

The effect of functional loads on free spanning pipeline's VIV response(PDF)

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Title: The effect of functional loads on free spanning pipeline's VIV response

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摘要: During the operation and installation of offshore pipelines, high axial forces and pressures are experienced, and their effects cannot be neglected. In this article, the effect of internal flow velocity and functional loads on vortex-induced vibration (VIV) response is investigated. On the basis of the Hamilton principle, a differential equation was derived to describe the motion of a pinned-pinned tensioned spanning pipeline conveying fluid. The VIV response was calculated according to DNV-RP-F105 under different functional loads. The results showed that functional loads influence free spanning pipeline VIV response by changing the natural frequency. Internal flow velocity was found less important for VIV response than other functional load factors, such as effective axial force, because the speed in reality is not high enough to be significant. The research may provide a reference for sensitivity studies of the effect of functional loads on allowable free span lengths.

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