Penggunaan Kawat Tanah untuk meningkatkan Unjuk Kerja Jaringan Tegangan Menengah terhadap Samabaran Petir

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Abstrak

Lightning strikes to the distribution lines can produce over voltages due to direct or indirect strikes. For medium voltage 20 kV lines according to some researchers more than 80% of the failures caused by indirect nearby strikes. Installation of earth wires can reduce over voltages to the lines. A Study on Application of earth wire to improve the lightning performance on medium voltage lines was carried out at feeder Kapur and feeder Beton located in the area of Depok and Bogor at south side of Jakarta which has very high lightning density and has recorded a lot of failures due lightning since the lines. No earth wire installed on any lines in this area. To choose the suitable earth wire installation six different scenario was made. This scenario will he applied to these two feeders to get the number and the best position of earth wire. The influence of the direct strikes and induction of lightning strikes of these six scenarios will be compared and the number of earth wire, position of earth wi re to the phase wire at the pole and the size of the conductors will be determined The tropical local lightning data derived from Indonesian Lightning Detection System and the Rusck formula were used for this analysis. The results of the study shows that the additional of earth wire improved the performance of the system with minimum of 26% by installing only one earth wire and the maximum performance can be achieved till 75% by installing two earth wire on the lines. Field measurement by installing the earth wire on both lines has given the significant results that the scenarion 6 has reduced the failures to 30%-60% for one year observation.