



Arabian Institute For Training

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

## INTRODUCTION

- This Designing of Blast Resistant Buildings for Oil, Gas & Petrochemical Plants training seminar will focus about the phenomena of blast load, the dynamic material strength, in addition to the concrete and steel structure design to resist the ballast load. The dynamic analysis technique will be presented, as well as the new materials as CFRP to be used to protect the structure from the blast load.
- This Civil & Construction Engineering training seminar content relies heavily on the recently revised ASCE publication for the Design of Blast Resistant-Buildings in Petrochemical Facilities. The design management procedure for industrial projects will be clarified and the entire load that affects the structure building in oil and gas facilities will also be illustrated.

### This training seminar will feature:

- The concrete and steel structure design principal in selecting the suitable structure system
- The materials response and characteristics
- The CFRP design principal to resist the building against the blast load
- The integrity management system procedure, taking into consideration the major factors in design, construction and repair to maintain the concrete structure economically in all its lifetime

## OBJECTIVES

- Familiarity with any problem and its solution in the concrete structure in the petrochemical industry and its causes of failure
  - Familiarize participants with the issues, standards, and procedures used to design structures that resist blast loads
  - Provide participants with in-depth knowledge of the principles of dynamic analysis
  - Develop basic competence in the use of available engineering methods for calculating blast loads and dynamic structural response
  - Provide an overview of the design approach used for typical construction materials (steel, concrete, masonry), Systems (shear walls and frames), non-structural components (doors and windows)
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## **TRAINING METHODOLOGY**

- This Designing of Blast Resistant Buildings for Oil, Gas & Petrochemical Plants training course will utilise a variety of proven adult learning techniques to ensure maximum understanding, comprehension and retention of the information presented. The daily workshops will be highly interactive and participative. The illustration will depend on videos and photos.

## **ORGANISATIONAL IMPACT**

- Reduce the cost by knowing the most economic way to design blast resistance building
- Improve organization structure behavior by Up to date technology will discuss and its practically in real project
- Reduce the cost of structure failure by new ideas to enhance building design
- Protect the organization investment by provide a structure can with stand the blast load

## **PERSONAL IMPACT**

- The trainee will understand the structure dynamic behavior
- Increase knowledge of up to date of execution phase for blast resistance
- Increase the skill for design blast resistance building
- Increase the skill to review the engineering of blast resistance building

## **WHO SHOULD ATTEND?**

This training programme is designed for and will greatly benefit:

- Construction Civil Engineers
  - Construction Structural Engineers
  - Junior and Senior Structural Engineers
  - Project Engineers
  - Engineering Managers
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## Course Outline

### Loads in Different Design Codes

- Design Management Process
- Control the Design of the Industrial Projects
- Define the Load on the Industrial Structure

### Characteristics of Blast Load

- Reason for Blast Load
- Blast Load Effect and Calculation
- Pressure vs. Time Characteristic
- Load Combination with Blast Load
- Joints Ductility / Response to Blast Loads
- Special Detailing of Blast Resistant Structures
- Fragment Impact, Positive / Negative Phase Duration
- Behavior of Structural Members / Damages Forecast
- Progressive Collapse

### Materials Behavior under Blast Load

- Dynamic Material Strength
- Materials and Structure Element Type
- Dynamic Materials
- Deformation Limits
- Dynamic Increase Factor
- Elastic, Elasto-Plastic & Plastic Deformation due to Blast Loads
- Inspection and Maintenance Plan
- Evaluation of Existing Structure

### Case Study Workshop

- Dynamic Analysis Method
- Design Procedure
- Typical detail for the Connection
- Upgrade Existing Building
- Workshop for Case Study Concrete Structure
- Workshop for Steel Structure
- Construction Precaution to Achieve Design Requirement

### Using CFRP for Blast Resistance

- The Inspection and Monitoring Procedure to Control the Construction
  - CFRP Principal and Design
  - Doors and Walls Resistance Specs to Resist Blast Load
  - Advanced Materials for Protection
  - Precaution in Control Room Design
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