

ABSTRAK

ANALISIS PENGARUH PEMBEBANAN TERHADAP EFESIENSI TRANSFORMATOR 60 MVA DI GARDU INDUK TALANG KELAPA

(2025 : xv + 51 Halaman + 20 Gambar + 23 Tabel + 6 Daftar Pustaka)

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Listrik merupakan salah satu energi yang sangat penting bagi manusia untuk memenuhi kebutuhan hidupnya. Transformator merupakan salah satu komponen yang penting pada gardu induk, pada transformator suplai tenaga listrik yang terus menerus dan bertambah yang menyebabkan panas dari kumparan transformator sehingga menghasilkan rugi – rugi yang berupa rugi inti dan rugi tembaga. Rugi-rugi daya yang dihasilkan transformator menimbulkan perbedaan daya masukan dan daya keluaran. Berubah-ubahnya beban atau pembebanan yang berlebih juga dapat berakibat menurunnya efisiensi transformator. Penelitian ini bertujuan untuk mengetahui pengaruh pembebanan terhadap efisiensi transformator di Gardu Induk Talang Kelapa. Pengumpulan data meliputi studi literatur, metode observasi, metode bimbingan. Kemudian data dianalisa dengan menggunakan metode kuantitatif yaitu menghitung nilai rugi-rugi tembaga, rugi-rugi total, dan efisiensi transformator, kemudian nilai-nilai tersebut kemudian dibandingkan antara pembebanan dan efisiensi transformator. Hasil perhitungan perhitungan Efisiensi dengan beban dasar tertinggi 27,82 MW nilai efisiensinya 99,783%, sedangkan ketika beban terendah 20,46 MW setelah dilakukan perhitungan nilai efisiensinya sebesar 99,769%. Efisiensi dengan beban puncak tertinggi 28,96 MW nilai efisiensinya 99,783%, sedangkan ketika beban terendah terendah 20,46 MW setelah dilakukan perhitungan nilai efisiensinya sebesar 99,769%.

Kata kunci : Pembebanan, efisiensi, transformator, gardu, rugi tembaga, rugi inti

ABSTRACT

ANALYSIS OF THE EFFECT OF LOADING ON THE EFFICIENCY OF 60 MVA TRANSFORMER AT TALANG KELAPA SUBSTATION

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Electricity is one of the most important energies for humans to fulfill their life needs. A transformer is one of the important components in a substation, where a continuous and increasing supply of electricity causes heat from the transformer's coils, resulting in losses in the form of core losses and copper losses. The power losses generated by the transformer cause a difference between the input power and the output power. Varying loads or excessive loading can also result in a decrease in transformer efficiency. This study aims to determine the effect of loading on the efficiency of the transformer at the Talang Kelapa Substation. Data collection included literature studies, observation methods, and guidance methods. The data was then analyzed using quantitative methods, which involved calculating the values of copper losses, total losses, and transformer efficiency. These values were then compared between the loading and the transformer efficiency. The results of the efficiency calculations showed that with the highest base load of 27.82 MW, the efficiency value was 99.783%, while with the lowest load of 20.46 MW, the efficiency value was 99.769%. With the highest peak load of 28.96 MW, the efficiency value was 99.783%, while with the lowest load of 20.46 MW, the efficiency value was 99.769%.

Keywords: Loading, efficiency, transformer, substation, copper loss, core loss