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SCIENTIFIC & RESEARCH PROJECTS

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Project Title:

New Method for Designing Optimum Distributed Cooling Sys. for Effluent Thermal Treatment System

Abstract:

Temperature restrictions on aqueous effluents dictate that streams with a temperature higher than the permitted level needed to pass through cooling systems to reduce the effluent temperature before discharge. In this study, by considering the grouping design rules based on pinch technology, an optimum design for a distributed effluent cooling system, has been developed. A counter-flow wet cooling tower, with a mechanical air draft, is also assumed as an effluent thermal treatment facility in predicting the exit water and air conditions of the tower in the system. In this new design method, an optimum inlet flow rate to cooling tower has been achieved by exploring the feasible region. Also, the evaporation loss effect, flexible design variables, and physical properties have been incorporated in targeting the optimal conditions for the cooling tower. A case study is presented to illustrate the design methodology and the optimization model of cooling systems.