原子能科学技术 2010 44 (5): 548-552 ISSN: 1000-6931 CN: 11-2044/TL

反应堆工程

摇摆条件下非能动余热排出系统运行特性的试验与理论研究

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收稿日期 修回日期 网络版发布日期:

摘要 在摇摆台架上对摇摆条件下的非能动余热排出系统运行特性进行了试验研究。在RELAP5/MOD3.2程序的基础上，采用漂移流模型替代两流体模型，通过修正混合物动量方程、冷凝传热模型，对程序进行改进，利用改进的RELAP5程序，对摇摆条件下的非能动余热排出系统进行了数值模拟，计算结果与试验结果相吻合，误差在10%以内。改进的冷凝换热关系式可较好地用于含有液滴夹带的冷凝换热计算。在摇摆试验中，凝水温度与蒸汽压力波动很小。

关键词 摇摆 非能动余热排出系统 数值模拟

分类号

Experimental and Theoretical Research on Operational Characteristics of Passive Residual Heat Removal System Under Rolling Motion

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Abstract The operational characteristics of passive residual heat removal system on the rolling roof were investigated experimentally. On the basis of RELAP5/MOD3.2 code, the two-fluid model was substituted with drift flux model. This code was improved by modifying the mixture momentum equation and condensation heat transfer model. The passive residual heat removal system under rolling motion was simulated by the advanced code, and it was consistent with experiment results. The discrepancy between calculation and experiment results was less than 10%. The advanced condensation heat transfer model can also be used to calculate the condensation heat transfer coefficient with droplet carryover precisely. In the experiments, the fluctuation of condensate temperature and steam pressure was very limited.

Key words rolling _ passive residual heat removal system _ numerical simulation

DOI

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