CHAPTER 1

INTRODUCTION

METROPOLITAN ELECTRICITY AUTHORITY (MEA) is responsible for providing customers electricity within the metropolitan area of Bangkok, Nontabori area and Samutprakan area. At present the demand for electricity increases very fast so MEA must carefully monitor the situation within its distribution system in order to secure a suitable voltage profile and avoid overloading of lines not only during normal operation but also when outages occur.

In an attempt to obtain strength against single outages part of the distribution system (the Watlieb district) is heavily mashed on the lowest level i.e. 400 V. This means however, it is not possible to make correct load flow calculations for this part of the distribution system due to lack of input data. So we will use a software package , SIMPOW, to see what can be done to overcome this problem.

This study is of principle nature and will focus only part of MEA's distribution system in "Sapandam area". All data have been supplied by MEA.

The studied test case consists of :

number of nodes = 183

number of lines = 221

number of loads = 77

number of transformers = 37

Load flow calculation is made by use of SIMPOW software package,executed on a VAX-2000 workstation installed in room 405 on the fourth floor of Electrical Engineering building.

The computer program package "SIMPOW"is developed and marketed by ABB Power System AB.It offers tools for load flow,transient stability, eigenvalues as well as short circuit analysis.

The SIMPOW package consists of :-

- OPTPOW for load flow calculations.
- STAPOW for fault current calculations.
- DYNPOW for dynamic calculations.
- DSL dynamic simulation language for special modelling.

In this thesis only OPTPOW will be used. It affords the possibility of calculating initial and optimal load flows in networks. There is unlimit on the number of nodes but in case of many nodes the computation time might be too long for practical purposes.

A load flow calculation of a power system is a study of the steady state performance i.e. bus voltages, line loads and transformer loads but demands a certain minimum set of input data (see chapter2.)

One purpose of a load flow study is to find answers to :

1. What will happen if any transformer or any feeder is out of operation.?

2. Can more customers be connected to the system without jeopardizing the service of current customer.

If it is possible to use the SIMPOW software package on the MEA distribution system in spite of the lack of the proper amount

of measurement to perform a normal load flow calculation it might give the engineer in charge of planning and operation a tool to monitor the quality of service to MEA customer under various conditions.The idea is to estimate the quality of the answers to the two question above under prevailing circumstances.