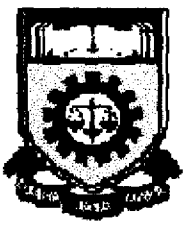
DAILY PEAK LOAD FORECASTING USING FUZZY LOGIC

Thesis presented in partial fulfillment for the award of the Bachelor in Electrical Engineering (Hons) of INSTITUT TEKNOLOGI MARA



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Abstract

Fuzzy logic is recently increasing giving emphasis on several applications. In this thesis an adaptive fuzzy logic control system is used to forecast daily peak load from the historical load data collection. This adaptation should consider loads generation and weather characteristics like temperature and humidity. In this thesis, *fuzzy*TECH precompiler 4.1 edition software, one of the fuzzy logic engineering tools had been used to forecast daily peak load. Three experiments were carried out to obtain good output forecast result. Modification of input and output language variables is made to improve the forecast accuracy. In this approach the forecasted error increased was only 1.97 %.

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INTRODUCTION

1.1 Introduction

Load forecasting is an important part of electric power system operations for optimum operation planning of power generation facilities. The main objective is to set up power load distribution in all time adaptation between demand and generation. This adaptation must consider load and generation characteristics and possible paths in transmission or distribution network to supply load energy to customers[1]. Therefore, customers can schedule load management activities to take advantage of their facilities based on the knowledge of the power utility load. Exact forecasting of load energy will identify the type of facilities required and scheduling standby power using of generating capacity, also represent a great potential savings for electric utility and to influence decision making in fuel allocation and so on.

1.2 Classification of load forecasting

There are two different objectives for studying load forecasting: economical operation of power plants, and economical solution of the distribution system. The first objective is to study the global performance of the load without taking into account the individual performance of each feeder. The second objective takes into account the characteristics of each load. The first objective is applied to the operation and planning of the power system, while the second is applied to the operation and planning of the distribution system. Currently, there are three possible classifications for load forecasting focusing on time: short-term (the next half-hour to twenty-four hour ahead), medium-term (the next day to the next year), and long-term (beyond the next year)[2]. The criteria for selecting each classification are different. As an example, the most important factors for short-term load forecasting include: the day of the week, temperature, humidity,