

# STUDY ON SURGE PROTECTION SYSTEM

by

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Report submitted in partial fulfillment  
of the requirements for the degree  
of Bachelor of Engineering



MAY 2011

**DECLARATION SHEET**

**I hereby declare that my Final Year Project Thesis is the results of my research work under supervision of Prof. Dr. Syed Idris bin Syed Hassan. All literature sources used for the writing of this thesis have been adequately referenced.**

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## ACKNOWLEDGEMENTS

First and foremost, I would like to express my grateful thanks to my supervisor, Prof. Dr. Syed Idris bin Syed Hassan for his valuable guidance and advice. He inspired me greatly to work in this project. The supports that he gave truly help the progression and smoothness of the project. The cooperation is much indeed appreciated.

Besides, I owed my thanks to the entire technician in School of Electrical System Engineering for all the co-operation and help in completing this project. Thanks for all the time, help and excellent guide that more than words can describe. In addition, thanks to all my friends for their help and support.

Last but not least, my most heartfelt appreciation goes to my beloved parents, brother and sister who had persistently giving me invaluable spiritual motivation and inspiration.

To those who have involved directly or indirectly in completing this project, I would like to say thank you too. Without helps of the particular that mentioned above, I would face many difficulties while doing this project.

## MENGAJI SISTEM PELINDUNGAN VOLTAN TINGGI “SURGE”

### ABSTRAK

Projek ini melibatkan kajian tentang sistem pelindungan daripada voltan tinggi “surge”. Projek ini juga melibatkan proses membuat dan mereka bentuk sistem perlindungan voltan tinggi yang mana melibatkan softwer dan komponen hardwer. Komponen utama yang digunakan dalam litar pelindungan voltan tinggi ini ialah semikonduktor komponen iaitu metal oxide varistor (MOV). Sistem ini juga mengandungi litar penunjuk dan litar “filter”(penuras). Softwer Pspice digunakan untuk simulasi litar “filter”(penuras). Untuk melihat keberkesanan litar pelindung ini diuji berdasarkan dua ujian eksperimen iaitu ujian respon frekuensi dan ujian masukan voltan. Di akhir projek ini, litar pelindungan voltan tinggi ini mampu menunjukkan keberkesanannya apabila voltan input yang tinggi melebihi voltan maksimum sistem dimasukkan, metal oxide varistor (MOV) mampu menunjukkan aplikasinya untuk menaikkan voltan 10 hingga 25% melebihi voltan maksimum sistem dan mampu mengalihkan voltan berlebihan kepada pembumian (ground). Walau bagaimanapun penuras tidak berfungsi dengan baik disebabkan komponen sesat dalam litar.

## ABSTRACT

This project is to study on surge protection system. This project also involves the design and construction of surge protection system which includes the software and hardware component test. The main component used in this protection circuit is semiconductor components which is metal oxide varistor (MOV). This system also consists indicator circuit and filter circuit. PSpice software has been used to simulate the filter circuit. The performances of this protection circuit has been investigated by conducting two types of experimental test which is frequency response test and supply voltage test. At the end of the project, the protection circuit able to show its effectiveness when supplied input voltage over maximum system voltage, the metal oxide varistor (MOV) able to show its application to continuous voltage at about 10 to 25% above maximum system voltage and able to divert the extra voltage to ground when overvoltage occur. However the filter did not function well due to stray components in the circuit.

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