

ABSTRAK

ANALISIS EFEKTIVITAS *TRANSMISSION LINE ARRESTER* (TLA) UNTUK GANGGUAN AKIBAT PETIR PADA PENGHANTAR 150 KV BARIKIN – PARINGIN – TANJUNG

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Gangguan akibat petir berakibat fatal karena memungkinkan mengalami peristiwa Back Flashover (BFO) dan Shielding Failure (SF) akibat sambaran petir, dalam penelitian ini diambil pembahasan gangguan petir pada penghantar Barikin – Paringin – Tanjung tergolong cukup sering dengan intensitas sambaran petir historis yang terjadi pada tahun 2024 mencakup arus puncak tertinggi yaitu sebesar 339 kA dan arus puncak positif tertinggi sebesar 145 kA serta terdapat 3 kali gangguan akibat petir yang berpengaruh pada kehandalan transmisi. Pemasangan instalasi Transmission Line Arrester (TLA) telah terpasang sebanyak 100 dari total 177 tower, dengan pertimbangan secara teknis. Setelah dilakukan melalui simulasi dengan menggunakan software Electromagnetic Transient Program (EMTP-RV). Simulasi dilakukan dengan parameter type tower AA+3, nilai resistansi kaki tower yang disimulasikan adalah 10 ohm, 50 ohm dan 100 ohm. Besar arus petir 60 kA, durasi simulasi selama 150 μ s dengan time step 5 ns maka didapati hasil bahwa dengan pemilihan TLA sebagai proteksi petir mampu meminimalisir tegangan impuls akibat petir sebesar 83,4% jika dibandingkan dengan tower yang tidak dilengkapi proteksi tambahan.

Kata Kunci : Gangguan, Petir, *Transmission Line Arrester* (TLA), EMTP

ABSTRACT

ANALYSIS OF THE EFFECTIVENESS OF TRANSMISSION LINE ARRESTER (TLA) FOR LIGHTNING INTERFERENCE IN THE 150 KV BARIKIN – PARINGIN – TANJUNG CONDUCTOR

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Disturbances due to lightning are fatal because they allow experiencing Back Flashover (BFO) and Shielding Failure (SF) events due to lightning strikes, in this study it was taken to discuss lightning disturbances in the Barikin – Paringin – Tanjung conductors are classified as quite frequent with the intensity of historical lightning strikes that occur in 2024 including the highest peak current of -339 kA and the highest positive peak current of 145 kA and there are 3 times the disturbance due to lightning that affect the reliability of the transmission. The installation of Transmission Line Arrester (TLA) installations has been installed as many as 100 out of a total of 177 towers, with technical considerations. After being carried out through simulation using the Electromagnetic Transient Program (EMTP-RV) software. The simulation was carried out with tower type parameters AA+3, the resistance values of the simulated tower legs were 10 ohms, 50 ohms and 100 ohms. The magnitude of the lightning current is 60 kA, the simulation duration is 150 μ s with a step time of 5 ns, so it was found that the selection of TLA as lightning protection was able to minimize the impulse voltage due to lightning by 83.4% when compared to towers that were not equipped with additional protection.

Keywords: Disturbance, Lightning, Transmission Line Arrester (TLA), EMTP