



Substation Grounding Studies

Powertech Labs conducts ground grid assessments and studies, and facilitates different grounding related testing.

At substations, grounding grids serve a dual purpose of providing currents with a safe path to earth under normal and fault conditions without exceeding the operating tolerances of station equipment, while keeping personnel safe by preventing exposure to electric shock resulting from excessive step and touch potentials. Achieving acceptable grounding system performance can be challenging when dealing with poor soil resistivity and constrained station sites. Often, a station's grounding system needs to be re-assessed following increased fault level due to addition of new generation sources or transmission lines. The IEEE Guide for Safety in AC Substation Grounding (IEEE Std. 80) provides guidelines for the grounding design for all outdoor, conventional or gas-insulated, distribution, transmission, and generation substations.

Powertech services include the following:

Data Gathering and Site Visits

Powertech engineers can collect all relevant background information, guidelines, and any applicable standards for the facility and evaluate the existing documentation. The data collected include the most recent soil resistivity tests, maximum fault current, and measured grid resistance. We can also conduct field visits to evaluate the site conditions and assess the grounding system. For input to the grounding study, our engineers supervise and facilitate site testing.

Testing Supervision

Powertech determines the required location of testing and coordinates with the testing team

for the preparation of the measurements, including ground grid impedance, continuity, soil resistivity, and step and touch potential.

Modelling

By using state-of-the-art grounding analysis software, our team can model and evaluate the grounding system for both greenfield and brownfield customer sites. We can calculate the different layers of soil resistivity, the ground grid resistance, the fault current split, the maximum tolerable step and touch potentials, the step and touch potential available at different site locations, and the ground potential rise of the grounding system. Based on these calculated values, Powertech engineers will develop recommendations and a computerized model to enhance the station grounding system, if needed, to meet the required performance.

Reporting and Grid Enhancement Recommendations

A sealed final report of the study includes assumptions, findings, calculation results, conclusions, and recommendations for enhancing the grid and eliminating the existing hazards while ensuring the safety of the personnel and equipment.

Powertech engineers can develop a bill of materials for grounding construction to implement the proposed mitigation recommendations.

ABOUT POWERTECH LABS:

Powertech Labs Inc. is one of the largest testing and research laboratories in North America, situated in beautiful British Columbia, Canada. Our 11-acre facility offers 15 different testing labs for a one-stop-shop approach to managing electrical utilities, and testing gas components, pressure vessels and systems.

Outside of the utilities industry, Powertech provides routine testing capabilities, product development, research and consulting services to support an array of industrial-type operations, electrical equipment manufacturers and automotive original equipment manufacturers.

www.powertechlabs.com



FOR MORE INFORMATION CONTACT:

Jorge Hollman - 604.831.5148

Senior Manager, Substations Engineering Studies
jorge.hollman@powertechlabs.com

Bruce Sunga - 604.812.7504

Director, Substations Technology & Testing
bruce.sunga@powertechlabs.com

Powertech
www.powertechlabs.com