

ABSTRAK

Transformator adalah suatu alat listrik yang dapat memindahkan dan mengubah energi listrik dari satu atau lebih rangkaian listrik ke rangkaian listrik yang lain melalui suatu gandengan magnet dan berdasarkan prinsip induksi elektromagnetik.(zuhal,1991). Karena pembebanan pada Transformator GST unit 2 lebih sering full load dibandingkan dengan Transformator GST unit 1.Pada tahun 2020 menyebabkan temperature hotspot pada Transformator GST unit 2 mencapai 110°C selama beberapa hari. Hal ini dikhawatirkan menyebabkan susut umur yang lebih cepat pada Transformator GST unit 2 sebelum batas umur Transformator berdasarkan standard IEC 60076-7.

Penelitian ini bertujuan Untuk menentukan pengaruh pembebanan dan efisiensi dari transformator GST unit 2 terhadap umur transformator. Di PT Merak Energi Indonesia pembebanan antara GST unit 1 dan GST 2 tidaklah sama. GST unit 2 lebih sering pembebanan full load dibandingkan dengan GST unit 1, hal ini akan berpengaruh terhadap efisiensi transformator masing-masing unit sehingga umur transformator GST unit 2 akan lebih pendek dibandingkan dengan GST unit 1. Metode penelitian ini, untuk mendapatkan hasil perhitungan, digunakan perhitungan yang meliputi perhitungan daya semu transformator, factor muat penampang, perbandingan rugi (d), kenaikan temperature stabil top oil, kenaikan temperature top oil, temperature hotspot ,laju penuaan thermal,susut umur transformator,perhitungan perkiraan umur transformator dan efisiensi transformator.

Hasil dari perhitungan pembebanan didapatkan nilai rata-rata pada bulan januari pembebanan 49,79 MW, Efisiensi 88,33%, temperature hotspot 91,40°C, susut umur 0,02. pada bulan januari pembebanan 47,21 MW, Efisiensi 88,02%, temperature hotspot 90,20°C, susut umur 0,01. pada bulan januari pembebanan 47,91MW, Efisiensi 89,64%, temperature hotspot 89,40°C, susut umur 0,01.

Kata kunci : Transformator, Susut umur, Pembebanan, *temperature*

ABSTRACT

A transformer is an electrical device that can move and change electrical energy from one or more electrical circuits to another electrical circuit through a magnetic coupling and is based on the principle of electromagnetic induction.(Zuhal, 1991). Because the loading on the GST Transformer unit 2 is more often full load compared to the GST Transformer unit 1. In 2020 the hotspot temperature on the GST Transformer unit 2 reaches 110°C for several days. This is feared to cause faster aging of the GST Unit 2 Transformer before the age limit of the Transformer based on IEC 60076-7 standards

The purpose of this work is to determine the effect of loading and efficiency of the GST unit 2 transformer on the life of the transformer. At PT Merak Energi Indonesia, the GST unit 1 and GST 2 charges are not the same. GST unit 2 loads more often than GST unit 1, this will affect the efficiency of each unit's transformer so that the life of the GST unit 2 transformer will be shorter than GST unit 1. This research method, to obtain the calculation results, is used calculation which includes calculation of transformer apparent power, cross-section load factor, loss ratio (d), stable top oil temperature increase, top oil temperature increase, hotspot temperature, thermal aging rate, transformer age loss, calculation of transformer age estimation and transformer efficiency.

The results of the calculation of the loading obtained an average value in January loading 49.79 MW, 88.33% efficiency, temperature hotspot 91.40 °C, age loss 0.02. in January the loading was 47.21 MW, the efficiency was 88.02%, the temperature hotspot was 90.20°C, the age loss was 0.01. in January the loading was 47.91MW, the efficiency was 89.64%, the temperature hotspot was 89.40°C, the age shrinkage was 0.01.

Keywords : Transformer, Loss of age, Loading, temperature