



INTISARI

Frekuensi sambaran petir di Indonesia cukup tinggi dikarenakan Indonesia merupakan negara tropis. Proteksi terhadap surja petir sangat dibutuhkan untuk menjaga keandalan sistem tenaga listrik Indonesia. Arester merupakan alat proteksi petir yang umumnya terpasang di luar ruangan. Akibat berada di luar ruangan, pengaruh keadaan luar seperti kelembaban dan suhu dapat mempengaruhi kinerja dari arester.

Penelitian ini dilakukan untuk mengetahui pengaruh kelembaban terhadap kinerja arester tegangan menengah 20 kV khususnya pada tegangan residu dan arus bocor arester. Pengujian tegangan residu arester dilakukan dengan memberikan tegangan impuls pada arester lalu dibandingkan nilai tegangan residunya pada setiap variasi kelembaban. Pengujian arus bocor arester dilakukan dengan memberikan tegangan tinggi AC pada arester yang besarnya sesuai rating arester lalu dibandingkan nilai arus bocornya pada setiap variasi kelembaban.

Hasil dari penelitian ini adalah kelembaban memberikan pengaruh terhadap kinerja arester tegangan menengah 20 kV. Tegangan residu arester meningkat seiring naiknya kelembaban. Dalam rentang variasi kelembaban dari 50 % sampai 90 % diperoleh tegangan residu terbesar 49,82 kV dan terendah 49,18 kV dari tegangan impuls 80,03 kV. Arus bocor arester meningkat seiring naiknya kelembaban. Dalam rentang variasi kelembaban dari 50 % sampai 90 % diperoleh arus bocor terbesar secara berurut untuk tegangan 20 kV; 15 kV; 10 kV adalah 329,65 μA ; 243,53 μA ; 174,23 μA dan arus bocor terendah adalah 303,91 μA ; 231,65 μA ; 158,39 μA .

Kata kunci : arester, kelembaban, arus bocor, tegangan residu



ABSTRACT

The frequency of thunderstorm in Indonesia is quite high because Indonesia is a tropical country. Protection against lightning surges is needed to maintain the reliability of Indonesia's electrical system. Arrester is a lightning protection device that is generally installed outdoors. As a result of being outdoors, outside conditions such as humidity and temperature may affect the performance of the arrester.

This study was conducted to know the effect of humidity on the performance of 20 kV medium voltage arresters, especially on the residual voltage and leakage current of the arrester. The test of the residual voltage of the arrester was carried out by gave the impulse voltage to the arrester and then compared the residual voltage value of each variation of humidity. The leakage current test of the arrester was carried out by gave an AC high voltage to the arrester and then compared the value of the leakage current in each variation of humidity. The value of AC high voltage must be equal or lower from arrester's rating.

The result of this research was that humidity affect the performance of 20 kV medium voltage arrester. Humidity affect the residual voltage of arrester with residual voltage proportional to humidity. In the range of humidity variations from 50% to 90% obtained the largest residual stress of 49.82 kV and the lowest of 49.18 kV from the impulse voltage of 80.03 kV. Humidity affect the leakage current of arrester with leakage current proportional to humidity. In the range of humidity variations from 50% to 90% the largest leakage current was obtained sequentially for a test voltage of 20 kV; 15 kV; 10 kV is 329,65 μ A; 243,53 μ A; 174,23 μ A and the lowest leakage current was 303,91 μ A; 231.65 μ A; 158.39 μ A.

Keywords: arrester, humidity, leakage current, residual voltage