Thesis Title	Electrical Energy Conservation Analysis for Mae Moh Thermal Power Plant Unit 1-3
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Abstract

This thesis concerns with an analysis of electrical energy conservation for Mae Moh thermal power plant unit 1-3. Total generated power of this plant is 225 MW (3×75 MW). The electrical power consumption in power plant generating process is approximately 7% of this generating capacity (or 20 MW). As three identical units, the analysis was made on plant unit 1 only. By continuous recording of power consumed in unit 1 on the tenth of January 1997, average power consumed in plant generating process are 5,705 - j4,750 kVA for unit 1 auxiliary transformer and 778 - j740 kVA for station service transformer. Electrical energy conservation measures were investigated by energy auditing in the plant unit 1. Then energy analysis and planing for energy conservation and peak demand control have been done. It was found that at the power factor correction to 0.90, the 3.3 - kV rated capacitors of 1,876 kVAr and the 380 V rated capacitor 665 kVAr should be installed. Peak demand control can be made by disconnecting the primary side of the unloaded transformer, managing the operation cycle and stopping unnecessary

machines. High-efficiency motors were considered also in this work. Low voltage standard motors in power plant were selected on the condition that they operate continuously more than 8 hours per day and have their rating power more than 1 horsepower. The power of 14.22 kW will be reduced. An interesting point is an electrical energy conservation by controlling the heating value of lignite to more than 2,600 calorie/g. Electrical power consumed by forced draft fans, induced draft fans, primary air fans and pulverizers were analyzed. And the results are shown that there is energy saving about 81.56 kW. Total energy saving from unit 1 auxiliary transformer and station service transformer are 107.24 kW 2,071.00 kVAr and 294.81 kW 1,045.58 kVar respectively. In the Mae Moh thermal power plant unit 1, it was estimated that electrical energy of 639,420.67 kWh per year could be saved. Thus the total saving electrical energy around 2 million kWh per year would be expected in the three units.

The outcome of this thesis work has given a practical solution and can only be carried out by a skilled, experienced and well-trained process engineer who must understand the power plant operation.