

反应堆工程

## 严重事故下氢气风险及氢气控制系统的初步分析

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**摘要** 采用一体化严重事故分析工具, 对600 MWe压水堆核电站严重事故下氢气风险及拟定的氢气控制系统进行分析。结果表明: 相对于小破口失水始发事故和全厂断电始发事故工况, 大破口失水始发严重事故堆芯快速熔化, 在考虑100%锆-水反应产氢量的条件下, 大破口失水始发事故氢气风险较大, 有可能发生氢气快速燃烧; 在氢气控制系统作用下, 发生大破口失水始发严重事故时, 安全壳内平均氢气浓度和隔间内氢气浓度低于10%, 未达到氢气快速燃烧和爆炸的条件, 满足美国联邦法规10CFR中关于氢气控制和风险分析的准则, 认为该氢气控制系统是可行、有效的。

**关键词** [严重事故; 氢气风险; 氢气控制](#)

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## reliminary Analysis of Hydrogen Risk and Hydrogen Control System Under Severe Accident

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**Abstract** With an integral systems analysis computer code, hydrogen risk and the assumed hydrogen control system were analyzed for 600 MWe Pressurized Water Reactor Nuclear Power Plant. The results show that in view of 100% of zirconium clad reacted, the severe accident induced by large break loss of coolant accident (LB-LOCA) with fast core's melting progression, has more hazards, possibly resulting in hydrogen deflagration, than those induced by small break loss of coolant accident (SB-LOCA) and station blackout (SBO). With the effect of the assumed hydrogen control system, the average and local hydrogen concentrations in compartments of the containment are less than 10%, which means that hydrogen deflagration or detonation will not occur according with the hydrogen control and risk analysis standard in 10CFR of USA. So the assumed hydrogen control system is feasible and effective.

**Key words** [severe accident](#) [hydrogen risk](#) [hydrogen control](#)

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