反应堆工程

反应堆一回路装置的重量优化设计

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摘要　　本文将最优化理论应用到核动力装置方案设计中，以核动力装置重量作为性能评价指标，建立了核动力一回路系统中主要设备的重量评价模型，在对影响一回路主要设备重量的热工参数进行敏感性分析的基础上，应用自主开发的改进复合形算法对核动力装置总体热工参数进行寻优，在满足功率要求和安全准则的前提下，获得了使压水堆一回路装置重量最小的优化设计方案。优化设计方案与原始设计方案相比，重量减少了3.77%，从理论上证明了优化的可能性，可为工程设计提供参考。

关键词　　核动力装置　一回路　优化设计　敏感性分析

分类号

Optimal Design of Nuclear Reactor Primary Circuit Weight

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Abstract　Optimal theories were applied to scheme design of nuclear power plant, and the nuclear power plant weight served as a performance evaluation index, the weight evaluation models of main equipments in primary circuit were established, based on the sensitivity analysis of thermal parameters which influence weight of nuclear equipments in primary circuit The optimal design of primary circuit weight was carried out using an improved complex method algorithm The optimal results indicate that the weight of optimum design is 3.77% less than original design, which proves the possibility of optimization and can provide reference for engineering design

Key words　nuclear　power　plant　primary　circuit　optimal　design　sensitivity　analysis

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