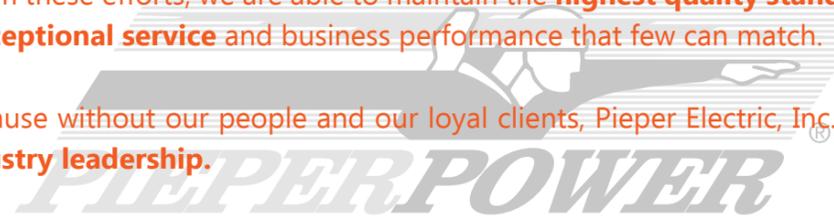


At Pieper Electric, **Our People Are Our Power** isn't just a tagline, it's a philosophy. We work tirelessly to keep our people safe, enlightened and stimulated while encouraging them to be good stewards to the community. From these efforts, we are able to maintain the **highest quality standards** in the industry, backed with **exceptional service** and business performance that few can match.

We do this because without our people and our loyal clients, Pieper Electric, Inc. could not celebrate decades of **industry leadership**.

Nothing else matters without the protection and well-being of our employees and those we serve. We view **safety as our greatest responsibility** and we pledge to continuously strive for an accident-free workplace through a total awareness, proactive planning, consistency and discipline.



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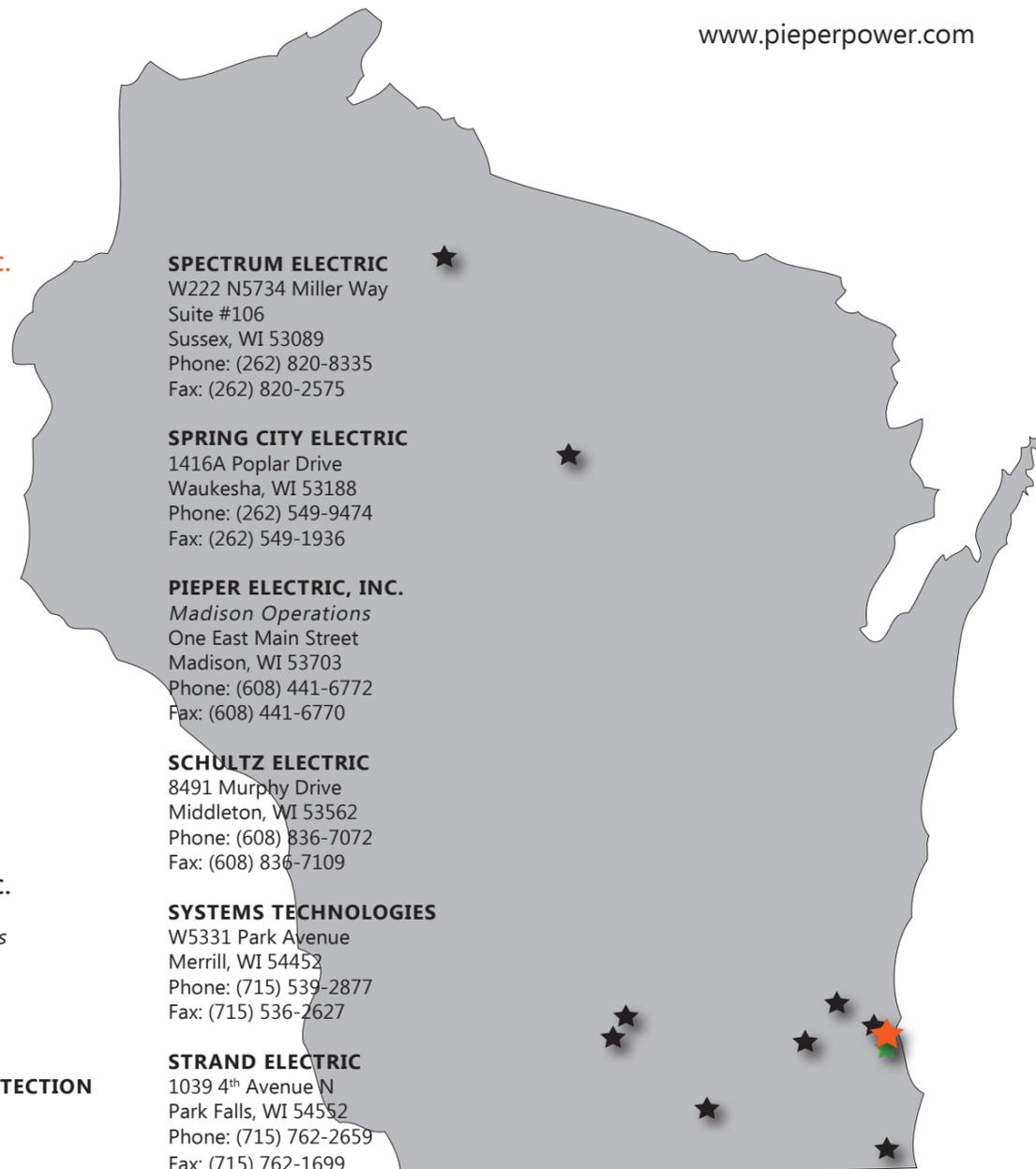
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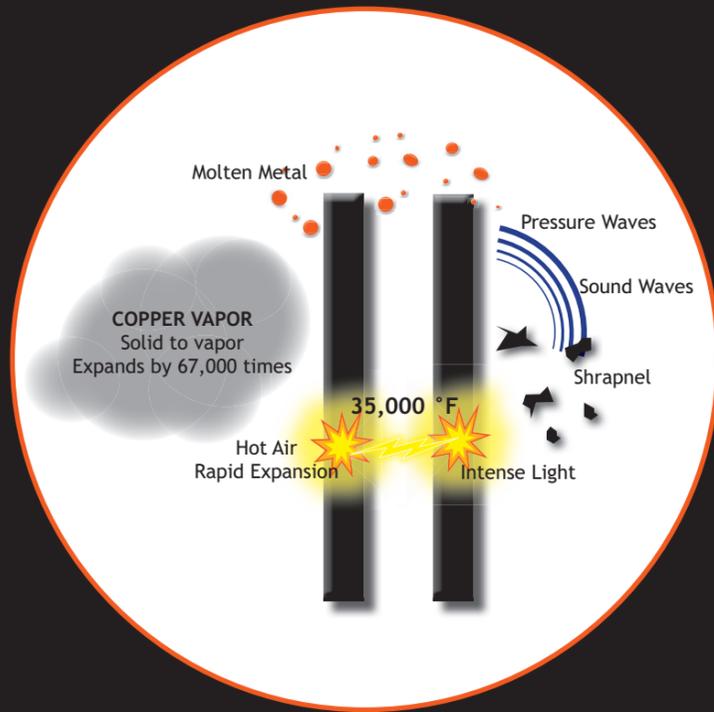


