Fault Monitoring Techniques for a High Temperature Reduction Reactor

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Abstract

The onset of research into the monitoring techniques for detecting faults in the high temperature reduction reactor commenced in 2001 and a preliminary study was performed in order to support the successful reduction process. The tasks of the fault monitoring techniques are to identify reactor integrity and agitator driving system integrity. Appropriate sensors and related electronic equipment were constructed for the acquisition and analysis of the fault-induced signals. Fault signal acquisitions were performed on the full-scale reduction reactor and the agitator driving experimental facility. Through the fuel oxide reduction experiments in the full-scale reduction reactor, some defects within the reactor were detected and located by use of the acoustic emission signal analysis method. For the agitator driving system, the faults pre-categorized were identified and classified by use of advanced signal analysis and the diagnosis method with measured vibration signals.

측정 불확실도 해석을 통한 초음파유량계의 급수유량 측정 적용성 고찰
A Study on Applicability of Ultrasonic Flowmeter for Feedwater Flow Measurements Using Measurement Uncertainty Analysis

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요약

원자력발전소 주급수유량의 측정과 관련하여, 현재 사용되는 벤츄리계 대비 초음파유량계의 적용성을 평가하기 위해 초음파유량계와 벤츄리계의 측정 불확실도를 분석하고, 그 결과에 근거하여 원자로 열출력의 측정 불확실도를 분석하였다. 가동중인 한국표준형원전의 증기발생기 급수배관에 초음파유량계를 설치하였고, 취득된 실측자료들은 측정 불확실도 분석에 활용되었다. 본 연구의 결과들은 초음파유량계를 이용하여 급수유량을 측정할 때 원자로 열출력의 측정 불확실도는 안전해석 가정치내에서 충분하게 개선됨을 보여주었다.