

反应堆工程

# 压水堆核电站高压熔堆严重事故序列分析

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**摘要** 压水堆核电站的高压熔堆事故覆盖了大部分的严重事故序列, 且具有很大的潜在威胁。根据我国900 MW压水堆核电站的概率安全分析(PSA)结果选取了丧失厂外电、未能紧急停堆的预期瞬态、二回路管道破口、一回路小破口和蒸汽发生器传热管破裂5种典型的高压熔堆严重事故序列, 并使用SCDAP/RELAP5程序对这些事故序列的进程和后果进行了计算分析。计算结果表明: 5种典型高压熔堆事故序列可能导致高压熔喷和安全壳直接加热风险, 可能引起安全壳早期失效, 很有必要采取相应的一回路卸压措施。

**关键词** [900 MW压水堆核电站](#); [高压熔堆事故](#); [SCDAP/RELAP5程序](#)

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## Analysis of High-Pressure Core Melt Severe Accidents in PWR Nuclear Power Plant

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**Abstract** The high-pressure core melt accidents in PWR nuclear power plant which cover most of the severe accidents, have large potential risk. According to the probabilistic safety analysis (PSA) reports of Chinese 900 MW PWR nuclear power plant, the paper selected five typical severe accidents with high-pressure core melt, such as TMLB', LOFW-ATWS, MSLB, SBLOC A and SGTR. The progressions and results of these accidents were analyzed by using SCDAP/RELAP5 code. According to the calculation results, these typical accidents can induce large risk of high-pressure melt-spray event (HPME) and direction containment heat (DCH), which may arise the early failure of containment. Thus, it is very necessary to implement the primary depressurization strategies.

**Key words** [900 MW PWR nuclear power plant](#) \_ [high-pressure core melt accident](#) \_ [SCDAP/RELAP5 code](#)

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