

**Training Title**

**PRESSURE RELIEF BLOWDOWN & FLARE SYSTEMS**

**Training Duration**

5 days

**Training Dates & Venue**

REF PE048	Pressure Relief Blowdown & Flare Systems	5	08-12 March, 2021	\$6,250	Paris, France
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Training will be held at any of the 5 star hotels. The exact venue will be informed once finalized.

**Training Fees**

- 6,250 US\$ per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Buffet Lunch

**Training Certificate**

Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.

**TRAINING OVERVIEW**

**TRAINING DESCRIPTION**

Liquids should not be discharged directly to a vapor disposal system. Flare knockout drums and flares need to be large enough to handle emergency blowdowns. Drums should be provided with relief in the event of over pressure. Pressure relief valves must be provided where the potential exists for overpressure, or accumulated gases. Maintenance is important because valves are required to function properly. The most common operating problems are listed below.

- Failure to open at set pressure, because of plugging of the valve inlet or outlet, or because corrosion prevents proper operation of the disc holder and guides.
- Failure to reseat after popping open due to fouling, corrosion, or deposits on the seat or moving parts.
- Chattering and premature opening, because operating pressure is too close to the set point.

**TRAINING OBJECTIVES**

- Know how the air requirements for combustion are calculated and provided
- Understand the staging arrangements of flare systems and how this staging is achieved

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- Recognize the various types of elevated flare tip and understand how they operate to achieve the necessary performance
- Be aware of the effects of radiation, noise and emissions on personnel and adjacent equipment
- Understand the need for and the methods of achieving adequate liquid knockout in flare systems
- Know how seal pots work and understand the options for seal water systems
- Be aware of the use of compressors in flare gas recovery systems and understand the potential economic savings which such a system can offer
- Understand the maintenance and repair needs of an efficient flare system
- Be aware of the recommendations of standard flare system specifications such as API 520/521.

### WHO SHOULD ATTEND?

Operations engineers, process engineers, operators, facility engineers, plant engineers, and Operations personnel who are involved in the use of the flare and/or who rely upon the flare system to safely dispose of unwanted releases.

Design engineers who are involved in the design, modification or repair of the flare system.

### TRAINING METHODOLOGY

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions, and motivate everybody find the right answers. The delegates will also be encouraged to raise their own questions and to share in the development of the right answers using their own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

### DAILY OUTLINE

Following topics will be covered in 5 days:

- ✓ Function of a Flare System
  - \_ Equipment and vessel relief valves and the need for a disposal system
  - \_ What do we want from our disposal system?
- ✓ Components of a Flare System
  - \_ Collection main, liquid knockout, back pressure control and disposal
  - \_ Group exercise: Develop a performance specification for the total flare system
  - \_ Requirements of each item for satisfactory performance
- ✓ Introduction to Combustion of Gas Mixtures
  - \_ Typical components, heat of combustion, air demand and combustion

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- Products ,Total flare load, total heat and flue gas emission
- ✓ What do we get out of the flare?
  - \_ Possible emissions from the flare system : Radiated heat, smoke, particulates, downwind pollutants, un-burnt hydrocarbons, noise
  - \_ Possible steps to minimize environmental impact
  - \_ Dangers to personnel and limits on emissions
- ✓ Types of Flare
  - \_ Ground and Elevated flares – Construction and Operation
  - \_ Combination to form an integrated disposal system
  - \_ staging to achieve back pressure control
  - \_ Group exercise: Develop a staging policy for an integrated flare system
- ✓ Elevated Flare Types
  - \_ Pipe flares, steam injected and air-blown, sonic flares performance and typical application
  - \_ Radiation, noise, emissions and utility requirements
  - \_ Constraints on flare height and types of tower
  - \_ Group Risk Assessment – Minimum flare height for safe operation
  - \_ Ignition and flame monitoring systems
  - \_ Smoke and emissions monitoring
  - \_ Radiated heat and sterile area requirement
- ✓ Liquid Knockout
  - \_ Knockout pots – types and typical construction
  - \_ Vertical vs. horizontal – advantages and disadvantages
  - \_ Target sizes for maximum droplet size
  - \_ Disposal of Liquids
- ✓ Seal Pot Systems
  - \_ Back Pressure control as a prelude to flare gas recovery
  - \_ Seal Water systems to maintain the seal
  - \_ Minimum purge rates on elevated flare stacks not in use to prevent oxygen ingress
- ✓ Flare System Maintenance
  - \_ Crucial role of the flare system for safe operation
  - \_ What can we do between shutdowns?
  - \_ Group exercise – How can we make our flare system more easily maintainable while the process is on stream?
- ✓ Flare Gas Recovery
  - \_ System Requirements – equipment arrangement
  - \_ Types of compressor
  - \_ Methods of capacity control to ensure safe operation
  - \_ Group Exercise
  - Review of the economics of alternative capacities of

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\_Flare gas recovery system to identify the optimum solution

**Note:**

**Pre & Post Tests will be conducted**

**Case Studies, Group Exercises, Group Discussions, Last Day Review & Assessments will be carried out.**



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