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### **Abstract**

The purpose of this thesis is to analyze and evaluate the ice harvesting storage system for the air conditioning. In general, the air conditioning system composes of the main instruments which are the compressor, condenser, evaporator and thermo - expansion valve. These instruments will be examined and analyzed to develop a new storage tank with an ice storage air conditioning system. This research will emphasize applying the ice storage tank to 5-ton of air conditioning. In this case, the flat plate evaporator is the ice producer. For the study and analysis of the parameters, the cold water will be measured for temperature, pressure, flow rate and electric consumption in the experimentation. The values from this test will be used to calculate its coefficient of performance(COP). In the period of the cold water, the COP is 3.17 and decreases to 2.88 in the ice making period. In 9 hours the machine can make  $0.27 \text{ m}^3$  of ice floating on the surface of the water from  $1.352 \text{ m}^3$  of water. The temperature of the water which is combined with the ice is  $-0.4 \text{ }^{\circ}\text{C}$ . This cold water is sent to the Air Handling Unit(AHU) through a heat exchanger in the T.110 building. Finally the temperature of this cold water will be increased until it is  $15 \text{ }^{\circ}\text{C}$  for 3 hours from 6.30 PM to 9.30 PM. it has the cooling load of 124814 BTU in the T.110 building. The performance of Air Handling Unit is 90%. The value of the cooling load was estimated at 43,711 Btu/hr in the first hour, 36,303 Btu/hr in the second hour and 28,152 Btu/hr in the third hour. As a result the cooling load from this ice storage system will create comfortable temperature for the people in the building.

 **Committee Chairperson**