

عنوان مقاله:

SEISMIC RESPONSE ASSESSMENT OF OFFSHORE WIND TURBINES USING ENDURANCE TIME METHOD

محل انتشار:

هشتمین کنفرانس بین المللی زلزله شناسی و مهندسی زلزله (سال: 1398)

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خلاصه مقاله:

This study examines the applicability of Endurance Time (ET) method in the seismic response assessment of offshore wind turbines. The ET method is a time history dynamic analysis in which structures are subjected to predesigned intensifying acceleration time histories. The ET method produces incremental dynamic analysis curves by a single time history analysis, and hence considerably reduces the required computational time. Although many research performed to assess offshore wind turbines structures under wind and wave loads, few attentions devoted to their performance under seismic actions. The performance of an offshore wind turbine designed by existing codes is evaluated by the ET method. Results will be presented at different hazard levels. The transformation of ET curves by these endurance time excitations to incremental dynamic analysis curves is briefly explained. The concept of endurance time method could be explained by a hypothetical test. In this example, the objective is to determine the performance of three structures in an earthquake. These structures are located in a shaking table as shown in Figure 1. These structures are subjected to random excitation, the amplitude of which increases with time. With the intensification of the amplitude of excitation, the vibration amplitude of the structures increases as well as the structures demand. As time passes in this test, structures gradually move from elastic region to nonlinear and they finally collapse. Damage indicators of these structures are monitored during the test. For example, maximum inter-story drift ratio is plotted against time.

کلمات کلیدی:

Offshore wind turbine, Seismic performance, Endurance time method, Dynamic time history analysis, Incremental dynamic analysis

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