原子能科学技术 2000 34 (5): ISSN: 1000-6931 CN: 11-2044/TL

A

蒸汽发生器大泄漏钠水反应引起的二回路压力波传播

@骆焱$西安交通大学!陕西西安710049 @张建民$西安交通大学!陕西西安710049 @单建强$西安交通大学!陕西西安710049 @朱继洲$西安交通大学!陕西西安710049

收稿日期 1999-7-6 修回日期 网络版发布日期:

摘要 研究建立了钠冷快堆蒸汽发生器在单管束发生双端断裂情况下钠 水反应中气泡从球形到柱状的变温绝热生长模型 ,及采用一维特征线方法建立的压力波在快堆二回路中的传播模型。模型中考虑了爆破膜、管壁弹性变形和气蚀的影响。对在两相汽水混合区发生大泄漏后有、无爆破膜情况下的钠 水反应和二回路压力传播瞬态进行了计算 ,定性分析了其影响以及爆破膜在钠 水反应中的安全保护作用。

关键词 蒸汽发生器 钠-水反应 压力传播 爆破膜

分类号 TL425

Secondary Loop Pressure Propagation Caused by Large Leak Sodium-water Reaction in Steam Generator of Liguid Metal-cooled Fast Breeder Reactor

LUO Yan, ZHANG Jian min, SHAN Jian qiang, ZHU Ji zhou (Xi'an Jiaotong University, Xi'an 710049, China)

Abstract The model of adiabatic spherical to columnar hydrogen bubble growth in large leak sodium water reaction as well as the model of secondary loop pressure propagation with the one dimensional characteristic method are established under one double ended guillotine tube break in the steam generator of liquid metal cooled fast breeder reactor. Both of the characters of large leak sodium water reaction and secondary loop pressure propagation transient are calculated and analyzed at the two phase water large leak with and without rupture disks.

Key words steam generator sodium water reaction pressure propagation rupture disks

DOI

通讯作者