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FINAL REPORT OF DIPLOMA PROJECT

FACULTY OF ELECTRICAL ENGINEERING



UNINTERRUPTIBLE POWER
SUPPLY (UPS)

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ABSTRACT

Uninterruptible power supplies are necessary for any business operation which requires a very availability factor and purity factor for a key facility on which the core activities crucially depend. For applications where corruption of data or interruption of supply even for a fraction of a second cannot be tolerated, a UPS is needed.

A surge, dip, break, fluctuation, or other contamination can in some situations prove to be absolutely devastating. Such circumstances can result in disastrous loss of data. The most susceptible and vulnerable facilities are the whole range of computer and instrumentation process.

The vulnerability of a computer system or information technology system to interference or main supply disturbance is dependent upon the precautions built into the system by the designer.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Whilst the general standards of supply are completely adequate for most applications in industry and commerce, the contamination of the supply by relatively small disturbances can cause serious and unacceptable problems for sensitive loads---typically computers. The need is not just to provide standby power in the event of the supply failure, but is also to make certain that the electrical input to valuable computer is a pure, clean and continuous as is required, to prevent any data or control signals being corrupted or lost entirely.

Although from the information already provided it can be seen that total power outage from the electricity supply utility is infrequent, it should be recognised that the timing of a break is beyond the customer's control. It follows that a sudden break in power supply or even a mild fluctuation could occur at a critical time for the business.

Similarly, mains-borne electrical interference such as surges can adversely affect computers and process control equipment. Typically this electrical interference results from thunderstorms and lightning, from switching operation and from other electrical apparatus within the building (e.g. from thyristors within electronic devices utilised for controlling other essential electrical equipment).

One might have expected the computer and process control manufacturers to have designed their equipment to be less susceptible to electrical interference arising from spikes, dips, and surges. Apparently this has not proved to be possible, and for this reason there has been progressive development of uninterruptible power supply (UPS) systems. They become an economic proposition for organisations whose business and associated information technology demand a vital need to protect against power supply breaks and disturbances.