



## Training Course:

Dynamic Analysis for RC  
Structures Under Dynamic  
Loading in Petroleum Industry

Training Course For One Week In

KSA - Riyadh - Carawan Al  
Fahad Hotel

Which Be Held As Under Details :



**Abar Solutions Petroleum Consultancy Invite Your Employee To Participate With Us In Special Training Course As Under Details:**

Course Name		<b>Dynamic Analysis for RC Structures Under Dynamic Loading in Petroleum Industry</b>			
Code	Period	Language	Start	End	Location
CE 35	5 Days	Bilingual (Arabic & English)	13/08/2017	17/08/2017	KSA - Riyadh - Carawan Al Fahad Hotel
			03/09/2017	07/09/2017	
			08/10/2017	12/10/2017	
			12/11/2017	16/11/2017	
			10/12/2017	14/12/2017	
			14/01/2018	18/01/2018	
			11/02/2018	15/02/2018	
			11/03/2018	15/03/2018	
			15/04/2018	19/04/2018	
			20/05/2018	24/05/2018	
			10/06/2018	14/06/2018	
			22/07/2018	26/07/2018	

**\*\* The Fees Includes : Lecturer , Training Material , Training Room With One Coffee Break Daily , Certificate Of Attendance In Last Day Training Course \*\***

### **About The Course:**

⇒ In most industrial projects as petroleum industry in general and power generation and also refinery projects. There are many structures affecting by dynamic load due to machines or due to blast load. The design management procedure for industrial projects will be clarified. All load that affect the structure building in oil and gas facilities will be illustrated. The principal of dynamic analysis will be discussed in detail. This course will focus also about the phenomena of blast load, the dynamic material strength, in addition to the concrete and steel structure design to resist the blast load. The dynamic analysis technique will be presented. In addition the new materials as CFRP to be used to protect the structure from the blast load. The course content relies heavily on the recently revised ASCE publication, Design of Blast Resistant-Buildings in Petrochemical Facilities. In addition to most practical aspects for different

international specification and standard. The case study for design a control room and the specification of doors and windows in blast resistance building will be discussed. The concrete and steel structure design principal will be illustrated to select the suitable structure system. The materials response and characteristics will be discussed in the course.

### **Course Objective:**

- ⇒ The participants will be provided with detailed course material and will be familiarized with suitable way in concrete design in industrial structure. The engineer will be familiar 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)

### **Who Should Attend?**

- ⇒ This course is designed for junior, senior and lead civil and structural engineering from owner, engineering firm and project engineers' point of view

### **Course Content & Outline:**

- ⇒ **Day 1:**
  - Design Management process
  - Control the design of the industrial projects
  - Define the load on the industrial structure
  - BS and ACI code in design of concrete
  - The dynamic loads behavior
- ⇒ **Day 2:**
  - Foundation design principal

- Design foundation under power turbine
- Design of foundation under reciprocating equipment
- Reason for blast load
- Blast load effect and calculation
- Pressure Vs time Characteristic
- Load combination with blast load

⇒ **Day 3:**

- 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 Dynamic material strength
- Materials and structure element type
- Dynamic materials

⇒ **Day 4:**

- Deformation limits
- Dynamic increase factor
- Elastic , Elasto-Plastic & Plastic deformation due to blast loads
- Inspection and maintenance plan
- Dynamic analysis method
- Design procedure
- SDOF procedure
- MDOF procedure
- Typical detail for the connection
- Upgrade existing building
- Workshop for case study concrete structure

⇒ **Day 5:**

- Upgrade existing building to blast resistance
- Evaluation of existing structure
- Construction precaution to achieve design requirement