



2017 ELECTRICAL SAFETY SERVICES

- ⚡ Arc Flash
- ⚡ Electrical Maintenance
- ⚡ Lockout/Tagout
- ⚡ And More

Lewellyn
TECHNOLOGY



ABOUT LEWELLYN TECHNOLOGY

Improving workplace safety since 1993

Daryn Lewellyn founded Lewellyn Technology more than two decades ago to focus specifically on electrical safety training for maintenance workers. As a former maintenance worker himself, Daryn saw the opportunity to fill a need in the industry by starting a company offering practical training taught by experienced instructors.

In the past twenty years, Lewellyn Technology has grown into an industry leader in Arc Flash and Combustible Dust safety, offering a wide range of services, from assessments and consulting, to engineering and training. While our team of in-house, industry experts has grown since our founding, what hasn't changed is the practical, thorough, and company-wide commitment to workplace safety.

Learn more about our Electrical and Combustible Dust safety services and training at www.Lewellyn.com or by calling us at 800.242.6673.

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ELECTRICAL MAINTENANCE

PROGRAM DEVELOPMENT

Electrical equipment deterioration is normal and equipment failure over time is inevitable due to physical and environmental factors. Failure to recognize and mitigate the deterioration process can cause expensive equipment breakdowns and unsafe working conditions. A written Electrical Preventive Maintenance Program identifies and recognizes these factors and provides methods for addressing them.

The NFPA 70 E Article 130.2 (A)(4) states “electrical equipment shall be properly maintained to allow for normal operation and for the safety of the employees that must work on the equipment”. Article 200 further states that the employer must decide on what maintenance methods will be used to maintain their equipment properly. The NFPA 70 B, NETA (National Electrical Testing Association) and the IEEE 3007.2 were developed to assist facilities with the recommended practices and testing techniques for electrical maintenance.

Lewellyn Technology has been a provider of electrical safety services for over 2 decades. Our safety experts, experienced engineers and instructors have the skills and knowledge necessary to develop an Electrical Preventive Maintenance Program for your facility.

The review and development of an EPMP is completed in three stages:

1. Program Review And Development

Lewellyn safety experts will gather information about your company's operations and equipment to better understand your working conditions and common electrical tasks. We will also review your current EPMP if available.

2. First Draft Discussion and Findings

Our Safety Team will communicate with your electrical maintenance teams, via phone conference to discuss findings and details of program. Revisions will be made to the first draft until a final copy is created.

3. Final Copy Overview and Implementation Process

The Lewellyn Technology safety team will walk through the final program and define who is responsible for what tasks. We will also discuss how to implement this program in your organization. Finally a question and answer period will be held to make sure all loose ends are tied up.

Items to be included or defined in your EPM program:

- Determining what equipment is considered critical, through an equipment survey
- Determining the frequency of maintenance on critical equipment and suitable tests, keeping environmental conditions in mind
- Determining what spare parts will be kept in stock
- Ensuring accessibility to electrical equipment for maintenance
- Determining why a failure in the system occurred (root cause analysis)
- Ensuring that maintenance work on electrical systems is performed by a person trained and qualified to perform such work activity
- Developing a system for monitoring electrical equipment
- Determining the internal and external personnel needed to implement and maintain an EPM program
- Establishing and recording an operators baseline equipment data log book
- Ensuring equipment tags or identifiers in the field match the drawing's description.
- Updating single line and logic diagrams of all electrical equipment
- Updating short circuit, coordination and risk assessment studies
- Ensuring that your arc flash study gets updated when new equipment is added, the circuit is moved, protective devices are replaced or settings changed and when cable(s) are modified in any way. (Not to exceed 5 years)
- Ensuring that electrical equipment is maintained in accordance with manufacturer's instructions or industry consensus standards
- Ensuring that all equipment maintenance and changes are documented

PHASE I: DATA COLLECTION

Lewellyn Technology Field Technicians will visit your facility to collect the necessary electrical data to perform an Arc Flash Hazard Analysis. Electrical information will be gathered and the systems analyzed from the utility connection point to the equipment in the plant. We will be looking for enclosures that present potential exposures to an Arc Flash. We will gather wire size, wire length, transformer data, circuit over-current protection information, among other data. We will gather data on all equipment necessary per IEEE 1584. We will not stop at an arbitrary or convenient point on your system.

