DNV·GL

SOFTWARE

# PHAST™

## The world's most comprehensive hazard analysis software for all stages of process industry design and operation.

Phast is used to analyse situations that present potential hazards to life, property and the environment and to quantify their severity. Consequences may then be managed or reduced by design of the process or plant, modification to existing operational procedures, or by implementing other mitigation measures.
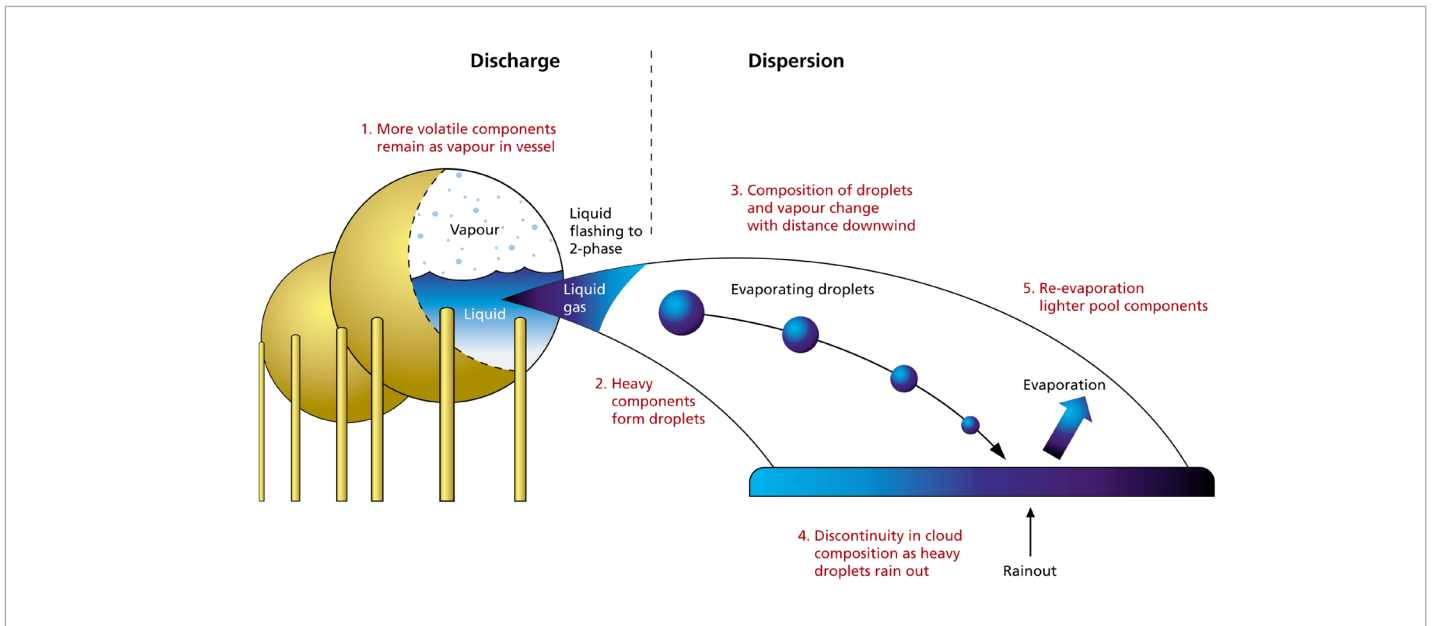
### Industries currently using Phast include:

- Oil and Gas
- Petrochemical
- Chemical
- Governments and Regulatory Authorities
- Consultancy and Design Services
- Insurance
- Academic and technical institutions

### User Friendly:

- Extensive modelling capabilities for hazard analysis
- Compatible with popular office word processing, spreadsheet and database applications
- Consistent Windows™ look-and-feel
- Online electronic help and dedicated helpdesk

### PHAST BENEFITS INCLUDE:

- Provides clear illustration of the outcomes that may result from the hazards on your site
- Assists in compliance with safety regulations
- Enables more effective response to hazardous incidents by understanding their outcomes
- Regular software upgrades incorporate industry experience and expertise, and advances in consequence modelling technology
- Facilitates cost reduction in terms of losses and insurance
- Ensures safe optimization of plant and process design

**Discharge** | **Dispersion**

1. More volatile components remain as vapour in vessel

Vapour

Liquid flashing to 2-phase

Liquid

Liquid gas

3. Composition of droplets and vapour change with distance downwind

5. Re-evaporation lighter pool components

Evaporating droplets

Evaporation

2. Heavy components form droplets

4. Discontinuity in cloud composition as heavy droplets rain out

Rainout

# Offering a complete solution

DNV GL continuously develops the UDM to ensure it is the industry standard by extensive research and development and experimental validation. Recent validation includes modeling of LNG, $CO_2$ and Hydrogen.

### Discharge of mixtures and pure components from:
- Long and short pipelines
- Leaks
- Catastrophic ruptures
- Relief valves and disk ruptures
- Tank roof collapse
- Venting from tank vapor space
- Releases to atmosphere from loss of containment indoors or outdoors

### Dispersion:
Phast includes DNV GL's Unified Dispersion Model (UDM), a world leading dispersion model for:
- Jet, heavy and passive dispersion phases
- Buoyancy
- Interaction with the substrate
- Plume lift-off
- Capping at the mixing/inversion layer
- Droplet formation and rainout

### Phast's extensive modelling capabilities further include:
- Liquid Rainout, resulting from the latest DNV GL led research and development
- Pool spreading and vaporisation

- Indoor and outdoor analysis of downwind toxic effects
- Radiation, fire and explosion:
  - Jet fire, which includes the API and frustum models
  - Pool fire
  - Fireball, includes Roberts (HSE) and TNO (Yellow Book) models
  - Explosion, including TNT, TNO Multi-Energy and Baker Strehlow models.

### Applications of Phast
Phast is the industry standard tool for process hazard analysis. It is used to estimate, understand and visualise the effects from loss of containment scenarios. Applications of Phast include:
- Plant layout
- Inventory planning
- Pollution control
- Providing input to major accident prevention and safety management planning
- Emergency response plan development
- Safety case preparation
- Compliance with regulations
- Non-standard operations analysis