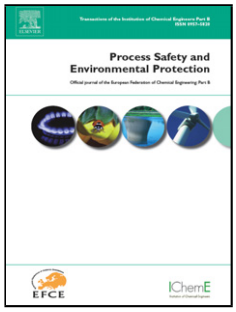

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PII: S0957-5820(17)30248-3
DOI: http://dx.doi.org/10.1016/j.psep.2017.08.005
Reference: PSEP 1136

To appear in: *Process Safety and Environment Protection*

Received date: 26-6-2017
Revised date: 2-8-2017
Accepted date: 4-8-2017

Please cite this article as: Adedigba, Sunday A., Khan, Faisal, Yang, Ming, Dynamic Failure Analysis of Process Systems using Neural Networks.Process Safety and Environment Protection http://dx.doi.org/10.1016/j.psep.2017.08.005

Dynamic Failure Analysis of Process Systems using Neural Networks

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Highlight

- A novel artificial neural network model for process failure analysis is proposed
- The proposed artificial neural network model is integrated with dynamic failure probability analysis
- The integrated approach and model is tested on the Tennessee process system as a case study

Abstract

Complex and non-linear relationships exist among process variables in a process operation. Owing to these complex and non-linear relationships potential accident modelling using an analytical technique is proving to be not very effective. The artificial neural network (ANN) is a powerful computational tool that assists in modelling complex and nonlinear relationships. This relationship has good potential to be generalized and used for subsequent failure analysis.

This paper integrates ANNs with probabilistic analysis to model a process accident. A Multi-layer perceptron (MLP) is used to define the relationship among process variables. The defined relationship is used to model a process accident considering logical and casual dependence of the