved in Emergency Response.

REFERENCES:

NFPA 70E – THE STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE
OSHA 29 CFR 1926 CONSTRUCTION INDUSTRY STANDARD



TITLE: LOCKOUT/TAGOUT - BEST PRACTICE

STATEMENT: Provides safe procedures for deenergizing circuits and equipment and ensuring they are maintained in an electrically safe work condition using an effective lockout/tagout procedure to enable work to be performed without injury.

DESCRIPTION:

These steps follow the requirements of OSHA General Industry Standards in 1910.333(b) and are supplemented with requirements contained in Article 120 of NFPA 70E.



Note: 1910.333(b)(2)(i) permits 1910.333 to be used as a written LOTO procedure so long as it complies with paragraphs (c) through (f) of 1910.147.

DEENERGIZING

1. Determine all possible sources of electrical supply to the specific equipment. Check applicable up-to-date drawings, diagrams, and identification tags.
2. The circuits and equipment to be worked on shall 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 deenergizing circuits or equipment. Interlocks for electric equipment may not be used as a substitute for lockout and tagging procedures. After properly interrupting the load current, open the disconnecting device(s) for each source. Wherever possible, 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.

3. Stored electric energy which might endanger personnel shall be released. Capacitors shall be discharged and high capacitance elements shall be short-circuited and grounded, if the stored electric energy might endanger personnel.

Note: If the capacitors or associated equipment are handled in meeting this requirement, they shall be treated as energized

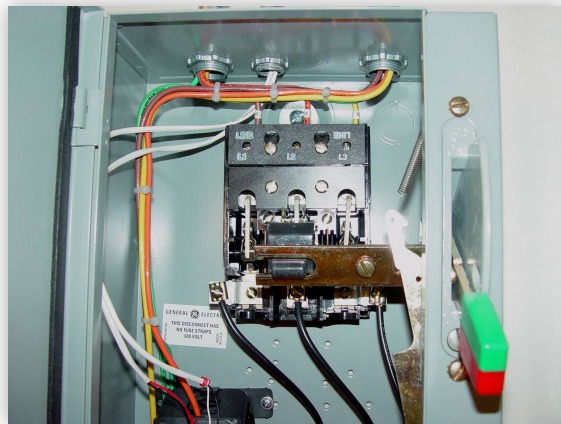
4. Stored non-electrical energy in devices that could reenergize electric circuit parts shall be blocked or relieved to the extent that the circuit parts could not be accidentally energized by the device.



5. A lock and a tag shall be placed on each disconnecting means used to deenergize circuits and equipment on which work is to be performed. Each tag shall contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag and attached so as to prevent persons from operating the disconnecting means unless they resort to undue force or the use of tools.

Exception:

- If a lock cannot be applied, or if the employer 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, as permitted by this section, shall be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by use of a lock. (i.e. 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 deenergized, and
 - The lockout period does not extend beyond the work shift, and
 - Employees exposed to the hazards associated with reenergizing the circuit or equipment are familiar with this procedure.



6. Verification of the deenergized condition must meet the following before any circuits or equipment can be considered and worked as deenergized. A qualified person shall:

- operate the equipment operating controls or otherwise verify that the equipment cannot be restarted.
- use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and verify that the circuit elements and equipment parts are deenergized.
- test to determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage backfeed even though specific parts of the circuit have been deenergized and presumed to be safe. If the circuit to be tested is over 600 volts, nominal, the test equipment shall be checked for proper operation immediately after this test.
- use an adequately rated test instrument to test each phase conductor or circuit part to verify they are deenergized.
- test each phase conductor or circuit part both phase-to-phase and phase-to-ground. Before and after each test, determine that the test instrument is operating satisfactorily.
- ground the phase conductors or circuit parts before touching them where the possibility of induced voltages or stored electrical energy exists.
- apply temporary protective grounding equipment rated for the available fault duty, where it could be reasonably anticipated that the conductors or circuit parts being de-energized could contact other exposed energized conductors or circuit parts.



REENERGIZING EQUIPMENT

These requirements shall be met, in the order given, before circuits or equipment are reenergized, even temporarily.

