

Thesis Title	Technical and Economic Feasibility Study of the Existing Split-Type Air Conditioners Compared with a Central Unit System in Classroom Building 3, 4, 5 at King Mongkut's University of Technology Thonburi
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Candidate	Mr. Chatphon Piyathamkul
Supervisors	Asst. Prof. Dr. Apichit Therdyothin Asst. Prof. Kuskana Kubaha
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Abstract

The objective of this thesis is to study the technical and economic feasibility of replacing the existing split-type air conditioners with a central unit system in classroom buildings (at King Mongkut's University of Technology Thonburi). Based on present conditions (activities of rooms, number of split-type air conditioners), the study compares these two systems for two cases. The first case, the central unit system is included in design period of the buildings. Second case, replacing the existing split-type air conditioners with the central unit system. There are 681 sets of various sizes of the split-type air conditioners with total investment cost of 23.9 Mbaht, total capacity of 17 MBtu/hr, total power consumption of 1.9 MW and annual operating cost of 4.3 Mbaht. All water system and fan coil unit are selected to use in the central unit system. The capacity of the central unit system corresponding to the total capacity of split-type air conditioners is 1,480 ton refrigeration, with total cost of 38.2 Mbaht and annual operating cost of 2.6 Mbaht. Nevertheless, the capacity of the central unit system based on cooling load of building is 850 tons with total cost of 35.7 Mbaht and annual operating cost of 1.8 Mbaht.

The results of comparison show that for the first case with 1,480 ton obtains an internal rate of return at 15.5 % and at 24.5 % for 850 ton. For the second case, it can be compared by using the equivalent annual worth method. Annual worths for 1,480 ton and 850 ton of central unit system are 6.7 and 5.6 Mbaht/year, respectively.

Keywords : Air conditioning System / Central Unit System / Split-Type Air Conditioner / Cooling Load Calculation / Economic Analysis / Classroom Building