

소성거동이 고려된 원주방향 균열 열림에 미치는 압력유기급힘의 구속효과 평가 모델

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Evaluation Model for Restraint Effect of Pressure Induced Bending on Circumferential Crack Opening Considered Plastic Behavior

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Key Words: Pressure Induced Bending (압력유기급힘), Restraint Effect (구속효과), Crack Opening (균열열림), Plastic Behavior (소성거동), Evaluation Model (평가모델)

Abstract : This paper presents the evaluation model for restraint effect of pressure induced bending (PIB) on the circumferential crack opening, which is considered plastic crack opening behavior. This study performed 3-D elastic-plastic finite element (FE) analyses under various crack angles, restraint conditions, pipe geometries, load levels, and materials, and investigated the influence of each parameter on the restraint effect. Based on this investigations and additional elastic-perfectly plastic FE analysis results, the evaluation model, that is a normalized form with restraint effect on the elastic crack opening, was proposed as function of crack angle, restraint length, radius to thickness ratio, and applied axial stress due to internal pressure.

Monte Carlo 방법을 이용한 Model F 증기발생기 전열관 AVB 마모의 성장 및 생성에 대한 확률론적 예측

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Statistical Prediction of AVB Wear Growth and Initiation in Model F Steam Generator Tubes Using Monte Carlo Method

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Key Words: Monte Carlo Method, Steam Generator Tubes, Statistical Assessment

Abstract : The growth of AVB wear in Model F steam generator tubes is predicted using the Monte Carlo Method and statistical approaches. The statistical parameters that represent the characteristics of wear growth and wear initiation are derived from in-service inspection (ISI) non-destructive evaluation (NDE) data. Based on the statistical approaches, wear growth models are proposed and applied to predict wear distribution at the end of cycle (EOC). Probabilistic distributions of the number of wear flaws and maximum wear depth at EOC are obtained from the analysis results. Comparing the predicted EOC wear flaw data with the known EOC data the usefulness of the proposed method is examined and satisfactory results are obtained.