

Lightning impulse strength of 275 kV and 132 kV tower with composite crossarm

ABSTRACT

Severe lightning overvoltage is regarded to the multiple flashovers on the overhead lines. Therefore, it signifies the needs of having a robust insulation system, especially to those which highly susceptible to lightning strikes. In order to minimize the impact of lightning, it is necessary to evaluate lightning performance of the tower and its components before implementing any proposed design. Therefore, in this work, a feasibility study was done on proposed 275 kV and 132 kV transmission tower with composite crossarm installed. In order to assess the insulation strength of the tower against the lightning activities, lightning caused events i.e. backflashover and shielding failure were applied onto the tower models by using FEM based software. The CFO of the tower insulation were calculated based on the design provided, whereby it was complementary verified by the voltage and electric field profiles of the simulation. For each case, none had shown a voltage magnitude higher than the voltage supposed to possibly cause 50% chance of flashover.

Keyword: Composite crossarm; Tower insulation; ANSYS Maxwell; CFO