

反应堆工程

安注方式对设计基准失水事故下元件包壳破损份额影响的分析

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摘要 以某船用压水堆为研究对象, 采用RELAP5/MOD3 2程序, 分析了发生在主管道冷端的极限中破口失水事故中, 采取冷端、热端安注方式时不同的事故过程。引入临界管概念, 确定了包壳破损临界功率因子。对全堆进行精细功率重构, 确定每根燃料元件功率因子, 最终确定不同安注方式下的元件包壳破损份额, 并指出: 对破口出现在主管道冷段的设计基准事故, 热端安注能减轻事故后果, 减少破损份额。

关键词 [船用压水堆](#) [MBLOCA](#) [安注方式](#) [包壳破损](#)

分类号

Analysis of Safety Injection Manner Influence on Cladding Failure Fraction in Design Basis Loss of Coolant Accident

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Abstract Extreme middle break loss of coolant accident (MBLOCA) occurring at cold leg was analyzed with the RELAP5/MOD3 2 code for a marine reactor, and different accident processes were simulated separately under the conditions of cold leg safety injection and hot leg safety injection. Based on the concept of critical pipe which was introduced in this paper, the critical power factor of fuel cladding failure was given, and then pin power distribution of the whole core was calculated subsequently. Finally, the cladding failure fraction of the reactor was got. It is pointed that, during the design basis LOCA occurring at cold leg of the main loop, hot leg safety injection can reduce the accident results and the failure fraction.

Key words [marine reactor](#) [MBLOCA](#) [safety injection](#) [manner](#) [cladding failure](#)

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