

## **Application of the insulator coordination gap models and effect of line design to backflashover studies**

### **ABSTRACT**

Any insulation coordination study must accurately (or as accurately as possible) express the type and magnitude of all overvoltages on the power system. If these overvoltages are higher than the rating of the equipment, they will result in damage to that equipment. This paper presents the application of the insulator coordination gap models and the effect of line design to the line performance in terms of backflashover rate. The models which are ranging from as simple as voltage controlled switch to as detail as leader progression model will carefully be evaluated. Sensitivity analyses on the effect of line designs such as variation in footing resistance, height of tower/conductor, tower surge impedance and soil resistivity will also be carried out in determining the backflashover rate and the probability of transformer damage by comparing the maximum voltage recorded at the substation entrance with the basic lightning insulation level (BIL). Results will then be compared in finding which model makes the analysis more or less sensitive to any design parameter.

**Keyword:** Backflashover, Insulation coordination, Coordination gap, Leader progression model, Basic lightning insulation level (BIL)