

# Earthquake Geotechnics in Offshore Engineering

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**Abstract** This paper presents a number of geotechnical issues encountered in earthquake design of offshore structures and subsea facilities. Parallel with construction of traditional structures such as jackets and gravity-based structures, a considerable effort has recently been put to field developments in deep water. This has brought about other challenges that are largely dependent on geotechnical knowledge. This paper addresses some of the more recent approaches and solutions in geotechnical earthquake design of both shallow water and deep-water structures and facilities such as platforms with large bases, pipelines traversing slopes and seabed installations. It is demonstrated how incorporation of radiation damping and nonlinear soil-structure interaction in offshore installations could optimize the design. Considering the importance of earthquake stability of slopes in deep water development, special attention is given to highlighting several key issues in the earthquake response of submarine slopes including strain softening and three-dimensional shaking.