

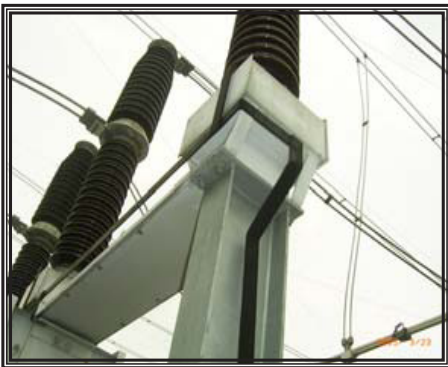


R&D Fund Project

Evaluation of Alternative Earthing Materials in Substations



Galvanised Steel Lattice Support Structures in Substation



Present copper earthing conductor connection of circuit breaker support

Project Overview

This project investigates other materials and determines the feasibility of using these materials to replace copper as earthing downleads in the substations. The cross-sectional areas of the downleads required to carry the fault currents as specified in TNB were determined in accordance to the IEEE Std. 80 (1983)

procedures. The economics based on the amount or volume of materials required and on the prices of the materials was determined.

The option of using the existing galvanized steel lattice equipment support structures that are readily available in substations was examined. The currents that flows through the current paths in the lattice support structures were determined by means of CDEGS simulations. The current carrying capacity of the respective current path was calculated as per the IEEE Std. 80 (1983) formula. The option was investigated at the very substation in TNB for the practicality of its implementation.

Deliverables

Project final report that provides findings and recommendations on:

- a) The alternative materials that can be used as earthing downleads and the corresponding cross-sectional areas required to carry the fault currents as specified in TNB.
- b) The economics of the downleads based on the prices of the materials
- c) The results of CDEGS simulations on Rohas-Euco galvanized lattice steel 275kV and 132kV equipment support structures in Bukit Beruntung substation and of the feasibility of using these structures as earthing downleads.

Benefits

- a) Enabled more cost-effective materials to be used for earthing downleads
- b) Increased level of safety of TNB personnel and the public
- c) Increased level of security and stability of TNB power system