

PE044:
Process Flare Fundamentals: Design, Operation & Troubleshooting

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Training Description:

This intensive training course will provide a comprehensive overview of process flare systems in oil and gas processing facilities. The course begins with the need for pressure control/overpressure protection, continues with the key engineering and design aspects including code considerations, and concludes with selecting and defining the components of flare, blow- down and relief systems. It outlines the many different flare technologies available and the type of application each is most suited for. It will also demonstrate to the participants how to control smoke, noise, radiation and flame luminosity. Philosophy of Zero Flaring/flare gas recovery and its limitations will be covered as well. In addition to the scientific procedures and contents of this course, many real-life case studies and implementations are planned to be presented in an open discussion forum with the participants. All case studies are developed from "Actual Case Studies."

The training will highpoint:

- A comprehensive overview of flare systems in oil and gas processing facilities
- Detailed types of flares and the importance of its components
- Operational considerations and pressure relief, flare system data management
- Monitoring and controlling production losses and identification of the types of leaks
- How to maintain the efficient operation of process units taking into account safety as the prime consideration

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Have a comprehensive overview of flare, blow down and pressure relief systems
- ✓ Identify the different types of flares and review to improve the operation
- ✓ Understand types, design, sizing of a pressure relief valve and a rupture disk
- ✓ Understand the process hazards, LOPA, SIL, ESDs levels, ESD philosophy
- ✓ Understand all terminologies related to flare & overpressure protection
- ✓ Understand of design, operation, and maintenance of the flare system
- ✓ Identify/understand overpressure protection guidelines
- ✓ Describe flare knock out drum and liquid seal drum functions and troubleshooting
- ✓ Be aware of the important role of steam in smokeless flare operations
- ✓ List the components used in relief and blowdown system and discuss its function
- ✓ Understand how to operate a flare system competently
- ✓ Be aware with the flare emissions and their effects on personnel and the environment
- ✓ List the components used in relief and blowdown system and discuss its function
- ✓ Explain what is meant by 'maximum relief load' and 'relieving capacity'
- ✓ Describe which scenarios should be considered for sizing a relief valve and explain which criteria should be used for sizing a depressurizing valve
- ✓ Explain the effect of thermal radiation
- ✓ Understand the philosophy of zero flaring/flare gas recovery

Training Designed for:

This course is intended for Process Engineers, Operation Engineers, Production Engineers, Senior Operation Personnel, Operation Staff, Technical Supervisory Staff, Maintenance Engineers, Plant Engineers, and Design Engineers.

Training Requirement:

"Hand's on practical sessions, equipment and software will be applied during the course if required and as per the client's request."

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Program:

DAY ONE:

- Introduction
- Process Flare System Description and Design
  - Purposes and overview of typical relief and flare systems and key components
  - Safety implications and the causes of overpressure
  - Scenarios to be considered for sizing a relief valve
  - Flare system relevant code & standards
  - Types of flares and main components
  - Flare selection: Vertical vs. horizontal flare (advantages and disadvantages), air-assisted and multi-point flares
  - Case study

DAY TWO:

- Flare System Operational Considerations
  - Flashback prevention
  - Seal pot and knock out system
  - Noise and smoke control
  - Flare pilots
  - Ignition and flame monitoring system
  - Thermal radiation
  - Efficiency, emissions
  - Troubleshooting flare system
  - Case study

DAY THREE:

- Flare System Safety Considerations and Measures
  - Safety considerations in flare system design
  - Types, design, sizing of a pressure relieve valve and rupture disk
  - Flare line routing and materials of construction
  - Definition of safety in process design
  - Components of process safety: People, plant, process
  - Risk identification and safety analysis
  - Process hazard analysis: HAZOP, HAZID, LOPA

- Examples and case studies

DAY FOUR:

❖ Operational and Environmental Considerations
- Monitor and control production losses and identify the types of leaks
- Flare versus vent decisions
- Emissions
- Noise
- Radiation levels
- Examples and case studies

DAY FIVE:

❖ Philosophy of Flare Gas Recovery/Zero flaring Systems
- Flaring impacts on health, safety, and environment
- Flare gas recovery process description
- Zero flaring systems
- Root cause analysis of critical failures
- Case studies

❖ Course Conclusion
❖ POST-ASSESSMENT and EVALUATION

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

CMCT Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

TBA as per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:00	Recess (Prayer Break & Lunch)
13:00 - 14:00	Last Session