1. A qualified person shall conduct tests and visual inspections, as necessary, to verify that all tools, electrical jumpers, shorts, grounds, and other such devices have been removed, so that the circuits and equipment can be safely energized
2. Employees exposed to the hazards associated with reenergizing the circuit or equipment shall be warned to stay clear of circuits and equipment.
3. Each lock and tag shall 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 person designated to perform this task provided that:
The employer ensures that the employee who applied the lock or tag is not available at the workplace, and
The employer ensures that the employee is aware that the lock or tag has been removed before he or she resumes work at that workplace.
4. There shall be a visual determination that all employees are clear of the circuits and equipment.

REFERENCED REQUIREMENTS

29 CFR OSHA 1910.333(b) "Working on or near exposed deenergized parts."
NFPA 70E, Article 120 verification of an Electrically Safe Work Condition.

TITLE: USE OF TEST INSTRUMENTS (SUCH AS VOLTAGE TESTING) - BEST PRACTICE

STATEMENT: Provide a concise approach that outlines the key steps involved with the use of test instruments such as voltage testing.

DESCRIPTION:

Any employee that is to use test instruments must be qualified and trained on the test instrument to be used. The qualified employee shall follow the accepted procedure for testing for the presence of voltage and the steps necessary for the verification for the absence of voltage. The employee shall be familiar with the maximum voltage potential and wear all necessary PPE determined in the shock and arc flash risk assessment.

1. Identify the circuit(s) to be tested
2. Determine the source of the circuit(s)
3. Determine the maximum nominal voltage that could be present.
4. Perform a shock risk assessment
5. Perform an arc flash risk assessment
6. Select the appropriate Personal Protective Equipment for use
7. Review the procedures for proper test instrument operation.
 - a. Verify proper operation of the test instrument.
 - b. Test to determine if voltage is present.
8. Verify proper operation of test instrument.
9. Implement Lockout/Tagout requirements.



Any employee using test instruments to measure voltage must:

- be a qualified person, trained in the use of the test instrument to be used
- be able to demonstrate knowledge related to the construction and operation of the test instrument being used
- have received safety training to identify and avoids the hazards associated with the procedure.
- be familiar with the appropriate rating of rubber protective goods, their use and limitations.
- be aware of arc rating of garments and choose appropriate PPE.
- know proper working clearances around electrical equipment.
- ensure proper illumination around equipment
- not engage work where there is blind reaching or poor visibility.

BENEFITS:

- Ensures qualified workers will be performing required tasks.
- Provides compliance with NFPA 70E Standard and OSHA Regulations.
- Incorporates risk managements procedures.
- Follows proper rules for establishing an electrically safe working condition.
- Demonstrates compliance with all applicable OSHA and NFPA 70E requirements.

REFERENCES:

NFPA 70E – THE STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE
OSHA 29 CFR 1926 CONSTRUCTION INDUSTRY STANDARD

Important: This practice was intentionally limited to the use of test instruments used for voltage testing. A Best Practices should be developed for each test instrument used to detect or measure for electrical energy (amp probe, phasing stick, etc.). These practices should provide detailed procedures and limit use of the test instrument to qualified persons.



TITLE: TEMPORARY POWER - BEST PRACTICE

STATEMENT: Provides a systematic approach that outlines key components of temporary power, such as installation use and maintenance.

DESCRIPTION:

Temporary wiring for construction activities involves many phases of work. The following must be complied with when providing temporary power:

- Determine and comply with all applicable codes (OSHA, NEC, NFPA 70E)
- Determine what power requirements are needed
- Identify the material needed and the installation environment
- Provide Temporary service equipment or separately derived system for construction/job site including any power for any construction trailers that may be a part of the project
- Provide Ground Fault protection as required and Assured Equipment Grounding Conductor Program, (AEGCP) as required for receptacles and use of portable tools
- Provide adequate lighting per the location and tasks
- Provide individual circuits for specialty tools
- Install equipment in protected locations or enclosures rated for the environment
- Use listed wiring methods and equipment
- Maintain enclosure integrity and ensure all openings are covered and/or closed



