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Risk and Reliability Analysis of Deepwater Reel-Lay Installation: A Scenario Study of Pipeline during the Process of Tensioning

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ABSTRACT

In terms of reel-lay installation in deep water, studies on the pipeline during the process of tensioning have been completed based on theories of risk and reliability analysis and Ergonomics. Qualitative risk results, including minimum cut sets, structural importance and probability expression of system failure, are obtained from fault tree analysis. Also, quantitative risk results, mainly consisting of failure probability and reliability index of pipeline plastic deformation, are worked out through Monte Carlo simulation. Simultaneously, scientific suggestions based on Ergonomics are provided. Conclusions drawn from this paper can, to some extent, provide certain references for reel-lay installation in deep water.

KEYWORDS

Reel-Lay Installation; Risk Analysis; Reliability Analysis; Monte Carlo Simulation; Ergonomics

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