ENERGY EFFICIENCY STUDY OF 4 STEPS AUTOTRANSFORMER AND CAPACITOR BANK SYSTEM IN SSAAS BUILDING

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ABSTRACT

Energy Efficiency study of 4 Steps Autotransformer and Capacitor Bank is conducted in Sultan Salahuddin Abdul Aziz Shah (SSAAS) Building, Shah Alam to find the method to reduce the maximum demand and starting current of the motor pump and these most suitable to reduce the electricity bill of SSAAS building. The objective of this study is to increase the Efficiency by using 4 Steps Autotransformer with Capacitor Bank system, to compare the equipment that already use for reduce the energy and other equipment that can reduce the energy and to prove the system that can reduce the maximum demand, bills and starting current. 4 Steps Autotransformer with Capacitor Bank system is used as requirement of the previous star delta (2 Steps Autotransformer) system in order to improve the energy efficiency of the building. The motor pump in SSAAS Building also is one of the factors that can due to high starting current of the motor pump. The data is collected for 5 months using Power Logger (Fluke 1735). From results, it's show that the Autotransformer and Capacitor Bank can reduce the starting current, maximum demand and the bill of the SSAAS Building and the results from the data shows that the power factor of the system increase from below than 0.85 to 0.95. The maximum demand and the starting current of the SSAAS Building also reduce and make the bills reduce better than previous system.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Malaysian government started various energy efficiency measures during the oil crisis in the 1970s such as using efficiency lamps and air-conditioning plants in public buildings. However, Energy efficiency was not pursued actively after the oil crisis. Promotion of Energy Efficiency was "renewed" in the 1990s by the Electricity and Gas Department (now the Energy Commission) and the Ministry of Energy. Energy efficiency Regulations was drafted in mid-1990 but not implemented due to some legal issue. An Energy Efficiency Unit was set up in late 1990s in the Electricity and Gas Supply Department for promotion Energy Efficiency [1]. Various activities were carried such as:

1. Minimum energy performance standards were implemented for certain electrical products which required to be approved by the Department such as lamp chokes and fans.
2. Awareness campaigns were conducted among school children, teacher and the general public as well as the industry and commercial sectors.
3. Brochures and guidebooks on how to use energy wisely were published and distributed to the public.

Energy efficiency offers considerable contribution to the social and economic demands for a secure and renewable energy supply. Significant energy savings can potentially be made on large-scale applications, but an alternative approach is to generate significant energy savings cumulatively through small-scale savings on individual devices, appliances and applications which are used by millions of people across Europe. In order to make electricity saving more efficient and to facilitate informed choices, it is beneficial to measure not only the total energy consumption or generation of each customer, but also to monitor the electricity consumption of individual appliances of each customer. Efficiency savings can be made both whilst devices are operational or in stand-by mode. Such measurements would have applications also in smart electricity grids and in micro scale trade of electricity.