STUDY OF SINGLE PHASE TRANSFORMER INRUSH CURRENT

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By

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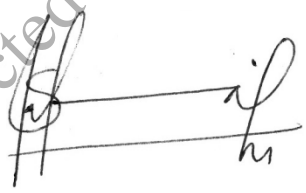
APPROVAL AND DECLARATION SHEET

This project report titled Study of Single Phase Transformer Inrush Current was prepared and submitted by Mohd Izwan bin Mohd Khalid (Matrix Number: 081070484) and has been found satisfactory in terms of scope, quality and presentation as partial fulfillment of the requirement for the Bachelor of Engineering (Industrial Electronics Engineering) in Universiti Malaysia Perlis (UniMAP).

Checked and Approved by



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KAJIAN ARUS LONJAKAN PADA ALAT UBAH SATU FASA

ABSTRAK

Apabila sebuah alatubah pada awalnya disambung ke sumber voltan arus ulang alik, terdapat kemungkinan berlakunya arus melalui gegelung primer yang disebut arus lonjakan. Hal ini merupakan analogi arus lonjakan yang ditunjukkan oleh sebuah motor elektrik yang di mulakan dari sambungan secara mengejut ke sumber kuasa, walaupun lonjakan alatubah disebabkan oleh fenomena yang berbeza. Arus lonjakan berkaitan dengan awalan sebuah motor dan penjanaan alatubah boleh menyebabkan masalah interaksi dengan beban lain dalam kemudahan atau pada sistem tenaga, khususnya gangguan voltan pada beban. Peranti perlindungan dapat menyalah tafsirkan peristiwa ini sebagai gangguan arus, jika koordinasi tidak di lakukan dengan baik. Ditambah pula dengan kecenderungan peranti kuasa malar untuk meningkatkan arus untuk menebus kekurangan voltan, lonjakan arus boleh menyebabkan peranti perlindungan terputus penyambungannya. Pemilihan peranti perlindungan lebihan arus seperti fius dan pemutus litar lebih sukar di buat ketika arus lonjakan tinggi harus dibiarkan. Perlindungan lebihan arus seharusnya bertindak balas lebih cepat untuk lebihan beban atau litar pintas tetapi tidak sepatutnya mengganggu litar ketika arus lonjakan mengalir. Projek ini menyediakan laporan kajian analisis terhadap lonjakan arus di dalam sebuah alatubah satu fasa. Tujuan projek adalah untuk memahami konsep dan pengaruh lonjakan arus ke mesin-mesin elektrik terutama alatubah satu fasa dan juga untuk memberikan penjelasan singkat tentang pengaruh lonjakan arus terhadap kualiti kuasa.

STUDY OF SINGLE TRANSFORMER INRUSH CURRENT

ABSTRACT

When a transformer is initially connected to a source of AC voltage, there may be a substantial surge of current through the primary winding called inrush current. This analogous to the inrush current exhibited by an electric motor that is started up by sudden connection to power source, although transformer inrush is caused by a different phenomenon. Inrush currents associated with motor starting and transformer energizing can cause interaction problems with other loads in a facility or on the power system, particularly sags that trip loads. Protection devices can misinterpret these events as fault currents, if the devices are not properly coordinated. Coupled with the tendency of other constant power devices to increase current to make up for the reduced voltage, the inrush current may cause protection devices to trip. The selection of overcurrent protection devices such as fuses and circuit breakers is made more complicated when high inrush currents must be tolerated. The overcurrent protection must react quickly to overload or short circuit but must not interrupt the circuit when the inrush current flows. This project presents an analysis report on inrush current based on hardware and software studies. The purpose of project is to understand the concept and effect of inrush current to electrical machines especially on single phase transformer and also to give a brief explanation about the effect of inrush current towards power quality.

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