

관막음된 증기발생기 전열관의 유체유발진동 특성 평가

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Estimation of Flow-induced Vibration Characteristics on Plugged Steam Generator Tube

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Key Words : Flow-induced Vibration (FIV, 유동유발진동), Steam Generator (증기발생기), Tube Plugging (관막음), U-tube (U자관), Fluid-elastic Instability (유체탄성불안정성), Stability Ratio (안정비), Cooling Water (냉각수)

Abstract : In this study, we investigate the plugging effect on the CE type steam generator tube. The natural frequency and mode shape will be changed due to decrease of the effective mass distribution along the tube. We compared the variation of stability ratio for plugged tube with that for unplugged one. The natural frequency increased because of removing the cooling water inside the steam generator tube, but the stability ratio decreased inversely because of changing the vibrational mode shape. We also investigated the turbulent excitation effect.

CE형 증기발생기 튜브의 행열 변화에 따른 유체유발진동 특성

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Characteristics of Flow-induced Vibration for CE Type Steam Generator Tube with Various Column and Row Number

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Key Words : Steam Generator(증기발생기), Fluid-elastic Instability(유체탄성불안정성), Stability Ratio(안정비), Turbulent Excitation(난류여기), Gap Velocity(틈새속도)

Abstract : The stability ratio and vibrational amplitude of each tube inside a steam generator have different values. We estimate the characteristics of flow-induced vibration for CE type steam generator with various column and row number of the tube. To obtain the thermal-hydraulic data and stability ratio we use the ATHOS3 and PIAT-FEI/TE code respectively. It turns out that the steam generator has a bounded central zone which the distributed values of the stability ratio and the vibrational amplitude, and those values across the zone boundary become decreased.