

## Advanced Well Log Interpretation

*Amsterdam (Netherlands)*

*16 - 20 December 2024*

UK Training

# PARTNER



## Advanced Well Log Interpretation

Code: OG28 From: 16 - 20 December 2024 City: Amsterdam (Netherlands) Fees: 4900 Pound

### Introduction

This interactive, 5-day Advanced Well Log Interpretation training course will highlight the techniques and principles of advanced well log interpretation for oil industry professionals who need to deal with wireline and/or LWD logs in their daily jobs.

The training will explore the tool's response explained from their physical principles as well as their relationship with the rock and fluid properties, most existing open-hole logging technologies will be covered explaining their main applications and limitations. Advanced interpretation methods will be discussed with numerous examples and exercises including complex lithology interpretation techniques.

### Course Objectives

- Understand the physical principles of most existing logging tools
- Apply basic quality control techniques to validate logging data
- Know the main applications and limitations of the different tool readings
- Perform a quantitative formation evaluation on a complex lithology
- Understand the uses of advanced logging tools in complex lithology interpretation

### Course Outlines

#### Day 1: Basic Concepts Review and Resistivity Tools

- Petrophysics Concepts Review.
- Introduction to Well Logging.
- Log Classification according to the Measured Properties.
- Auxiliary Measurements, Uses, and Common Issues.
- Basic Measurements: Gamma Ray and Spontaneous Potential.
- Resistivity Theory, Principles and Applications of Laterologs.
- Advanced Laterolog Logging Tools: Array and Azimuthal.
- Microresistivity Devices, Principles and Applications.

#### Day 2: Conductivity and Nuclear Logging Tools

- Conductivity Tools, Uses, and Limitations.
- LWD Resistivity Determination Tools.
- Advanced Induction Logging Tools, 3D Induction.
- RT and Invasion Profile Determination.
- Formation Density Tools, Principles, and Applications.
- The Photoelectric Factor, a key lithology indicator.



- Neutron Tools Principles and Applications.
- Porosity Determination from Density and Neutron Logs.
- LWD Nuclear Logging Tools.
- Lithology Determination, Calibrations, and Log Quality Control Parameters.

### Day 3: Acoustic and Geological Logging Tools

- Basic Sonic Tools, Borehole Compensation.
- Dipole Sonic Tools, Applications.
- Mechanical Properties Determination and Uses.
- Sonic Scanner Principles and Applications.
- Common Sonic issues in the Borehole.
- LWD Acoustic Tools.
- Diameter Interpretation Principles.
- Geological Image Logging Tools.
- Structural and Stratigraphic Interpretation Principles.
- Open, Partially Open, and Healed Fractures Interpretation.
- Faults and Unconformities Interpretation Examples.
- Facies Analysis for reservoir characterization with Image Logs.
- Ultrasonic Logging Tools.

### Day 4: Advanced Logging Tools and Introduction to Formation Evaluation

- Nuclear Magnetic Resonance, Principles and Applications.
- Relaxation Mechanisms and their association with Fluid and Rock Properties.
- Porosity, Irreducible Water Saturation and Permeability Determination.
- Advanced Fluid Determination Methods: 3D map T1-T2-Diffusion
- Dielectric Tools Principles and Applications.
- Saturation Determination Parameters,  $m$ ,  $n$ , and CEC.
- Geochemical Logging tools.
- Complex Lithology Evaluation Examples.
- Formation Evaluation Principles.
- $R_w$  Determination Methods.
- Crossplots Utilization, Hingle and Pickett Plots.
- Graphical Interpretation Techniques for Porosity and Lithology.

### Day 5: Complex Lithology Evaluation, Formation Testers and Mini-Workshop

- Saturation Determination Equations and Techniques.
- Complete Formation Evaluation for Complex Lithology.
- Reservoir Pressure Determination Tools.
- Pre-test Interpretation.
- Lost Seal, Dry Tests, and Supercharging.
- Pressure Gradient Interpretation.
- Fluid Sampling, Optical and Composition Fluid Analyzers.
- Advanced Probes for Special Well and Reservoir Conditions.
- Permeability Determination.
- Mini-workshop on Logging Program Selection.

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