AN INVESTIGATION OF HARMONIC EFFECT IN INDUSTRIAL SYSTEM EQUIPMENT

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by

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Report submitted in partial fulfillment
of the requirements for the degree
of Bachelor of Engineering (Electrical System Engineering)

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APPROVAL AND DECLARATION SHEET

This project report titled The An Investigation of Harmonic Effect in Industrial System Equipment was prepared and submitted by Hillman B Abdullah sani (Matrix Number: 071090223) and has been found satisfactory in terms of scope, quality and presentation as partial fulfillment of the requirement for the Bachelor of Engineering (Electrical System Engineering) in Universiti Malaysia Perlis (UniMAP).

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ABSTRAK

Pada masa ini, kuasa menjadi keperluan yang lebih dari semua halhal lain. Sistem kualiti power menjadi perhatian besar untuk memastikan kelangsungan banyak peralatan elektrik dan peranti. Kesan harmonik keatas sistem kuasa adalah salah satu isu kualiti kuasa yang harus di kaji dengan lebih teliti. Banyak penggunaan peranti elektronik kuasa memiliki konsekuensi dalam menyumbang meningkatkan distorsi harmonik. Masalah harmonik akan mempengaruhi baik pembekal power supply dan juga pelanggan.

Projek ini membahas mengenai kajian mengurangkan harmonik oleh pemasangan penapis pasif menggunakan perisian SIMULINK MATLAB dalam merancang sisi elektrik pelanggan dan simulasi untuk analisis distorsi harmonik. Simulasi dilakukan dengan dan tanpa pemasangan penapis. Selanjutnya keduadua keputusan yang diperolehi akan dibandingkan dan dianalisis. Menggunakan perkakas dari perisian SIMULINK, adalah bahawa tahap jumlah herotan harmonik (THD) berkurangan dengan pasif penapis yang dipasang pada sistem.

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ABSTRACT

Nowadays, electricity becomes the most demand amongst all other things. Power system quality is the big concern to ensure the continuity of many electrical equipments and devices. Power system harmonic is one of the power quality issues that must be taken care of. Many power electronics devices contribute to harmonic in the system. Harmonic problem will affect both the power supply providers and also the customers.

This project studied about the harmonic mitigation by the installation of passive filter using MATLAB SIMULINK software in designing customer's electricity side and simulation for harmonic distortion analysis. Simulation was conducted with and without filter installation. Furthermore the two results obtained will be compared and analyzed. Using tools from the SIMULINK software, it is observed that the total harmonic distortion (THD) is reduced when passive filter is installed in the circuit.

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LIST OF ABBREVIATIONS

THD	Total Harmonic Distortion
ASD	Adjustable Speed Drives
FFT	Fast Fourier Transform
PC	Personal Computer
HID	High Intensity Discharge
CFL	Compact Fluorescent Lamp
PCC	Point of Common Coupling
GUI	Graphical User Interface

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