

UNIVERSITI TEKNOLOGI MARA

**ANALYZING BLAST FRAGMENT PROJECTION
EFFECT OF FEYZIN DOMINO ACCIDENT**

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ABSTRACT

This research is conducted in order to study the blast fragment projection effect of Feyzin domino accident and also to study the relationship between the probability for the domino accident to occur against the blast fragment projection distances. The method that is used for this research in order to achieved the objectives is the monte carlo simulation method. The result of the relationship between the probability for the domino accident to occur against the blast fragment projection is then tabulated into the graphically data. For the probabilistic analysis, both of the graph that has been made shown that the relationship between the probability of the domino accident to occur against the blast fragment projections distances were decrease monotonically. It can be justify that the longer the distances for the blast fragment projection effect to get the impact, the lower the probability for the domino accident to happened.

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CHAPTER ONE

INTRODUCTION

1.1 RESEARCH BACKGROUND

The Feyzin refinery which was run by Elf and now acquired by Total located at the town of Feyzin, 6th miles away from the south of Lyon, France was commissioned in July 1964. The refinery was designed to manufactured 1.7 million tons of petroleum per year. According to ARIA report by French Ministry of Environment (2008), the site received an authorization by prefectoral order dated on 20th April 1962 modified by orders of 4th May 1962, 4th August 1964 and 30th July 1965. This refinery employed around 250 personnel or workers during that time. The refinery was fitted with a pressurized liquid petroleum gas (LPG) storage facility that having a capacity amount of 13 100 m³ which located at the refinery zone B, south of the production unit. In addition, the LPG storage facility includes 10 tanks (8 spheres and 2 cylinders), storage container for furnace fuel oil, gasoline and premium.

On the 4th of January 1966, according to the ARIA report by the France Ministry of Environment (2008), a sphere tank T 6-1443 or commonly known as sphere number 443 contained a redundant ethane content (12%) and also high purity of propane was added. A series of explosions and fires occurred at the refinery's LPG storage zone. Before the explosions happened, around 6.00 a.m, it was still dark and not adequate of the ambient lighting, the laboratory technician required to take the sample of the gas from the sphere tank. In order to take the sample and perform the initial removal operation, he then asked some helped from a security worker and a helper to perform the operations. As usual, the lower sampling valve was used for the sampling as the other three side of sampling taps were always frozen and difficult to be reached or operated. At 6.40 a.m, the helper opened the lower valve half way and then he opened the upper valve even further. The water containing sodium were poured out and small amount of gas were then released. Therefore, he closed the upper valve back. Before finishing the purge, he then opened the valve back, a bit of liquid flowed out, and then stopped. So he decided to open the upper valve wide open.

Just in a few seconds, an explosion sound was heard and the propane suddenly