

ANALYSIS OF THE EFFECTIVENESS OF INTERMEDIATE DISTRIBUTION SUBSTATIONS IN OVERCOMING VOLTAGE DROP PROBLEMS IN LOW-VOLTAGE NETWORKS OF PLAMPANG FEEDER

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ABSTRACT

The electrical distribution network is a crucial component of the power system responsible for delivering electricity from substations to consumers. However, voltage drop issues often occur, especially in low-voltage networks such as the Plampang feeder. This study aims to analyze the effectiveness of installing intermediate distribution substations (*gardu sisip*) to mitigate voltage drops in the network. The research method involves network system simulations using ETAP software, evaluating two scenarios where substations are placed at points D15B2C2 and D15B2C12. Simulation results indicate that the addition of intermediate substations can significantly improve voltage at terminal loads, such as *Ternak Ayam23*, increasing from 204 V to 226 V, with an improvement effectiveness of over 10.78%. Substation placement at both points yields equally optimal and balanced voltage distribution outcomes. Therefore, strategically placing intermediate substations proves effective in enhancing voltage quality in low-voltage electrical distribution networks.

Keywords: voltage drop, intermediate substation, low-voltage network, ETAP, distribution effectiveness.