



Oil and Gas Wells Completion and Sand Control Methods

Course Description:

This five day course is designed to explain completion and sand control methods. As oil and gas wells age and needed to be renovated for further primary, secondary and tertiary productions, they need very challenging completion methods. Downhole packers that can stand higher temperature, pressure and harsh downhole environment are needed. These packers need to be install and remove with less hassle to the workover crew. If during oil and gas production formation solids are produced they will add to the complexity of the well completion. This 5 day course starts with discussions of state of art completion methods available and ends with detail discussions of why solids are produced with oil and gas and what completion methods and hardware could be install to depress their production so fluids can be produced over long period of time.

Course Level:

This course is an intermediate- advance level course.

Who Should Attend?

This course is intended for the following audience:

- Petroleum Engineers
- Reservoir Engineers
- Environmental Engineers
- Production Engineers
- Personnel involved with day to day of oilfield and gasfield operation

Course Content:

Course Materials:

he following course materials will be provided by Petrolects:

- Course workbook
- Course Outline

Completion Systems

- Packers
 1. Retrievable Tension Packer
 2. Retrievable Compression Packer With Bypass
 3. Wire-line Set- Tubing Retrievable
 4. Retrievable Tension/Compression Set-Versatile Landing
 5. Retrievable Hydraulic-Set Single –String Packer
 6. Dual String packers
- **Methods of Conveyance**
 1. Through-Tubing Operations
 2. Casing Cleanup Operations
 3. Other Casing Considerations
- Metallurgy



- **Elastomers**
 1. Packing Element
 2. Packer-to-Tubing Seal Stacks

- **ISO and API Standards**
 1. Grade V6 Supplier/Manufacturer Defined
 2. Grade V5 Liquid Test

- Packer Rating Envelopes

- **Flow- Control**
 1. Wire-line Re-Entry Guides
 2. Profile Seating Nipples
 3. Sliding Sleeves
 4. Blast Joints
 5. Flow Coupling
 6. Blanking Plugs
 7. Bottom-hole Choke

- **Subsurface Safety Systems**
 1. Subsurface Controlled safety Valves
 2. SCSSVs

- **Cased Hole Applications**
 1. Single string LP/LT Wells
 2. Single string Medium Pressure/medium Temperature wells
 3. Single String HP/HT Wells
 4. Multiple Zone Single String Selective Completion
 5. Dual Zone Completion Using parallel Tubing Strings
 6. Big Bore/Mono-bore Completions

- **Multilateral Completions**
 1. TAML Level 1-6

- Operational Well Modes

- **Impact of Length and Force Changes to the Tubing string**
 1. Piston Effect
 2. Buckling Effects
 3. Temperature Effects
 4. Net Results of Piston, Buckling, Ballooning, and temperature Effects

- Combination Tubing/Packer systems
 1. Tubing/Packer Forces on Intermediate Packers

Sand Control

- **Causes of Sand Control**
 1. Fluid Flow
 2. Restraining Forces

- **Consequences of Sand Control**
 1. Accumulation Downhole
 2. Accumulation in Surface Equipment
 3. Erosion of Downhole and Surface Equipment
 4. Collapse of the Formation



- **Predicting Sand Control**
 1. Operational and Economic Influences
 2. Formation Strength
 3. Sonic Log
 4. Formation Properties Log
 5. Porosity
 6. Drawdown
 7. Finite Element Analysis
 8. Time Dependence
 9. Multi-Phase Flow

- **Sand Control Techniques**
 1. Maintenance and Workover
 2. Rate Restriction
 3. Selective Completion Practices
 4. Plastic Consolidation
 5. High Energy Resin Placement
 6. Resin Coated Gravel
 7. Stand Alone Slotted Liners and Screens
 8. Gravel packing
 9. Guidelines for Selecting Sand Control

- **Gravel Pack Design**
 1. Formation Sand Sampling
 2. Sieve Analysis
 3. Gravel Pack Sand Sizing
 4. Gravel pack Sand
 5. Gravel Pack Sand Substitutes

- **Slotted Liners and Wire-Wrapped Screens**
 1. Slotted Liners
 2. Wire-Wrapped Screens
 3. Prepacked Screens
 4. Flow Capacities of Screens and Slotted Liners
 5. Tensile/Collapse Strength of Wire-Wrapped and Prepacked Screens
 6. Proprietary screen Designs
 7. Plugging and Erosion Tests on Proprietary and Commodity Screens

- **Gravel Pack Completion Equipment and Service Tools**
 1. Gravel Pack base
 2. Seal assembly
 3. Gravel pack Screen
 4. Blank Pipe
 5. Shear Out Safety Joint
 6. Knock Out Isolation Valve
 7. Gravel Pack Extension
 8. Gravel Pack Packer
 9. Gravel Pack Service Tools

- **Well preparation for gravel Packing**
 1. Drilling Practices
 2. Maintaining Wellbore Stability
 3. Formation Damage
 4. Cleaning the Casing Openhole, and Work String
 5. Surface Facilities
 6. Quality Assurance
 7. Filtration



8. Completion and Gravel Pack Fluids
 9. Perforating for Gravel Packing
 10. Perforation Cleaning
 11. Washing
 12. Backsurging
- **Gravel Placement Techniques**
 13. Background
 14. Physical Model Observation
 15. Field results
 16. Gravel Packing with Shunts
 - **Prepacking the Perforations**
 1. Cased-Hole Gravel Packs
 2. Choices of fluids
 3. Prepacking Below Fracture Pressure
 4. Prepacking Above Fracture Pressure
 - **Openhole Gravel Packing**
 1. Guidelines for Selecting Openhole Gravel Pack candidates
 2. Top Set Openhole Gravel pack
 3. Selecting the Casing Seat
 4. Drilling the Open-Hole
 5. Underreaming
 6. Hole Cleaning
 7. Set Through Openhole Gravel Pack
 8. Gravel Packing Openhole Completion
 - **Sand Control in Horizontal and Long Throw Highly Deviated Wells**
 1. Stand Alone Slotted Liner and screen Completion
 2. Horizontal Gravel Packing
 3. Field Results