

피로재료상수의 변동을 고려한 신뢰도 기반 최적설계

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Reliability-based design optimization considering variation of fatigue material properties

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Key Words: Reliability-based design optimization(RBDO), fatigue, durability

Abstract : Durability has been one of the most important issues in the vehicle design. But it has much uncertainties in itself. The variation of fatigue material properties is one of the major factors which make uncertainties in durability. To consider this variation, reliability-based design optimization(RBDO) is preferable to deterministic design optimization. In this study, we proposed a proper fatigue reliability assessment method using a strain-life analysis and RBDO with durability constraints is performed using SLSV(Sing Loop Sing Variable).

유한요소법에 의한 경수로용 핵연료집합체의 낙하충격 해석

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Drop Impact Analysis of a Fuel Assembly for PWR by FE Method

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Key Words: Drop impact(낙하충격), Joint/Connection(조합/연결), Fuel Assembly(핵연료집합체)

Abstract : The drop impact analysis of a fuel assembly for pressurized water reactor power plant are executed by finite element analysis method. The used commercial FE code are the ANSYS and DYNA-3D. The analysis results are compared with the experimental results. The impact force results differed from the analysis condition depending on how many fuel rods slipped down to the bottom nozzle. And the joint and connection parts between components of a fuel assembly are very important for determining the stiffness of it. The fuel assembly experienced an impact force of approximately 110 kN when dropped from a height 38 mm with the fuel rods on the bottom nozzle. The developed finite element model and analysis procedure will be useful tool for evaluating the stiffness and strength of a fuel assembly.