Stress Comparison of Pipe Saddle Support Between Experiment and FEA under Vertical Load

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Abstract:

In the oil and gas industries, piping system is necessary and required for transferring fluid from one location to another. Piping commonly supported by pipe fittings and other structure. One of the fittings that is used is pipe saddle support. It is used to support horizontal steel pipes from underneath. Many cases regarding pipe saddle support are reported, such as displacement and overloading. These cases caused a failure in the pipe saddle supports or even worse in the pipe structure. The lack of accuracy from stress analysis become one of the main problems that caused these cases. Finite element analysis (FEA) is one of the methods that used to perform stress analysis for pipe saddle support. The objective of this study is to compare the result between experiment and FEA of pipe saddle support under vertical downward load. This comparison would provide initial step for performing validation of the FEA. The comparison shows that FEA results deliver the same trend as experiment results. Meanwhile, error of the FEA results remains significantly large with the highest error 84%. Due to that, it is required to refine the FEA model to improve the accuracy of the result.

Keywords:

Finite element analysis, Pipe saddle support, Stress analysis, Structural test.