Prediction of sand kinematic pressure and fluid-particle interaction coefficient as means of preventing sand-induced corrosion in crude oil pipelines

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Abstract:
Sand induced corrosion and scaling of petroleum pipes is a serious situation that barely lowers any solutions by conventional or new methods of corrosion control. This is because, the mechanisms behind sand corrosion and scaling of petroleum pipes is yet to be accounted. Rather than as in the situation, the integration of sand filters installation from also contribute to the problem. In this work, a three phase model was used to simulate water flow and sand particles to assess the performance of the model. The effect of fluid-particle interaction coefficient between sand and water is conserved in the model to consider the corrosion, deposition, and scaling of petroleum pipes, thereby increasing the life of the pipe. The model was validated with the experimental data.