

2. What pool fire sizes were modelled?

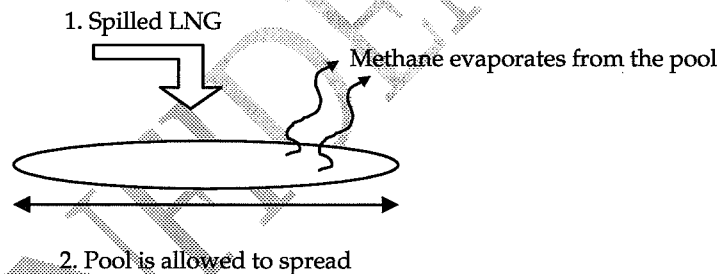
Two types of spills were modelled using Phast; unconfined and confined.

Unconfined spills are modelled for locations across the terminal where no specifically designed spill impoundment is located (e.g. along the jetty).

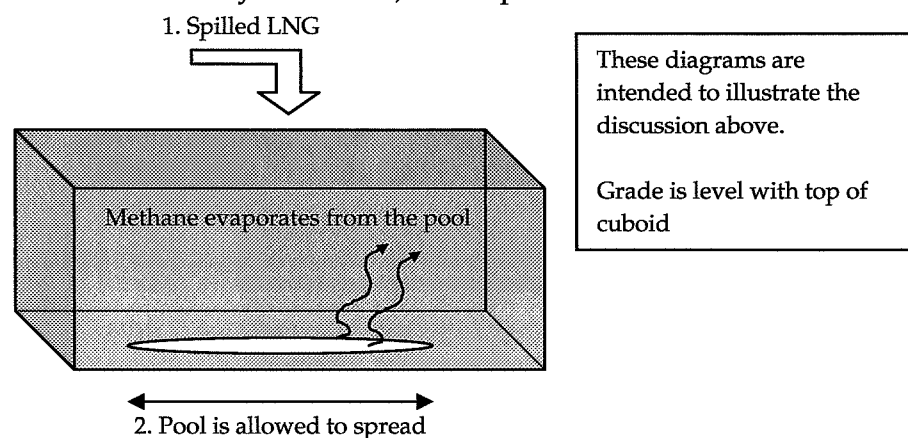
Confined spills are modelled for locations across the terminal where spill impoundment provision is located (e.g. for process area releases).

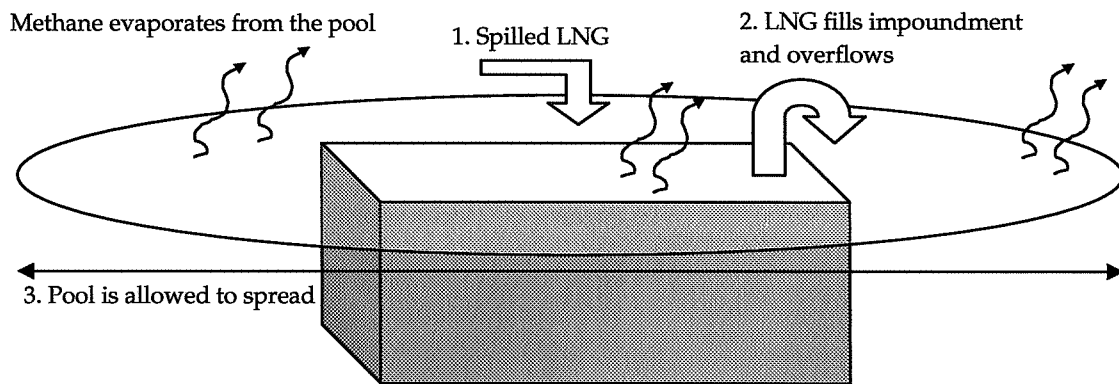
Phast uses the physical properties of the streams to calculate a release rate based on the hole sizes being modelled (as defined in HSE's guidance). This release rate continues for a period until isolation has occurred and the subsequent isolated inventory has been drained from the process equipment.

For unconfined cases the spilled LNG is assumed to spread without any 'man-made' barriers and vaporises on contact with the substrate defined in the model (e.g. water, insulated concrete, standard concrete, etc.). Phast's pool spreading and vaporisation models calculate liquid pool diameters, vaporisation rates with time etc based on the release rate, substrate thermal properties, ambient conditions, etc.



For confined cases, Phast was configured so that the spilled LNG entered a bund of volume approximately 400m³ to represent the spill impoundment provision onsite. Should Phast calculate that the bund volume would be exceeded (based on the release rate, release duration, and the rate of evaporation of spilled LNG), it continues its calculations with overflowing LNG being allowed to spread freely. Phast's pool spreading and vaporisation models calculate liquid pool diameters (which may, or may not be constrained by the 'bund') and vaporisation rates with time.





Phast then considers ignited and unignited spills. Phast's pool fire model calculates distances to thermal flux levels as well as the pool fire diameter (which may not necessarily be equal to the diameter of the spreading unignited pool), whilst its dispersion model calculates the extent of given gas concentrations (in our case LFL).

In conclusion, there is a range of pool fire sizes that takes into account the individual characteristics of each spill scenario.

CONFIDENTIAL