- Provide physical protection and/or warning signs for temporary wiring and devices
- Limit access to equipment and circuits to authorized personnel, keep doors and covers locked
- Coordinate with Host/Owner on conditions and procedures or special requirements
- Define routine and critical tasks.
- Review shock and arc flash risk assessment procedures
- Identify hazards
- Identify qualifications (Only qualified and authorized persons should design, install and maintain temporary wiring systems for any job site or location.)
- Determine and use appropriate Personal Protective Equipment.
- Comply with all electrical Lockout/Tagout requirements per 29 CFR 1926 and/or 1910 and NFPA 70E
- Ensure temporary wiring is adequate for the load and environment it will be exposed to.
- Remove all Temporary wiring as soon as the need for temporary power is over.
- Follow all applicable manufacturers' requirements when using portable generators to provide portable/temporary power including maintenance and refueling activities.

BENEFITS:

- Ensures temporary wiring will be adequate for the installation and protect workers from the hazards associated with electricity.
- Provides compliance with NEC, NFPA 70E and OSHA Regulations.
- Details project planning processes and requirements.
- Ensures qualified workers will be performing required tasks.
- Proper checklists and forms help to remind employees of routine and non-routine activities.
- Maintains employer and employee communication and open dialogue.

REFERENCES: NFPA 70E – THE STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE
 OSHA 29 CFR 1926 CONSTRUCTION INDUSTRY STANDARD
 NECA GUIDE TO TEMPORARY POWER



EMPLOYEE POLICIES AND PROCEDURES ACCEPTANCE FORM

The policies and practices in this manual have been reviewed and accepted by management at the highest level. All employees must also review these policies and practices and agree to its terms by affixing their signature to a copy of this signature page on the appropriate lines and submit the copy to their supervisor.

I understand that it is my responsibility to comply with the policies and practices addressing the company's adherence to the requirements set forth by NFPA 70E Standard for Electrical Safety in the Workplace and related company procedures as well as any revisions.

Employee Name_____

Title_____

Employee Signature_____ Effective Date_____

ACKNOWLEDGEMENTS

Program Developed by:

Joe O'Connor

INTEC, Inc.

www.intecweb.com

800.745.4818

Wesley Wheeler,

Director of Safety

Michael Johnston,

Executive Director,

Standards and Safety

National Electrical Contractors

Association (NECA)

www.necanet.org

James T. Dollard

Subject Matter Expert/

Technical Editor

Special Thanks to the following for photographs considered for inclusion in this Guide:

Rick Worch, Safety Director

EMCOR Group, Inc.

Ed Hixson, Safety Director

Dynalectric Co.

Ryan Hand

Michael Maffioli

Wilson Electric Co.

Brad Munda

Kyle Borneman

Morse Electric, Inc.

Jeff Costello

Larry McCrae, Inc.

Dave Ganther

Bill Inforzato

J.P. Rainey Company, Inc.

George Novelli

Tom McCusker

Carr and Duff, Inc.

Todd Kindred

Northern Illinois Electrical JATC

Todd Cratty

M45 Marketing Services

Salisbury Electrical Safety by

Honeywell

Skokie, IL

Westex by Milliken

Oak Brook, IL

* Staging was performed to illustrate certain issues, but safety compliance was maintained at all times during the photo sessions.



Necessary measures have been taken to ensure the accuracy and reliability of the information herein; however, the National Electrical Contractors Association (NECA) and Intec make no representation, warranty or guarantee either expressed or implied, in connection therewith. NECA and Intec disclaim any liability or responsibility for any direct or indirect loss or consequential damages resulting from the use of any of the information herein, or for the violation of any federal, state or municipal regulation with which any of the information may conflict. This publication is sold with the understanding that NECA and Intec are not engaged in rendering legal advice or safety and insurance consultation. If legal advice or expert assistance is required, the services of a competent person should be sought. Disputes will be governed by the laws of the State of Maryland.

**National Electrical Contractors Association
1201 Pennsylvania Ave. NW
Washington, D.C. 20004
www.necanet.org**