



Production Logging Principles



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Introduction:

This course introduces fundamental concepts used for production logging in vertical and deviated wells. Quantifying multiphase flow will be illustrated by introducing the hold-up principle and its measurement tools. The course enables the participants to adjust data acquisition programs selecting the best set of sensors depending on fluids being produced, well deviation, completions type, and objective of the log. The course includes a review of advanced PL technology and its use.

Targeted Groups:

Reservoir and Production Engineers

Course Objectives:

At the end of this course the participants will be able to:

- Understand Basic Principles of Flow Regimes.
- Differentiate Between Different PLT Measurements Tools and their Uses.
- Prepare and Plane Production Logging Program.
- Practice PLT Responses for Different Flow regimes and Wellbore Deviation.
- Practice Special Uses of PLT Measurements.

Course Content:

Unit 1: Production Logging Objectives, Fluid Mechanics Fundamentals, and Velocity Measurement:

- Production Logging Objectives.
- Multi-Phase Flow Regimes.
- Flow Regimes in Deviated Well.
- Holdup Definitions.
- Slippage Velocity.
- Principle of Spinner Tool.
- Factors Affecting Spinner Response.
- Spinner Interpretation Exercise.

Unit 2: Basic Measurements Tools and Production Logging Interpretation:

- Holdup Measurement.
- Temperature Log Interpretation.
- Time Lapse Temperature Log Profile.
- Uses of Pressure Log.
- Single Phase Flow/Injection Well Interpretation.
- Multiphase Flow Interpretation.

- Fluid Conversions

Unit 3: Planning Production Logging Job & Application of Advanced Technology:

- Production Logging Planning and Programs.
- Validation of Measurements Tools.
- Principles of Advanced Technology.
- Application of Advanced Measurements Tools and Techniques.

Unit 4: Special PLT Uses & Cases:

- Temperature Profiling to Detect Leaks.
- Evaluating Inflow Performance Relationship IPR.
- PLT in Wells with ESP pump.
- Water Recirculation.
- Time Lapse PLT and Reservoir Depletion Monitoring.
- The Effect of Low and High Flow Rate on PLT Measurements.

Unit 5: Examples of Real Conventional and Advanced PLT Cases:

- PLT for Water Injection Wells.
- Oil Well PLT.
- Gas and Gas Condensate well PLT.
- PLT in Deviated and Horizontal Wells.