

Florence, Italy
30th September – 2nd October 2019

Paper Ref #
(the paper ref# will be supplied to authors)

Experimental Study on Pullback Loads for Steel Pipelines Installed by Horizontal Directional Drilling

Abstract:

Pull force estimation during Horizontal Directional Drilling (HDD) is one of the essential steps during the planning and design phases of these projects.

Although numerous studies have been completed in an effort to increase the accuracy of the theoretical calculations, the importance of site-specific factors are often neglected which has sometimes led to significant discrepancies between expected forces and observed values during construction. Among many factors affecting pullback force, engineering assumptions are often the same regardless of the project-specific considerations and the scope of the crossing.

This paper reviews the design parameters affecting the pull force calculation and compares measured pullback forces and theoretically calculated values for over a hundred completed HDD projects. Also, the paper discusses a strain monitoring program which was utilized in several case studies to capture the magnitude of the forces applied to the product pipe. The mechanical stresses calculated from the strain gauges will be used as a basis to determine the portion of the rig pull load transferred to the product pipe and the force required to move the bottom hole assembly and the drill pipes inside the hole.

This study will provide an evaluation of the applied tension on the product pipe and suggest modified design parameters for improving the accuracy of the pull force estimations.