

UNIVERSITI TEKNOLOGI MARA

**PREVENT MAJOR INCIDENT
INSTALLATION USING
CONSEQUENCES BASED METHOD**

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ABSTRACT

Based on previous chemical industry accident, such as Bhopal accident (2nd December 1984) and Mexico City accident (19th November 1984), it portraits the severity of the after effect of a chemical accident which affect an area with high population density. Through this event, some of the European countries start showing their concern and awareness by taking into consideration the importance of Land-Use Planning (LUP) in their legislatures. However the concern arises with major accident installation is the major accident hazard facilities were built in the area of high population density also the method used to address the risk varies among countries due to different cultural, historical background and administrative framework. Thus, the aim of this paper is to identify the consequences of LPG explosion towards the surroundings area and to compare the land-use restriction imposed by different countries with the result obtained. The consequences was calculated by using the static model of BLEVE and the overpressure. Askolani LPG storage facilities has been selected to perform a case study. The result obtained from the thermal radiation and overpressure calculation have allowed a comparison of different LUP criteria. The French, Italian and UK LUP criteria have been used to evaluate the consequence of the explosion. The result obtained from the thermal radiation and overpressure calculation have allowed a comparison of different LUP criteria.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

As the day past by the needs for energy usage kept increasing. However, the supply of the energy itself unable to fulfil the demand. Thus, due to this the usage of Liquefied Petroleum Gas (LPG) catch attention as it is a chemicals and fuel that rich with resources, less pollution and cheap. Moreover, LPG usage have been applied widely in the industry and in our daily life. However due to its flammable nature, the storage of LPG became a high-risk procedure. As there would be possibility that the leakage of LPG might happen at the storage area which lead to fire and explosion (Dong, Song, & Hu, 2013).

The matter that need to be investigated was not only the prevention of the explosion but also the domino effect from the explosion. Based on the domino effect theory, it stated that the after effect of the domino event is more disastrous than its initiating event. In this case, from the explosion of LPG storage it can cause a catastrophic disaster as the affected area can be wide and badly damaged. From its potential accident risk, preventive measure need to be taken into account in order to reduce the like-hood of the LPG explosion (Spoelstra, Mahesh, Kooi, & Heezen, 2015). Kumar (2018) stated that from the historical analysis it shows the LPG storage explosion contributes 17% from the total major accident in the chemical industry. Thus it is important for the services provider to apply some safety measure in order to prevent accident from happening (Kumar Malviya & Rushaid, 2018).

Consequences based method can be used in order to determine the risk of Major Accident Hazard (MAH) with respect to Land-Use Planning (LUP) (Cozzani, Bandini, Basta, & Christou, 2006).

Other than potential accident risk and preventive measure, the Land-Use Planning Procedure also need to be considered. As from the previous accident that