PHASE II: SINGLE-LINE MODEL

Data collected by our Field Technicians during Phase I and/ or provided by the facility will be used to build a computer model of your facility's electrical distribution system. The model will be sent to the facility immediately. This model will be used to complete the Engineering Analysis, which includes a Short Circuit Analysis, Protective Device Coordination Analysis, Protective Device Interrupt Rating Analysis, and the Arc Flash Hazard Analysis, once the utility data is received.

PHASE III: ENGINEERING ANALYSIS

Delivery / Labeling

The results from Phase II will be documented and provided to the facility in a report format. The report will include a binder as well as a CD-ROM containing electronic files of the report. We will also retain copies of the report and data. A presentation meeting will be held with our representative and key people from the facility to go over the report and discuss recommendations. A Lewellyn Technology Field Technician will apply labels.

Arc Flash Hazard Analysis:

The report will present findings describing dangerous or disruptive conditions within the facility. The calculated arc flash hazards are compared to the criteria in NFPA Standard 70E, and hazards requiring personal protection equipment (PPE) are reported. The report will include recommendations for mitigating hazards Category 2 and above.

Labels:

Labels will be printed based on the data calculated. The labels will indicate the Arc Flash Boundary, Incident Energy, Flash Hazard Category, Voltage, Limited Approach Distance, Restricted Approach Distance, and the Prohibited Approach Distance. The label will indicate the device name and the over-current protective device which feeds it. This is no indicator of all devices of various voltages that might be feeding an enclosure. We list the device with the greatest impact on arc and shock hazard. This label is not a substitute for proper Lockout Tagout labeling which would indicate all power sources feeding an enclosure. A Lewellyn Technology Field Technician will apply the labels.



ELECTRICAL SYSTEM AUDIT

NFPA 70E & 70B COMPLIANCE

Service Description:

“The employer shall conduct routine audits on electrical equipment to ensure normal operation of the equipment and to monitor any changes that may be occurring.” —NFPA 70E 2015 110.3(A)

Lewellyn Technology has been a provider of electrical safety services for over two decades. Our safety experts, experienced engineers and field technicians have the skills and knowledge necessary to conduct electrical safety audits for your facility.

Electrical equipment will be exposed to environmental and physical conditions through its service life. Environmental conditions such as heat and humidity, combined with dust and chemicals can deteriorate equipment over time. Physical conditions such as vibrations and accidental damage caused by workers can also add to the breakdown of your electrical equipment throughout its service life.

The audit process is completed in three stages:

1. On-site Information Collection

Lewellyn field technicians will gather specific information regarding the proper installation and condition of the electrical equipment selected for the audit. A checklist will be used and Potential Electrical Hazards will be noted.

2. Development of Audit Report

The information that has been collected by our Field Technicians will be shared with our safety lead. The information will then be put into either a stand-alone report format, or included within your Electrical Safety Program Plan. The audit report will identify the condition of the equipment and call out actual and potential safety hazards.

3. Audit Report Overview

Upon delivery of the audit report, your team will have an opportunity to review, comment and provide questions and feedback to Lewellyn’s safety lead. If the audit report is being delivered within an Electrical Safety Program Plan, the audit review will be included during the review of the program plan.

