

反应堆工程

蒸汽发生器传热管腐蚀监测技术研究

侯素霞^{1, 2}, 赵福宇¹, 罗积军², 郜云¹

¹ 西安交通大学 多相流国家重点实验室, 陕西 西安 710049 ² 第二炮兵工程学院 物理室, 陕西 西安 710025)

收稿日期 修回日期 网络版发布日期:

摘要 蒸汽发生器传热管的腐蚀监测是保障核动力装置安全运行的重要问题之一。在对声发射技术原理进行介绍的基础上, 采集和分析利用声发射仪对传热管进行加压实验时的声发射信号。实验结果表明: 在传热管上形成微小直径穿孔性管壁腐蚀点, 这种点蚀形成后, 腐蚀先是向深处发展, 形成尖端腐蚀, 然后再向两侧延伸, 逐渐形成裂纹, 随着裂纹的进一步发展便形成泄漏事故; 利用声发射仪对蒸汽发生器的传热管工作过程进行实时监控, 可实时判断传热管材料的应力腐蚀情况, 操作人员可根据声发射信号强度及其变化控制核动力装置的运行情况。

关键词 [蒸汽发生器](#); [核动力装置](#); [腐蚀](#)

分类号

Analysis on Corrosion Inspection of Steam Generator Heat Transfer Tubes

HOU Su xia^{1, 2}, ZHAO Fu yu¹, LUO Ji jun², TAI Yun¹

¹ State Key Laboratory of Multiphase Flow, Xi'an Jiaotong University, Xi'an 710049, China;

²Section of Physics, The Second Artillery Engineering Institute, Xi'an 710025, China

Abstract The corrosion inspection on heat transfer tubes of steam generator is an important problem which ensures the security of the nuclear plants. Based on the principle of acoustic emission (AE) technique, acoustic emission signals about tubes of steam generator gathered by instrument were analyzed. The results show that corrosion dots come into being for tubes of steam generator, and the corrosion dots develop deeply to form tip corrosion which extends to become crack gradually, which causes serious leaking accident. The realtime inspection on the work of steam generator was achieved, according to which the stress corrosion can be judged timely. So the operator can control the nuclear plants according to intensity of acoustic emission signals.

Key words [steam generator](#) [nuclear plants](#) [corrosion](#)

DOI

扩展功能

本文信息

- ▶ [Supporting info](#)
- ▶ [\[PDF全文\]\(763KB\)](#)
- ▶ [\[HTML全文\]\(0KB\)](#)
- ▶ [参考文献](#)

服务与反馈

- ▶ [把本文推荐给朋友](#)
- ▶ [文章反馈](#)
- ▶ [浏览反馈信息](#)

相关信息

- ▶ 本刊中 [包含“蒸汽发生器; 核动力装置; 腐蚀”的相关文章](#)
- ▶ 本文作者相关文章

- [侯素霞](#)
- [—](#)
- [赵福宇](#)
- [罗积军](#)
- [郜云](#)
- [云](#)