

PHAST code uses the Unified Dispersion Model (UDM) as an integral calculation model to estimate the dispersion following a pressurized release or an unpressurised release. It consists of the following linked modules (as shown in Figure 28):

- Near-field jet dispersion
- Non-equilibrium droplet evaporation and rainout, touchdown
- Pool spread and vaporization
- Heavy gas dispersion
- Far field passive dispersion

The UDM allows for continuous, instantaneous, constant finite-duration and general time-varying releases. The UDM also allows for possible plume lift-off if a grounded plume becomes buoyant. The UDM has been validated extensively with experimental data and is the subject of several peer-reviewed scientific papers.³⁶ The PHAST-UDM has also been approved by PHMSA for analyzing LNG vapor dispersion exclusion zones.³⁷

PHAST model calculations assume that the terrain is completely flat and do not account for any obstructions (either natural or nearby equipment) on the dispersion distance of flammable clouds. In many cases, this assumption produces a conservative overestimate of the distance to hazardous outcomes.

³⁶ Witlox, H.W.M. and Holt, A., 1999, A unified model for jet, heavy and passive dispersion including droplet rainout and re-evaporation, International Conference and Workshop on Modeling the Consequences of Accidental Releases of Hazardous Materials, CCPS, San Francisco, California, September 28-October 1, pages 315–344.

³⁷ PHMSA Docket No. 2011-0075, October 11, 2011.