

IMPROVING THE RELIABILITY OF THE 20 KV DISTRIBUTION NETWORK AT THE WONOKOYO REFEITER USING ETAP SOFTWARE

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ABSTRACT

Currently, the need for electrical energy is increasing very rapidly. The increasing need for electrical energy must be balanced with the increasing reliability of the electrical power distribution system. One method to increase the reliability of the distribution network is by adding fuse components, Load Break Switches (LBS), and reclosers in sections that have the longest disturbance levels. Based on the results of the manager's report, in section I a value of 15.7244 f/year was obtained and in section II a value of 17.3658 f/year was obtained, so reliability improvements were carried out in section II. Increasing the reliability of the Wonokoyo feeder was carried out using ETAP (Electrical Transient Analysis Program) software using the reliability assessment feature. The simulation of adding fuse, LBS and recloser components aims to evaluate which components can most effectively increase the reliability of the electric power distribution system at the Wonokoyo feeder. Based on the reliability assessment simulation in the ETAP software, the Wonokoyo feeder in existing conditions obtained a SAIFI value of 1.1526 f/customer.yr, and a SAIDI value of 4.2922 hr/customer.yr. Based on the reliability index evaluation, the most effective increase in reliability on the Wonokoyo feeder was the addition of fuse components, with a SAIFI value of 0.8442 f/customer.yr, and a SAIDI value of 2.2873 hr/customer.yr. The addition of a fuse reduces the SAIFI value by 0.3084 f/customer.yr, and SAIDI by 2.0049 hr/customer.yr. The reliability index value of the Wonokoyo feeder after adding the fuse meets the standards set by IEEE Std. 1366-2000, namely SAIFI of 1.45 f/customer.yr and SAIDI of 2.30 hr/customer.yr.

Keywords: *Distribution System Reliability, Fuse, Load Break Switch, Recloser, ETAP*