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A CFD Analysis of Flow through a High-Pressure Natural Gas Pipeline with an Undeformed and Deformed Orifice Plate

Authors : R. Kiš, M. Malcho, M. Janovcová

Abstract : This work aims to present a numerical analysis of the natural gas which flows through a high-pressure pipeline and an orifice plate, through the use of CFD methods. The paper contains CFD calculations for the flow of natural gas in a pipe with different geometry used for the orifice plates. One of them has a standard geometry and a shape without any deformation and the other is deformed by the action of the pressure differential. It shows the behaviour of natural gas in a pipeline using the velocity profiles and pressure fields of the gas in both models with their differences. The entire research is based on the elimination of any inaccuracy which should appear in the flow of the natural gas measured in the high-pressure pipelines of the gas industry and which is currently not given in the relevant standard.

Keywords : orifice plate, high-pressure pipeline, natural gas, CFD analysis
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