

ABSTRACT

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Title : Network Reconfiguration and Addition of a Parallel Transformer for Increase the Voltage on the Radial Network using a Genetic Algorithm

Along with the development of technology, the need for electrical energy continues to increase, so the need for electrical energy needs to be met accompanied by good quality. The problem that arises in Indonesia is the radial distribution network topology and has a drawback, namely the value of voltage drop on buses that are far from the source so that it can result in voltage quality at the last customer will receive the lowest voltage quality. This study uses an IEEE 33 bus network that has been modified by adding a low voltage (LV) network that contains a distribution transformer in the analysis process of adding an parallel transformer. This study aims to analyze a radial distribution network that will be optimized to obtain optimal voltage values in the system using Genetic Algorithms (GA) and the addition of parallel transformers that will be recalculated day calculations using Backward Forward Sweep (BFS) on MATLAB R2023a software and validated using ETAP 19.0.1 software. The results of this study prove that using the Genetic Algorithm to reconfigure the radial electric power system network can increase the voltage value by 0.012587 p.u or 0.252 kV on the MV network and 0.009333 p.u or 3.733 V on the LV network. As for the addition of the parallel transformer can increase the voltage based on the capacity of the transformer, if the greater the capacity of the installed transformer, the greater the increase in voltage value.

Keywords: Voltage drop, BFS, GA, Rekonfiguration, Paralell Transformer