Challenges in Fire, Dispersion and Explosion Consequence Modeling During Preliminary Design Stage of an Offshore Platform

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Hazards associated with fire, toxic gas and explosion are inherent to all offshore production platform facilities. Management of these hazards, over the life cycle of the facility, is essential to minimize the risk to personnel, asset and operation. The process of risk management should start at the conceptual design phase of the project. It will continue with increasing levels of sophistication right through the various stages of design. Hazard assessment applied during the preliminary design stage can have a significant positive impact to the design of the platform. It is therefore important that such studies are executed with methodologies that are commensurate with the level of information available.

A key element of this risk evaluation is to conduct consequence modeling of prospective fire, gas dispersion and explosion release scenarios. In spite of the availability of a range of software applications for simulation of accident scenarios, there are numerous challenges that a user faces during consequence modeling in the preliminary design stage. These challenges exist for most part due to insufficient process and design information during the preliminary design stage. Also, limitations to accurate consequence modeling are introduced due to inadequate software functionality.

This paper will discuss the key issues relevant to consequence modeling difficulties during the preliminary design stage of an offshore installation. Recommendations to overcome these difficulties by making experience based assumptions are also included in this paper.