PSE OIL & GAS
PRESSURE RELIEF, FLARE & BLOWDOWN
CENTRE OF EXPERTISE

Optimising flare investment through dynamic analysis

"Dynamic system load modelling allows the user to predict the timing of individual system peak loads to determine the disposal system hydraulic performance."

API 521 6ED

As industry guidelines evolve and technology improves, forward-thinking Oil & Gas companies increasingly place high-fidelity dynamic modelling techniques at the centre of flare system design decisions. This session examines the benefits of determining transient relief and blowdown loads for the flare system through dynamic analysis. This technology accurately quantifies flare capacity to optimise investment decisions and improve project viability for new builds or project revamps.

We consider recent case studies from natural gas plants and refineries (greenfield projects, brownfield projects and asset integrity assessments). In each case, a suitable assumption basis for the dynamic analysis is discussed; as well as the delivered benefits in flare system design capacity and, ultimately, capital expenditure.

From a technical perspective, this session describes how to assess overpressure scenarios that affect the entire facility such as process depressurisation, blocked outlet, total power and cooling water failures. The seminar illustrates the importance of a dynamic assessment of individual loads to determine peak rates durations and whether they occur at the same time as other loads. The flare system pressurisation during these transient events results in reduced flare tip flowrate and hence opportunities to reduce flare stack diameters and capacity.

This seminar is one in a series of process safety seminars hosted by PSE's Centre of Expertise in pressure relief, flare and blowdown. As leaders in high accuracy dynamic analysis, PSE seeks to improve understanding of the importance of accurate assessment in Oil & Gas system design.

See psenterprise.com/oil-and-gas for dates and locations.

WHO SHOULD ATTEND

The seminar will be of use to Oil & Gas engineers, especially those with safety / depressurisation experience or remit, dynamic modelling experts and managers with responsibility for asset and plant integrity.

Sample agenda

Times and content will vary by location. The free seminar includes lunch and refreshments.

08:30 **Registration**

09:00 **Session 1 - Introduction**

- PSE Oil & Gas
- Motivations for dynamic simulation in overpressure protection and blowdown system design
  - Key challenges for upstream and downstream
  - Benefits of dynamics in design phase and operations
- gPROMS and the gFLARE simulation environment

09:30 **Session 2 - Application of dynamics to complex problems**

- Fire relieving load assessment
  - Conventional assessment using latent heat
  - Benefits of the dynamic analysis approach
- Material selection assessment
- Operational validation
- Application of dynamic simulation
  - Historical challenges
  - Workflows in project lifecycles
- Flare cost benefit example

10:15 **Break**

10:30 **Session 3 - Full facility modelling of upstream and downstream processing plants**

- Case study: Flare relief load assessment for distillation columns
  - Crude distillation units
  - Ethylene fractionators
  - Assessing HIPPS
- Case study: Analysis of blocked outlet on a gas processing facility
- Case study: Emergency depressuring of Oil & Gas platform
  - Conventional blowdown
  - Staggered blowdown

12:30 **Lunch**

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