Experimental and Finite Element Analysis of Reinforced Goalpost Pipeline Support Using Stiffener Under Vertical Load

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Abstract:

Pipe rack or pipe supports are widely applicated, especially in the oil and gas industry. Pipe support structures should be withstanding various load from the piping system. However, the structure of the pipe support is designed to withstand foreseeable loads. Unanticipated loads or conditions that occur on the pipe support will cause the structure to overstress and fail. Some researches using finite element analysis (FEA) to evaluate the behaviour of pipe support and optimized pipe support to achieve compatible structural design. On the other hand, FEA should be validated to ensure accurate results compared to the real application. This research performs experimental analysis to obtain the accuracy of FEA. The specimen will be loaded until fail, also load and strain measurement will be recorded every 1000N increment. Next, experiment result and FEA result are compared to obtain the accuracy of FEA. The comparison between experimental results and FEA results shows a good agreement. However, several section indicates lack of accuracy around 50%. Thus, further investigation is recommended to obtain a higher accuracy of FEA.

Keywords:

Experimental analysis, Finite element analysis, Pipe Support, Quasi-static load.