

# Addressing Arc Flash Safety on a University Campus

**Customer**  
University

**Markets Served**  
Institutional



## The Value of PowerChain™ Management

PowerChain™ Management helps enterprises achieve a competitive advantage through proactive management of the power system as a strategic, integrated asset throughout its lifecycle.

-  Enhanced Safety
-  Greater Reliability
-  Operating Cost Efficiencies
-  Effective Use of Capital
-  Risk Mitigation

### To learn more, contact:

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*A reliable, high-quality power system is critical to every enterprise, but managing a power system effectively can be a challenge. Here is an example of how Eaton's PowerChain™ Management solutions helped a major Pennsylvania university achieve:*

-  **Enhanced safety** — Reduce electrical hazards with safety-conscious design and installation, plus products and information that help people recognize and avoid danger.
-  **Risk mitigation** — Reduce the risk of construction delays and cost overruns with a coordinated approach to power system design, procurement, installation and maintenance.
-  **Greater reliability** — Maintain vital operations with steady, high-quality power every minute of every day.

## Background

Ensuring campus safety for students, administrative personnel and faculty members is a prime concern of every university. A major safety consideration involves meeting the current NEC (National Electric Code) requirements and the NFPA 70E standard.

These requirements/standards serve as a guideline for electrical safety in the workplace. OSHA oversees compliance and may become involved if an event occurs.

A major university located in the eastern U. S. recently planned the addition of a new Information Technology department building to its campus. Facility engineers decided to capitalize on the opportunity to improve and update the school's arc flash safety practices at that time.

Their intent was to modify the campus distribution system while providing for the electrical needs of the new facility.

## Challenges

The expansion and improvements planned for the campus electrical distribution system were complex and resulted in large part to expanded utility services.

The new IT facility required the local power company to add a third feeder and 7500KVA transformer. The resulting modifications to the electrical distribution system were necessary to accommodate the increased utility power and to ensure safe operation. Specifically, the existing protection scheme had to be changed to accommodate the transfer scheme from two mains to three.

*“This job highlights the outstanding functionality capabilities of the relay.”*

*Kevin Friedrich, Application Engineer*

Also, to ensure system reliability, it was essential that the new system be designed to minimize any outages that could occur during a fault condition.

Like most universities, this campus was beset with an aging infrastructure that through the years absorbed numerous additional loads, as well as relocated loads from one circuit to another, thereby increasing the safety risk related to the system operation.

To ensure that the university collected appropriate data for analysis, its facilities management personnel selected a supplier with arc flash experience to implement the data collection. The results were designed to identify risks and hazards associated with the existing distribution system.

### Solution

The Eaton Engineering Systems & Services (EESS) was chosen to gather the data and perform the analysis. EESS conducted three studies – short circuit, coordination and arc flash – to accurately determine the level of arc flash hazard and appropriate Personal Protective Equipment (PPE).

As Kevin Friedrich, application engineer on the project, explained to the facilities personnel, “Two conditions influence arc flash – current and trip time. While it is difficult to limit the current, the Eaton arc flash solution produces a faster trip time, which is critical

to personnel safety when performing maintenance, repair or inspection on live critical equipment.”

The study results led EESS to install an effective arc flash mitigation solution that involved Eaton FP-5000 protective relays and Arcflash Reduction Maintenance Switches. The application consists of ten FP-5000 protective relays and as many Arcflash Reduction Maintenance Switches, which were installed on the three incoming main utility lines, as well as seven outgoing feeders. The Arcflash Reduction Maintenance Switches served as the selector switches to activate the group settings of the FP-5000 relays.

The installations served as a simple, reliable solution to reduce fault clearing times and arc flash hazards.

In addition, EESS engineered the protection and automatic transfer scheme, modified drawings and installed the new equipment without a single campus outage.

### Results

The campus electrical equipment associated with this project has been labeled in accordance with NFPA 70E, and EESS has conducted a series of safety training sessions for facilities personnel at the university.

The existing electrical distribution system was identified as Risk Category 3, which



requires significant Flame Resistant Clothing and Personal Protective Equipment for repair/maintenance activity.

Integrating the installed Arcflash Reduction Maintenance Switches into the campus changed the rating to Risk Category 1, significantly reducing the required Personal Protective Equipment safeguards.

The Eaton solution represents the first step in providing the university with a safe, reliable campus distribution system. Subsequently, the university's facilities management authorized Eaton to perform a second arc flash study focused on other parts of the campus.