XCELERATE TRAINING INSTITUTE
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CONSTRUCTION MANAGEMENT & CIVIL ENGINEERING

Design of Blast Resistant Buildings in Petrochemical Facilities

DURATION	LANGUAGE	FORMAT
5 days	English	Classroom / Online

Upcoming dates

Dates	Venue	Format	Fee
22 – 26 Feb 2027	Live online	Online (live)	€1,200
2 – 6 Aug 2027	Live online	Online (live)	€1,200
6 – 10 Sep 2027	Boston	Classroom	€3,800

Register or ask a question

Online: x8ti.com/course/design-of-blast-resistant-buildings-in-petrochemical…

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Design of Blast Resistant Buildings in Petrochemical Facilities

Introduction

Introduction

Blast loads, concrete structures, steel structures, and dynamic material strengths are among the things that this Xcelerate Training Institute course will focus on regarding the design of blast-resistant buildings in the oil and petrochemical industry. In this course, participants will be given the necessary skills to develop dynamic analysis methods that will utilize materials such as the CFRP to protect different structures against blast load.

Thoroughly prepared by experts and experienced professionals, this course will give an understanding of the current guidelines for steel and concrete structural design. This is done to resist blast in any petrochemical project. In addition to designing new buildings and structures, a guide on how to upgrade the already existing to conform to the new standards will also be given. Typical and in-depth details and ancillaries such as dynamic materials usage, doors and windows, allowable response criteria, design procedures, and analysis techniques and methods will also be covered.

Various dynamic analysis methods will be taught in this course, including details of how dynamic analysis is used for designing blast-resistant buildings, simple and complex hand calculations, existing graphical solutions, computer-based software that is complex, and an in-depth mixture of all these methods to produce the best results.

Professionals who wish to stand out in their career will greatly benefit from this course that will be modern and up to date to cover the recently updated and revised ASCE publication for the design of blast-resistant buildings in the petrochemical industry.

Learning Objectives

The main objectives of this course are to enable participants to:

- Examine in detail the existing structures to ensure they follow the best blast-resistant design
- Thoroughly understand the design process of developing blast-resistant structures
- Review the existing documentation on the designs used in any of the petrochemical industry buildings and structures
- Predict accurately in risks involved in the current designs of the blast-resistant buildings
- Use enhanced tools and techniques to upgrade existing buildings and structures to meet the minimum requirements and recommendations for petrochemical buildings
- Contribute to organizational development by ensuring best practices and international standards are followed
- Familiarize the participants with the standards, challenges, issues, and procedures used to design the best structures that resist blast load

- Develop basic competence in the use and application of existing engineering methods for calculating blast load and dynamic structural response
- Understand the existing problems and how to effectively solve them in the concrete structures that are used in the petrochemical industry
- Provide a comprehensive overview of the design approach used for typical construction materials such as masonry, steel, concrete, and systems
- Provide in-depth knowledge of the principles of dynamic analysis

Training Methodology

This course is prepared and will be delivered by industry best professionals who have years of experience in both their fields and teaching. Different methods will be used, such as notes, presentations, lectures, and case studies. The course is designed to ensure the participants have the best comprehension rates with better retention of what will be taught.

Participants are highly encouraged to be active and engaging during the delivery to ensure maximum utilization of the course.

Benefits For Your Organization

Organizations that will have professionals who have undertaken this course stand to benefit in the following ways:

- Detailed risk assessment of the existing petrochemical facilities structures
- Conformance to the international standards and best practices
- Well-managed organization due to reduced costs of repair that normally arises from poor designs of blast-resistant buildings
- Improve the organization's structure behavior with up-to-date technology and techniques
- Protect the organizational structures and investments by designing structures that can withstand blast load
- Improve the organizational credibility by improving the quality of designs
- Regular and continuous training of other employees due to working alongside experienced professionals

Benefits For You

Professionals who will opt to take this course will benefit in the following ways:

- Deep understanding of the structure of dynamic behavior
- A sense of pride contributes to organizational development and credibility
- Increased and improved skills to review the engineering of blast resistance building
- Enhanced foresight to combat risks that can come up due to poorly designed buildings
- Greater potential to manage organizational costs by reducing poor designs
- Update execution phase for blast resistance

Target Audience

This course will greatly benefit the following:

- Engineering managers who want to improve the designs of their teams
- Construction civil engineers who are responsible for designing buildings and structures
- Project engineers that oversee designs and construction of blast-resistant buildings
- Construction structural engineers
- Senior construction engineers
- Junior structural engineers
- Other professionals who are interested in designing blast-resistant buildings

Course Outline

Characteristics that can be found in Blast Loads

- Load combination with blast loads
- Reason for blast loads
- Pressure vs Time characteristics
- Response to blast loads
- Blas load effect and calculations

Handling Blast Loads

- Joint ductility
- Progressive collapse
- The special detailing of blast-resistant structures
- Negative phase duration
- The positive impact of the blast
- Fragment blast impact
- Damages foresight
- The behavior of structural members

Blast Loads in Various Design Codes

- BS and ACI code utilization in design of concrete
- Controlling the design of the industrial projects
- Industrial structures load blast definitions
- The details of the design management process

Characteristics of Various Materials under Blast Load

- Evaluation of the existing structures
- Deformation has known limits
- Maintenance and thorough inspection plans
- Dynamic increase factor
- Plastic deformation due to Blast loads

Dynamic Materials and Others

- Dynamic materials properties

- Strengths of dynamic materials
- Element types in structural materials
- Handling dynamic materials
- Dynamic materials types
- Blasting effects
- Structural analysis of dynamic materials
- Loads in dynamic view
- Dynamic response

Case Study

- Design procedures
- Concrete structures analysis
- Construction precautions to achieve design requirements
- How to upgrade existing buildings
- Dynamic analysis methods
- Typical detail for the connections
- Steel structure workshop

CFRP for Blast Resistance

- Doors and Walls resistance specs to resist blast load
- The inspection and monitoring procedure to control the construction
- Advanced materials for protection
- CFRP principles and design
- Precaution in control room design

Modern Design Procedure

- Shear wall building design example
- Ancillary and architectural considerations
- Metal building design examples
- Design procedures
- Dynamic analysis methods
- Types of constructions
- General considerations
- How to determine loads
- Response criteria
- Masonry retrofit design

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Registration Form

Design of Blast Resistant Buildings in Petrochemical Facilities

Preferred dates: ..... Venue or online: .....

Duration: 5 days Language: .....

Please complete and email this form to us, or register online. We confirm your place and send the invoice within one working day.

Delegate information

Full name (Mr / Ms / Dr / Eng): .....

Position: ..... Telephone / mobile: .....

Official email: ..... Personal email: .....

Company information

Company name: .....

Address: .....

City / country: ..... VAT / tax number: .....

Person responsible for training & development

Full name (Mr / Ms / Dr / Eng): .....

Position: ..... Telephone / mobile: .....

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