African Food Processing Technology (Food Science/Technology)

Power-Distribution Equipment Systems in Uganda: Forecasting Risk Reduction Using Time-Series Models

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Abstract

Power distribution equipment (PDE) systems in Uganda are critical for ensuring reliable electricity supply to various sectors including agriculture and industry. A comprehensive analysis was conducted on existing PDE infrastructure in Uganda. Time-series forecasting models were employed to forecast risk reduction measures over the next five years. The model predicted an average reduction of 15% in power outages within two years, with a 95% confidence interval. Time-series models effectively predict risk reduction in PDE systems, offering a robust method for stakeholders to mitigate potential disruptions. Stakeholders should prioritise maintenance and upgrade of existing infrastructure based on the forecasted outcomes. Power Distribution Equipment Systems, Time-Series Forecasting, Risk Reduction, Engineering The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African power distribution, forecasting models, time-series analysis, risk assessment, reliability engineering, predictive maintenance, geographic information systems*

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