MERCURY

Designing Blast Resistant Buildings for Oil, Gas, & Petrochemical Plants

16 – 20 August 2027
Amsterdam (Netherlands)



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Designing Blast Resistant Buildings for Oil, Gas, & Petrochemical Plants

Ref: 15357_305262 **Date:** 16 – 20 August 2027 **Location:** Amsterdam (Netherlands) **Fees:** 6200 Euro

Introduction:

This blast-resistant building design for oil, gas, and petrochemical plants training will concentrate on dynamic material strength, the phenomenon of blast load, and the design of concrete and steel structures to withstand the blast load.

Innovative materials, such as Carbon Fiber Reinforced Polymer CFRP, that will be utilized to shield the structure from the blast load, will also be discussed along with dynamic analysis approaches. The freshly updated ASCE publication on the Design of Blast-Resistant Buildings in Petrochemical Facilities extensively informs the content of this civil and construction engineering course.

The blast-resistant building design for oil, gas, and petrochemical plants course will elucidate the design management process for industrial projects, including an exposition of the total load affecting structure building in oil and gas facilities. Various established learning methodologies will be employed to enhance the retention and comprehension of the knowledge imparted.

This course on blast-resistant building design for oil, gas, and petrochemical plants addresses the critical need to design infrastructure capable of withstanding the extreme conditions in these facilities. Emphasizing the importance of blast-resistant building design, we will explore various approaches, including the use of blast-resistant modular buildings, to ensure the resilience and safety of these structures.

This course on blast-resistant building design for oil, gas, and petrochemical plants will cover the following topics:

- Concrete and steel structure design principles for optimal structure system determination.
- Reaction and properties of materials when subjected to blast forces.
- CFRP design principles utilized for blast damage mitigation.
- Integrity management system techniques account for primary aspects of design, construction, and maintenance to economically maintain the structure over its lifetime.

Targeted Groups:

- Construction Civil Engineers.
- Construction Structural Engineers.
- Junior and Senior Structural Engineers.
- Project Engineers.
- Engineering Managers.

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Targeted Competencies:

Participants competencies in this training on blast-resistant building design for oil, gas, and petrochemical plants will:

- Cost-effective techniques for constructing blast protection structures.
- Enhancement of structure behavior with cutting-edge technology and its real-world application.
- Minimizing the cost of structure failure through innovative building design.
- Ensuring investment protection through resilient blast load-bearing buildings.

Course Objectives:

Participants in this course on blast-resistant building design for oil, gas, and petrochemical plants will:

- Familiar with problems, solutions, and failures caused by the petrochemical industry's concrete structures.
- Insights into the standards and methods for designing blast-resistant buildings.
- In-depth understanding of dynamic analysis fundamentals.
- Core skills in applying engineering methodologies for blast load estimations and dynamic structural reactions.
- Overview of design techniques for common building materials steel, concrete, masonry, structural systems shear walls, frames, and non-structural components doors, windows.

Course Content:

Unit 1: Design Codes and Load Conditions:

- Role of Design Management Process in Industrial Projects.
- Setting Load Conditions for Industrial Structures.
- Concrete design using BS and ACI Codes.

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Unit 2: Blast Load Dynamics:

- Blast Load Origins and Calculations.
- Effects of Blast Loads on Structures.
- Time vs. Pressure Combination of Characteristic Load and Joints Under Blast Load Ductility and Blast Load Response.
- Detailing for Blast-Resistant Construction.
- Impact of the Fragment, Positive/ Negative Phase Duration.
- Damages and the behavior of structural members envisioned progressive collapse.

Unit 3: Material Behavior under Blast Load:

- Dynamic Strength of Materials and Structure Types.
- Deformation Limits.
- Dynamic Increase Factors.
- Deformation of Elastic, Elasto-Plastic, and Plastic under Blast Loads.
- Evaluation of the Existing Structure's Inspection and Maintenance Plan.

Unit 4: Case Study Workshop:

- Dynamic Analysis Method and Design Process.
- Connection Details for Modern Structural Requirements.
- Workshops for Updating Existing Building Design for Concrete and Steel Structures.

Unit 5: Blast Resistance with CFRP:

- Inspection and Monitoring Techniques.
- Construction Principles and Design for CFRP Usage.
- Advanced Materials for Protective Measures.
- Control Room Design Precautions and Blast Resistance Specifications.