

عنوان مقاله:

APPLICATION OF SECOND-ORDER WAVE THEORY IN RELIABILITY ANALYSIS OF OFFSHORE STRUCTURES

محل انتشار:

ششمین همایش بین المللی سواحل، بنادر و سازه های دریایی (سال: 1383)

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خلاصه مقاله:

The structural reliability analysis of offshore structures under wave actions is considered using second order random wave theory. The "Hermite Moment Series" is used to represent the non-Gaussian properties of the resulting wave kinematics. This series relates the space of non-Gaussian wave kinematics to some (standard) Gaussian spaces. This series in conjunction with the Morison's equation make it possible to transform the relevant limit state function into a new Gaussian space. This transformation allows well-known structural reliability formulations to estimate the upcrossing rate and the structural probability of failure. In this paper, some examples are analyzed. The results for the probability of failure are compared with those obtained using simple linear wave theory. The results indicate that nonlinear wave effects may be considerable in some circumstances. These include (i) the situation when the structural points near to the water surface are considered, (ii) cases in which the wave spectral density function being used is broad banded and possesses a relatively small peak spectral frequency.

کلمات کلیدی:

Offshore Structure, upcrossing, probability of failure, second order, Nonlinear wave theory, Hermite moment

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