

## **ELECTRICAL SAFETY PROGRAM DEVELOPMENT**

### **Based on NFPA 70E 110.7 & OSHA 29 CFR 1910**

#### **PURPOSE**

The purpose of a written Electrical Safety Program is to provide a guideline and instruction for employees to follow in order to help create a safer work environment for those who work on or around electrical equipment. The implementation and adherence of this program helps create an electrically safe workplace for all employees, contractors, and visitors who might be exposed to electrical hazards capable of causing injury or death.

This program is also intended to help with compliance of OSHA electrical safety requirements published as Federal Law in the Code of Federal Regulations 29 CFR 1910, NFPA 70E Standard for Electrical Safety in the Workplace, and NFPA 70 National Electrical Code.

#### **OBJECTIVES**

- Develop an Electrical Safety Program that:
  - Helps meet OSHA Compliance
  - Follows recommendations from NFPA 70E
  - Is customized for the customer's needs and application

#### **SCOPE**

This Electrical Safety Program applies to all employees, contractors, and vendors that may be exposed to electrical hazards in the course of performing their work including examination, maintenance, repair, diagnostics, troubleshooting, calibrating, and installation.

When there are differences between this Electrical Safety Program and other local or state regulations exist, the more stringent must be followed.

Contractors and vendors are expected to comply with the provisions of this program in addition to their own policies and procedures when working at or within your facility. However, this program is not intended to abrogate or assume responsibility for a contractor's employees or the need for the contractor to comply with all local, city, county, state, and federal electrical safety requirements.

#### **WORK PROCESS**

The Martin Technical Electrical Safety Program Development process examines the customer's current procedures and documentation for electrical safety, identifies gaps and develops a new documented program that meets OSHA compliance and follows recommendations of NFPA 70E.

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The program will be conducted by an electrical safety specialist who has a strong understanding of the various electrical standards/laws and who is experienced in developing electrical safety and maintenance programs.

The process is generally done via multiple phone conferences and exchange of electronic documents, however site visits can be arranged or are sometimes necessary. The electrical safety program specialist will:

1. review current processes
2. identify gaps
3. make recommendations
4. implement new policies and procedures into a new document
5. review changes with customer

**OUTLINE of WRITTEN ELECTRICAL SAFETY PROGRAM**

The following outlines a typical electrical safety program.

**FUNDAMENTALS**

- Purpose
- Scope
- Principles
- Definitions
- Responsibilities
- Regulations, Codes, and Standards

**QUALIFICATION**

- Qualified Persons Requirements
- Qualified Person Task-Qualified Person
- Qualified Electrician/Technician versus Task Qualified Person
- Determining Qualification
- Non-Qualified Persons Training
- General Requirements
- Qualified Persons Task-Qualified Persons
- Non-Qualified Persons
- Contractors, Vendors, and Suppliers

**DESIGN and INSTALLATION**

- Design Considerations
- Layout and Sizing
- Entrances
- Working Space
- Installation
- Listed or Labeled
- Interrupting Rating
- Operating Environments
- Guarding
- Abandoned Cables
- Clearances

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- Temporary Wiring

IDENTIFICATION and LABELING

- Electrical Equipment Identification
- Identification Scheme
- Identification Maintenance
- Conductor Identification
- Warning Labels
- Flash Hazard Warning Labels

DRAWINGS, REPORTS, and TESTS

- Drawings and Diagrams
- Single-Line Electrical Drawings
- Classified Area Drawings
- Reports
- Arc-Flash Hazard Analysis
- Electrical Safety Audit
- Electrical Compliance Report
- Lockout-Tagout Annual Audit
- Tests
- Infrared Scanning
- Relay Testing
- Circuit Breaker Tests
- Transformer Analysis

EQUIPMENT

- Test Equipment
- Ground Fault Circuit Interrupters (GFCI)
- Circuit Breakers
- Portable Electrical Equipment
- Hand Tools
- Extension Cords
- Flexible Cords and Cables
- Disconnecting Devices
- Portable Ladders
- Capacitors
- Current Transformers
- Uninterruptible Power Supplies
- Batteries
- Power Electronic Equipment

SAFETY RELATED WORK PRACTICES

- Job Planning
- Hazardous Locations
- Electrically Safe Work Condition
- Temporary Grounding
- Energized Electrical Work Permit
- Hazard Analysis Methods
  - Calculation Methods
  - Theoretical Analysis
  - NFPA 70E Analysis



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- IEEE Standard 1584 Analysis
- Shock Hazards Analysis
- Limited Approach Boundary
- Restricted Approach Boundary
- Prohibited Approach Boundary
- Flash Hazard Analysis
- Flash Boundary
- Detailed Arc-Flash Hazard Analysis
- No Detailed Analysis
- PPE for Arc-Flash
- Detailed Arc-Flash Hazard Analysis
- No Detailed Analysis
- Completing a Detailed Arc-Flash Hazard Analysis
- Phase I - Data Collection
- Phase II - Engineering Analysis
- Lockout / Tagout
- Individual
- Simple
- Complex
- Safety Watch
- Infrared Scanning
- Left-Hand Rules
- Illumination
- Confined Work Space
- Manhole Entry
- Conductive Materials and Equipment
- Conductive Apparel
- Housekeeping
- Interlocks
- Using Test Equipment
- Resetting Tripped Devices
- Fuse Handling
- Flammable Materials
- Switching Procedures
- Overhead Powerlines
- Vehicles and Mechanical Equipment
- Direct Current (DC)
- Alerting Techniques
- First Aid
- Changing Lamps

