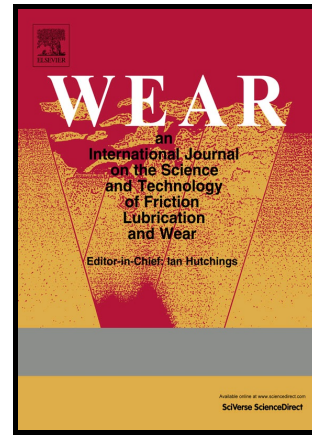


Author's Accepted Manuscript

Erosion Prediction for Slurry Flow in Choke Geometry

Farzin Darihaki, Ebrahim Hajidavalloo, Amir Ghasemzadeh, Gholam Abbas Safian



PII: S0043-1648(16)30747-5
DOI: <http://dx.doi.org/10.1016/j.wear.2016.12.008>
Reference: WEA101849

To appear in: *Wear*

Received date: 21 June 2016
Revised date: 27 November 2016
Accepted date: 5 December 2016

Cite this article as: Farzin Darihaki, Ebrahim Hajidavalloo, Amir Ghasemzadel and Gholam Abbas Safian, Erosion Prediction for Slurry Flow in Choke Geometry, *Wear*, <http://dx.doi.org/10.1016/j.wear.2016.12.008>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain

Farzin Darihaki^a, Ebrahim Hajidavalloo^{a*}, Amir Ghasemzadeh^b, Gholam Abbas Safian^b

^a**Mechanical Engineering Department, Shahid Chamran University of Ahvaz, Ahvaz, Iran**

^b**NISOC , Ahvaz, Iran**

* Corresponding author: hajidae@scu.ac.ir

Abstract

Erosion damage is common in many industries and one of the flow components which may experience severe erosion rates is choke geometry. Choke valves in wellhead or well completion may experience such conditions. In the present study, Computational Fluid Dynamic (CFD) was employed to calculate erosion for a choke geometry constructed of aluminum. The Eulerian-Lagrangian approach was utilized for continuous and discrete phase calculations in which different turbulence models were implemented to investigate the importance of erosion mechanisms in the choke geometry. Meanwhile, various erosion models were examined to achieve accurate erosion prediction. Afterward, two modifications in the geometry were made to see how erosion will be changed in different sections. It was revealed that the modifications can affect the dominating erosion mechanisms and newly designed profiles can reduce the erosion rate in different parts of the geometry significantly. Finally, erosion rate for carbon steel material which might be found in the oil and gas production systems was compared with the one of original aluminum case and it was found that thickness loss rate for the carbon steel case is one-third of the aluminum one in the most parts of the choke and much smaller on contraction plane.

Keywords: Multiphase Flow, Liquid-Solid, Particle Erosion, Choke, CFD

1. Introduction:

Erosion caused by solid particles carried with the fluid is common in many industries. In some cases such as oil and gas production, it is not possible to eliminate the solid phase. The extent of erosion damage depends on the flow conditions and the equipment geometry. Regarding the geometry, cases like elbow and choke in which the direction of flow-streamlines is changed considerably, there is the risk of high erosional damage. As a part of the production system, chokes which might be found in wellhead downstream or well completion are considered as equipment with high erosion rates.

Download English Version:

<https://daneshyari.com/en/article/4986766>

Download Persian Version:

<https://daneshyari.com/article/4986766>

[Daneshyari.com](https://daneshyari.com)