ARC FLASH HAZARD ANALYSIS



What is an Arc Flash?

An Arc Flash is the rapid release of incident energy from an electric source in the form of heat at any electrical source above 50V.



Where and when can an Arc Flash occur?

Hazardous Arc Flash can occur in any electrical device with voltages above 50 volts and in which energy is high enough to sustain an arc. Common places for a fault include:

- Industrial control panels
- Panel boards and switchboards
- Motor control centers
- Metal clad switchgear
- Transformers
- Motor starters
- High voltage switching and grounding
- Pad mount switching
- Anywhere electrical equipment failure can occur

Who is most at risk and when?

Personnel who are typically affected by Arc Flash Hazards are maintenance workers, electricians, equipment operators and HVAC technicians. Examples of tasks that require fire-rated clothing under NFPA-70E are:

- Removing or installing circuit breakers or fuses
- Low voltage testing
- Working on control circuits with energized parts exposed
- Applying safety grounds
- Racking circuit breakers
- Racking starters
- Removing bolted covers

What are the effects of Arc Fault?

The effects of an arcing fault can be devastating. The intense thermal energy can cause severe burns in just a fraction of a second. The temperature of an arc can reach approximately 35,000 degrees Fahrenheit, or about four times as hot as the surface of the sun. One of the major causes of electrical burns and death to workers is ignition of non-fire rated clothing due to an arcing fault.

In the United States, 5 to 10 arc flash explosions occur in electrical equipment every day, while 100 - 300 fatalities are attributed to electrical hazards each year.

What are my obligations?

Per NFPA-70E, IEEE and the National Electrical Code, employers are required to determine if electrical hazards are present within their facilities. If hazards are present, use of proper Personal Protective Equipment (PPE) is required of employees. NFPA-70E further requires that before a worker approaches exposed electric conductors or circuit parts not in safe working condition, a flash hazard analysis must be performed to identify the energy level statistics and determine the level of PPE required.

Per NEC 2011 section 110.16: Electrical equipment such as switchboards, panel boards, industrial control panels, meter socket enclosures and motor control centers, that are in other than dwelling units, and likely to require examinations, adjustment, servicing or maintenance while energized shall be field marked to warn qualified personnel of potential electric arc flash hazards. The marking shall be located so as to be clearly visible to qualified personnel before examination, adjustment, servicing or maintenance of equipment. The newly added requirement of NEC 2011 section 110.24 (a) mandates that any marking performed for 110.16 compliance, shall include the analysis date and 110.24 (b) requires that when modifications are performed that affect the maximum available fault current, the existing Arc Flash Analysis is verified/updated/adjusted to reflect the new level of maximum available fault current.

NOTE: Most state Occupational Safety and Health Agencies (OSHA) adopt the National Electrical Code as Law. You can be cited by OSHA for being out of compliance with NFPA-70E.



Pieper Electric is equipped to provide the services necessary to **prevent your risk** of electrical hazards. We utilize the most advanced and sophisticated software available to conduct our studies. Coupled with our highly trained and skilled technicians, our solutions are the best available in the industry.

Contact Roger Porter at 414.831.2321 or porterr@pieperpower.com

The **Risk Control Hierarchy** in Appendix G of the ANSI-Z10 standard provides a road map for setting the right safety objectives for reducing electrical risks. We help you implement these goals.



Protection
Risks Closer
Current Focus
(NFPA 70E)

Prevention
Risks Remote
Future Focus

Personal Protection: Wrapping Up Risks	Engineering Controls: Reinventing Risks
Administration: Regulating Risks	Substitution: Replacing Risks
Awareness: Revealing Risks	Elimination: Removing Risks

Arc Flash Hazard Study

We can perform a short circuit study to implement a complete, cost effective Arc Flash solution for your facility. We will develop ways to reduce your higher Arc Flash Ratings in areas where testing, troubleshooting or energized work is frequently performed.

The short circuit analysis determines available short circuit current throughout your electrical system. This study will evaluate the interrupting and withstand ratings of your existing equipment and aid in the design for future installations.

- Clearly labeled Arc Flash and shock hazard locations and PPE requirements
- Printed, bound details of the analysis, recommendations and precautions
- CD of analysis, recommendations, drawings and precautions
- 11 x 17 copy of any drawings
- Full-size plans of layout & study

Protective Device Coordination Study

This study determines proper breaker settings to ensure conductivity of service. Proper coordination between protective devices ensures that the devices trip in the proper order to protect equipment and prevent unnecessary blackouts.

On-Site Training

We can also provide on-site classroom training on NFPA-70E and OSHA standards involving Arc Flash Hazards and Lock-Out/Tag-Out procedures to further ensure the safety of your facility and your employees.

