



CIVIL ENGINEERING AND CONSTRUCTION TRAINING

Blast Resistant Design of Buildings for Oil and Gas Facilities

5 day course

Classroom, online or in-house

Course overview

Vapour cloud explosions at refineries and gas plants have shown that control rooms and occupied buildings near process units can kill the people they were meant to shelter. This course covers how such buildings are specified and designed to survive a defined overpressure. Delegates begin with explosion phenomena and how blast loads are characterised by peak overpressure, impulse and duration, then move to siting studies and the performance levels an owner sets. Dynamic response follows through single degree of freedom models, pressure impulse diagrams and ductility and support rotation limits. Design of reinforced concrete, steel framed and modular buildings is covered, along with blast doors, windows, penetrations and the connections that often govern. The course closes on upgrading existing buildings. Delegates leave able to review blast design criteria and calculations.

What you will learn

- Explain deflagration, detonation and vapour cloud explosion phenomena relevant to process plant
- Characterise blast loads by peak overpressure, impulse, duration and reflection
- Apply building siting and occupancy principles used in facility risk studies
- Analyse structural members using equivalent single degree of freedom methods
- Interpret pressure impulse diagrams and response limits for different damage levels
- Design concrete, steel and modular buildings and their connections for blast loading
- Specify blast doors, windows and penetrations compatible with the building response
- Evaluate options for strengthening existing buildings against blast

Who should attend

- Structural engineers on oil, gas and petrochemical projects
- Process safety and loss prevention engineers
- Owners' engineers reviewing contractor designs
- Facility and plant engineers responsible for occupied buildings
- Suppliers and designers of modular and blast resistant buildings

Course outline

- 01 Explosion hazards in process facilities
- 02 Blast load parameters and reflection
- 03 Building siting and performance levels
- 04 Dynamic material properties and response limits
- 05 Single degree of freedom analysis
- 06 Pressure impulse diagrams
- 07 Concrete, steel and modular building design
- 08 Doors, windows, penetrations and connections
- 09 Upgrading existing buildings

Upcoming dates



Dates	Venue	Format	Fee per delegate
12 to 16 October 2026	Johannesburg, South Africa	Classroom	R19,950
21 to 25 December 2026	Online	Online	R8,500
18 to 22 January 2027	Cape Town, South Africa	Classroom	R19,950
15 to 19 March 2027	Addis Ababa, Ethiopia	Classroom	USD 1,325

Fees and how to register

This 5 day course is **R8,500** per delegate online, **R19,950** in the classroom in South Africa, Botswana, Namibia, Lesotho and Eswatini, and **USD 1,325** in the classroom elsewhere in Africa. In-house training is quotation on request. Book 2 or more delegates on this course and save 10%.

To register or request an in-house proposal, visit www.afrisciencegroup.com, email info@afriScience.co.za, or WhatsApp us on **+27 63 479 1136**.

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