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压水堆压力壳堆焊不锈钢的动电位再活化行为与晶间应力腐蚀破裂敏感性

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摘要 用动电位再活化方法研究了压水堆压力壳堆焊不锈钢衬里材料的活化与再活化行为以及晶界形貌,用高温水恒变形和慢应变速率应力腐蚀破裂试验比较了晶间应力腐蚀破裂的敏感程应。结果表明再活化行为与晶间应力腐蚀破裂敏感性之间有一致关系。动电位再活化有可能作为核动力装置中不锈钢焊接件晶间应力腐蚀破裂敏感程度的无损检验方法。

关键词 压水堆(PWR) 动电位再活化(EPR) 晶间腐蚀(IGA) 晶间应力腐蚀破裂(IGSCC) 无损检验(NDI)

分类号

STUDY ON EPR BEHAVIOUR AND SUSCEPTIBILITY TO IGSCC ON STAINLESS STEEL WELDED LINING IN PRESSURE VESSEL OF PWR

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Abstract Behaviour of activation-reactivation and intergranular attack (IGA) patternhas been studied by means of electrochemical potentionkinetic reactivation (EPR).The degree of susceptibility to intergranular stress corrosion cracking (IGSCC) iscomparable by both constant strain test and slow strain rate test in high temperaturewater. Results reveal that a good agreemcnt between RPR and IGSCC is found.EPR may be carried out as a nondestructive inspection (NDI) in practice to pre-dict the degree of sensitization to IGSCC of welded stainless steel in nuclar powersystems.

Key words Pressurized water reactor Electrochemical potentionkinetic rcactivation Intergranular attack Intergranular strees corrosion cracking Nondestructive inspection

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