

**CITY UNIVERSITY OF HONG KONG**

香港城市大學

**The Application of SURE Model in  
Operational Risk Management  
of Container Terminals**

SURE模型在集裝箱碼頭的操作風險管理應用

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## **Abstract**

In the last two decades, development of the container port industry in China and in Hong Kong has been remarkable. Hong Kong has ranked among the top three in terms of throughput in the past eleven years until 2012, while there are five to six ports in China listed among the Top-10 container ports in the world in the last couple of years. However, there is a gap between risk management capabilities and their leading role. Accidents in container terminals not only cause disruption in operations which affects the revenue, but also increase the insurance premium, besides lowering the company's reputation and value. Even with such huge impacts and inefficiencies in relation to the risk management, there has been little research focusing on this issue and there is hardly any research that solely investigates the operational risk in container terminals.

To bridge this gap, the current research begins with developing a new model named Stakeholder Uniplanar Risk Evaluation (SURE) for container terminal operational risk management. SURE model is an extension of two well-known ideas - Theory of Planned Behaviour and Protection Action Decision Model, and it is used as the tool for risk assessment in the risk evaluation process.

The SURE model includes the necessary risk attributes in terminal operations (1. Probability, 2: Severity, 3: Perceived Cost, 4: Perceived Efficacy, 5: Goal & Objectives, 6: Resource & Ability, 7: Perceived Image, and 8: Subjective Norm). The six risk categories are adequate and comprehensive enough for classification of risk events frequently encountered by container terminals (1: Natural Disaster, 2: Accident caused by External Event, 3: Accident caused by Staff, 4: Breakdown/failure of Equipment, 5: Breakdown/failure of IT System and 6: Social and Human Issue). These, together with the choice on risk responses and the demographic variables, can provide a lot of insights for container terminal operational risk administration. It is desired that the decision rationale of risk management actions can be presented in an objective manner. Furthermore, container

terminal companies can make use of the SURE model to reflect upon the efficiency and efficacy of the risk management process.

Through the study, it is found that Subjective Norm plays an important role in the risk handling process, as it is the significant variable in a series of analysis. Furthermore, the study reveals that container terminal companies should pay more attention to their surroundings in determining their risk responses and focus. But still, these companies should take into account their company backgrounds when making risk response decisions as it is found that the risk response effects vary among different types of companies, and thus they should pay greater attention to findings from companies with similar backgrounds as the reference.

Moreover, container terminal companies should think deeply and not solely rely on conventional methodologies and considerations in the risk management process, as it is surprisingly found that companies that focus only on the severity might not be able to significantly reduce the risk severity. Instead, companies which focus on Perceived Efficacy might perform better in reducing the impact of the risk events.

Keyword: Risk responses, Risk attributes, Operational risk, Container terminals, Risk evaluation, Subjective Norm, Perceived Image