

## Success Story:

### Arc flash studies for hyperscale data centers around the US

**Market Served**  
Hyperscale data centers



## Eaton helped a national, hyperscale data center document a complete picture of their data center safety

**Location:**  
Various throughout US

**Segment:**  
Hyperscale data centers

**Problem:**  
Original arc flash study was not done properly and the report was either incomplete or nonexistent leading to safety concerns and operational challenges.

**Solution:**  
Arc flash studies

**Results:**  
The arc flash study was completely redone to ensure accuracy in the new results and was documented in a detailed report to allow customer facility engineers to safely maintain and operate the electrical system at the data center.

*A detailed report was prepared, including a short circuit analysis, protective device coordination study, arc flash hazard analysis and more, that serves as a base for maintenance personnel to understand their electrical system and help ensure personnel safety.*

### Background

Globally renowned software giants have their hyperscale data centers located in different parts of the United States and the world. The focus of these companies when it comes to setting up a data center revolves predominantly around getting the equipment installed and commissioned safely and ensuring that the server loads are energized as quickly as possible. Arc flash studies typically tend to fall by the wayside and its importance is realized only later when the department that is responsible for maintaining the electrical system within the data center takes charge and realizes that the things are not in order.

Given the importance of worker safety and downtime minimization, Eaton gets called in to provide the necessary expertise in the field of power systems engineering—providing a comprehensive arc-flash solution that involves data collection, analysis, adjustment of protective devices in the field, application of proper arc flash labels, and a detailed arc flash report that is amongst the best in the industry.

### Challenge

The customer had a cluster of quickly commissioned hyperscale data centers. Their arc flash studies were performed by an electrical contractor. Once the site maintenance was turned over to the customer, it was noticed that identical equipment had inconsistent arc flash labels and there was no report that could provide clarity in terms of how the calculations were done, what scenarios were considered, etc. The customer had no way of knowing whether their maintenance personnel could work safely and were properly protected while working on the electrical system—even during routine tasks such as racking or switching.

Since the customer has multiple data centers in multiple locations, it would require deploying multiple engineers across these locations to get the arc flash study completed to meet their deadline. That's where Eaton came in—a company that has a vast pool of highly skilled and knowledgeable power systems engineers ready to jump into action to undertake such an assignment and meet deadline.



Powering Business Worldwide

## Solution

Eaton provided a best-in-class arc flash solution for the customer's entire cluster of hyperscale data centers in a region. The customer is now secure in the knowledge that their employees are working in a safe environment; the equipment has the correct arc flash labels and equipment settings are adjusted correctly on the protective devices, etc.

The first step taken by Eaton's Electrical Systems and Services Division was to meet the individual data centers facility managers to discuss the project background, understand their concerns, and provide an overview of how Eaton will conduct the coordinated studies. Eaton provided a lead engineer to ensure that consistency is maintained across all the sites, and a lead engineer to perform the actual calculations and analysis, along with Eaton field service representatives.

Eaton's full-service approach, working with both Eaton and third-party equipment, included field data collection, analysis and modelling, adjustment of protective devices in the field, application of the correct arc flash labels, recommending equipment modifications and alternate solutions, preparing a comprehensive arc flash analysis, and training the customer's maintenance personnel.

The information collected by Eaton's on-site field service representatives was vital to ensure consistent arc flash labels—labels that showed not just incident energy and arc flash boundary, but provided line vs load side calculations, along with highlighting what arc flash scenarios were considered—whether the power is being fed by utility, back-up generator, etc.

The intricate analysis and modelling was done using a software platform, based on the collected information, by Eaton's lead engineer and it enabled the adjustment of settings as required across various equipment - adjustable trip unit settings on Magnum Power Circuit breakers, adjustable settings on molded-case breakers, and relay settings for medium voltage equipment. To ensure that the overall electrical system is well coordinated.

Upon completion, a detailed report was prepared, which included a short circuit analysis, protective device coordination study, arc flash hazard analysis and supplementary items such as settings table, one-line diagrams, etc. Eaton also recommended potential mitigation solutions for identified issues.

The report serves as a base for the customer's maintenance personnel to truly understand how the electrical system operates; Eaton also provided training to them so that they get a firm grasp as to what the number on the labels mean, how they are calculated, and how they can operate it from a safety compliance perspective.

## Results

### Enhanced employee safety

The study significantly enhanced the personnel safety, contribution to the lowest possible chance of injury, as well as playing a role in the litigation avoidance in the event of a potential injury.

### Minimized downtime

The study helped minimize the probability of equipment getting damaged and associated equipment repair costs due to an arc flash event. A well-coordinated electrical system, with all the correctly set protective devices also helps in minimizing the outage/ load loss when isolating a potential problem in the power system.

### Peace of mind and serving future needs

Eaton provided a turnkey arc flash study process from beginning to end. The customer's maintenance personnel can now work on their electrical systems in a secure and confident manner knowing that every minute detail was taken care of by Eaton. In addition, the comprehensive report contains all the information necessary for a new maintenance person to come up to speed.

In summary, the customer benefited not just from Eaton's expertise in the field of power systems engineering, but also has the potential to tap into Eaton's products and services portfolio across the wider electrical domain to ensure that its hyperscale data centers continue to stay best-in-class.



**New labels can be printed and affixed to power distribution equipment as part of Eaton's studies.**

To learn more, visit [Eaton.com/pse](https://www.eaton.com/pse)

