

# Proposal for Transitioning from Static to Dynamic Risk Management

**Ming Yang, Rioshar Yarveisy, Muhammad Bin Ab Rahim**

**Department of Value, Technology, and Innovation**

**Faculty of Technology, Policy, and Management**


**TU Delft**

## **Correspondence:**

Dr. Ming Yang

Faculty of Technology, Policy, and Management, TU Delft.

 Jaffallaan 5, 2628 BX, Delft, The Netherlands

 [m.yang-1@tudelft.nl](mailto:m.yang-1@tudelft.nl)

## **Acknowledgment:**

The preparation of the research project proposal presented here is funded by Safety Delta Netherlands (SDN). Safety Delta Netherlands is a partnership between the Dutch petro(chemical) industry, its partners, knowledge institutions, and government agencies. This organization strives to improve the sector's state of safety by supporting the development and implementation of safety concepts revolving around handling hazardous materials. The authors would like to thank SDN and the representatives of interested industrial partakers from Brightsite, Chemelot, SABIC, SHELL, and University of Maastricht for sharing their invaluable insights into the matter.

## Contents

Executive Summary .....	3
Introduction.....	4
Background.....	5
Major losses .....	5
Conventional risk management.....	6
Systemic view of major accidents.....	7
Dynamic risk management .....	10
What is DRM? .....	11
DRM in the chemical process industries .....	15
Establishing the context .....	16
Dynamic risk assessment .....	17
Implementation strategy.....	22
The proposal and research question .....	26
References.....	28

## **Executive Summary**

The shift from prescriptive to performance-based safety management has led to risk-based decision-making in managing safety in high-consequence industrial activities. This approach has improved safety, productivity, and competitiveness. However, passing years have seen the unchanged occurrence frequency of major accidents in the oil, gas, and (petro)chemical sector, highlighting the insufficiency of current safety management approaches. One proposed solution is Dynamic Risk Management (DRM), which has a higher capacity to address the uncertainties associated with modern socio-technical systems. This proposal relies on a study to determine how to transition to DRM effectively. The Safety & Security Science section of the Delft University of Technology (TU Delft) has conducted the study on behalf of Safety Delta Netherlands. This proposal puts forward a road map based on available methodologies, cloud-based technologies, and industrial requirements.