

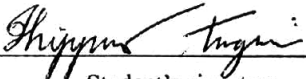

Thippawan Angsiri 2007: Impact Evaluation of LPG Leaks from Tank Farm: Case Study
Horizontal Cylinder Storage Tank. Master of Engineering (Safety Engineering), Major Field:
Safety Engineering, Interdisciplinary Graduate Program. Thesis Advisor: Assistant Professor
Jarun Chutmanop, D.Eng. 139 pages.

This thesis is to study and evaluate the impact of LPG leaks from tank farm of a large scaled industry in Bangkok. The ALOHA program is used for evaluating the characteristic of gas dispersion, while the MARPLOT and Google Earth, as the electronic map, show the dispersion boundary which support the improvement of the emergency plan and identify the safety zone.

This case study is simulated on the LPG leak, stored in the horizontal cylindrical tank with diameter of 3.35 meter and 10.96 meter long at filling condition of 85% of maximum volume. The ratio of propane and butane is 60:40. The location of tank farm is riverside. The environment temperature is at 35.4 degree Celsius. Wind speed is 5 knot, North East direction to the tank. The accident is caused by the joint leak of the 0.5 inch diameter rotogage.

According to the simulation, it shows that the significant impact is fire and explosion. When the leakage occurs, gas disperses within 29 meters far. Therefore, the distance of 29 meters must be enforced to be the zone with no ignition, otherwise there would occur the BLEVE explosion which is seriously harmful by heat radiation and the exploded building construction. It would cause fire ball of 208 meters diameter and heat radiation of 447 meters wide, causing damage to buildings and people's death. With the peripheral area of 630 meters, the radiation would cause people burnt upto the 2nd level.

On this evaluation of the fire and explosion impact, the electronic map programs, MARPLOT and Google Earth, are very helpful to identify the impact area comfortably and rapidly. Moreover, they support the improvement of emergency plan to indicate the ignition-free area at 29 meters and the safety zone from BLEVE at 1.4 kilometers from the tank farm location.

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Student's signature	Thesis Advisor's signature	