

## 严重事故下氢气控制系统的优化设计

佟立丽, 曹学武, 郭丁情

上海交通大学 机械与动力工程学院, 上海 200240

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**摘要** 采用一体化严重事故仿真程序, 对600 MW核电厂严重事故下氢气控制系统进行功能分析及优化设计, 并提出工程上可实施的氢气控制系统优化准则。结果表明: 该氢气控制系统能确保大破口失水始发严重事故下安全壳内平均氢气浓度和隔间内氢气浓度低于10%, 满足美国联邦法规10CFR中关于氢气控制和风险分析的准则; 改变非能动氢气复合器的布置方案, 在有效缓解氢气风险的前提下, 尽量降低复合器数量, 优化结果为优化方案2优于优化方案1, 优化方案1优于原拟定方案。

**关键词** [严重事故](#) [氢气控制](#) [优化设计](#) [非能动氢气复合器](#)

分类号

## Optimization of Hydrogen Control System During Severe Accident for Nuclear Power Plant

TONG Li-li, CAO Xue-wu, GUO Ding-qing

College of Mechine and Power Engineering, Shanghai Jiao Tong University, Shanghai 200240, China

**Abstract** With an integral system analysis computer code, the assumed hydrogen control system was analyzed and optimized for 600 MW nuclear power plant. Basic principles for optimization of the hydrogen control system and a set of guidelines which can be implemented in projects were put forward. During the severe accident induced by large-break loss-of-coolant accident (LB-LOCA), the assumed hydrogen control system ensures that the average and local hydrogen concentrations in compartments are less than 10%, matching the hydrogen control and risk analysis standard of United States Nuclear Regulatory Commission (USNRC) 10CFR. Changing the layout of the autocatalytic recombiners and with the hydrogen risk effectively mitigated, the evaluation of the optimization indicates that the optimization mode 2 is better than the optimization mode 1, and the optimization mode 1 is better than the former one.

**Key words** [severe accident](#) [hydrogen control](#) [optimization design](#) [passive autocatalytic recombiner](#)

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