

Reduction of earth grid resistance by addition of earth rods to various grid configurations

ABSTRACT

Achieving low earth grid resistance is highly desirable in power distribution substations design. However, due to variation of soil resistivity from one location to another, it is not possible to obtain the same value of low earth resistance at all locations. Changing earth conductor dimensions such as cross sectional area and length may lower earth resistance. In this paper, six different earth grid configurations have been used to study the effect of adding vertical earth rods to the grid periphery and at all grid conductor intersections of each configuration with the aim of reducing the overall grid resistance. Three grids were designed with compression ratio of 1, while the other three had a compression ratio of 0.8. Results indicated that for grids with compression ratio of 0.8 and with earth rods at all conductor intersections, the grid resistance was lower than those with a compression ratio of 1. It was also found that, the resistance of all grids with a compression ratio of 0.8 were lower than those with a compression ratio of 1.

Keyword: Grid resistance; Grid configuration; Earth rods; Compression ratio