Electrical power system studies provide essential information to ensure that new DNO connections comply with connection agreements and that extensions / alterations to existing electrical systems are designed and planned to provide a safe and secure energy source.

The addition of new generating plant whether it is greenfield or embedded alters the characteristics of its associated electrical system. Typically this will introduce different load flow characteristics, increased fault levels throughout the system and perhaps the introduction of harmonics and voltage fluctuations.

When generators are added to an existing system these changed characteristics may push the operational requirements of existing cabling, switchboards and transformers beyond their capacity.

New generating plant, for example wind turbine generation, tidal or wave power generation, require system studies to be carried out prior to connection to the grid.

Protection coordination issues may not be detected until an electrical fault occurs, causing unnecessary widespread supply disconnection together with associated loss of production.

It is extremely important that the incident energy available at equipment is understood so that mitigation measures can be established to protect operation and maintenance personnel from the risks of arc flash.

What we offer
Using industry standard software (DigSILENT, Amtech) ABB have the capability to model complete electrical systems providing:

- Load flow
- Short circuit analysis
- Harmonic analysis
- Voltage flicker analysis
- Transient stability studies
- Protection coordination studies
- Arc flash calculations

System voltages up to 36kV ac and beyond can be accurately modelled. In addition, protective devices across transformers can be modelled enabling complete coordination diagrams from load to source to be displayed on a single diagram. Short circuit and protection coordination studies provide the key inputs for arc flash studies. This enables flash protection boundaries to be confirmed and the incident energy at assigned working distances to be established throughout the electrical system.

ABB can tailor the level of the power system study to cover recent plant modifications or for a more detailed site wide study to produce a single comprehensive reference document for the site operation and maintenance manual.
Benefits

It is essential that the rating requirements of equipment are fully understood when developing new projects and prior to placing orders for switchgear and transformers as late changes to specifications can lead to additional cost and delays to deliveries. Power system studies are a prerequisite for any major power generation scheme to be connected to the grid.

Knowing how your power system operates over its complete range of operation scenarios provides identification of equipment rating issues, loading and protection coordination issues. Arc flash studies provide key information to facilitate safe operation and maintenance of electrical equipment and the appropriate selection of personal protective equipment.

Why ABB?

ABB has a wide range of practical design and operations experience on almost every type of industrial system. We also have considerable experience of creating system protection studies and power system studies for a variety of applications including power plant upgrades. Our engineers have received formal training on the use of DigSILENT and have been using amtech software for several years.

Although we are not limited to ABB Products, our consultancy team have direct access to the global resources of ABB interfacing directly with our drives, switchgear and transformer technical experts. This puts us in a unique position to draw upon our internal wealth of experience of power system products and industry best practices.