

Electrical HAZOP / SAFOP Assessment



The safety and operability of an electrical system is fundamental to its intended performance.

Electrical Safety and Operability (EHAZOP / SAFOP) studies use a structured, collaborative approach to identify, assess, eliminate or minimise potential hazards present in Electrical Power System Installations to enhance the safety of personnel who will operate and maintain the equipment. Electrical systems can present significant risks to operation and maintenance personnel if they are not designed with safety and operation correctly taken into account. In the UK the Electricity at Work Regulations impose absolute requirements on Duty holders to control danger and prevent harm to employees involved in electrical activities. Similar requirements are stipulated in NFPA 70E. Electrical systems can present major hazards to operation and maintenance personnel if they are not designed with safety and operation properly taken into account.

An EHAZOP/SAFOP assessment typically comprises: Safety Analysis (SAFAN) which considers the layout of plant and facilities to assess potential hazards, System Security (ability to discriminate and isolate only affected faulted areas) and Operability Analysis (SYSOP), which considers the way the system is designed to function, reviewing the design intent, and assessing security of supply. It covers the main equipment items and auxiliaries including multiple supplies, on-site generation, changeover schemes, standby generation and UPS

systems and Operator Task Analysis (OPTAN), which examines probable tasks to be undertaken by local and remote operators during both normal and abnormal conditions

These three elements, when combined, form a complete EHAZOP/SAFOP assessment process. In the early stages of a project it is advisable to carry out a SAFAN and SYSOP once the basis of design is established. A complete SAFOP, including OPTAN, should be undertaken when the details of the design and the selected equipment have been established in enough detail. The EHAZOP/SAFOP methodology can also be applied to undertake the required EHAZOP/SAFOP assessments on existing installations as part of periodic safety reviews. A key deliverable is that the basis of safety is challenged and better understood by stakeholders.

What we offer

ABB offer professional services to lead and document EHAZOP/SAFOP studies for electrical power systems. Using a structured methodology, the studies include input from the client's project managers, electrical system designers, process designers, operators, maintainers, safety engineers and manufacturers if required. It is important regarding robustness of the process that the hazard study leader is independent and not involved in the project.

Our hazard study and electrical specialist engineers have widespread experience in the design, construction, operations and maintenance of electrical power systems and are well qualified to lead and guide EHAZOP/SAFOP studies. This experience has been applied in both traditional power generation and renewable energy sectors.

EHAZOP/SAFOP studies are used to identify design and functional deficiencies and potential enhancements which will lead to safer and more controlled operations. Depending on the outcome of the EHAZOP/SAFOP findings and the established hierarchy of safeguards available, further support may be required in the areas of additional risk assessment for instrumented protective systems e.g. Layers of Protection Analysis (LOPA) and the requirements for safety functions to be designed to meet target safety integrity level requirements (SIL).

Why ABB?

ABB have highly experienced engineers who have excellent knowledge of industry best practices with regard to process and functional safety, electrical design & systems verification, plant maintenance and operations. We are able to carry out EHAZOP/SAFOP studies on site or remotely dependant on our customers' requirements and availability. Additional services also include for:

- Process and Functional Safety Management Gap Assessment
- SIL Determination and Achieved SIL for SIS
- Safe Operating Procedure Development
- Electrical Systems Project FEED Verification
- Electrical Systems Obsolescence Studies

