

# ELECTRICAL SERVICES

Putting Electrical Safety to Work

SOLUTIONS GUIDE



FERRAZ SHAWMUT IS NOW MERSEN

**MERSEN**

# The Safety Hazards



Direct contact with electrical systems



Machine operators



Potential contact with overhead wires



Work on or near energized parts

**ELECTRICAL INJURIES ON THE JOB CAN COST MORE THAN \$15 MILLION FOR ONE INCIDENT...**

## **ELECTRICAL SAFETY IS AN ONGOING CHALLENGE FOR EMPLOYERS.**

**Electricity remains the sixth leading cause of injury-related occupational death. An average of 1,000 workers are electrocuted each year, while more than 46,000 workers are injured by electricity. The cost-impact of electrical injuries on the job can reach a staggering \$15 million for one incident, and rising!**

Drawing on a century of experience - and an ongoing commitment to critical research in electrical safety - Mersen has built a reputation for providing innovative electrical protection products that meet NEC, UL, CSA, IEC, ANSI/IEEE, CE, NFPA, and other critical safety standards. In fact, many of our respected field engineers serve on leading electrical safety codes and standards committees. Today, Mersen brings its highly regarded electrical protection expertise to you through our new suite of Electrical Services. Explore the information and services outlined in this brochure, and you'll discover why more Safety Managers, Facility Engineers and Maintenance Supervisors turn to Mersen to help them put electrical safety to work for their companies.

## **ELECTRICAL INJURY FACTS**

- The National Safety Council estimates that about 1,000 fatalities each year are due to electrocution, more than half of them while servicing energized systems of less than 600 volts.
- Sixty percent of the electrocutions occurred to workers less than 35 years of age.
- Ninety-nine percent of the electrocutions occurred among men.
- The industries with the highest number of electrocutions were construction (121); followed by manufacturing (40); transportation, communications, public utilities (30); and public administration (19).
- Fifty-one (23%) of the incidents occurred at establishments that employed 500 or more workers. Eighty-five (38%) of the incidents occurred at establishments that employed less than 50 workers.
- Electricity remained the sixth leading cause of injury-related occupational death.
- During the course of a year, 46,598 workers were non-fatally injured by electricity.
- Contact with electric current of machine, tool, appliance, or light fixture and contact with wiring, transformers, or other electrical components accounted for 36% and 34% of nonfatal electrical injuries, respectively.
- There were 3378 worker fatalities classified as electrical events between 1992 and 2002.

# The Compliance Challenge



## ARE YOU HAVING DIFFICULTY WADING THROUGH THE COMPLEX SCOPE OF ELECTRICAL SAFETY REGULATIONS IN ORDER TO ENSURE A SAFE WORKPLACE?

You're not alone. Electrical safety is a growing challenge for employers. With an increasing number of regulations, codes and guidelines to consider, it's sometimes difficult to know where to start. With Mersen Electrical Services, you'll have a trusted ally on your side and peace of mind knowing that your Electrical Safety Program is in compliance.

Consider making Mersen Electrical Services your first call. Our electrical safety experts and engineers are ready to help you understand the electrical hazards that occur in your facility and develop an electrical safety program that works to meet your unique needs. The first step to an OSHA compliant Electrical Safety Program is understanding where you are today. We've developed the Electrical Safety Survey below to help you pin-point your electrical safety program's strengths and weaknesses. We hope the survey sheds some light on where you might benefit the most from our expertise and services.

