

反应堆工程

压水堆核电站严重事故下堆腔注水措施研究

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摘要 针对百万千瓦级压水堆核电站, 采用一体化严重事故分析工具, 对一回路冷段大破口冷却剂丧失 (LB-LOCA) 始发严重事故下, 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, 并对影响该措施的因素进行研究。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, LB-LOCA 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。

关键词 [大破口失水事故](#) [堆腔注水](#) [压力容器完整性](#)

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External Reactor Vessel Cooling Measure in Severe Accident for Pressurized Water Reactor Nuclear Power Plant

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Abstract Making use of an integral systems analysis computer code, a severe accident sequence induced by large-break loss-of-coolant accident (LB-LOCA) at cold leg, with external reactor vessel cooling (ERVC) measure, was calculated for 1 000 MWe nuclear power plant. The validity of the measure for mitigating core's melting progression, keeping the integrity of the vessel, and also the effect factors of the measure, were 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.

Key words [large-break](#) [loss-of-coolant](#) [accident](#) [external](#) [reactor](#) [vessel](#) [cooling](#) [reactor](#) [vessel](#) [integrity](#)

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