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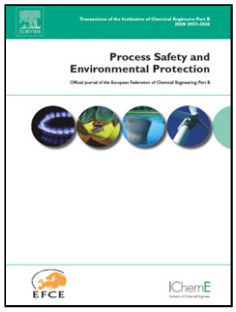

Title: Safety Assessment of Natural Gas Purification Plant

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PII: S0957-5820(17)30397-X
DOI: https://doi.org/10.1016/j.psep.2017.11.012
Reference: PSEP 1232

To appear in: *Process Safety and Environment Protection*

Received date: 20-6-2017
Revised date: 13-11-2017
Accepted date: 20-11-2017

Please cite this article as: Chen, Kun, Khan, Faisal, Jing, Xiaofei, Safety Assessment of Natural Gas Purification Plant.Process Safety and Environment Protection https://doi.org/10.1016/j.psep.2017.11.012

Safety Assessment of Natural Gas Purification Plant

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Highlights

- A novel framework of safety evaluation of natural gas purification plant is proposed
- Improved AHP is applied to calculate weights based on expert opinion.
- Application of the tool in natural gas purification plant is illustrated

Abstract: With risks becoming more complex and diverse in natural gas purification plant (NGPP), safety evaluation approaches are required to quickly identify hazards, and effectively assess safety levels. NGPP-safety evaluation represents an essential analytic step in preventing catastrophic accidents and reducing losses. This paper presents a safety evaluation model for NGPP based on fuzzy comprehensive evaluation and improved analytic hierarchy process (F-IAHP). The assessment model is established based on the authors' years of work experience in this field. To correct the subjectivity of the traditional weighting method, a new method used to determine the relative weight is adopted, and an evaluating index system was established for NGPP. Then the F-IAHP methods were combined to validate the safety levels of 3 representative enterprises. The results show that three NGPP plants at Moxi, Wanzhou and Zhongxian have very low risk, low risk and medium risk, respectively. These results reflect the actual safety situation of the facility. The application of this work can make the evaluation easy, effective and reliable. It is expected that this work may serve as an assistance tool for managers of enterprise in improving NGPP-safety level.

Keywords: Natural gas production plant; Fuzzy comprehensive evaluation; Safety assessment; Improved analysis hierarchy process