

Cattareya Chavalitthitikorn 2007: Lightning Performance Improvements of EGAT Transmission Lines Based on Lightning Location System. Master of Engineering (Electrical Engineering), Major Field: Electrical Engineering, Department of Electrical Engineering. Thesis Advisor: Assistant Professor Dulpichet Rerkpreedapong, Ph.D. 176 pages.

This thesis purposes a methodology for evaluating and improving lightning performance of EGAT transmission lines using information from the Lightning Location System. Lightning location detected by LLS are shown on Thailand map by Arcview GIS 3.3 program to find ground flash density of each line span. The ground flash density is used as an input in TFlash version 3.0.21 program to calculate expected lightning performance for 115kV, 230kV, 500 kV EGAT transmission lines. The results are compared with actual interruption events caused by lightning using related standards. In addition, the most frequently faulted line, 115kV Klang-Chanthaburi, is selected for improvement by Optimizer of TFlash version 4.0.22. The steps in evaluating and improving lightning performance comply with "Handbook for Improve Overhead Transmission Lines Lightning Performance (EPRI)"

The calculated lightning performance of 115kV Klang-Chanthaburi and 500kV Sainoi-Wangnoi Circuit No.3 transmission lines are found above the allowable value in the IEEE1313.2-1999 Standard. However all 3 transmission lines have actual lightning performance from faulted events compliante with this standard. The differences between calculated and actual values can be reduced by using actual transmission line data from surveys. The 115kV Klang-Chanthaburi line is selected for improvement with a budget of 1 million baht. The optimal result is obtained by reducing ground resistance to 5 ohms, adding 2 insulators and adding 1 shield wire to the problem towers. This solution yields the number of flashover reduce by 60%. Also, It can be used to design a new transmission line on high ground flash density area to reduce faulted events caused by lightning, and also results in the good lightning performance.



Student's signature



Thesis Advisor's signature

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