

Our dedicated power systems studies group supports in-house projects and stand-alone client projects from start to finish.

Short Circuit

A short circuit study provides the foundation on which other system studies such as coordination, device evaluation and arc-flash are built. Various unbalanced situations are analyzed such as three-phase, single-line to ground, line-to-line and double line-to-ground faults. In addition to being required by the National Electrical Code (NEC) short-circuit studies are invaluable tools for assessing the performance of an electrical system to ensure system and personnel safety are maintained during contingency situations.

Power (Load) Flow

A power flow analysis is performed to examine how different voltages and power levels are maintained under normal and contingency steady-state conditions. Power flow studies are great tools for planning a new system or in analyzing expansions of an existing electrical network. The study allows profiles to be generated for various operating scenarios. By correcting these profiles, it is possible to greatly reduce the operating cost of a system and decrease the amount of time needed between maintenance intervals.

Power Factor

A power factor analysis is a subset of power (load) flow study. Many facilities operate at a much lower power factor than is optimal and end up paying considerably higher utility costs than they should. Uncorrected power factors can create high demand charges in a utility bill and place unnecessary stresses on an electrical system. Saber Power's study team

can develop a rigorous power flow and power factor analysis to mitigate these issues and help keep the lights on.

Motor Starting

Motor starting studies evaluate system performance items and can be used to determine the effects starting motors have on other equipment and whether a motor will accelerate, and to analyze the response of generators to the starting motor and whether alternative starting methods are required. Saber Power's study team conducts motor starting studies early in the design phase of a project to ensure all associated equipment is properly specified.

Coordination

Protective device coordination studies are a critical component in specifying and developing protective devices and their settings. Coordination studies are required to minimize hazards to personnel, select overcurrent device ratings and settings, and ensure the minimal amount of equipment is de-energized as the result of a fault. A properly coordinated system provides the optimal balance between sensitivity and selectivity, resulting in devices that trip when they should – and just as importantly, don't trip when they shouldn't.

Arc Flash

Arc flash studies are used to categorize the hazard at specific equipment based on the incident energy, determine the arc-flash boundary, and bring a facility into compliance with NFPA and OSHA requirements. Saber Power's engineers have performed thousands of arc flash and coordination studies and fully understand balancing the competing objectives of system security, in which selective protective device operation is paramount, with personnel protection in which the fault current magnitude and duration are critical.

Power Quality

An electrical power quality analysis allows our engineers to determine and mitigate the cause of outages, spikes, or surges in power systems. Saber Power's study engineers and technicians determine the most appropriate locations and monitoring durations for a facility based on the frequency and nature of the disturbances. Once complete, these data are analyzed and a detailed report is provided recommending remedial measures.

Harmonics

Harmonic studies are used to determine voltage and current distortion level in all buses and conductors of interest, ensure compliance with IEEE 519, determine whether series or parallel resonance situations exist when capacitors are applied in a harmonic-rich environment, and design harmonic filters as a mitigation means. Saber Power's studies team can help with up-front design to ensure harmonic issues don't arise and can also build a harmonic system model based on equipment or field-gathered monitoring/metering data to accurately diagnose and mitigate harmonic-related issues.

Transient Stability

A transient stability study is designed to determine how an electrical system will respond to specific conditions using dynamic analytical tools. Stability studies are intricate and data intensive, requiring detailed modeling of machine governors, voltage regulators, and exciters for input data for the time and frequency domain analysis required to determine stability. Saber Power's engineering studies group understands these intricacies and can help our clients design systems that perform as intended under normal and emergency situations.

Grounding

Saber Power's grounding studies will detect any installation or calibration errors in your grounding system. These include problems

in tripping tolerance, polarity issues, and neutral connections to ground. Saber Power couples this engineering expertise with its wholly-owned subsidiary, Saber Power Field Services, which provides soil resistivity via Wenner-method testing, ground continuity testing, and grid evaluation using Fall-of-Potential method.

Switching Transients

A switching transient study is a particular power quality analysis focused on temporary (transient) over voltages that arise from sudden changes in circuit conditions. Switching transients generally are of longer duration and significantly more commonplace than lightning-induced surges. Saber Power's study team can perform switching transient studies as a stand-alone item or incorporate the results and solutions into a thorough insulation coordination analysis.

Power System Reliability/Availability

An electrical power system reliability study is a mathematical projection of equipment availability, i.e. the percentage of time a particular piece of electrical equipment can be expected to be available for use as intended. Saber Power's engineers can create a detailed reliability model tied to costs of process interruptions for projects in nascent developmental stages or for systems experiencing frequent upsets to help clients analyze the level of electrical infrastructure needed to operate in the most practical fashion.

Field Mitigation Services

Our services don't stop with the issuance of a study report. As a matter of routine, every report contains comprehensive documentation detailing all system deficiencies and options to mitigate them. As a one-stop shop for our clients, Saber Power offers field mitigation services through our Engineering, Construction and Field Services divisions. In this capacity, we address things such as mis-coordination, inadequate protection, NEC violations, excessive arc flash PPE level mitigation, motor starting issues, low power factor, non-functional or outdated equipment and poor voltage regulation.

All mitigation work is fully engineered, tested and commissioned with test reports. As-left settings and updated facility drawings are provided at completion of the project.

Saber Power's study team includes a contributor, chapter chair and ballot committee member for the IEEE Red and Brown books, an engineer from one of the leading power system analysis software companies, multiple licensed professional engineers, and NETA-certified electrical field technicians. In addition to the studies detailed on this flyer, we also perform cable ampacity studies; cable pulling studies; DC station power studies; EMT simulations; NERC, FERC and interconnect studies; noise abatement studies and a host of others.

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