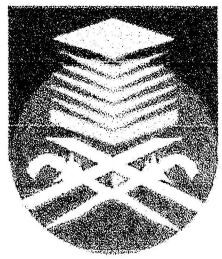

A CASE STUDY OF CHILLED WATER AIR-CONDITIONING SYSTEM IN UiTM PENANG

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ABSTRACT

Many office buildings in Malaysia including Universiti Teknologi MARA (UiTM) Penang were installed with the air-conditioning system to provide comfort for the occupants. The examples of air-conditioning types system used were a split unit, chiller system and many more. In UiTM Penang, chiller system that has a capacity of 2100 refrigerant tonnage is used to cool the building such as Faculty of Mechanical Engineering (FKM). The recommended degrees for thermal comfort zone are between 23°C to 25°C. However, in some areas in FKM building, there is an air-conditioning problem where comfort zone cannot be achieved. Thus, the purpose of the study is to investigate the heat loss and head loss for chilled water piping between the chiller plant and AHU room. Besides that, the total cooling capacity is calculated and compared to the installed air-conditioning. Most of the air-conditioning system installed in the building has complied with the design requirement, but the result shows that most of the chilled water temperature produced is high and not achieved to set point setting in the chiller system which is 7.5°C. The water supply pressure from the chiller plant maintained at 6.3 bar for each day. The heat loss occurred in chiller plant is acceptable because lower than design requirement which is 8.3°C. The head loss in the chiller plant is maintained on 2.3bar. The average heat loss between the chiller plant and AHU room is 1.25°C while the head loss is 1.3bar. There are three options proposed to improve the air-conditioning system in the FKM building. The selected option is to install a new chiller system near to FKM building with the new piping layout but using the existing AHU/FCU.

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