

MODELLING OF DISTRIBUTION LOAD PATTERN FOR ODI-OLOWO AND IKIRUN ROAD DISTRIBUTION SUBSTATIONS, OSOGBO

AKANBI OLAWALE¹

¹Affiliation not available

May 5, 2020

Abstract

Electrical energy occupies the top position in the energy hierarchy and its demand is not always met in Osogbo due to overloading of distribution transformers. In the past, several methods have been used to solve the problem of load demand and forecasting like Parametric Methods, Trend Analysis, Isolated Area Load Forecasting, Long and Short Time Load Forecasting. This work aimed to model the distribution load pattern of Odi-Olowo and Ikirun road distribution substations in Osogbo, Osun state for the purpose of forecasting load demand for the future. The readings were the peak hourly readings in Amps as documented by the power holding company of Nigeria (PHCN). The data were recorded and arranged on daily basis. It was transformed using Microsoft Excel Package. A scatter diagram was plotted with the transformed load in (MVA) on the vertical (y) axis and the dates on the horizontal (x) axis using the Statistical Package for Social Science (SPSS) version 17. “Best line of fit or surface” was drawn using the least square method, a test of significance was conducted for each of the fitted line or surface and model equations were obtained for the three transformers. The scatter diagram shows a linear relationship between transformer load demand and date, Correlation coefficient of 0.661, 0.665 and 0.446 were obtained for transformer 1, 2 and 3 respectively. Analysis of Variance indicated about 43.7%, 43% and 19% of the variation in capacity of transformers 1, 2 and 3 respectively. Linear models were obtained for forecasting load power distribution. The predicted results showed a high degree of closeness for the distribution load pattern of the three transformers. The model developed can be used to determine the load pattern of electrical distribution substation which will assist utility companies in efficient operation planning.

Hosted file

thesis journal.docx available at <https://authorea.com/users/297939/articles/427117-modelling-of-distribution-load-pattern-for-odi-olowo-and-ikirun-road-distribution-substations-osogbo>