عنوان مقاله:

Numerical Investigation of the Influence of Sand Particle Concentration on Long Radius Elbow Erosion for Liquid-Solid Flow

محل انتشار:

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خلاصه مقاله:

Erosion caused by sand transportation in flow changing devices is a serious concern in the hydrocarbon and mineral processing industry, which entail to failure and malfunction of flow devices. In this study, computational fluid dynamics (CFD) with discrete phase models (DPM) were employed for analysis of carbon steel long radius 90-Degree elbow erosion due to the sand concentration of 2, 5 and 10% transported in the liquid phase. The simulation is completed with the Reynolds Stress Model (RSM) and Oka erosion model. The simulation result from the RSM model was validated by comparison with the erosion distribution results in the literature. The largest erosion zones have been identified at or near the outlet of the 90-Degree elbows outer wall surface with a maximum erosion rate appeared for 10% sand concentration. Furthermore, the relationships of turbulence intensity on erosion, particle trajectory, and particle mass concentration in the elbow pipe were discussed.

کلمات کلیدی:

Erosion, Long radius elbow, discrete phase model, Computational Fluid Dynamics, Sand Concentration