

Arc Flash Hazards — Standards and Regulations

ABB Electrification Industrial Solutions



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Electrical Workplace Safety and Compliance

With over 100 years' experience in analyzing power systems, ABB's comprehensive arc flash hazard analysis is designed to evaluate, analyze and provide recommendations addressing arc flash hazard per National Fire Protection Association's Standard 70E® (NFPA 70E®-2018). The arc flash hazard analysis is based on IEEE Std 1584™-2018 (Guide for Performing Arc-Flash Hazard Calculations). A key element of an arc flash hazard analysis is to enhance employee safety against dangers associated with the release of energy caused by an electrical arc.

Arc Flash Risk Assessment

Power systems engineering is one of the oldest and most fundamental services provided by ABB. Our power system engineers have unprecedented expertise gained from over 100 years of working with a wide range of customers and utilizing pioneering techniques. In order to provide as complete an arc flash risk assessment for an electrical system, our power system engineers will analyze an electrical system as follows: collect the system and installation data, device evaluation, protective device coordination and arc flash hazard analysis.

Collect the System and Installation Data

Data collection is one of the most important step to analyze the electrical system. Our power system engineers will collect the data or work directly with facility's qualified workers who are familiar with the electrical system to provide the necessary data to complete the analysis.

Device Evaluation

Our power system engineers will be evaluating the devices in the electrical system to determine if the interrupting capacities of the devices provide adequate protection when a fault occurs. This data is utilized to select equipment ratings and may serve as the basis for a protective device coordination and an arc flash hazard analysis.

Protective Device Coordination

The immediate protective device should operate if a fault occurs, thus a protective device coordination will be performed to determine if the protective devices provide adequate protection and are set properly to maintain proper coordination between protective devices.

Our power system engineers will be evaluating the protective devices in accordance per NEC, ANSI/IEEE Std. 242 (IEEE Buff Book) to determine if it provides proper protection for electrical equipment. Overcurrent protective device coordination will be reviewed for each electrical system and time current curves will be generated to review proper coordination.

If proper protection and coordination is not achieved, our power system engineers will provide recommendations where possible to improve selectivity and/or reduce arc flash hazard.

Arc Flash Hazard Analysis

An arc flash hazard analysis is a continuation of the device evaluation and protective device coordination of an electrical system. Arc flash hazard exposure is a function of fault clearing time of an arcing current and a working distance from the prospective arc source. Multiple techniques can be employed to limit exposure. ABB employs only proven data collection methods, detailed calculations and thorough software-based analysis to identify the calculated incident energy and arc flash boundary for each potential hazard.

ABB provides a comprehensive single source for examination of the existing electrical system, recommend safety upgrades and provide solutions to make the site compliant to current electrical codes (NFPA 70, NFPA 70B, NFPA70E & IEEE 1584). ABB offers a single source for data collection, electrical device evaluation, protective device coordination, arc flash hazard analysis, and recommendation of electrical system maintenance/upgrades.

Our power system engineers will calculate arc flash hazard values under multiple scenarios when needed, analyze the maximum and minimum fault current conditions are evaluated to determine worst-case arc flash hazard conditions

Detailed Labeling

It is the employer's responsibility to provide an electrically safe work environment. In order to provide an electrically safe work condition, the employer is responsible to field mark electrical equipment for the potential of electrical hazards. Field marking is to ensure qualified employees have the information necessary to select the appropriate personal protective equipment (PPE).

ABB will provide as part of the arc flash risk assessment, arc flash hazard labels for electrical equipment such as switchboards, panelboards, industrial control panels, meter socket enclosures, switchgear and motor control centers with following information:

- Nominal system voltage
- Available incident energy and the corresponding working distance
- Arc flash boundary
- Limited Approach Boundary
- Restricted Approach Boundary

Mitigating Arc Flash Hazard Risk

Our power systems engineers will work directly with facility managers/safety manager to mitigate arc flash hazard where the incident energy levels are deemed too high for facility employees to work on. Arc flash mitigation is not only limited to a newly designed electrical system, more importantly the existing system can be retrofitted to utilize features that limit the arc flash hazard energy exposure to technicians working on energized equipment.

ABB engineers have direct access to ABB product design teams who maintain expertise in the intricate details of power system equipment and review each scenario to provide sound, proven applications and solutions for arc flash mitigation. ABB Electrification Industrial Solutions will provide a single point of contact to assist your facility in the reduction of incident energy levels for arc flash, training & updated NFPA 70E & IEEE 1584 requirements.

Contact us:

For more information, call us toll free at +1 888 434 7378, or +1 540 387 8617 and visit us on the web at solutions.abb/industrial-services