



Production Logging Principles & Analysis in Oil and Gas

28 February – 4 March 2027
Online



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Introduction:

This Production Logging Principles and Analysis in Oil and Gas course introduces fundamental concepts for production logging in vertical and deviated wells. The holdup is multiphase, and its measurement tools will illustrate how to quantify multiphase flow. Participants adjust data acquisition programs, selecting the best set of sensors depending on fluids being produced, well deviation, completions type, and the objective of the log. It includes a review of advanced PL technology and its use.

This Production Logging Principles and Analysis in Oil and Gas course delves into the principles of production logging in the oil and gas industry, focusing on interpreting and analyzing production logs. The curriculum is designed to enhance the understanding of production logging and introduce the use of production logging tools PLT and software in vertical and deviated wells.

In this Production Logging Principles and Analysis in Oil and Gas course, participants will learn to optimize production data acquisition by appropriately selecting sensors and adapting data acquisition programs based on the fluids produced, well deviation, completions type, and the logging objectives. They will explore the advanced technology available for production logging and its practical applications.

Targeted Groups:

- Reservoir and Production Engineers.
- Logging Engineers.
- Petrophysicists.
- Oil and Gas Well Intervention Specialists.
- Drilling Engineers.
- Oil and Gas Field Operators.
- Subsurface Engineers.
- Oil and Gas Well Completion Engineers.
- Petroleum Geologists.

Course Objectives:

At the end of this Production Logging Principles and Analysis in Oil and Gas course, participants will be able to:

- Understand Basic Principles of Flow Regimes.
- Differentiate Between Different PLT Measurements Tools and their Uses.
- Prepare and plan production Logging Program.
- Practice PLT Responses for Different Flow Regimes and Wellbore Deviation.
- Practice Special Uses of PLT Measurements.
- Understand fundamental principles of production logging.
- Analyze and interpret production logging data effectively.
- Identify and diagnose well performance issues using logging tools.
- Enhance decision-making for oil and gas well interventions.
- Learn the application of various production logging tools.
- Optimize reservoir management through logging analysis.
- Integrate production logging data with reservoir models.
- Improve well productivity and operational efficiency.
- Develop skills in selecting appropriate logging techniques.
- Understand the challenges and limitations of production logging.

Targeted Competencies:

By the end of this Production Logging Principles and Analysis in Oil and Gas training, participants competencies will be able to:

- Production Logging Analysis.
- Data Interpretation and Diagnostics.
- Oil and Gas Well Performance Evaluation.
- Tool Selection and Application.
- Problem-Solving in Oil and Gas Well Interventions.
- Reservoir Management Integration.
- Decision-Making in Production Optimization.
- Advanced Logging Techniques.
- Operational Efficiency Improvement.
- Cross-Disciplinary Collaboration Skills.

Course Content:

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

- Understanding production logging objectives within the context of oil and gas operations.
- Discussion on multiphases and their characteristics in both vertical and deviated wells.
- Flow Regimes in Deviated Oil and Gas Well.
- In-depth review of holdup definitions and importance in production logging.
- Examination of slippage velocity and its implications on production log interpretation.
- A detailed explanation of the principle of the spinner tool as a key aspect of production logging tools.
- Factors affecting spinner response and its interpretation with a focus on production logging tool interpretation.
- A practical spinner interpretation exercise will be used to solidify the concepts covered.

Unit 2: Basic Measurements Tools and Production Logging Interpretation:

- Exploration of the different holdup measurement tools and techniques as they apply to production logging tool interpretation.
- Analysis of temperature log interpretation and its significance in the production logging process.
- The practical application of time-lapse temperature log profiles in production logging analysis and production logging oil and gas monitoring.
- Discussion of the uses of pressure logs and their role in production logging.
- Interpretative strategies for single-phase flow and injection well-using production logging interpretation principles.
- Multiphase Flow Interpretation using production logging principles.
- Fluid Conversions.

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

- Strategies for planning and preparing comprehensive production logging programs.
- A critical review of the validation process for production logging measurement tools.
- Understanding the principles of advanced technology in production logging, including advanced production logging software and equipment.
- The application of advanced measurement tools and techniques demonstrates the evolution and current practices in production logging.

Unit 4: Special PLT Uses & Cases:

- Temperature profiling is used to detect leaks as a function of production logging analysis.
- Evaluation of Inflow Performance Relationship IPR and its relevance to production logging oil and gas.
- Specific considerations of using PLT in wells with Electrical Submersible Pumps ESP.
- Case studies on water recirculation identification using production logs.
- The value of time-lapse PLT and its role in monitoring reservoir depletion.
- Analysis of the effect of low and high flow rates on PLT measurements and its implications on accurate production logging.

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

- Real-world examples and case studies involving PLT for water injection wells.
- Analysis of oil well production logs and the insights they provide.
- Production logging tool interpretation in gas and gas condensate wells.
- Challenges and solutions for PLT use in deviated and horizontal wells, expanding on the principles of production logging.