

反应堆工程

压水堆核电站全厂断电事故及其缓解措施

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摘要 以1座典型的3环路压水堆核电站为参考对象, 分别研究了发生全厂断电事故时堆芯在低压和高压状态下的损坏进程。结果表明: 在考虑稳压器波动管的蠕变失效时, 虽避免了高压熔堆, 但低压状态下堆芯损坏更为严重, 且产生更多的氢气。分析了导致这一结果的原因, 提出了在堆芯出口温度达923 K时的严重事故缓解措施。计算结果表明: 该缓解措施能有效地延缓堆芯损坏进程, 为操纵员恢复交流电源以及采取其它缓解手段赢得更多时间。

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Station Blackout Accident and Mitigation Measure for PWR-NPP

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Abstract The reference plant is a typical three-loop PWR-NPP. The progress of core damage under low pressure and high pressure was studied respectively during a station blackout accident. The results show that the high pressure core melt accident is eliminated when pressurizer surge line creep failure is considered, but core damage is more serious and much hydrogen is generated under low pressure transient. The reason was analyzed and the mitigation measure was suggested when core outlet temperature reached 923 K. Calculation results show that core melt progress is greatly delayed, thus the operators have more time available to recover AC electrical source and take other mitigation measures.

Key words [severe](#) [accident](#) [station](#) [blackout](#) [creep](#) [rupture](#) [lower](#) [head](#)

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