



THERMAL ENERGY SYSTEM WITH CHILLED WATER STORAGE

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ABSTRACT

In most modern office building or complex in tropical Malaysian climate, Heating, Ventilating and Air-Conditioning (HVAC) system are the largest energy consumers and offer the owners significant potential for savings.

A substantial part of this energy consumption comes from the building chilled water system and specifically the chillers. This is because they operate during cooling climate zones, thereby contributing to peak energy demands, resulting in high electricity bill. The electricity bill normally contain the charges incur due to the use of electricity during the off-peak and on-peak hours together with maximum demand charges of the month.

Thus, the objective of this project is to identify how the unique technological features offered by Thermal Energy Storage (TES) can be manipulated as an effective means of energy saving i.e. reducing energy cost on the central chilled water air-conditioning system for Engineering Faculty Complex, National University of Malaysia (UKM), Bangi, Selangor.

The report consists of 7 chapters. The 'Introduction' present an overview on energy consumed and potential conservation in a building services sector mainly on air-conditioning system.

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TO ALL MAY ALLAH BLESS YOU.

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CHAPTER 1

1.1 INTRODUCTION

The energy crisis in 1974, immediately following the October 1973 oil embargo (Gulf Crisis) was a blessing in disguise as far as building services were concerned. Not only the bitter experiences had taught the society an important reason ; pay attention to energy cost, but also when designing services in buildings, the designers must consider the energy conservation measures.

Buildings, especially the high rise ones, are common in this country. They have been designed with great sophistication to require considerable energy inputs for their operation. Studies of energy distribution in commercial buildings revealed that the three main energy users are the air-conditioning system, the lighting system and other services such as lifts, equipment and other miscellaneous users which consume up to 55 - 56 % , 25 - 35 % and 5 - 15 % respectively of the total energy supplied to the buildings.

Hence, the main stress of energy conservation is inevitably on the air-conditioning system where the highest portion of the energy supply is being consumed. The various components of the air-conditioning system with potential for savings are the chillers, pumps and fans.