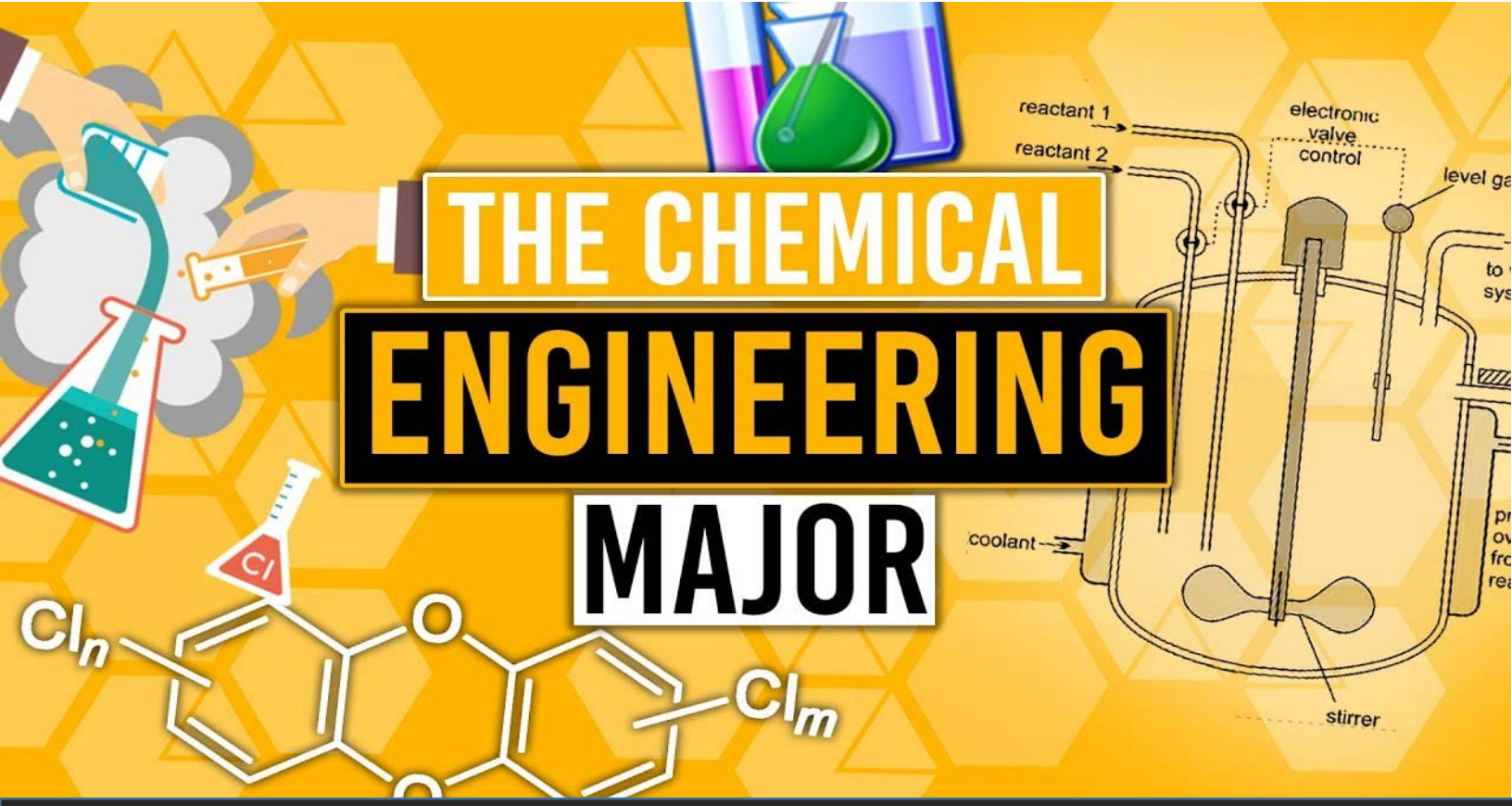

Process Flare Fundamentals

BTS
Training & Consultancy

Process Flare Fundamentals

Introduction

This intensive BTS 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 attendee 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".

This BTS training course provides both theoretical and practical knowledge and skills highlighting:

- 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

What are the Goals?

By the end of this BTS training course 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

Target Audience

Who is this Training Course for?

This BTS training course is suitable for a wide range of professionals but will greatly benefit:

- Process Engineers
- Operation Engineers
- Production Engineers
- Senior Operation Personnel
- Operation Staff
- Technical Supervisory Staff
- Maintenance Engineers
- Plant Engineers
- Design Engineers

Training Methods

How Will this Training Course be Presented?

A highly interactive combination of lecture and discussion sessions will be managed to maximize the amount and quality of information, knowledge and experience transfer. The sessions will start by raising the most relevant questions and motivate everybody finding the right answers. The attendants will also be encouraged to raise more of their own questions and to share developing the right answers using their own analysis and experience. Course material through power point equipped with necessary animation, learning videos, and general discussion to provide participants with full understanding concerning the subject course will be provided.

Organisational Impact

- This BTS training course will guide the participates to understand the key concepts and techniques for the flare, blow down and pressure relief systems. These key concepts can be utilized to maintain the safe and efficient operation of the processing facilities
- This training course will emphasize the safe utilization of these fundamentals by operations and maintenance personnel, and equipment troubleshooting techniques

Personal Impact

By attending this BTS training course, you will be able to:

- Gain a detailed overview of flare, blow down and pressure relief systems.
- Understand how to operate a flare system competently
- Gain an understanding of the flare emissions and its effects on personnel and the environment
- Understand the process hazards, LOPA, SIL, ESDs levels, and ESD philosophy.
- Understand how to maintain the efficient operation of process units taking into account safety as the prime consideration

Daily Agenda

Day One: 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