Well Completion Design

INTRODUCTION

- In the development of a hydrocarbon reservoir, many wells are drilled and required to be completed, to allow the structure to be depleted. However, the drilling and completion operations are crucial to the long-term viability of the wells in meeting the specified objectives.

The design and completion of both production and injection wells are required to satisfy several objectives including:

- Provision of optimum production/injection performance
- Ensure safety
- Maximize the integrity and reliability of the completion over the envisaged life of the completed well
- Minimize the total costs per unit volume of fluid produced or injected, i.e.
- Minimize the costs of initial completion, maintaining production and remedial measures

This training course on Well Completion Design will feature:

- The main functions of completion
- Developing a high-level completion strategy for wells in a variety of situations
- Select tubing, packers, and completion flow control equipment
- Understand different sand control techniques and their application

OBJECTIVES

- Evaluate for a given reservoir scenario the bottom hole completion options and make a recommendation based on well integrity and reservoir management requirements
- Identify, evaluate and recommend functional capability of completion strings for a variety of situations
- Describe the purpose and generic operating principles for major completion equipment components
- Identify limitation of well completion schematically designs and potential failure mechanisms / operational problems with equipment
- Assess well safety requirements and capabilities inherent in well design
- Describe the integration of the various stages of completing a well
- List and flow chart a general procedure to run a completion string

TRAINING METHODOLOGY

- This Well Completion Design training course will utilise a variety of proven adult learning techniques to ensure maximum understanding, comprehension and retention of the information presented. The daily workshops will be highly interactive and participative.

ORGANISATIONAL IMPACT

The organisation will gain in sending their employees to attend this training course, the following:

- Reduction in the cost of the well and the proper selection of production string
- Extending the well life and control it, achieve the optimum production
- Ensuring the well integrity and avoiding all risks

PERSONAL IMPACT

- Obtain integrating knowledge of well completion design
- Hone their knowledge and get the self-confidence in designing proper completion
- Get the latest technology in well operations
- Solving and avoiding the problems which impact on the optimum production, and well integrity

WHO SHOULD ATTEND?

This training course is suitable to a wide range of professionals but will greatly benefit:

- Asset Managers
- Petroleum Engineers
- Production Technologists
- Production Personnel (Production Operators, Maintenance Supervisors)
- Drilling and Well Servicing Personnel (Drilling Manager, Drilling/Well Engineers, Completion and Well Service Engineers, Drilling Supervisors, Rig Manager, Toolpusher, Drillers)

Course Outline

Well Completion Design, Practices and Strategies

- Introduction of Reservoir Drive Mechanism
- Introduction into Artificial lift methods and their application
- IPR and Productivity Index
- Vertical Lift Performance
- Well Outflow and Inflow Systems
- Typical Vertical Lift Performance (VLP) for Various Tubing Sizes

Lower & Upper Completion String Components & Selection Consideration

- Production Packer functions
- Packers Types
- Packers Generic Mechanisms
- Permanent and Retrievable Packers
- Locator Seals and Anchor Seals
- Applications for Permanent and for Retrievable Packers
- Setting Packers
- Inflatable Packer Applications
- Sliding Side Door Function
- Gas Lift Mandrel
- Running the Completion
- Perforation Methods and Perforating Equipment
- Perforation Selection and Conveying Methods

Wellheads / Sub-Surface Safety Valves & Flow Control Equipment

- Wellheads Components, Function and Types
- Subsurface Safety Valves Function
- Safety Valves Types
- Setting Depth of Subsurface Safety Valves Consideration
- Surface Control Subsurface Safety Valves
- Flow Control Devices
- Nipple Profiles Types and Plug Selection
- Workover Reasons
- Well Killing Operations Technique and Consideration

Overview of Sand Control Completion

- Sandstone Formation Properties and Geology
- What causes Sand Production?
- Consequences of Sand Production Downhole and on Surface
- What is the mean of sand control?
- Perforation System for Non-sand Control Completion
- Sand Control Options
- Chemical Consolidation
- Mechanical Sand Control Methods
- Cased Hole Gravel Pack
- Open Hole Gravel Packing
- Expandable Screens
- Gravel Pack Design, Gravel Sizing and Slot Sizing
- Placement Methods
- Carrier Fluid Concept
- Choosing the Appropriate Method of Sand Control

Fundamentals of Rigless Operations Theory & Stimulation

- Coiled Tubing Surface and Subsurface Components
- Coiled Tubing Applications
- Cleaning Operations with CT
- Well Back Flow (nitrogen lift)
- Wireline Types and Application
- Surface and Subsurface Components of Wireline
- Formation Damage Mechanisms and their Remediation
- Stimulation Design Considerations
- The Most Important Production Logging (PLT)
- Well Barrier Philosophy during Well Interventions