

# Perforating Guns Using Explosive Technique



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## Introduction:

Oil industries make use of Perforations for Hydrocarbon Exploration. Well bore has different formations which contains different fluids. During drilling these formation fluids are not allowed to flow inside the well bore with over balanced mud. Once well is drilled & logged, formations are identified which are interesting (Hydrocarbon bearing).

For hydrocarbon exploration well is cased & cemented to check the fluid flow from these formations. A path has to be created for the fluid from interested formation by the method termed Perforation. A tunnel is created in casing, cement & formation by Perforation technique. Depending upon the well completion, Formation pressure & other parameters different perforating technique are used to perforate the well. Basically different perforating guns are used to fire the bullets (Jet Charges) to create the tunnels. These jet charges make use of explosives to perform the task. The course will cover various methods of perforations, their advantages & disadvantages. This will help the candidates to decide the method for perforation in their well.

## Objectives:

By the end of this course delegates will be able to:


- Familiarize the personnel's in oil industries about the various techniques of perforations
- Be able to decide the better way or technique for perforating their well
- Learn about the explosive handling & various safety measures required during perforation operations

## Who should attend?

Drilling Engineers, Senior Drilling Engineers, Drilling Supervisors, Petroleum Engineers, Completion Engineers, Tool Pushers, Reservoir and Senior Reservoir Engineers, Geologists, Production and Completion Engineers, Foremen, Industry Personnel

## Course Outline

### An Introduction to Perforation


- Why perforation
  - A way to formation fluid to well bore
  - Explosive use in exploration a brief history
  - Development of explosives for oil exploration
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- Explosion & detonation
- Formation of jet
- Types of explosive
- Explosive classification
- High & low explosives
- Primary & secondary explosives

### **Dangers Associated with Explosives & Their Handling**

- Special requirements of storage of explosives, magazines, types etc
- Transportation of explosives
- Requirement of explosive vans & licensees

### **Development of Jet Perforators Technology**

- Factors affecting perforators efficiency, depth of penetration, entry hole diameter
  - Safety while perforating
  - Safety requirement during perforation
  - Various factors which may cause problems
  - Radio frequencies
  - Hazards during perforations
  - RF detectors
  - Safe detonators ,their requirement, types
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### Types of Perforations

- Over balanced or conventional gun perforations
- Hollow steel carriers (multiple uses)
- TAG or Throw Away Guns
- Under balance or through tubing perforations
- Zero phasing guns

- 180 phasing guns
- TRI phase guns
- Pivot guns
- TCP (Tubing Conveyed Perforators)
- Its advantages & disadvantages
- Special requirement for TCP
- Different type of firing system
- Extreme over balance perforators
- A way of perforation & simulation
- Advantages & disadvantages
- Various perforators



- Available types
- Back Off jobs
- Case Studies