

Arc Flash Risk Assessment

NFPA 70E Compliance Assistance + Electrical Safety Program



COMMITMENT TO WORKER SAFETY + COMPLIANCE

Maintaining vital power systems and providing a safe working environment for employees is a priority for all ISG facility clients, and an especially critical responsibility for partners across the industrial sector. ISG understands the importance of minimizing electrical safety hazards in the workplace and on the production floor, as well as the impacts events such as arc flashes can have on the industry, businesses, and its employees.

What is an Arc Flash?

In simple terms, an arc flash is a sudden energy release in the form of light, heat, and pressure that can be dangerous to equipment and personnel in the vicinity of the event. These incidents are often caused by dropped tools, animals, or an equipment failure that results in live electrical components going phase to phase, or phase to ground. Because workers in industrial facilities frequently perform maintenance or service on energized electrical equipment, risks posed by these events are a major concern.

What Can Be Done to Avoid or Mitigate Risk?

To evaluate electrical hazards, ISG conducts arc flash risk assessments, which provide clients with detailed and concise documentation outlining the available risk. Coupled with our



arc flash training, this information can be added to the overall electrical safety program and activities appropriate for electrical hazards, voltage, energy level, and circuit conditions.

An electrical safety program provides hazard identification and risk assessment to determine protective equipment needs, including personal protective equipment (PPE). ISG's arc flash risk analysis helps facility managers maintain electrical safety standards aimed at protecting worker safety and facility compliance. This includes alignment with the National Fire Protection Association (NFPA) 70E, the standard for electrical safety in the workplace, and OSHA's general duty clause which requires all employers to implement employee training and safety programs.

DID YOU KNOW?

According to the NFPA, more than 2,000 people are admitted to burn centers every year because of arc flash related incidents. Similarly, case studies have put the average cost of each injury and death at \$6 million and \$15 million respectively; OSHA fines can exceed \$100,000. Injuries and deaths are preventable, and adequately protecting workers is key.

CUSTOM APPROACH

ISG's six step arc flash hazard analysis process supports a simple, replicable approach to protecting employee safety and maintaining facility compliance. The six steps below, which comply with NFPA 70E requirements, analyze each facility's electrical systems, processes, and equipment to develop a custom program, training, and upgrade/maintenance schedule.



Data Gathering +
One-Line Development



Short Circuit
Calculation/Evaluation



Protective Device
Coordination Evaluation



Arc Flash
Risk Assessment



Safety Training + Labels



Recommendations

- ### 1 Data Collection + One-Line Development

ISG begins arc flash risk assessments by conducting a site visit and data analysis. During this visit, ISG collects information to create an accurate and complete one-line diagram of the facility's electrical system. An identification of all electrical circuits and equipment is included, which is used to determine whether to verify or expand existing diagrams, or create new one-line diagrams of the facility.
- ### 2 Short Circuit Calculation/Evaluation

The second step is to determine available short circuit levels at every circuit and each piece of equipment on the one-line diagram. To do so, an evaluation is performed to identify any underrated equipment and calculate arc flash risk assessment results.
- ### 3 Protective Device Coordination Evaluation

To verify that the electrical system is properly clearing faults, ISG conducts a detailed arc flash analysis. This also helps determine how long it will take each protective device on the electrical system to operate in the event of a short circuit.
- ### 4 Arc Flash Risk Assessment

Arc flash incident energy level calculations are then provided for all electrical equipment using the incident energy analysis method. Based on results, recommended personal protective equipment (PPE) are assigned for all points in the facility.

ISG performs incident energy analyses for all three-phase distribution equipment, MCC loads, transformers, and power circuit breakers using the short circuit information, protective device coordination information, and other data. An analysis of the facility will identify high incident energy locations, and if possible provide recommendations to reduce these levels with equipment changes.
- ### 5 Findings, Training, and Labels

Following the assessment, ISG reviews study findings and recommendations with facility management personnel. Recommendations can include supportive drawings, reports, and computer data, as well as equipment labels outlining all relevant arc flash data to comply with NFPA 70E requirements. ISG then develops training sessions customized for each client and their applicable facilities.
- ### 6 Program + Update Plan

As a final deliverable, ISG provides a customized facility program, recommended improvements with cost effective options, and an update schedule, each of which are compiled into a comprehensive tool helping facility managers continue to protect employee safety and maintain building compliance. Whether the facility requires a complete electrical safety program created from scratch, a program update/review, or personnel compliance audits, ISG helps partners keep their employees and facility users safe, and buildings operating efficiently.