

反应堆工程

核动力装置冷凝器体积的优化设计

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摘要 冷凝器是核动力装置中的重要设备, 它的尺寸是影响核动力装置经济性和合理布置的重要因素。本文在总结冷凝器设计经验的基础上, 建立了冷凝器的数学模型, 并开发了相应的计算程序。在此基础上对影响冷凝器体积的设计参数进行了敏感性分析。以冷凝器总体积最小为目标函数, 在所确定的约束条件下, 采用复合形-遗传算法对冷凝器进行了优化设计。结果表明, 参考冷凝器的设计并非最优方案, 尚有较大的优化空间。也证明了该优化设计方法的可行性。本文的计算结果可为工程设计提供参考。

关键词 [冷凝器体积](#) [优化设计](#) [复合形-遗传算法](#) [敏感性](#)

分类号

Optimal Design of Condenser Volume in Nuclear Power Plant

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Abstract The condenser is an important component in the nuclear power plant, whose dimension will influence the economy and the arrangement of the nuclear power plant. In this paper, the calculation model was established according to the design experience. The corresponding codes were also developed. The sensitivity of design parameters which influence the condenser volume was analyzed. The present optimal design of the condenser, aiming at the volume minimization, was carried out with the self-developed complex-genetic algorithm. The results show that the reference condenser design is far from the best scheme. In addition, the results also verify the feasibility of the complex-genetic algorithm. Furthermore, the results of this paper can provide reference for the design of the condenser.

Key words [condenser](#) [volume](#) [optimal](#) [design](#) [complex-genetic](#) [algorithm](#) [sensitivity](#)

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