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SCIENTIFIC & RESEARCH PROJECTS

Project No.: 03 **Year: 2013**

Project Field: Multi-Stream Heat Exchangers (MSHEs)

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Project Title:

Improving MSHE Design Procedure, Using Genetic Algorithm and Reduced Number of Sections

Abstract:

Pinch Technology is one of the best methods for designing a multi stream heat exchanger (MSHE) through a network; current pinch-based methods, however, lead to a larger and more complicated design problems. The major drawback of the current methods is they result in designs having more individual MSHE sections than essential, correspond to the enthalpy intervals on temperature vs. enthalpy diagrams or composite curves. In this paper, a new conceptual procedure for optimizing the entrance and exit points of each stream of a MSHE is proposed minimizing the number of sections required for a given duty. Moreover, Genetic algorithm (GA) is used to find the suitable fin type for making the heat exchanger dimensions consistent with manufacturing needs and the fully utilization of allowable pressure drops. Having applied the new design procedure in two industrial case studies, the results showed 11% and 7% cost reductions compared to the current method, respectively.