

Rancang bangun program aplikasi HFCALC (harmonic filter calculation) untuk menentukan parameter berbagai jenis filter pasif harmonisa = Development of HFCALC (harmonic filter calculation) application's program for parameters determination of several harmonic passive filters / Muhammad Ridwan Arif Cahyono

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Abstrak

ABSTRAK

Harmonisa memberikan dampak buruk bagi komponen elektronik. Salah satu upaya mitigasi yaitu dengan pemasangan filter pasif. Saat ini software-software yang digunakan dalam studi kelayakan filter pasif, hanya mampu mensimulasikan harmonisa berdasarkan komponen-komponen dalam library-nya bukan berdasarkan data pengukuran lapangan. Simulasi harmonisa dengan menggunakan program komputer diantaranya dengan aplikasi Matlab/Simulink, LabView, OpenDSS dan HI_Wave, memiliki kelemahan yaitu data harmonisa yang dihasilkan masih berdasar plug-in library. Pada penelitian ini akan dilakukan rancang bangun program aplikasi HFCalc Harmonic Filter Calculation berdasarkan data pengukuran lapangan. Langkah yang digunakan yaitu dengan menentukan parameter filter, melakukan pemodelan impedansi filter pasif, dan mengimplementasikan pemodelan dan penentuan filter dalam bahasa pemrograman Java. Hasil program aplikasi HFCalc yang telah dirancang mampu menghitung parameter 4 jenis filter. Program aplikasi HFCalc dibandingkan simulasi dengan PSIM memiliki nilai kesalahan rata-rata sebesar 10.95 , dengan rincian Single Tuned Filter 10.89 , Double Tuned Filter Parallel Inductor 15.97 , Damped Tuned Filter 11.26 , dan C-Type Filter 5.7 . Perbedaan hasil ini dikarenakan pada program aplikasi HFCalc harmonisa tegangan diasumsikan mendekati nol, tidak ada perbedaan fasa pada arus harmonisa, dan tidak ada tegangan awal kapasitor dan induktor. Sehingga program aplikasi HFCalc dapat digunakan untuk proses studi penentuan filter pasif harmonisa berdasarkan data pengukuran lapangan.

ABSTRACT

Harmonics are give negative impacts to electronic components. One of the mitigation tenique is by using a passive filter. Currently, the software that used in the feasibility study of a passive filter, only able to simulate the harmonics based on the components in the software library, it is not based on the data from field measurements. Simulation of harmonics by using a computer program such as by application of Matlab Simulink, LabView, OpenDSS and HI Wave, has the disadvantage of harmonics generated data is still based on the plug in library. This research will be conducted to design HFCalc Harmonic Filter Calculation application program based on field measurements data rsquo s. The moethod is determine the parameters of filters, passive filter impedance modeling, modeling and determination of the filter implemented in the Java programming language. The HFCalc application program has been designed is able to calculate the parameters of four types of filters. The HFCalc application program compared with PSIM simulation has an error value by an average of 10.95 , with Single Tuned Filter 10.89 , Double Parallel Tuned Filter Inductor 15.97 , damped Tuned Filter 11.26 , and the C Type Filter 5.7 . The difference because HFCalc application program assume that harmonic voltage is approach zero, there are no phase difference in harmonic currents,

and no initial voltage of the capacitors and the inductors. So, HFCalc application program can be used to study the process of determining passive harmonic filter based on field measurements data's.