



Production Logging Principles in Oil and Gas



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Introduction:

This oil and gas production logging principles and interpretation course introduces fundamental concepts for production logging in vertical and deviated wells within the oil and gas industry. Participants will learn about quantifying multiphase flow using the holdup principle and its measurement tools.

The oil and gas production logging principles and interpretation course equips individuals with the ability to tailor data acquisition programs by selecting the most appropriate sensor set, considering the type of fluids produced, well deviation, completion types, and the objectives of the production log. It also includes a comprehensive review of advanced production logging technology and applications.

Targeted Groups:

- Reservoir and Production Engineers will find this oil and gas production logging principles and interpretation course particularly beneficial.
- Oil and gas engineers and technicians.
- Geologists specializing in reservoir analysis.
- Petrophysicists are involved in the interpretation of oil and gas well logging.
- Production managers overseeing oil and gas well performance.
- Researchers in the field of oil and gas exploration and production.
- Training professionals are conducting courses on production logging principles.
- Students studying petroleum engineering or related disciplines.

Course Objectives:

By the end of this oil and gas production logging principles and interpretation course, participants will be able to:

- Understand the Basic Principles of Flow Regimes.
- Differentiate between different PLT Production Logging Tool measurement tools and their uses.
- Prepare and plan a production logging program effectively.
- Interpret PLT responses for various flow regimes and wellbore deviations.
- Apply advanced techniques for nuanced production logging analysis and interpretation of PLT measurements.
- Gain proficiency in troubleshooting and problem-solving during production logging operations.
- Enhance skills in data interpretation and integration for optimizing well performance.
- Acquire knowledge of industry best practices and emerging trends in production logging technology.
- Collaborate effectively with multidisciplinary teams to achieve production logging objectives.
- Demonstrate competency in using software tools for processing and analyzing production logging data.

Targeted Competencies:

At the end of this oil and gas production logging principles and interpretation course, participants' competencies will be able to:

- Master flow regime principles.
- Proficiency in utilizing PLT measurement tools.
- Effective planning and execution of production logging programs.
- Accurate interpretation of PLT responses.
- Apply specialized PLT measurements for analysis.
- Problem-solving during production logging operations.
- Data interpretation and integration skills.
- Know industry best practices.
- Collaborate within multidisciplinary teams.
- Competency in using software for data analysis.

Course Content:

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

- Understand what production logging is in oil and gas and its objectives.
- Explore multiphase flow regimes and their manifestations in deviated wells.
- Flow Regimes in Deviated Well.
- Examine holdup definitions and their significance in production logging.
- Learn about slippage velocity and its impact on production logs.
- Grasp the principle of the spinner tool.
- Factors affecting spinner response.
- Undertake a spinner interpretation exercise to solidify comprehension.

Unit 2: Basic Measurements Tools and Production Logging Interpretation:

- Investigate holdup measurement tools and their application in production logging oil and gas.
- Understand temperature log interpretation.
- The utility of time-lapse temperature log profiles.
- Discuss the uses of pressure logs in production logging software.
- Evaluate single-phase flow/injection well interpretation and its challenges.
- Analyze multiphase flow interpretation and its complexities.
- Delve into fluid conversions and their importance in production logging principles.

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

- Create production logging plans and programs with a focus on objectives and accuracy.
- Validate the use of production logging tools PLT and measurement tools.
- Grasp the principles of advanced technology utilized in production logging tool interpretation.
- Examine the application of advanced measurement tools and techniques in the field.

Unit 4: Special PLT Uses and Cases:

- Identify the application of temperature profiling to detect leaks in production logging.
- Assess inflow performance relationship IPR with the aid of PLTs.
- Recognize the use of PLT in wells with Electric Submersible Pumps ESP.
- Comprehend water recirculation issues and their detection using PLTs.
- Discuss the application of time-lapse PLT for reservoir depletion monitoring.
- Consider the effect of low and high flow rates on PLT measurements.

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

- Study PLT cases for water injection wells and understand their outcomes.
- Analyze oil well PLT examples for better interpretation of production data.
- View gas and gas condensate well PLT instances to comprehend different flow characteristics.
- Discover the challenges and techniques of conducting PLT in deviated and horizontal wells.

Conclusion:

In the comprehensive wrap-up of this oil and gas production logging principles and interpretation course, participants will consolidate their knowledge of production logging tools PLTs, production logging tool interpretation, and production logging analysis. They will emerge with both a theoretical understanding and practical insights into the principles of production logging, enabling them to apply these concepts effectively in the field.