### PERSONAL PROTECTIVE EQUIPMENT

- General
- Hand Protection
- Voltage Rated Gloves
- Head Protection
- Face Shields
- Hearing Protection
- Safety Glasses

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- Footwear
- Clothing
- Cleaning
- Insulated Tools
- Live-Line Tools
- Protective Shields / Barriers and Insulating Materials

PROCEDURES

- LOCKOUT / TAGOUT PROCEDURES
- TEMPORARY GROUNDING
- VOLTAGE AND CURRENT MEASUREMENT PROC.

CHECKLISTS

- ENERGIZED ELECTRICAL WORK PERMIT
- JOB PLANNING CHECKLIST

DELIVERABLES

- Electrical Safety Program Document based on NFPA and OSHA standards and is customized to your needs. Document will be delivered in editable Word format.
- Consultation on implementing the program.

## Completing Your Electrical Safety Program

While an arc flash analysis is an important part of an electrical safety program, it is only one component of a complete program. In order to help you complete your program, trust the experts at Martin Technical with the following services to complete your electrical safety program. Contact us for

### **ARC FLASH ANALYSIS**

Martin Technical has one of the most experience arc flash engineering teams in the world to help you come in compliance with arc flash analysis and labeling standards to protect your workers.

### **ELECTRICAL SAFETY TRAINING**

OSHA requires that Qualified Persons receive live electrical safety training. Martin Technical offers training sessions ranging from ½ day to 2 days to meet your electrical safety training needs. Unqualified Person training for electrical safety is also available.

### **QUALIFIED PERSON / ELECTRICAL WORKER CERTIFICATION**

OSHA requires that Qualified Persons demonstrate skill and knowledge in the electrical tasks they are performing. The team at Martin Technical can provide an off-the-shelf or customized certification program to evaluate your employees and document tasks they are qualified for.

### **LOCKOUT / TAGOUT PROGRAM**

Lockout / Tagout is an essential part of working safely on electrical equipment and is required by OSHA. The Martin Technical team can develop a LOTO program for you that identifies all equipment to be locked out and includes placards on each piece of equipment indicating the proper process for locking out and tagging out.

### **ELECTRICAL SAFETY AUDIT / INSPECTION**

Based on the National Electrical Code, NFPA 70E, NFPA 70B, and OSHA 1910.331-335, this inspection identifies gaps in meeting regulations and standards and provides recommendations to make your plant or facility compliant.

### **ELECTRICAL MAINTENANCE & PROCESS AUDIT**

Based on NFPA 70B, this inspection identifies work processes and procedures in conducting electrical maintenance activities, identifies gaps in meeting best-practices and standards and provides recommendations to improving your electrical system maintenance.

### **THERMAL INFRARED ELECTRICAL INSPECTION**

The Martin Technical team can conduct a thermal infrared inspection of your electrical equipment, identifying problems before they become hazards or break-downs.

## About Martin Technical

### About Us



Martin Technical is a provider of practical services for making facilities better, safer and more efficient. Our expert staff combines their real world work experiences of the past with today's technologies and best practices to provide our customers with the solutions and knowledge they need to maximize their operations and keep safe doing it. And because all our experts have in-field experience, we understand the difference between theory and application and are able to translate today's complex problems into simple solutions that can be implemented tomorrow.

### About Our Customers

Our customers represent a broad spectrum, big and small, and we have provided services for virtually every type of company, plant or facility, including:

- Manufacturing Plants
- Schools & Universities
- Data & Service Centers
- Airports
- Government & Military
- Hospitals
- R&D Facilities
- Public Buildings
- Energy & Utility Plants
- Water & Waste Water
- Hotel & Hospitality
- Commercial Buildings

### Liability / Insurance

We carry the following insurance policies:

- General Liability - \$2 Million per occurrence / \$4 Million aggregate policy
- Professional Liability - \$1 Million policy

In addition, any outside engineers used on projects are required to have their own individual professional liability and general liability insurance.



## Products & Services

We specialize in making plants and facilities better, safer and more efficient by providing the following services and products:

### Electrical Studies & Testing

- Arc Flash Analysis & Labeling
- Short Circuit Study
- Protective Device & Coordination Study
- Power Quality Audit
- Motor Load Studies
- Infrared Inspection

### Electrical Safety

- Electrical Safety Program Development
- Electrical Safety Audit
- Electrical Safety Training
- Qualified Person / Electrical Worker Certification
- Lockout / Tagout Programs
- Infrared Inspections

### Energy Management

- Energy Audits
- Boiler, Compressor & HVAC Audits
- Energy Management Training

### Electrical Maintenance Training

- Electrical maintenance training topics are available through our training partners.