The NFPA 70E and 70B stress the importance of proper maintenance of electrical equipment to ensure the equipment functions to manufacturer specs. Auditing is the only way to actually measure the condition of your electrical system to identify actual and potential hazards. Below are examples of common hazardous situations that may lead to violations:

- Electrical panel accessibility
- Loose wire connections
- Circuit labeling
- Proper installation of cover plates
- Electrical box condition
- Proper use of electrical rooms



Safety from arc flash and other workplace electrical hazards isn't solved by compliance alone. A truly safe workplace starts with your employees having the practical knowledge needed get the job done safely. We believe in the responsibility to provide a safe environment for each and every person under your roof. Lewellyn Technology was founded as an electrical safety training firm, and our history of comprehensive safety training designed to meet and exceed OSHA standards means that you're in good hands.

70E+PLUS

There is 70E training and then there is 70E Plus. The National Electrical Code, NFPA 70E and OSHA now all require that individuals receive OSHA safety training before they can be considered qualified to perform electrical preventive maintenance work.

70E+PLUS is different because it goes a step further and covers additional material that is needed if your goal is truly avoiding injuries from electrical hazards and not just compliance.

ELECTRICAL SAFE WORK PRACTICES*

Learn all the requirements for electrical safety with proper OSHA safety training (includes NFPA 70E - 2015 edition). This course pairs well with a complete arc flash risk assessment.

Electrical Safe Work Practices is designed for all personnel who work on, around or near any type of electrically energized equipment. Electrical hazards, proper electrical work practices, electrical safety training and procedures, and the safe installation of electrical equipment will be discussed. Available in a 2-day format or as a 1-day refresher course.

HIGH VOLTAGE SAFETY

High Voltage Safety covers the key aspect of the OSHA generation, transmission and distribution standard, 29 CFR 1910.269. This standard applies to organizations that either generate electricity or transmit energy to others. It also applies to organizations that have their own substations or electrical distribution systems.

By educating workers on the high voltage safety issues central to the safe performance of their everyday jobs, loss of life or serious injuries can be reduced and eliminated with safety workplace training. Your safety and the safety of your co-workers depend on it!

BASIC INDUSTRIAL ELECTRICITY I & II

Often copied, never duplicated, these are the original "Basic Industrial Electricity" classes and premier electrical training courses in the industry. In these separate, one day courses, attendees will be equipped with the skills that an industrial or institutional electrician must know to be effective on the floor. This is not only a course on electrical theory; the discussion will be on practical procedures, knowledge and skills needed to troubleshoot safely and effectively.

HANDS-ON ELECTRICAL TROUBLESHOOTING I & II

These intensive one-day hands-on courses cover the troubleshooting and repair of control circuits and electrical components. The novice as well as the experienced electrician will learn how to safely and efficiently build, troubleshoot, and repair motor control circuits using the hands-on troubleshooting methods covered in this class. The attendee will build circuits on realistic training panels that contain a motor starter, relays, terminal strips, push buttons, selector switches, and limit switches.

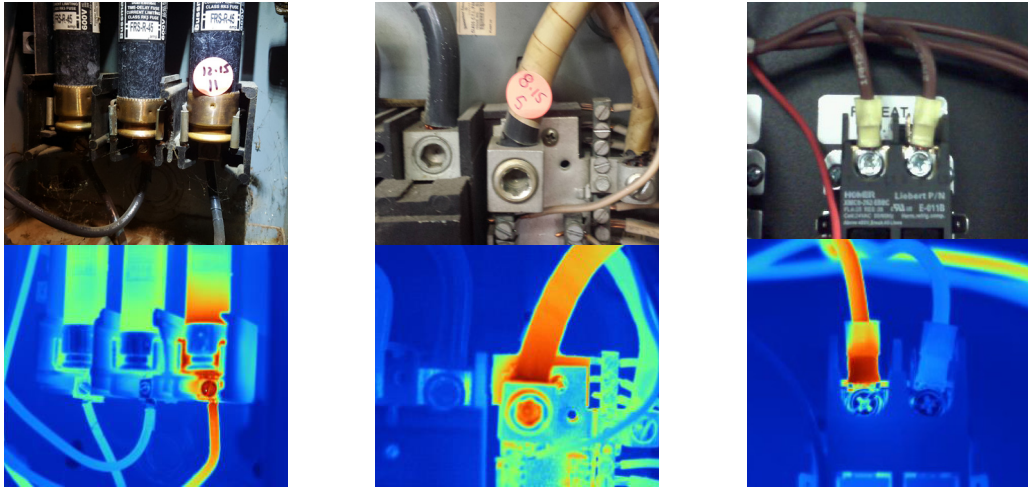
One of our student-favorites, this course is hands-on and very practical in its approach to troubleshooting. The examples you will be shown are applicable to practices in any facility.

