

Predicting the Iron Losses from Steel pipes Due to Erosive Environment Using New Algorithm

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Abstract

Seawater is an erosive environment and widely used in many fields such as desalination systems. This paper uses a developed algorithm for estimating and predicting the iron losses due to seawater flow in a steel pipes. The seawater in pipelines flow either plain or sand contaminating. The developed algorithm depends on the Neural Network of feed-forward. The networks are trained with two series of laboratory experiments which were applied on steel pipes. Four velocities (Reynolds numbers) are used for laminar and four for turbulent regimes. For each experiment the iron losses were measured six times in three hours' time interval. The proposed predicting system managed to predict the behavior of the erosion corrosion rate for extra three hours. The results have shown that there are differences between the trends and behavior of plain-corrosion and the erosion-corrosion at different flow regimes in such system.

Keywords: Erosion-corrosion, Neural Network, sand-seawater