



SHORT CIRCUIT STUDIES

CASE STUDY

Pioneer Power Group was tasked to perform an electrical system study for a university; this included short circuit, coordination, and arc flash studies. The distribution system consisted of several switchboards, panelboards, and overcurrent protective devices that required evaluation to confirm that they would be able to withstand or interrupt any fault current in the system.

▶ CHALLENGES



Fault currents in a distribution system can vary due to a range of factors both inside and outside of the system, such as the utility source and the types of loads being served. Equipment that is not properly rated for these fault currents may fail to interrupt a circuit fault, which could cause damage or failure to equipment and severe injury to site personnel. Over Current Protective Devices (OCPDs) are a key component in these systems. Distribution can be designed with equipment that is either fully rated, where all OCPDs are rated to clear faults in the system, or series rated, where OCPDs can only withstand faults or overloads until an upstream device trips.



Pioneer Power Group modeled the university's distribution system using the Engineer of Record's design and all data provided in the equipment submittals. A short circuit analysis was performed using SKM Power Tools Software and the fault currents in the distribution system were compared against the equipment ratings. The analysis showed that many panels were overdutied due to improperly applied breakers. Pioneer Power's engineers immediately notified the distributor of the failing equipment.

CONTACT US:



(301) 569-7931



info@pioneerpwr.com



www.pioneerpwr.com



Given this situation, the client and contractor had two choices: submit the study report to the Engineer of Record with failures noted or address the failures in advance. They decided to collaborate with Pioneer Power to address the failures in advance. As a result, Pioneer Power's engineers were able to provide the best solution for the failing equipment *ahead* of submitting the study.

▶ OUR SOLUTION



Pioneer Power Group collaborated with the client, contractor, and manufacturer to address system inadequacies, thereby keeping all project stakeholders on time and within budget. After discussing various options, all parties agreed that the most viable solution was to series rate the OCPDs within each panelboard. For the series rating to be successful, all possible breaker combinations in each panel had to be tested and passed by the equipment manufacturer. Our engineers reviewed the manufacturers' series rating information, compiled listings on all relevant breakers, and finally, called attention to the breakers that would make series rating possible.



With this collaboration complete, a new Bill of Material was provided for the project and Pioneer Power Group was able to update the study and confirm that all equipment would now pass the short circuit analysis and the system would be properly protected.

▶ RESULTS



While it would have been easy to run the report and recommend that all failing panels be replaced, our engineers knew that would not be the best solution for the customer. Upon review of preliminary results, our team proactively notified the customer of the issue, thereby preventing the premature and costly manufacture of improperly rated equipment. Once the problem had been identified, our team took the time to collaborate with multiple parties to identify and implement the solution – a methodical series rating of the distribution system.



Through this extra effort, the customer was able deliver a properly protected distribution system to the university, while remaining on time and within budget despite the unexpected challenges. Through a short circuit analysis, our customers can verify that all proposed equipment, especially OCPDs in a Series Rated system, are properly rated before manufacturing.



CONTACT US:



(301) 569-7931



info@pioneerpwr.com



www.pioneerpwr.com