TRANSFORMER EFFICIENCY: CASE STUDY ON 11KV TRANSFORMERS IN UiTM SHAH ALAM CAMPUS

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ABSTRACT

This project present a loss measurement and efficiency determination of the 11 kV distribution transformers at UiTM Shah Alam campus. The study determines the load factor, loss factor, capacity factor and total losses for calculating the efficiency.

The data is taken from maintenance department that has installed smart metering system. The data obtained is analyzed and calculated. The program using MatLab 6.0 was developed to do some simulation study. The study focus on 11kV transformer at Hal Ehwal Pelajar (HEP), Menara building and Kolej Cempaka.

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INTRODUCTION

1.1 Introduction

All power transformers have a very high efficiency. The largest transformer operating in the UiTM Shah Alam have an efficiency of around 99.3% at full load, but since full load can be as high as 12.5MVA, the loss can be 78 kW. UiTM, as a higher learning institution is also expending its energy usage. Its main intake is 33kV bulk-supply point is distributed to a primary substation of 11kV and finally to 415V distribution substation. By the time it is consumed, it has undergone three stages of voltage transformation. These entire transformers are energized 24 hour per day, for almost twelve months a year and are therefore consuming losses almost all the time.

This project was conducted at three 11kV Distribution Transformers in Universiti Teknologi MARA (UiTM) Shah Alam i.e. at Student Centre (HEP), Kolej Cempaka and Menara Building. Different feeder was taken in selected location to show a different load profile for three 11kV-distribution transformers. This project explains how the losses of a transformer i.e. load losses and no load loses are becomes and the effect of the losses to their efficiency.

Below are the steps that been taken for this project:

i)   Study on theoretical of distribution transformers included their principle of operation, losses and also their classification.

ii)   Do some surveys at the feeders to know the characteristics of the transformer and set up the selected feeder for make data collection.