

反应堆工程

立式倒U型管蒸汽发生器倒流现象及初步分析

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摘要 文章涉及中国核动力研究设计院自然循环实验装置单相稳态自然循环实验过程中立式倒U型管蒸汽发生器(UTSG)模拟体一次侧流体的流动特性。实验观察到: 1) UTSG模拟体进口腔室压力低于出口腔室压力; 2) UTSG模拟体进口腔室温度较热段温度有一陡降。通过对该实验现象的分析可以判定, 在单相自然循环工况下, UTSG模拟体中某些传热管内出现了倒流。实验结果表明, 倒流的出现使UTSG模拟体自然循环工况下的流动阻力系数较强迫循环工况下的明显增大。

关键词 [自然循环](#) [立式倒U型管蒸汽发生器](#) [倒流](#)

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Phenomena and Analysis of Reversal Flow in Vertically Inverted U-Tube Steam Generator

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Abstract The experimental results of flow characteristics of vertically inverted U-tube steam generator(UTSG) primary side fluid under single-phase steady state natural circulation condition, which were conducted on natural circulation test facility in Nuclear Power Institute of China (NPIC), were presented. Following phenomena were observed from experiment: 1) The pressure of UTSG inlet plenum is lower than that in exit plenum; 2) The inlet plenum temperature of UTSG is sharply lower than that in hot leg. By analysis, reversal flow in some U-tubes of UTSG under single-phase natural circulation condition can be deduced. Experiment result shows that the flow resistance coefficient of UTSG under natural circulation is obviously larger than that under forced circulation as the occurrence of flow reversal in some U tubes of UTSG under single-phase natural circulation condition.

Key words [natural circulation](#) [vertically inverted U-tube steam generator](#) [flow reversal](#)

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