ABSTRAK

Transformator daya merupakan komponen penting dalam sistem kelistrikan yang rentan mengalami penurunan kinerja seiring waktu akibat faktor usia, kondisi operasional, dan degradasi sistem isolasi. Untuk mengantisipasi kerusakan mendadak, diperlukan metode penilaian yang mampu mengevaluasi kinerja transformator secara menyeluruh. Salah satu metode yang digunakan adalah *Health Index* (HI). Penelitian ini mengusulkan metode *Health Index* yang dikembangkan dengan mempertimbangkan tiga parameter utama, *yaitu faults factor, oil quality factor, dan paper condition factor,* serta menambahkan aspek laju perubahan gas *(decreasing rate)* untuk meningkatkan akurasi penilaian. *Dissolve Gas Analysis* (DGA) dilakukan menggunakan metode *Duval Pentagon*. Penelitian ini diterapkan pada tiga transformator di PT. PLN ULTG Bandung Timur. Metode konvensional menghasilkan nilai HI cenderung tetap, misalnya pada Trafo 2 Gedebage yang secara berurutan mencatat nilai 65,2, 100, dan 100, sedangkan metode baru mencatat variasi lebih realistis yaitu 43,4, 100, dan 100. Pada Trafo 3 Rancaekek, nilai HI metode konvensional tercatat 56,5, 30,4, dan 56,5; sementara metode baru memperlihatkan hasil 89,2, 30,4, dan 89,2. Sementara itu, Trafo 3 Sumedang berdasarkan metode konvensional menunjukkan HI sebesar 30,4, 25, dan 16,3, sedangkan metode baru memberikan hasil 56,5, 25, dan 27,3. Hasil ini menunjukkan bahwa kondisi transformator sangat dipengaruhi oleh pemeliharaan dan penanganan teknis. Dengan demikian, metode *Health Index* yang menggunakan metode baru terbukti efektif dalam menilai kondisi transformator dan dapat dijadikan acuan dalam program pemeliharaan berbasis kondisi *(condition-based maintenance).*

Kata kunci: *Decrasing rate*, *Dissolve Gas Analysis (DGA), Health index,* Transformator.

ABSTRACT

Power transformers are important components in electrical systems that are susceptible to performance degradation over time due to age, operational conditions, and degradation of the insulation system. To anticipate sudden damage, an assessment method is needed that is able to evaluate the performance of the transformer as a whole. One of the methods used is the Health Index. This study proposes a Health Index method that is developed by considering three main parameters, namely faults factor, oil quality factor, and paper condition factor, and adding aspects of the rate of gas change (decreasing rate) to improve the accuracy of the assessment. Dissolve Gas Analysis (DGA) was carried out using the Duval Pentagon method. This study was applied to three transformers at PT. PLN ULTG East Bandung. The conventional method produces HI values that tend to be constant, for example in Transformer 2 Gedebage which sequentially recorded values of 65.2, 100, and 100, while the new method recorded more realistic variations, namely 43.4, 100, and 100. In Transformer 3 Rancaekek, the HI values of the conventional method were recorded at 56.5, 30.4, and 56.5; while the new method showed results of 89.2, 30.4, and 89.2. Meanwhile, Trafo 3 Sumedang based on the conventional method showed HI of 30.4, 25, and 16.3, while the new method gave results of 56.5, 25, and 27.3. These results indicate that the condition of the transformer is greatly influenced by maintenance and technical handling. Thus, the Health Index method using the new method has proven effective in assessing the condition of the transformer and can be used as a reference in a condition-based maintenance program.

Keyword: Decrasing rate, Dissolve Gas Analysis (DGA), Health index, Transformer.