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Short Circuit & Coordination Studies (Overcurrent Protective Device Coordination Study)

No installation is immune to an electrical fault. It can happen on any system, on any circuit, at any time, regardless of how carefully it is designed. Preventive maintenance can reduce the probability of an electrical system component malfunctioning, but the possibility of human error, equipment failure, overloads, and natural events always exists.

In a short circuit study, the magnitude of fault current available at various locations throughout an electrical distribution system is determined by mathematical calculations, which sum up all contributors of fault current such as the utility, generators, synchronous and induction motors, etc. These currents will vary in magnitude throughout any facility due to the different impedance characteristics of each circuit. The most significant contributors of impedance are transformers and conductor length.

When the available short circuit exceeds a protective device's maximum interrupting capacity, it may literally explode under fault conditions, causing severe injury or death to anyone in the immediate area of the explosion. Not as important as personnel injury, but still significant, is the destructive damage to adjacent equipment and structures. Resultant fires can cause even more damage than the original electrical fault.

A coordination study is an engineering study that provides the selection and settings of protective devices so as to isolate short circuit or overloads to only the affected area. The circuit breakers and fuses are set such that the protective device just upstream of a fault will operate. Other protective devices further upstream from the faulted bus, towards the service, should not operate to clear the fault. Proper coordination prevents, in most cases, a larger than necessary blackout from occurring. For example, a feeder fault should trip only the feeder breaker, not the main switchboard breaker.

Today's specifications usually place the responsibility for the Short Circuit and Coordination Study on the electrical contractor. The contractor in turn, may order a Coordination Study from the switchgear manufacturer, or in many cases, *the electrical contractor in the know*, will hire a coordination engineer directly. **Response Engineers provides Short Circuit and Coordination Studies**, often less expensive, and usually with faster delivery than the switchgear manufacturer.

Response Engineers has completed the following Short Circuit and Coordination Study Projects:

777 South Broad Street, Philadelphia PA
AmerisourceBergen Corp Dist Center, Hanover PA
Asher's Chocolates, Inc., Souderton PA
Blackrock Institutional Management, Wilmington DE
Bristol Myers Squibb, Hopewell NJ
Bryn Mawr Surgery Center, Wayne PA
Comcast Data Center, Goshen PA
Concord EFS Data Center, Atlanta GA
Conway Regional Medical Center, Conway AR
Entergy Data Center, Little Rock AR
Floral Vale Phase III, Yardley PA
Villanova University, Fedigan Hall, Villanova PA
Lehigh Carbon Comm College, Morgan Center, PA
Switch and Data, Philadelphia PA
Metromedia Fiber Network, Boston MA
Metuchen Municipal Building, Metuchen NJ

Mt. Vernon Redevelopment, Mt. Vernon NY
Olympus America, Center Valley PA
PAETEC Data Center Expansion, Bethlehem PA
Philadelphia Job Corps Center Relocation, Phila PA
QVC Data Center, Malvern PA
Tyco Healthcare Retail Group, King of Prussia PA
Ursinus College Residence Hall, Collegeville PA
US Military Academy, Bldg 609, West Point NY
Saucon Valley Plaza, Upper Saucon Township PA
Superior Tube Co., New Switchboard, Collegeville PA
Spruce Street Parking Garage, Scranton PA
Three Bridges School, Readington Township NJ
Toms River Community Medical Center, NJ
Verizon Northampton Central Office, PA
Wyeth Corporate Headquarters, Collegeville PA
YMCA of West Chester PA

Response Engineers uses SKM Systems Analysis Software.

SHORT CIRCUIT-COORDINATION-ARC FLASH