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FINITE ELEMENT STRESS ANALYSIS OF THE MARINE PIPELINE DURING LAYING OPERRATIONS

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ABSTRACT

Pipeline response due to waves and imposed motions of the lay-barge will be considered in this paper. The theoretical analysis of pipe vibrations and stresses induced by laying vessel motions and sea waves is based on a theoretical investigation of oscillations of slender beams in a fluid excited by arbitrary line forces or motions at the beam's end. The hydrodynamic load components in the unsupported span are deduced from the linear wave theory and generalized Morison equation. The Newmark-β method is used for the solution of nonlinear equations. A time domain solution for the bi-dimensional dynamic structural response is obtained with the help of a computer programs.

Keywords*: circular pipes, stress analysis, finite elements, wave dynamics*

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