### ELECTRICAL SAFETY SURVEY

- |   |                           |                          |
|---|---------------------------|--------------------------|
| Do you have an established Electrical Safety Program?   | <input type="radio"/> Yes | <input type="radio"/> No |
| Have you published an Electrical Safety Manual (ESM)?   | <input type="radio"/> Yes | <input type="radio"/> No |
| Does your ESM have clearly defined standards & procedures?                                      | <input type="radio"/> Yes | <input type="radio"/> No |
| Have you recently performed a site assessment?  | <input type="radio"/> Yes | <input type="radio"/> No |
| Have you created or updated your facility's one-line drawing?                                   | <input type="radio"/> Yes | <input type="radio"/> No |
| Have you identified and documented safety hazards?  | <input type="radio"/> Yes | <input type="radio"/> No |
| Did you recently perform an electrical hazard assessment?                                       | <input type="radio"/> Yes | <input type="radio"/> No |
| Did you complete a short-circuit and coordination study since any power distribution was added? | <input type="radio"/> Yes | <input type="radio"/> No |
| Did you perform a shock hazard analysis?  | <input type="radio"/> Yes | <input type="radio"/> No |
| Did you establish shock protection boundaries?  | <input type="radio"/> Yes | <input type="radio"/> No |
| Did you conduct an arc-flash hazard analysis?   | <input type="radio"/> Yes | <input type="radio"/> No |
| Did you calculate incident energies?  | <input type="radio"/> Yes | <input type="radio"/> No |
| Have you recently conducted a current-limiting fuse audit?                                      | <input type="radio"/> Yes | <input type="radio"/> No |
| Have you determined & documented hazard risk categories?  | <input type="radio"/> Yes | <input type="radio"/> No |
| Have you established arc flash protection boundaries?   | <input type="radio"/> Yes | <input type="radio"/> No |
| Have you determined your PPE requirements?  | <input type="radio"/> Yes | <input type="radio"/> No |
| Did you select & purchase the appropriate PPE?  | <input type="radio"/> Yes | <input type="radio"/> No |
| Have you labeled your equipment per NFPA 70E specifications?                                    | <input type="radio"/> Yes | <input type="radio"/> No |
| Has your company conducted and documented its electrical safety training?                       | <input type="radio"/> Yes | <input type="radio"/> No |
| Did you identify your qualified and unqualified employees?                                      | <input type="radio"/> Yes | <input type="radio"/> No |
| Have you audited your Electrical Safety Program within the last year?                           | <input type="radio"/> Yes | <input type="radio"/> No |

**IF YOU ANSWERED "NO" TO ONE OR MORE QUESTIONS, THEN IT'S TIME TO CALL MERSEN AT 978-462-6662.**



# The Solution: Mersen Electrical Services

Engineering Services | Electrical Hazard Analysis | One-Line Drawings | Inspections & Audits  
Hazard Labeling | High Power Testing | Training and Consultation | And More!

## HELPING YOU PUT ELECTRICAL SAFETY TO WORK IN YOUR FACILITY

Mersen offers a comprehensive suite of on-site engineering, training and consulting services. The Electrical Services team is comprised of some of the best electrical protection and safety experts in the business. You can be confident that you'll receive the most up-to-date advice and direction. Here is a brief summary of the services we provide:

### ELECTRICAL SAFETY PROJECT MANAGEMENT

Some facilities are unsure about how to comply with complex safety requirements and require hands-on project management. Mersen can coordinate some or all of the electrical safety requirements for a facility. This may include initial assessment through program development, implementation or training. Or you may choose this service on a project-basis for assistance with arc flash analysis, integrating the latest NFPA 70E requirements, development of Request for Quote (RFQ) packages for Arc Flash studies, and more.

### ARC FLASH HAZARD ANALYSIS

Turn to our experienced team of electrical safety engineers to analyze your electrical system's exposure to Arc-Flash and other electrical hazards in accordance with NFPA 70E and OSHA. A standard analysis includes: arc flash, shock and other hazards assessment, arc flash incident energy calculations, arc flash protection boundary calculations, determining hazard risk categories, required PPE, and recommended warning labels for electrical equipment.

### ONE-LINE DRAWINGS

The foundation of a strong electrical safety program is built upon one-line electrical drawings that are current and accurately represent the facility's electrical system with all of the electrical components, power sources, and electrical equipment located and clearly identified.

### SHORT CIRCUIT ANALYSIS & COORDINATION STUDIES

The reliability and safety of electric power distribution systems depend on accurate and thorough knowledge of short-circuit fault currents that may be present, and on the ability of protective devices to effectively interrupt these currents. Mersen's seasoned electrical safety experts are available to provide analysis of short circuit current faults, identify electrical equipment deficiencies and inappropriately sized components, conduct circuit protection coordination studies, and pin-point potential short circuit current rating (SCCR) issues.

### FIELD INSPECTION AND DATA COLLECTION SUPERVISION

Electrical engineers are available to perform field inspections in order to help ensure your facility is compliant with today's electrical codes. Our team is also on hand to supervise data collection and input to ensure the accuracy of arc flash calculations.

### HAZARD LABELING

After we complete your arc flash energy calculations, Mersen helps you satisfy the NEC 110.16 code and NFPA 70E standards requiring Arc Flash Warning Labels on all equipment that could be energized while being worked on.

