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Process Optimization for Industrial Load Management

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Abstract

Continuous process industries engaged in large scale manufacturing of chemicals and fertilizers are highly energy intensive and contribute significantly to system peak demand. Consequent to the introduction of TOU tariff rates by the utilities, industrial load management programs aimed at economic reduction of electric energy demand of the industries during utility's peak generation period, gained importance. This paper presents an optimization model and formulation for peak demand and electricity cost reduction in continuous process industries. The formulation utilizes non-linear programming technique for minimizing the electricity cost by rescheduling the loads satisfying the process, production, and maximum demand constraints. The proposed optimal schedules when applied to a typical chemical plant resulted in significant reduction in peak demand (about 16.8%) and electricity cost (about 4.6%) under the TOU tariff.

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