HIGHER TECHNICAL INSTITUTE

ELECTRICAL ENGINEERING COURSE

DIPLOMA PROJECT

TEACHING AID (MODEL): OF A POWER GENERATION, TRANSMISSION SYSTEM

E. 1225

BY

PARPOTTAS DOROS

JUNE, 2000

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Parpottas Doros

Summary

The main objective of this project is to study the power generation and transmission system that is been used nowadays. This project is to provide enough information to the new students of H.T.I either (Civil, Marines, Mechanical, Computers) and especially to the **Electrical.**

In order to be more familiar with power generation and transmission a teaching aid model was designed. This model will be extremely useful for the following reasons:

1. **The student will be familiar how the current is been generated.**
2. **How is been transmitted.**
3. **In what ways current can be used in our lives.**
4. **The lecturer will use this teaching aid model in class in order to make students understand the topic in electrical power.**

However before constructing the teaching aid, students must know the theory about power. In this project with the help of diagrams and pictures a student will learn all about (electrical power in modern world, EAC, power, transformers, distribution equipment, substations, reclosers, fuses etc)

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INTRODUCTION

1.1 Electrical power in the modern world:

The electrical power industry is mature, established industry. Electrical power is the prime source of energy that supports almost all of our technologies. Electricity is the most convenient and omnipresent energy available today. Imagine a day without it. Electrical power is an energy transportation system. It is a safe, convenient, efficient way to transport large amounts of power long distances. The high efficiency of electrical machines - generators are over 98% efficient with efficiencies reaching over 99%, transformer efficiencies that are routinely over 80% and many are over 90% - makes the conversion of energy to electricity for transportation and reconversion to heat, light, and mechanical power cost effective.

One measure of the wealth of a nation is the total production of the society or that nation. Electrical energy conveniently provides light that lengthens both work and leisure how. Power for work, from electric motors in tools, extends human physical work output from approximately 2.8kw to many times that amount. The human effort guides the tools. Electricity provides power for both the computers and the tools. Thus, electricity is an integral part of the daily life of the citizens of any developed country. Electricity provides power for light, tools and entertainment. It provides power for both work and play.

ii) **Relationship between electric utilities, customers and regulatory authorities:**

1. The product is intangible in the common sense of the world. It cannot be driven, displayed, or handled directly (at least shouldn't be).

2. Customers are charged for service and amount used. Service is defined as making available the correct voltage and frequency without interruption.

Often good service and low rates are in conflict because of the equipment investments necessary for continued good service.

3. The product cannot be stored in large quantities. Enough equipment must be installed and ready to operate on short notice to meet the peak demand. If, as expected, the storage of electrical power in superconducting rings becomes economical, then the storage of large quantities of electrical power for use at peak loads may become practical.

4. The utility is responsible for delivering the product so the transmission and distribution systems must operate properly at all times.

5. The utility must use public right of ways for delivering the product. Thus the utility must have the right to buy, lease, and in extreme cases condemn property for right of way to assure the delivery of electricity to the public.

6. The utility is responsible for reasonable precautions to ensure the safety of its workers and the public. It must assure there is no injury to people or property because of inadequate equipment. The electric utilities take their responsibility for public safety very seriously.

iii) ELECTRICAL POWER SYSTEM CONSIDERATIONS:

Societies must use energy resources in the form, in which they appear, whether as water, wind, oil, coal, or uranium to accomplish the tasks the societies consider desirable. The desirable tasks may be heating, cooling, lighting, manufacturing, or transportation of people and materials. Finding and converting the raw energy resources to usable energy is a vital function, as in the design, production, and of efficient equipment to convert energy to useful work (motors, heaters, air conditions, etc)

Recall that electricity is an efficient and convenient transportation system for energy that allows the raw energy resources and the equipment that converts energy to work to be separated by great distances. Electricity does exist in nature as lightning and static electricity, but it cannot be controlled well enough to be put to practical use. Thus electricity must be generated by converting another raw energy resource. Electricity can be stored in batteries, but only in relatively small quantities. Therefore, at least for the present time, electricity must be produced at the same time it is used.