UNIVERSITI TEKNOLOGI MARA

INVESTIGATE UNCERTAINTY QUANTIFICATION IN THE HEALTH CONSEQUENCES OF THE BLEVE IN FEYZIN DISASTER

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ABSTRACT

On January 4th 1966, there has a severe blast occurred at the Feyzin refinery in France, killing 18 people, injuring 84, 49 of whom were hospitalized. The accident also resulted extensive damage both inside and outside of the site. This tragedy happened when an operator was draining water from 1200 m pressurized propane sphere lead to LPG spill. The resultant cloud of propane vapour spread 150 m and suddenly it has been ignited by a car at an adjoining road. The storage sphere T61443 had be engulfed in flame due the pool of propane in the bund. The vessel become overheated due to the exposed in fire and fails catastrophically. This result to BLEVE (Boiling Liquid Expanding Vapour Explosion) and lead to the sphere ruptured. The BLEVE producing large fireball which killed and injured fireman and workers. In the era of 60's BLEVE was poorly understood, thus pressurized tanks were not protected against this phenomenon. The objective of this paper is to present a methodology for assessing the uncertainties quantification in the health consequence of the BLEVE in the Feyzin disaster. The consequences are considered conditional on the BLEVE when occurring. There has two consequence that considered, first is thermal radiation towards structure and human. Second is blast wave effect towards structure and human. In this research we will see all those uncertainty will effect in the health consequence of the BLEVE in Feyzin disaster.

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CHAPTER ONE
INTRODUCTION

1.1 Overview

In the era of 21st century, economic was rose from year to year especially from petrochemical fields. This rising build a lot of demand from the petrochemical field and led to building many plants and refineries all over the world especially in Asia. Based on the Asia-Pacific Economic Cooperation (APEC) statistic, there are 264 petrochemical plants and refineries build all over the Asia.

Since the year 1760s of Industrial Revolutions, many major accidents were reported involving these industries. The consequences of these major accidents also giving a huge impact to the economy, society and country. Furthermore, the effect is not only damage with billions of loss but also life of the people and the environment. However, the use of large amounts of dangerous chemicals in the Petrochemical industry is unavoidable which are important for a modern industrialized society.

In other hand, working in a chemical plant was a high risk job because we are talking about highly hazardous flammable chemicals. Once lack it will triggered a major hazard that will causes accident in the plant and sometimes the worst case can lead to fatality. Major Accident Hazard (MAH) is defined as hazard that potential to cause a major accident [12]. Furthermore, managing a Major Accident Hazard in the chemical plant building is a fundamental towards the safe operation.

1.2 Directive to control Major Accident Hazard

During the last decade, directive to control MAH is by Seveso Directive. They called as Seveso Directive, after almost 3 years of negotiations in the Council and the European Parliament, Council Directive 82/501/EEC adopted in 1982 [1]**.** The Seveso Directive was created after the catastrophic tragedy of Seveso Disaster occurred in Italy at 1976 involving a chemical plant of manufacturing pesticides and herbicides. A dense vapor cloud containing dioxins was released from a reactor. Almost 2000 people were treated for Dioxin poisoning and more than 600 people had to be evacuated from their homes. [1]