Development of Plant-wide Energy Monitoring System for a Purified Terephthalic Acid Manufacturing Process

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This paper deals with a development of Plant-wide Energy Monitoring System (PEMS) which plays important roles to reduce total energy cost for an industrial purified terephthalic acid (PTA) manufacturing process. Petrochemical plant is one of the highly energy consuming industries according to the report in 1999. PEMS is the on-line system that manages the energy cost and unit consumption totally through the key functions of evaluation, monitoring, diagnosis and analysis. At first, we identified and calculated key performance index (KPI) which represents the effectiveness of the total plant including the efficiency of an important unit process. The KPIs were monitored if they are consistently operated within a control limitation and the causes of degradation in KPIs are diagnosed when the value of KPI is abnormal. Operators could maintain optimal operation condition for improving the efficiency of equipment using the real-time monitoring and diagnosis information in PEMS. Engineers could find out the energy loss point and ideas of saving energy cost by the function of analysis in PEMS. The function of evaluation in PEMS supports the managers could improve the effectiveness of the total plant by supplying actual results of each plant daily, monthly, yearly.