

CHAPTER ONE

INTRODUCTION

1.1 Introduction

An electric power system is complex machine composed of a large number of generators, transmission lines, distribution systems, and substations. Although less physically obvious than generators and transmission lines, systems to coordinate the operation and planning are also vital components without which power systems could not function. Coordination systems include monitoring and communication equipment, devices that actually control generators and transmission lines.

An electric power system is comprised of the major pieces of equipment we commonly associate with the utility industry. This equipment includes generating units that produce electricity, transmission lines that transport electricity over long distances, distribution lines that deliver the electricity to customers and substations that connect the pieces to each other. The bulk power system includes the generating plants, transmission lines, and their associated equipment. Energy control centers co-ordinate the operation of the bulk power system components from moment to moment and prepare for the near future. A wide variety of other Planning and engineering systems coordinate operating and capacity expansion plans for the longer term.

Figure 1.1 shows a simple electric system with two power plants and three distribution systems connected by a transmission network of four transmission lines.

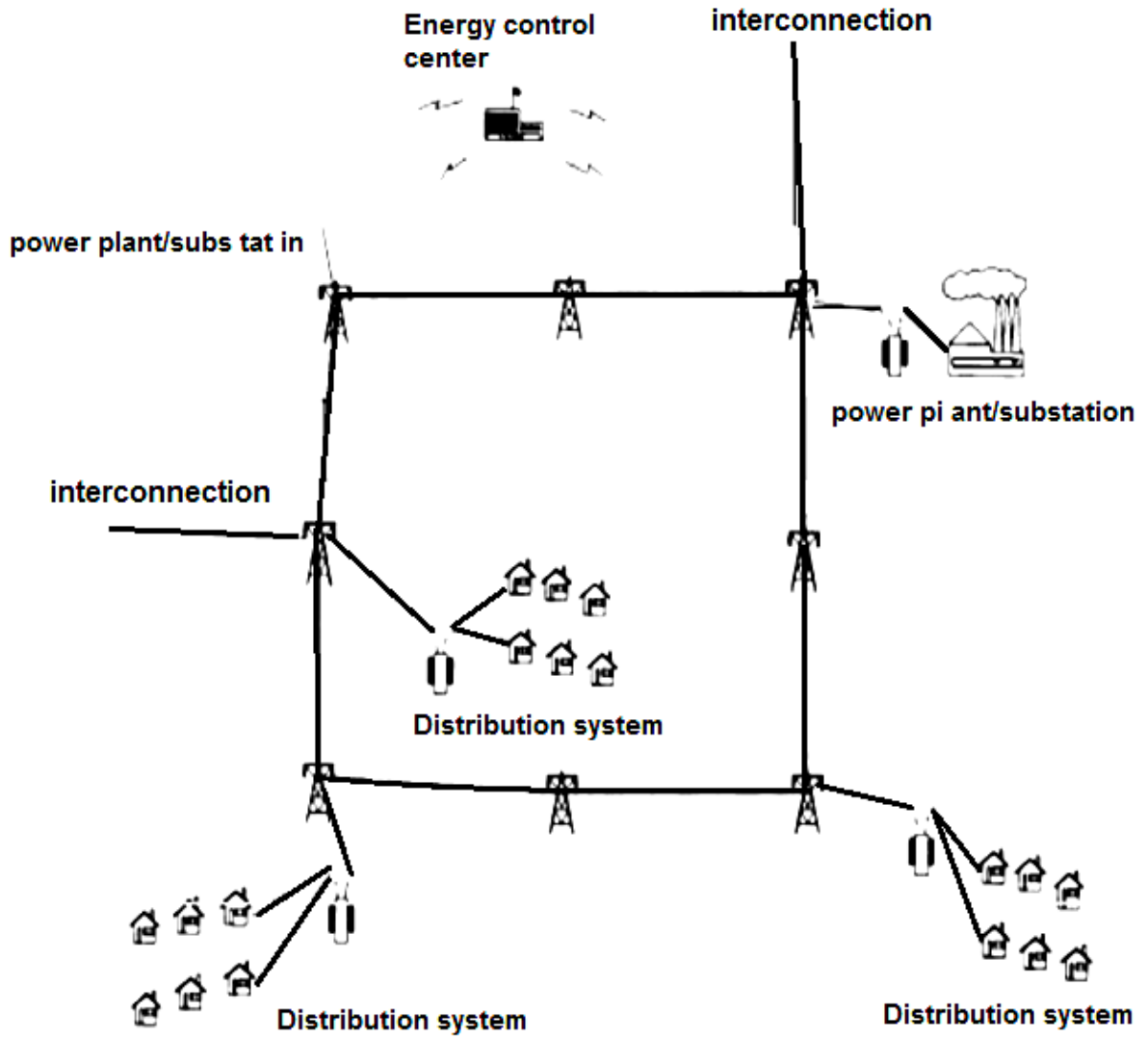


Figure 1.1 Electrical Power System

1.2 Problem statement

After studying electrical power system and we found that the main link between its parts is an electrical transformer, it problems that we faced in this electric transformers lower efficiency due to the effect of temperature, and the collapse of the files because of lightning or a mansion in an electrical circuit or increased loads.

1.3 Objective

- The design of the control circuitry in the transformer
- Implementation of the control circuit
- Reduce maintenance costs

1.4 Methodology

The project can be done after make the general overview with literue review of hole information about project such as electrical transformer and learn key points, which leads to solve problems, where the control system designby using PLC of type XC series programmable and used ladder diagram to write the code that recording the transformer and showing the results on HMI screen.

1.5 layout

This project consists of five chapters, each chapter addressed the connection of a limited part.

chapter one contains an overview of the power system and on the most important problems, as well as contain the objectives and methodology for the implementation of the project.

Chapter two included a general information and control about transformer and programmable logic controller PLC. the part regarding transformer, the studyidentified and determined its components, also addressed the types which include cooling, isolated media and the construction of the transformer.

regarding the controller, the study identifies and explain the uses of transformer in many means and in PLC.

Then a brief history about PLC and explain its components and language used to write the code regarding the transformer.

The third chapter discussed the circuit used, in details and then explain each component used in this circuit and illustrate the way of joint the transformer with PLC in small drawing and make block diagram .

The fourth chapter addressed the elements which joint the PLC and the software used and how which elements works separately , and then in third the particular part of the transformer in the ladder .

The five chapter included a summary to the project and recommendation .