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Optimal Captive Power Wheeling for Industrial Load Management

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Abstract

Captive power plants installed in large scale industries in many developing countries like India, are intended mainly as a stand by supply source or to cater some portion of critical load, and hence remain under utilized. In the context of ongoing power system deregulation, the spare capacity of captive power plants can be effectively utilized by wheeling the captive power among the deficient industries, which will in turn reduce the utility's peak demand. In this paper, an optimization model for captive power wheeling for peak demand management is proposed. The formulation utilizes non linear programming technique for minimizing the electricity cost and reducing the peak demand, by wheeling the captive power among the industries, satisfying the system constraints. The model when applied to three large scale industries of a typical industrial belt, resulted in significant reduction in peak demand (about 39%) and electricity cost (about 11%).

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