Best Technology Solutions **BTS**

Advanced Cased Hole Logging Training Program

Introduction:

Cased-hole logging involves retrieving logging measurements through the well casing, or the metal piping that is inserted into the well during completion operations. Cased-hole logging is performed more rarely but still provides valuable information about the well. Cased-hole logging is used to help operators obtain additional information from a well or reservoir that has already been completed. Cased-hole logging can be used to evaluate the formation and completion of the well, as well as determine the state of the cement, corrosion and perforation. Both gamma ray and neutron porosity logs can be run through the casing of a well, and better ideas of thermal decay and interval transit time can be achieved through porosity, hydrocarbon saturation and producibility measurements.

Cased-hole logging is performed more rarely but still provides valuable information about the well. It is used to help operators obtain additional information from a well or reservoir that has already been completed. This course covers all aspects of cased-hole logging and interpretation, with particular emphasis on logs and flow quantification. More knowledge about cased-hole logs will lead to better understanding of the well and the surrounding reservoir. The course will cover detection of leaks behind casing, cement bond logs and applied in deviated wells. Also the interpretation of Multi phase flow, tool threshold, Slip velocity correlation will be covered.

Who Should Attend?

Geologists, Geophysicists, Petrophysicists, Stratigraphers, Geochemists, Reservoir, Petroleum, Wellsite Geologists, Petroleum Engineers, Drilling Engineers, Reservoir Engineers, Production Engineers, Operations Engineers, Technologists, Log Analysts, E&P Personnel, Exploration & Development Personnel, Geologists, Reservoir Engineers, Seismic Interpreters, E&P Managers, Data Management and Oil & Gas Personnel

Course Objectives:

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

- Learn what is happening inside your well and its environment
- Understand if different fluids which enter the casing are really coming from the formation
- Know where your injection gas or water is going
- Reasons of leaks behind casing
- Learn and understand zonal cross flow
- Knowledge on injection efficiency and thief zones
- Understand how to define different production phases
- Learn how to calculate underground percentage of different production phases

Course Outline:

An Introduction to Cased Hole Logging
Temperature Log

- Temperature Measurement in Oil & Gas boreholes
- Origin of Thermal Energy
- Thermal Conductivity
- Static Geothermal Gradient
- Dynamic Thermal Profile
- Cement Exothermic Effect, Temperature Tool
- Zonal Inflow Temperature fingerprint
- Flow Rate detection using Temperature

Radioactive Tracer Log

- Tracers
- Uses and limitations
- Flow Rate Calculation

- Logging Procedures
- Slug Tracking
- Velocity Shot
- Radioactive Tracer Tool
- Calculation of Velocity Flow Percent and Flow Regime

Spinner Flow Meter Log

- Definition
- Uses
- Logging Tool
- Logging Procedure
- Interpretation Procedure
- Calibration Curve
- Mechanical Effects at Low Flow rates
- Fluid Velocity and Midpoint

Multiphase Flow Effects

- Monophase Flow
- Multiphase Flow

Density Log

- Principle and Definition
- Uses of Density log
- Factors Affecting Fluid Density Log
- Tools, Nuclear Fluid Densimeter
- Gradimanometer
- Factors Affecting Fluid Density Log

Fluid Capacitance Log

- Nature and definition
- Hold Up principle
- Factors affecting Capacitance Log
- Capacitance Log Tool

Hold Up and Slip Velocity Correlations

Multiphase Log Interpretation

Noise Log

- Definition & Nature of Noise Log
- Uses of Noise Log
- Logging Tool
- Interpretation Procedure

Sound Logs

- Cement Bond Log (CBL) & Variable Density Log (VDL)
- Definition
- Causes of Poor Cement Job
- Bond Index
- Factors Affecting CBL Measurement
- CBL Tool, Microannulus
- CBL Interpretation, Ultrasonic Pulse Echo Logs
- Principle & Definition
- Applications
- Advantages of Ultra sonic vs. Conventional
- Application
- Cement Evaluation Logs (CET)
- CET log interpretation

Ultrasonic Image Logs & Pulsed Neutron Logs

- Neutron Capture
- Capture Cross Section (SIGMA)
- Pulsed Neutron Capture Logs (TDT, PNL, NLL, PDK)
- Application
- Time Lapse
- Paulse Neutron Spectrometry Logs
- Phase Velocity Logs

Detection of Channels Behind Casing

- Causes of Flow behind casing
- Detection using Temperature Logs
- Detection using Tracer Logs

Horizontal Well Cased-Hole Logs

- Flow patterns in Horizontal wells
- Capacitance Array log
- Resistivity Array log
- Spinner Array log