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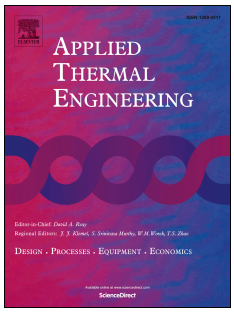

Thermoeconomic considerations in the allocation of heat transfer inventory for irreversible power systems

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Thermoeconomic considerations in the allocation of heat transfer inventory for irreversible power systems

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ABSTRACT

In this paper, thermoeconomic optimization of irreversible power systems with finite thermal capacitances for design situation is performed. Investigation is made with respect to the case of specified power output where exact expressions are determined without the use of an internal irreversibility parameter. The use of an internal irreversibility multiplier can omit important details even though it provides insight into real system behavior. Compared to the endoreversible case, the optimum hot- to cold-end unit cost ratio does not result in equal division of heat exchanger conductances and shows variation in the cycle thermal efficiency despite a constant fluid temperature ratio. It is also noted that optimization of the non-dimensional cost function does not translate into optimization of the thermal efficiency.

Keywords: Thermoeconomic; Irreversible; Endoreversible; Optimization; Effectiveness; Overall conductance

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