

反应堆工程

# 蒸汽份额对安全壳内氢气分布的影响

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**摘要** 核电厂严重事故下安全壳内氢气的热工水力特性极其复杂, 安全壳内氢气的流动与分布受多种因素影响, 如安全壳通路、产氢速率、水蒸气份额等。本文使用三维计算流体力学软件CFX研究安全壳内的氢气浓度分布, 关注在产生的混合气体中水蒸气份额对安全壳内氢气分布的影响。研究表明: 所产生的混合气体中的水蒸气份额越高, 水蒸气从破口区域携带出来的氢气越多; 水蒸气促进了安全壳内的空气流动, 导致破口区域的氢气浓度较低, 其他区域的氢气分布则较为均匀。

**关键词** [严重事故](#); [氢气局部风险](#); [水蒸气](#); [CFX](#)

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## Effect of Steam Fraction on Hydrogen Distribution in Containment

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**Abstract** During the severe accident of nuclear power plant, the thermal-hydraulic character of hydrogen in the containment is very complicated. The flow and distribution of hydrogen are influenced by many factors, such as the access of the containment, the production rate of hydrogen, the steam fraction in the source mixture, and so on. The paper studies the hydrogen distribution in the containment using the CFD code—CFX, and focuses attention on the steam fraction in the source mixture effect on the hydrogen distribution. The results indicate that the more steam in the source mixture carries the more hydrogen away from the breach location, and improves the air circulation in the containment, so the hydrogen molar fraction near the breach location is lower, but also well-proportional in other areas.

**Key words** [severe accident](#) \_ [local hydrogen risk](#) \_ [steam](#) \_ [CFX](#)

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