

Wannoptida Tiengtrong 2014: Risk Analysis for Loss of Containment of Hydrocarbon Gas at Natural Gas Production Platform by Bow-Tie Analysis. Master of Engineering (Safety Engineering), Major Field: Safety Engineering, Faculty of Engineering. Thesis Advisor: Associate Professor Peerayuth Charnsethikul, Ph.D. 87 pages.

The primary focus of this thesis is to analyze the risk based on safety barrier diagrams, called Bow-Tie methodology. It directly focuses on major accidents and barrier functions. This methodology is used predominantly in many industry sectors to perform an analysis of hazardous events protection and mitigate the consequences to humans, the environment, assets and organization's reputation. This thesis describes the risk factors and consequences of the hydrocarbon release on offshore oil and gas production platforms based on approaches for determination of safety barriers. The safety barrier systems introduced are to prevent hydrocarbon releases and with the failure of such barriers could lead to major accident consequences. Thus, the results are primarily useful for the process industry in their effort to control and reduce the risk of hydrocarbon releases.

This thesis was carried out via a workshop with the safety, maintenance and operation personnel to assess the adequacy of preventive and mitigative barriers of hydrocarbon gas under pressure hazard. The result of barrier analysis shows that existing barriers are not sufficiently effective. The barrier diagram appears to offer additional focus on remedial actions during operations for 2 threats that did not meet the barriers adequacy acceptance criteria. The author's use of the Layer of Protection Analysis (LOPA) for calculating the probability that the unsafe consequence will occur with these 2 threats, the results show its risk level were within the acceptable region. The remedial actions have been raised to Arthit project as a result of this thesis. It is imperative that all items that have been raised in the remedial actions and will be followed up by the assigned parties.

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Thesis Advisor's signature