

# Accepted Manuscript

Study of dynamic risk management system for flammable and explosive dangerous chemicals storage area

Liu Xuanya, Li Jingjing, Li Xinwei

PII: S0950-4230(17)30126-2

DOI: [10.1016/j.jlp.2017.02.004](https://doi.org/10.1016/j.jlp.2017.02.004)

Reference: JLPP 3413

To appear in: *Journal of Loss Prevention in the Process Industries*

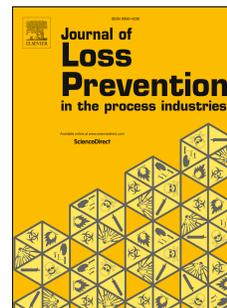
Received Date: 3 November 2016

Revised Date: 24 January 2017

Accepted Date: 6 February 2017

Please cite this article as: Xuanya, L., Jingjing, L., Xinwei, L., Study of dynamic risk management system for flammable and explosive dangerous chemicals storage area, *Journal of Loss Prevention in the Process Industries* (2017), doi: 10.1016/j.jlp.2017.02.004.

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 proof before it is published in its final 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.



# Study of dynamic risk management system for flammable and explosive dangerous chemicals storage area

Liu Xuanya<sup>a,b\*</sup> Li Jingjing<sup>a,b</sup> Li Xinwei<sup>a,b</sup>

<sup>a</sup> Tianjin Fire Research Institute of MPS, Tianjin 300381, China

<sup>b</sup> Key Laboratory of Building Fire protection Engineering and Technology, Tianjin 300381, China

## Abstract

In order to improve the ability of emergency management for storage area of dangerous chemicals, a framework of risk management technical system about the flammable and explosive dangerous chemicals was proposed. Combined with the dynamic changes of dangerous sources, risk analysis for storage area of dangerous chemicals was conducted based on the Bow-Tie model. Dynamic hazards analysis method and classification system were established based on Set Pair Analysis, updating results in real time with the storage capacity and accident characteristics. Integrating with the GIS, Internet of Things, detection and sensing information technology, a dynamic security monitoring system was proposed. Based on the database technology, the emergency decision support system of dangerous chemicals was made, including storage date, emergency resource, emergency plans, information of risk, etc. Using the dynamic risk management system, it can effectively achieve the goal of dynamic supervision, risk identification, real-time monitoring as well as assisting the emergency decision making of dangerous chemicals in the whole life cycle. All models are comprehensively composed of the framework of dynamic risk management system, including identification, classification, assessment, supervision and emergency management.

Keywords: *dynamic risk; dangerous chemicals; storage area; emergency management*

## 1. Introduction

In recent years, with the rapid development of chemical industry, chemical production and varieties increased at an alarming rate, including the intermediate chemical production of raw materials and the types of chemical products. The dangerous chemicals are always flammable, explosive, poisonous and corrosive. During the whole life cycle of packaging, transportation, storage, use and destruction, the risk of accidents varies with the amount and environment of storage, so it will be probably greater challenge to the safety management and accident prevention. At present, the production, storage and transportation of dangerous chemicals are required to enter the professional chemical industry park, which makes the installations of dangerous chemicals concentrated and easily forms a major concentration region of hazard installations. Once the leakage occurred, process is out of control, storage of flammable and

---

\* Corresponding author. Tianjin Fire Research Institute of MPS, Tianjin 300381, China  
E-mail address: [liuxuanya@tfri.com.cn](mailto:liuxuanya@tfri.com.cn)

Download English Version:

<https://daneshyari.com/en/article/4980302>

Download Persian Version:

<https://daneshyari.com/article/4980302>

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