

## ***ABSTRACT***

The reliability of an electrical power distribution system is a crucial factor in ensuring service quality for customers and reducing power losses. The primary parameters used to evaluate distribution system reliability are the System Average Interruption Duration Index (SAIDI), which indicates the average duration of power outages experienced by customers annually, and the System Average Interruption Frequency Index (SAIFI), which reflects the number of outage incidents experienced by customers per semester.

This study aims to analyze the SAIDI and SAIFI values of the distribution network in the ULP Bengkalis area, specifically focusing on the Sei Alam feeder, and to evaluate whether these values meet PLN standards. The disturbance data was collected from January to June. Based on the performance evaluation of three feeders using SAIDI and SAIFI indicators, only the Rc Penampi feeder demonstrated excellent performance, with a SAIDI value of 3.47 and a SAIFI value of 0.17—well below the national targets of 102.7 for SAIDI and 1.92 for SAIFI—achieving only 3.37% and 8.85% of the respective thresholds. In contrast, the Jur Sei Alam and Rc Pematang Duku feeders recorded SAIFI values significantly above the target, at 2.71 (141.14%) and 2.21 (115.10%), respectively, along with SAIDI values of 12.39 (12.06%) and 14.63 (14.24%), which also exceeded the limits. These findings indicate that Rc Penampi has a highly reliable distribution system, while the other two feeders require further evaluation and improvement to enhance service quality and meet the reliability standards set by SPLN/IEEE.

**Keywords** - Distribution System Reliability, SAIDI, SAIFI, Sei Alam Feeder