

HIGHER TECHNICAL INSTITUTE

ELECTRICAL ENGINEERING COURSE

DIPLOMA PROJECT

OVERVOLTAGES IN THE EAC NETWORK:

CAUSES AND REMEDIES

E. 1127

BY: DEMETRIADES ANDREAS

JUNE 1998

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Demetriades Andreas

SUMMARY

Overvoltages: Causes and remedies

by

Demetriades Andreas

The main objective of this project is to study the causes and remedies of overvoltages in the E.A.C. network. In particular the project examines the problem which arises from overvoltages, for example transient voltages from lightning surges and restrike transients from switching surges or from faults in transmission line.

This problem of overvoltages was analyzed using Electromagnetic Transients Programme (E.M.T.P.) which was available at the E.A.C.

It was found that, in order to tackle the overvoltages problem, an insulation coordination procedure must be found. Proper protective devices must be selected according to the conditions and types of overvoltages, the location and level on the line must be evaluated and simulated.

TABLE OF CONTENTS:

	<u>Pages</u>
1. INTRODUCTION:	5
1.1. E.A.C.....	6
1.2. CHAPTERS.....	7
2. ELECTRIC POWER SYSTEM.....	8
2.1. INTRODUCTION.....	9
2.1.1. THE ADVANTAGES OF A.C.....	9
2.2. COMPONENTS OF POWER SYSTEM.....	9
2.3. NATURE OF TRANSMISSION.....	17
2.4. DISTRIBUTION SYSTEMS.....	18
3. LOAD FLOWS AND FAULTS IN A POWER SYSTEM.....	20
3.1. LOAD FLOWS.....	21
3.1.1. LOAD FLOW EXAMPLE.....	23
3.2. FAULTS IN A POWER SYSTEM.....	25
3.2.1. TYPE OF FAULT.....	25
3.2.2. CALCULATION OF FAULT.....	26
4. OVERVOLTAGES CAUSES.....	30
4.1. OVERVOLTAGES AND INSULATION REQUIREMENTS.....	31
4.1.1. ORIGIN AND MECHANICAL OF LIGHTNING.....	33
4.1.2. EFFECTS OF LIGHTNING STROKES IN POWER SYSTEM.....	34
4.2. THE CIRCUIT CLOSING TRANSIENT.....	36

4.3. THE RECOVERY TRANSIENT INITIATED BY THE REMOVAL OF A SHORT CIRCUIT.....	39
4.3.1. RATE OF RISE OF RESTRIKING.....	44
5. INSULATION COORTINATION AND PROTECTION OF POWER SYSTEM.....	45
5.1. INSULATION COORTINATION.....	46
5.1.1. FUNTAMENTAL PRINCIPLES OF SURGE PROTECTION AND INDULATION COORDINATION.....	46
5.1.2. BASIC REQUIREMENTS.....	46
5.2. INSULATION LEVELS FOR OVERHEAD LINES.....	48
5.3. PROTECTION OF EQUOPMENT IN HIGH-VOLTAGE OUTDOOR SUBSTATION.....	49
5.5. THE PROTECTION OF SYSTEMS AND EQUIPMENT AGAINST TRANSIENT OVERVOLTAGES.....	51
5.3. LIGHTNING ARRESTERS AND SURGE SUPPRESSORS.....	53
5.4. SURGE CAPACITORS.....	55
6. ANALIZETION OF OVERVOLTAGES PROBLEMS USING ELECTROMAGNETIC TRANSIENTS PROGRAMME.....	58
6.1. EXAM1: SIMPLE RLC CIRCUIT.....	59
6.2. EXAM2: C.P.D.L. MODEL.....	60
6.3. EXAM2M1.....	61
6.4. EXAM3: THE RESTRIKE TRANSIENT.....	62
6.5. EXAM4: FERRANTI EFFECT.....	63
6.6. EXAM5: FAULT IN A LINE.....	64
7. CONCLUSIONS.....	67
8. APPENDICES	
9. REFERENCES	

CHAPTER 1:
INTRODUCTION

1. INTRODUCTION

1.1. THE ELECTRICITY AUTHORITY OF CYPRUS:

Purpose: The mission of the E.A.C. is to provide safe, reliable and sufficient electric energy supplies to its customers at reasonable prices, paying due respect to the environment and the health and safety of its personnel and the general public, as well as to provide services of a high standard, which will meet with the needs and expectations of its customers.

The Electricity Authority of Cyprus (E.A.C.) is an independent, non-profit making, semi-government organisation established under the electricity development law cap.171 of 1952 in order to exercise and perform functions relating to the generation and supply of electric energy in Cyprus.

This definition is used in Cyprus for all corporations which are independent and which were established in accordance with the relevant law, in order to render services in the public utility sector. Such corporations are governed by Authorities, the Members of which are appointed by the Council of Ministers.

Particularly, the government through the Minister of Commerce, Industry and Tourism, is empowered to give directives to the Authority on matters appertaining to the general interest of the Republic. The Authority advises the Government through the Minister of Commerce, Industry and Tourism on all matters connected with the generation, transmission distribution and use of electric energy.

Since its establishment, E.A.C. has developed an efficient generation, transmission and distribution system covering the needs of the whole country, even the most remote villages. The electrification of Cyprus proceeded at a particularly fast pace. This, without any doubt, was a significant factor underlying the economic growth of Cyprus.

1.2. CHAPTERS

Chapter 2 deals at first with the components of a power system and then with nature of transmission and distribution systems.

Chapter 3 deals with load flows and with faults in a power system.

Chapter 4 deals with mechanism of lightning and its effect in a line and yet with restrike voltages form switching operation.

Chapter 5 deals with insulation coordination and with the protection of system and equipment against transient overvoltages

Chapter 6 deals with the analization of overvoltage problems using Electromagnetic Transients Programme (E.M.T.P.).