

ABSTRAK

Pengujian daya listrik merupakan salah satu tolak ukur dalam menentukan kualitas kelistrikan suatu rangkaian. Dalam menganalisa tingkat kualitas daya listrik terdapat beberapa macam variabel yang menjadi tolak ukur diantaranya *supply voltages of traction system*, *voltage drop*, *voltage unbalance*, *load balance*, dan frekuensi. Pentingnya melakukan pengujian kelistrikan karena kualitas peralatan yang terpasang lebih sensitif, sistem utilitas telah terjadi peningkatan level harmonik, menambah dan memperkuat informasi mengenai permasalahan kualitas daya listrik, serta memperkecil kemungkinan konsekuensi kerusakan akibat kegagalan suatu komponen pada sistem distribusi atau instalasi. Penelitian ini membahas tentang pengujian kualitas daya listrik pada Kereta Rel Diesel Elektrik (KRDE) Bandara Internasional Adi Sumarmo produksi PT INKA (Persero) menggunakan instrumen kelistrikan HIOKI dan Wireshark. Dalam dunia perkeretaapian, faktor penyebab terjadinya penurunan kualitas daya listrik yaitu penggunaan beban-beban *non linier* seperti *Variable Frequency Drive* (VFD), penggunaan *converter*, dan lain-lain. Dari pengujian yang telah dilakukan, terdapat variabel yang memenuhi standar diantaranya *voltage drop*, *voltage unbalance*, *load balance*, dan frekuensi. Sedangkan terdapat satu variabel yang kurang memenuhi standar yaitu pada *Supply Voltages of Traction System*. Bagian yang kurang memenuhi tersebut terdapat pada parameter U_{min2} yaitu selisih 420.579 V terhadap standar yang berlaku. Namun secara keseluruhan kualitas daya listrik pada KRDE dapat dinyatakan memenuhi standar dan layak untuk digunakan.

Kata Kunci: *kualitas daya listrik, instrumen power quality analyzer, kereta rel diesel elektrik, standar kualitas daya listrik.*

ABSTRACT

Electrical power testing is one of the benchmarks in determining the electrical quality of a circuit. When analyzing the level of electrical power quality, there are several variables that serve as benchmarks, including supply voltages of the traction system, voltage drop, voltage unbalance, load balance, and frequency. It is important to conduct electrical testing because the quality of installed equipment is more sensitive, utility systems have experienced an increase in harmonic levels, it adds and strengthens information regarding power quality issues, and reduces the possibility of damage due to the failure of a component in the distribution system or installation. This study discusses the testing of power quality in the Diesel Electric Multiple Unit (DEMU) at Adi Sumarmo International Airport, produced by PT INKA (Persero), using HIOKI electrical instruments and Wireshark. In the railway industry, factors that cause a decrease in power quality include the use of non-linear loads such as Variable Frequency Drives (VFD), converters, and others. From the conducted testing, there are variables that meet the standards, including voltage drop, voltage unbalance, load balance, and frequency. However, there is one variable that does not meet the standard, which is the Supply Voltages of Traction System. The part that does not meet the standard is found in the Umin2 parameter, with a difference of 420.579 V from the applicable standard. However, overall, the power quality of DEMU can be stated to meet the standards and is suitable for use.

Keyword: *power quality, power quality analyzer instrument, diesel electric multiple unit, power quality standards.*