

反应堆工程

压水堆大破口失水事故引发的严重事故研究

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摘要 采用机理性严重事故最佳估算程序SCDAP/RELAP5/MOD3.2, 以美国西屋公司Surry核电站为参考对象, 建立了1个典型的3环路压水堆核电站的严重事故分析模型, 分别对主回路冷段和热段发生25 cm大破口失水事故(LBLOCA)导致的堆芯熔化事故进行研究分析。结果表明, 压水堆发生大破口失水事故时, 堆芯熔化进程较快, 大量堆芯材料熔化并坍塌至下腔室, 反应堆压力容器下封头失效较早, 且主回路冷段破口比热段破口更为严重。

关键词 [大破口失水事故](#) [严重事故](#) [堆芯熔化进程](#) [反应堆压力容器](#)

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Study on Severe Accident Induced by Large Break Loss of Coolant Accident for Pressurized Water Reactor

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Abstract Using the best estimate computer code SCDAP/RELAP5/MOD3.2 and taking US Westinghouse corporation Surry nuclear power plant as the reference object, a typical three-loop pressurized water reactor severe accident calculation model was established and 25 cm large break loss of coolant accident (LBLOCA) in cold and hot leg of primary loop induced core melt accident was analyzed. The calculated results show that core melt progression is fast and most of the core material melt and relocated to the lower plenum. The lower head of reactor pressure vessel failed at an early time and the cold leg break is more severe than the hot leg break in primary loop during LBLOCA.

Key words [large break loss of coolant accident](#) [severe accident](#) [core melt progression](#) [reactor pressure vessel](#)

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