Abstract

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A Finite Element Model for Subsea Pipeline Stability and Free Span Screening

An approach for the screening of subsea pipelines against on bottom lateral instability and free spanning is presented in this paper. The approach is based on the use of a nonlinear finite element model. Combined stresses/lateral displacement acting on offshore pipelines due to combined hydrodynamic loads including wave/current effects are computed using the finite element model for both on bottom stability and free spans. Results are compared with those obtained from pipeline design codes. A case study is presented for an actual pipeline off the shore of Saudi Arabia. Results show that computed stresses/lateral displacements are within the specified code values. The proposed approach can be a valuable tool for the pipeline designer/operator for assessment of pipeline stability and free spans.