

Seeding Fund Project

Study on the Impact of Seasonal Variations of Soil Resistivities on Safety of Substation Earthing Systems in TNB



In Situ Soil Moisture Measurement Setup



Soil Resistivity Measurement Setup

Project Overview

The project focused on the effects of soil resistivity variations on substation earthing resistance and substation safety; and review of current TNB practice & utility best practices, including international standard recommendations for safe substation earthing design.

This project investigated the relationship between average monthly rainfall intensities, top layer soil moisture, soil resistivities and earthing resistances for a period of 12 months at two substations, namely 132/33KV Guthrie substation and 275/132kV Kandis substation. The assessments of the earthing systems was also carried out using CDEGS simulations software.

Deliverables

Technical reports on:

- Analysis of measurement data for the assessment of seasonal variation effects of substation earthing resistance and substation safety
- Assessment on safety of case-study substations for varying soil resistivity values
- Review of TNB current practice & utility best practices in design safe substation earthing systems.

Benefits

The study provides input related to seasonal variation aspects for design of substation earthing system for TNB. A technically and economically effective, efficient, safe and practical earthing system would impact TNB in the following manners:

- Increased safety of personnel and public resulting from efficient and safe earthing system
- Reduced potential incident due to safety issues on earthing design
- Increased cost effectiveness of substation earthing design
- Increased power supply reliability resulting from reduced disturbances and outages