



PE254: Safety in Process Design

Training Description:

This intensive course covers a detailed and up-to-date overview of safety in process design. It covers the implementation of safety concepts, methods and standards in process design including redesign of existing processes for safety considerations; managing process safety including risk and process hazard analysis; and minimizing the risk of process hazards in the design of oilfield processing equipment and facilities.

Further, the course will also discuss the various types of corrosion; the different types of health hazards including chemical hazards, noise, radiation, thermal stress; the evaluation of reactive chemical hazards by using experimental screening, reaction hazard index and hydro-peroxide; the equipment design and operation; the strategies to prevent fires and explosions; and the issues associated with the process design of a facility and in developing “inherently safer” designs.

During this interactive course, participants will learn to eliminate hazards through process design; identify human error including unintentional errors, misleading information and poor design; improve the techniques used in the modification process used in process design; apply the various methods in the prevention of incidents; employ risk assessment as applied in process design and recognize its importance; and demonstrate how process design, management of change, and inadequate safeguards have all contributed to major accidents.

Training Objectives:

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

- ✓ Apply and gain an in-depth knowledge on safety requirements in process design including process hazard evaluation, process equipment design and operation
- ✓ Implement the safety concepts, methods and standards in process design including redesign of existing processes for safety considerations
- ✓ Manage process safety including risk and process hazard analysis
- ✓ Minimize the risk of process hazards in the design of oilfield processing equipment and facilities
- ✓ Identify the various types of corrosion and discuss the different types of health hazards including chemical hazards, noise, radiation and thermal stress
- ✓ Evaluate reactive chemical hazards by using experimental screening, reaction hazard index and hydro-peroxide
- ✓ Review the equipment design and operation and improve the strategies to prevent fires and explosions
- ✓ Recognize issues associated with the process design of a facility and in developing “inherently safer” designs
- ✓ Eliminate hazards through process design and explain human error including unintentional errors, misleading information and poor design
- ✓ Improve the techniques used in the modification process used in process design and apply the various methods in the prevention of incidents
- ✓ Employ risk assessment as applied in process design and recognize its importance in the process industry
- ✓ Analyze case studies that discuss incidents in the process industry and demonstrate how process design, management of change, and inadequate safeguards have all contributed to major accidents

Training Designed for:

This course is intended for those who are managing and performing process design and process hazard evaluations or risk assessments for operating facilities or are coordinating project activities. Further, the course is suitable for new graduates who wish to gain an understanding of practical process design issues.

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:

- ❖ PRE-TEST
- ❖ Process Safety Management
 - Risk
 - Process Safety Management Systems
 - Process Hazard Analyses
- ❖ Flammability
 - Sources of Ignition
 - Fire
 - Explosion
 - Flammability
 - Codes
- ❖ Materials of Construction
 - Material Selection Process
 - Metal Structure
 - Properties
 - Brittle Fracture
 - Creep
 - Thermal Expansion
 - Fatigue
 - Codes

DAY TWO:

- ❖ Corrosion
 - General Corrosion
 - Hydrogen Effects
 - Galvanic Corrosion
 - Stress Related Corrosion
 - Selective Attack
 - Stray Current Corrosion



- Microbial Corrosion
- Intergranular Corrosion
- Fretting Corrosion
- Corrosion Fatigue
- Pitting/Crevice Corrosion
- ❖ **Health Hazards Awareness**
 - Industrial Health Concepts
 - Industrial Toxicology
 - Chemical Hazards/Effects
 - Occupational Exposure Limits
 - Noise, Radiation
 - Thermal Stress
 - Ergonomics
- ❖ **Class Exercise - Process Hazard Analyses**

DAY THREE:

- ❖ **Evaluating Reactive Chemical Hazards**
 - Managing Reactive Chemical Hazards
 - Experimental Screening
 - Reaction Hazard Index
 - Hydro-peroxides
- ❖ **Equipment Design & Operation**
 - Inherent Safer Process Design
 - Strategies to Prevent Fires and Explosions
 - Piping Systems
 - Relief Systems
- ❖ **Class Exercise – Equipment Design**

DAY FOUR:

- ❖ **Plant Design & Operation**
 - Elimination of Hazards Through Process Design
 - The Human Error
- ❖ **Modifications**
 - Hardware Modifications
 - Other Modifications Affecting Plant Integrity: Case Studies
 - Prevention of Incidents
- ❖ **Overview of Risk Assessment**
 - Risk Identification
 - Risk Classification/Tolerance Criteria
- ❖ **Practical Sessions**
 - This hands-on, highly-interactive course includes real-life case studies and exercises

DAY FIVE:

- ❖ **Supplementary Workshops**
 - Case Study 1 Fire & Explosions at Formosa
 - Case Study 2 Fire at Prixair



- Case Study 3 Bhopal
- Case Study 4 Flixborough
- Case Study 5 Explosion at BP Refinery
- Case Study 6 Acetylene Explosion at ASCO
- ❖ 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

For training registrations or in-house enquiries, please contact:

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