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COURSE BROCHURE

Blast Resistant Building Design for Oil and Gas Plants Training Course

21 – 25 March 2027
Muscat

Blast Resistant Building Design for Oil and Gas Plants Training Course

Ref: 1465_54429 **Date:** 21 – 25 March 2027 **Location:** Muscat **Fees:** 6500 GBP

Blast Resistant Building Design for Oil and Gas Plants is a 1-week training course for structural, civil and process safety engineers, built around one work product: a blast design basis for a named plant building. Vapour cloud explosions keep showing that occupied buildings placed too close to hazards turn a process event into a fatality event. Jupiter Prime Training offers this subject to refining, gas processing and petrochemical sites.

Why Blast Resistant Building Design for Oil and Gas Plants Matters Now

Plant expansions today squeeze new process units closer to existing control rooms and laboratories. Owners now expect occupied buildings to be justified by an explosion study, not by tradition or spacing tables alone, and insurers ask for the same evidence in writing. Getting it right protects people and keeps control available; getting it wrong leaves staff in structures that collapse or glaze inward. The course rests on the single-degree-of-freedom SDOF model and pressure-impulse P-I diagrams as its core analysis methods.

Who Gains Most from Blast Resistant Building Design for Oil and Gas Plants

- Structural engineers who size frames, walls and connections for blast loads
- Civil engineers who lay out plant buildings and their foundations
- Process safety engineers who define explosion scenarios and building occupancy
- Building services engineers who specify doors, glazing and ventilation intakes
- Project engineers who own building siting decisions on expansions

A project or site engineering unit gains most when its structural and process safety members attend together, since the blast design basis joins their two disciplines.

Blast Resistant Building Design for Oil and Gas Plants Capabilities

Participants move from an explosion scenario to walls, roofs and openings that survive it.

- Calculate side-on and reflected overpressure and impulse at a building face — structural designers
- Assess building siting against explosion, fire and toxic hazards — plant layout decisions
- Apply SDOF models and P-I diagrams to wall and roof members — design approval
- Specify blast doors, glazing and HVAC dampers to match the load — procurement
- Weigh upgrade, relocation or occupancy reduction for existing buildings — site management
- Communicate response limits and damage levels to non-structural reviewers — safety committees

Key Blast Resistant Building Design for Oil and Gas Plants Terms

- Overpressure — the pressure above atmospheric produced by an explosion blast wave as it reaches a structure.
- Impulse — the area under the pressure-time curve, governing how much momentum a blast transfers to a building element.
- Building siting study — an assessment of explosion, fire and toxic hazards at each occupied building location on a plant.
- Single-degree-of-freedom model — a simplified dynamic model treating a wall or beam as one mass on a spring to predict its response.
- Response limit — the allowable deflection or rotation of a member for a chosen damage level, such as low or medium.
- Pressure-impulse diagram — a chart showing which combinations of pressure and impulse a member can withstand.

Blast Resistant Building Design for Oil and Gas Plants Day by Day

Day 1: Explosion Hazards and Occupied Buildings

- Vapour Cloud Explosion Case Histories — Why Buildings Became Fatality Points
- Explosion Scenario Selection — Credible Cloud Size and Congestion
- Building Siting Study Method — Occupancy, Function and Location Criteria
- Fire and Toxic Ingress Screening — Hazards Beyond Overpressure
- Owner Performance Criteria — Choosing Acceptable Damage Levels

Day 2: Blast Loads on Structures

- Blast Wave Parameters — Side-On, Reflected and Dynamic Pressure
- Load Shapes on Front, Side, Roof and Rear Walls — Member Design Inputs
- Clearing and Shielding Effects — Adjusting Loads for Geometry
- Fragment and Debris Hazards — Protection of Openings
- Load Calculation Spreadsheets — Checking Consultant Results

Day 3: Dynamic Structural Response

- SDOF Model Set-Up for Walls and Beams — Predicting Peak Deflection
- P-I Diagrams — Rapid Screening of Member Capacity
- Response Limits for Steel, Concrete and Masonry — Damage Level Choice
- Connection and Rebound Design — Avoiding Brittle Failure
- Foundation Reactions Under Blast — Sliding and Overturning Checks

Day 4: Building Envelope and Existing Assets

- Blast Doors and Frames — Specification and Factory Testing
- Blast Resistant Glazing and Window Removal — Inward Hazard Control
- HVAC Intakes, Dampers and Gas Detection — Keeping Occupants Sheltered
- Upgrade Options for Existing Buildings — Strengthening Versus Relocation
- Portable and Temporary Buildings — Turnaround Placement Rules

Day 5: Practising the Blast Design Basis

- Siting Screening for a Sample Control Room — Applying Day 1
- Wall Load Calculation for the Chosen Building — Applying Day 2
- SDOF Check and Envelope Selection — Applying Days 3 and 4
- Peer Review Against Owner Criteria — Testing the Assumptions
- Blast Design Basis — Completed for the Named Plant Building

Applying Blast Resistant Building Design for Oil and Gas Plants After the Course

- Screen each occupied building on one plant against current explosion scenarios.
- Check one existing control room wall with an SDOF model and record the damage level reached.

Blast Resistant Building Design for Oil and Gas Plants Questions FAQ

What is blast resistant building design for oil and gas plants and why does it matter now?

It is the siting, loading and structural design of occupied plant buildings so they protect people during an explosion. Plant expansions and stricter owner criteria now demand that protection.

Which roles gain most from blast resistant building design for oil and gas plants?

Structural, civil and process safety engineers gain most, together with building services and project engineers who specify openings and decide where buildings go.

How does blast resistant building design for oil and gas plants differ from a general structural dynamics course?

It applies dynamics to one plant problem from scenario to specification. Rather than general theory, you work through siting, blast loads, member checks, doors, glazing and HVAC for plant buildings.

What do you bring back from blast resistant building design for oil and gas plants training?

You bring back a drafted blast design basis for one building, with scenarios, loads, damage levels, member checks and envelope specifications.

Blast Resistant Building Design for Oil and Gas Plants: The Way Forward

The blast design basis first informs whether a building is strengthened, relocated or reduced in occupancy. Structural designers, process safety leads and project managers use it to agree scope and budget. After its first use, revisit whether the chosen explosion scenarios still match plant layout and congestion, since later expansions often change both.