*This training course is available in online, on-demand format.



INFRARED THERMOGRAPHY

THERMOGRAPHY STUDY



Service Description:

Lewellyn Technology can provide assistance in establishing an infrared thermography baseline study for electrical equipment. When done in conjunction with the data collection phase of your arc flash analysis, this IR study will include thermography of all electrical distribution equipment collected for your arc flash hazard report, completed by qualified electrical technicians and certified thermographers. This baseline study will provide a current snapshot of the facility's electrical system and outline any areas of immediate concern.

Advantages

- ⚡ Time** - Our qualified technicians are on-site, removing panel covers for the arc flash assessment, this is an opportune time for the (IR) study to be conducted.
- ⚡ Qualified & certified technicians** - There is no need to expose your employees to electrical hazards of opening or removing panel covers. Lewellyn Technology has qualified/ certified technicians that will take care of this for you while on-site.

Compliance Gap Assessment

For companies that have implemented a Lockout/Tagout (LOTO) program, the first step of your process should begin with a Compliance Gap Assessment (CGA). Our team of experienced Health and Safety Professionals will perform an in-depth review of your written program, energy control procedures, employee interviews, and compliance with applicable OSHA Regulations and Consensus Standards. Through the CGA process you will have a detailed report of where the LOTO program is for compliant items as well as a detailed report of gaps identified and recommendations to close the gaps.

Development of Site-specific Written LOTO Energy Control Program

If you have not yet developed a Written LOTO ECP the first step is to document a written program that documents the LOTO process within your facility. Our team of experienced Health and Safety Professionals have written LOTO programs in nearly every industry. Each program is custom developed to include your company's specific requirements and policies as well as compliance with the applicable OSHA regulations.

Development of Machine Specific Energy Control Procedures

Utilizing custom Energy Control Procedure software allows our team of experienced Health and Safety Professionals to author new ECPs using virtually any mobile device. The use of the software has reduced the amount of time required to produce a custom ECP with images and custom isolation point tags. The custom templates can be selected from our library of ECPs or we can customize your own template. Facilities that already have ECPs information can be imported and/or transferred to the software to allow editing and reviews to be completed.



ABOUT THE ELECTRICAL SAFETY TEAM



Jay Smith

Title: Executive Vice President
School: University of Southern Indiana
Degree: B.S. in Biology



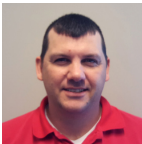
Chris Guffey, PE

Title: Chief Engineer/Arc Flash Operations Manager
School: Rose-Hulman Institute of Technology
Degree: B.S. Electrical Engineering



Joel Gibson, EE

Title: Engineer Team Manager
School: Purdue School of Engineering and Technology (IUPUI)
Degree: B.S. Electrical Engineering



Eric McCall, EE

Title: Engineer Team Manager
School: Indiana University - Purdue University Indianapolis
Degree: B.S. Electrical Engineering



Justin Sanders, EE

Title: Arc Flash Update Manager
School: Purdue University
Degree: B.S. Electrical Engineering

OTHER LEWELLYN SERVICES



Combustible Dust

- Dust Testing
- Dust Hazard Analysis (DHA)
- Engineering Controls
- Administrative Controls
- Electrical Area Classification





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