SIMULASI SISTEM PENTANAHAN SUTT 150 KV JEMBER-BANYUWANGI TERHADAP SAMBARAN PETIR MENGGUNAKAN SOFTWARE *ALTERNATIVE TRANSIENT PROGRAM (ATP) DRAW*

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ABSTRAK

Sistem pentanahan adalah perlengkapan penting dalam sistem transmisi yang berfungsi untuk meneruskan arus listrik dari tower SUTT maupun SUTET ke tanah dan mencegah terjadinya back flashover pada isolator saat sistem pentanahan terkena sambaran petir. Penelitian ini dimulai dengan melakukan survey data yang diperoleh dari PT. PLN (Persero) UITJBM UPT Probolinggo ULTG Jember. Peneliti menggunakan Alternative Transient Program (ATP) Draw untuk mengetahui nilai impedansi pada Sistem pentanahan kaki tower. Setiap penambahan elektroda pada kaki tower sedikit menurunkan tegangan *Body* tower saat terjadi sambaran petir tetapi masih berpotensi terjadi sambaran backflashover. Jika menggunakan metode pemasangan elektroda secara langsung ke GSW nilai Tegangan pada *Body* tower sedikit dibawah BIL Isolator jadi kecil berpotensi terjadi backflashover. Metode penambahan 1 Elektroda dan 2 elektroda pada kaki tower hanya mampu menurunkan sedikit nilai tahanan *body* tower saat terjadi sambaran petir. sedangkan metode pemasangan elektroda secara langsung ke GSW mampu mereduksi nilai tegangan *body* tower saat terjadi sambaran sampai 1,27 MV untuk 27 kA dan 0,94 MV untuk 20 kA. hasil diatas berada dibawah nilai BIL Isolator yaitu 1,375 MV sehingga kecil potensi terjadi backflhasover. Nilai Tahanan Petanahan mempengaruhi tegangan pada *Body* Tower saat terjadi Sambaran petir dengan menggunakan simulasi dari software ATP-draw. Semakin kecil arus sambaran petir maka tegangan *body* tower akan semakin kecil. Pemasangan elektroda secara langsung ke GSW dapat menurunkan nilai tegangan *body* tower saat terjadi sambaran petir dan mengurangi potensi terjadi backflashover.

Kata kunci : Sistem pentanahan, Tower SUTT, *Alternative Transient Program* (ATP) Draw

SIMULATION OF THE 150 KV JEMBER-BANYUWANGI GROUNDING SYSTEM FOR LIGHTNING STRIKES USING ALTERNATIVE TRANSIENT PROGRAM (ATP) DRAW SOFTWARE

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ABSTRACT

The grounding system is an important equipment in the transmission system that serves to forward the electric current from the SUTT or SUTET tower to the ground and prevent back flashover on the insulator when the grounding system is hit by a lightning strike. This research begins with a survey of data obtained from PT PLN (Persero) UITJBM UPT Probolinggo ULTG Jember. Researchers use the Alternative Transient Program (ATP) Draw to determine the impedance value of the tower leg grounding system. Each additional electrode at the foot of the tower slightly reduces the Body tower voltage during a lightning strike but still has the potential for a backflashover strike. If using the method of installing electrodes directly to the GSW, the voltage value on the tower body is slightly below the BIL of the isolator so there is little potential for backflashover. The method of adding 1 electrode and 2 electrodes at the foot of the tower is only able to slightly reduce the value of the tower body resistance during a lightning strike. while the method of installing the electrode directly to the GSW is able to reduce the value of the tower body voltage during a strike to 1.27 MV for 27 kA and 0.94 MV for 20 kA. the above results are below the BIL Isolator value of 1.375 MV so there is little potential for backflhasover. The value of the Grounding Resistance affects the voltage on the Tower Body during a lightning strike using a simulation of the ATP-draw software. The smaller the lightning strike current, the smaller the body tower voltage will be. Installation of electrodes directly to the GSW can reduce the value of the body tower voltage during a lightning strike and reduce the potential for backflashover

Keyword : Grounding system, SUTT Tower, Alternative Transient Program (ATP) Drawings