Modelling the Effect of Incompressible Leakage Patterns on Rupture Area in Pipeline

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Abstract

This paper presents a three-dimensional numerical analysis for rupture area in steel pipeline using a general-purpose CFD solver. A computational model is developed for studying leakage in steel pipes with different rupture diameters and different fluid flow properties such as pressures and velocity. The simulation results showed a good agreement with experimental measurements. Numerical solutions for the distributions of water flow velocity, pressure and turbulence are presented and discussed. The results show that there is a direct relation between the maximum velocity, total pressure, turbulence intensity and leakage mass flow rate with rupture area in pipelines.

Keywords: Pipeline; Leakage Water; Modelling; CFD; Rupture Area.