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DIPLOMA PROJECT

QUALITY OF ELECTRICITY SUPPLY AND
THE NEEDS OF CONSUMERS

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**QUALITY OF ELECTRICITY SUPPLY
AND
THE NEEDS OF CONSUMERS**

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BY
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SUMMARY

Quality of Electricity Supply and the Needs of Consumers.

The purpose of this project, was to research and study the quality of electricity supply and the needs of consumers, a very important subject that affects human lives, since a bad quality of electricity, causes a lot of troubles.

The steps that were followed in this work, were firstly to identify quality issues of the electricity supply industry, then identify limits that European Directives set on various quality measures of electricity supply, and finally to relate these limits to the actual supply that the Electricity Authority of Cyprus provides to the Cypriot consumer.

After the dispatch of the study on quality of electricity supply it was obvious that quality of electricity supply is affected by various external and internal factors, that can be reduced and in some cases, can be obliterated, with the methods and measures that are taken by Electricity Authority of each country.

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INTRODUCTION

Electricity is an energy form which is particularly versatile and adaptable. It is utilised by being converted into several other forms of energy: heat, light, mechanical energy, and the many electromagnetic, electronic, acoustic and visual forms which are the bases of modern telecommunications, information technology and entertainment.

Electricity as delivered to the customers has several characteristics which are variable and which affect its usefulness to the customer. Electricity is by far the most expensive form in which an organisation buys power. In relative terms, electricity is eight times as expensive as coal and six times as expensive as oil. Not only is electricity the most expensive, but it also has the highest rate of increase while the prices of many other fuels are falling. The use of electricity is justified because it is often the only practical form of energy for many purposes, for example, for lighting and for the provision of local power for rotating machinery. It also has the advantage of being pollution-free at the point of use. The fact that electricity is the only practical form of energy does not mean that it should be used without proper consideration.

So, from all what I have mentioned above, it is obvious that electricity is very important in human lives. Without electricity nothing works in this world, and this necessitates the proper use of electricity, in order to be useful to us. So the quality of electricity which is supplied to the customers should be of high stipulations. It is a particular feature of electricity that, in respect of some of its characteristics, its quality is affected by the user rather than by the producer or supplier. In these cases the customer is an essential partner, with the supplier, in the effort to maintain the quality of electricity. Of course it is extremely difficult to supply perfect quality of electricity because of some very important factors that affect the quality of electricity, but it is possible to limit the action of these factors.

In this project, we will study analytically these factors which affect the quality of electricity, how they are being created, what problems

they cause, effects on customers, and methods to face these factors. Firstly, we are going to study about the Harmonic Distortion, the most important factor in my opinion, that affects the quality of electricity. Then we are going to study about the Voltage Dips. In the third chapter we are going to research the Interruptions of the Supply, another important factor, which is separated into long interruptions and short interruptions.

After that we are going to study about flicker. In the fifth chapter we are going to study about the Overvoltages and Undervoltages, and then we are going to research the Voltage Surges and spikes. Finally, in the seventh chapter we are going to analyse the Voltage Unbalance, an important factor that affects the quality of electricity, too.