### ELECTRICAL SAFETY PROGRAM AUDIT

Mersen is available to provide an objective review of your facility's electrical hazards and safety manual for NFPA 70E and OSHA compliance in a confidential audit process.

### FUSE-OPENING ANALYSIS & HIGH POWER TESTING

Fuse-Failure occurs when a fuse opens without an overcurrent condition present or doesn't open when an overcurrent condition is suspected. Mersen offers fuse-opening analysis to determine the parameters at the time of failure using x-ray and other lab equipment. Mersen also has a high power test facility that provides various combinations of power up to 1,000VAC/1,250VDC and up to 100,000 amps three-phase. Our test facility is authorized to do official UL testing. Our focus on efficiency makes our test facilities extremely affordable for all of your testing needs.

# ELECTRICAL SAFETY TRAINING

## Standardized Electrical Training Courses

A wide variety of industry or regulation specific electrical safety courses are available to be delivered on-site at your facility, including:

- Introduction to Arc Flash Hazards
- Arc Flash Safety for Equipment Installers
- Arc Flash Safety
- 2008 National Electrical Code Over-Current Protection Updates
- Short Circuit Current Rating (SCCR) calculations for Panel Builders
- General Electrical Safety for Shock, Arc Flash, and Arc Blast
- Use of Power Distribution Fuses for 600 Volts and Below
- Basics of Selective Coordination
- Industrial Electricity: Basics and Troubleshooting
- National Electrical Code Basics
- Grounding and Bonding
- Hazardous Locations
- Industrial High Voltage Safety

## Customized Electrical Training Services

Standardized courses may be customized to meet your unique needs. Mersen can develop electrical safety training programs specific to your equipment, facility and procedures.

## 10 STEPS TO AN ELECTRICAL SAFETY PROGRAM

1. Establish an Electrical Safety Program
2. Publish an Electrical Safety Manual
3. Perform a Site Assessment
4. Identify and Document Hazards
5. Conduct an Electrical Hazard Analysis (Shock, Arc Flash & Arc Blast)
6. Establish Flash Protection Boundaries
7. Outline PPE Requirements
8. Apply Warning Labels per NFPA 70E 130.3(C)
9. Conduct Employee Training
10. Audit & Update on a Regular Basis

### NEED A QUOTE?

Email: [electricalservices.nby@mersen.com](mailto:electricalservices.nby@mersen.com)  
Phone: 978-462-6662

**TURN TO MERSEN FOR AN ELECTRICAL SAFETY PROGRAM THAT MEETS ALL APPLICABLE OSHA, NFPA 70E, NEC, NESC, AND IEEE REGULATIONS AND STANDARDS.**

Call us today at 978-462-6662.



## MORE ELECTRICAL SAFETY RESOURCES

### Mersen Electrical Services Website:

This is your one-stop resource for facility safety solutions. You'll find all the background you need regarding Mersen's electrical safety services, seminars, on-site training, up-to-date Arc Flash news and information, education resources, and more. Visit: [ep-us.mersen.com/electrical-services](http://ep-us.mersen.com/electrical-services).

### FUSE CONTROL™ PROGRAM

Mersen's Fuse Control™ program is a powerful combination of circuit protection products and services designed to help you get control of plant inventory, operating costs, code compliance and workplace safety. Developed by Mersen and refined through extensive field research, Fuse Control will give you the edge you need to mitigate arc flash hazards, achieve code compliance, reduce inventory by 25% or more and offer the highest grade overcurrent protection available. Visit: [ep-us.mersen.com/solutions/fusecontrol.cfm](http://ep-us.mersen.com/solutions/fusecontrol.cfm).



### ARCFLASH INFO CENTER:

The ArcFlash Info Center is the go-to resource for reliable arc flash news and know-how. To learn more about arc flash mitigation, download white papers, and use our handy arc flash calculator visit: [ep-us.mersen.com/arcflash](http://ep-us.mersen.com/arcflash).

- Arc Flash Calculator
- White Papers
- Tech Topics
- Articles





Main production sites

Industrial or commercial branch



**A WORLD LEADER**  
in safety & reliability  
for electrical power

## A GLOBAL PLAYER

Since its foundation in 1892, MERSEN has built an international reputation by creating subsidiaries on all continents. Today with industrial and commercial plants scattered in more than 30 countries, agencies

and representatives in more than 70 countries and 250 commercial contacts throughout the world, MERSEN offers its customers everywhere reliable, high technology products and services backed by its expert technicians.

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