

정수장용 교반기 시설의 과진동 원인 분석

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Investigation on the Excessive Vibration of A Mixer Facility in A Water Purification Plant

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Key Words : water purification plant, mixer, vibration characteristics, power spectrum, coherence

Abstract : Recently, mixers are being widely used in the water purification plant in order to increase the filtration efficiency. The cause of an excessive vibration of a base structure to which the mixers are supported, has been evaluated through modal analysis on the mixer shaft and vibration measurements during operation. The fundamental natural frequency of the mixer shaft is found to be around 1.8 Hz and the main vibratory frequency around 30 Hz. It has been turned out that the main vibratory frequency, 30 Hz is coincident with the fundamental natural frequency of the base structure and highly coherent to each other. Accordingly, it reveals that the main cause of the excessive vibration is due not to the mixer's vibration but to the natural frequency of the base structure excited by flow turbulence.

탄성지지된 구조물의 충격 햄머 실험에서 질량선의 개선을 통한 향상된 강체 특성 규명법

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The Identification of Rigid Body Properties with Improved Mass-Lines from Impact Hammer Tests of The Mounted Structure

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Key Words : Rigid Body Properties(강체특성), Mass-Line(질량선), Frequency Response Function(주파수응답함수), Rigid Body Modes(강체모드)

Abstract : There are many researches to identify the rigid body properties from the mass-line obtained by impact hammer testing. The correct rigid body properties of the structure may be estimated if the mass-line of the structure could be obtained exactly. When the structure is mounted by elastic materials, the mass-line cannot be read correctly from the impulse response spectrum. The reason is due to the effects of rigid body modes of mounted structure. In this paper, the effects of rigid body modes of mounted structure to the mass-line are discussed and the method to remove these effects is also presented.