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Risk Assessment and Cost-Benefit Analysis of Protection Measures for Bund Fires in Storage Facilities

Abstract

Bund fires in storage facilities are a big concern due to the risk of fire escalation to multiple tanks. Thus, the fire protection measure requirements have become more stringent.

However, the risk has not been properly assessed to establish fire protection requirements. Therefore, some fire protection strategies may not be economically beneficial due to the high implementation cost.

The aim of this work is to perform a quantitative risk assessment for bund fires and thus, a cost-benefit analysis of the bund fire protection measures.

A methodology is developed to determine whether a fire protection measure(s) is economically beneficial or not, according to the risk level. The most common bund fire protection measures are discussed and evaluated. Then, a case study is presented to exemplify the methodology applicability.

The results show that the some common fire protection measures are not economically beneficial for the actual bund fire risk level. Nevertheless, these protection measures might become a feasible option if other risks were considered in the assessment.