

反应堆工程

压水堆核电站LOFW始发严重事故下堆腔注水措施影响因素分析

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摘要 针对900 MW级压水堆核电站, 采用一体化严重事故分析工具, 对主给水丧失(LOFW)始发事件叠加辅助给水失效严重事故下, 采取堆腔注水(ERVC)缓解措施的事故进程进行模拟, 对该措施缓解堆芯熔化进程、保持压力容器完整性的有效性进行分析验证, 并对注水速率、注水高度和注水时间对该措施的影响进行了分析。结果表明: 在充足的水源条件下, 保证一定的注水速率和水位高度, LOFW始发严重事故下采取堆腔注水的缓解措施可为下封头提供有效的冷却, 保持压力容器的完整性;在事故进程不同时间点进行注水, 分析表明, 只要保证一定的注水速率, 注水入口时间延迟同样可保持压力容器完整性。

关键词 [主给水丧失](#) [堆腔注水](#) [压力容器完整性](#) [严重事故](#)
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Analysis on External Reactor Vessel Cooling Measure in Severe Accident Induced by LOFW for Pressurized Water Reactor Nuclear Power Plant

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Abstract Based on an integral system analysis computer code, a severe accident sequence induced by loss of feed water (LOFW) plus failure of auxiliary feed water, with external reactor vessel cooling (ERVC) measure, was calculated for 900 MWe nuclear power plant. The validity of the measure for mitigating core's melting progression, keeping the integrity of the vessel was analyzed, and three effect factors of the measure such as velocity of water injecting, water level in cavity and different injection time, were also analyzed. The results indicate that ERVC with enough mass of water, appropriate velocity of water injecting and water level in cavity, can provide adequate cooling capacity for vessel lower head, and the integrity of vessel can be retained. ERVC in different injection time with appropriate velocity of water injecting, the integrity of vessel can also be retained although the injection time is delayed.

Key words [loss of feed water](#) [external reactor vessel cooling](#) [integrity of reactor vessel](#) [severe accident](#)

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