Best Technology Solutions **BTS**

Cased Hole Logging Operations & Techniques

Training Program

Introduction:

This course will cover the new and traditional wireline diagnostic techniques for the surveillance of cased wells. Cased hole and production log evaluation, plus a loose-leaf workbook, are provided to participants of this course. This course teaches skills necessary to practice the art and science in accurately determining remaining hydrocarbons using modern dual-detector and emerging multi-detector pulsed neutron (PN) tools. The latter can compute multiple petrophysical parameters simultaneously and delineate gas better, especially in low porosity, but add to data and interpretation complexity. The course discusses measurement-to-interpretation techniques used by various players and thus offers an insight into their effectiveness in conditions of increasing wellbore and formation complexities. The user will gain a better understanding of why tools from different service companies, often recording similar raw data in near-identical conditions, may differ significantly in their predictions. The course will help users of the technology make targeted tool choices, plan logging jobs better, and perform in-house interpretation if needed. The course will highlight:

- Discussions on open hole tools physical principles and applications
- Tool limitations on different borehole environments
- Tips and examples to identify and understand common logging issues
- Explanation of petrophysical concepts and techniques for basic log interpretation
- Cement and corrosion evaluation tools principles and applications
- Cased hole resistivity, porosity and saturation tools
- Application of interpretation methods in some examples and exercises

Who Should Attend?

Geologists, Geophysicists, Geomechanics Engineers, Drilling Engineers, Production Engineers, Completion Engineers, Reservoir Engineers, Petrophysicists, Petroleum Engineers, Exploration Supervisors and managers concerned with the Geomechanics challenges of field development and exploration, Supervisors and managers concerned with wellbore stability, Technicians and Managers who are exposed to well-hole logs in their daily work, Engineers at different levels, Oil & Gas Companies Staff, Contractors and Service Companies Staff, Staff with a background of Geology, Petroleum Engineering, Petrophysics, Physics

Course Objectives:

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

- Understand the physical principles of main open and cased hole logging tools
- Know the main applications and limitations of the different tool readings
- Perform a quantitative formation evaluation on a simple lithology
- Understand the uses and interpretation of open and cased hole logging tools
- Understand the cement tools, basics on data review and full analysis
- Learn the corrosion tools; basics on phase shift tools, flux and eddy current, the micro-corrosion tools, data resolution and evaluation
- Learn the open hole production logging – vertical & horizontal wells
- Understand the monitoring tools; basics and advanced data monitoring
- Understand the noise logging data and well integrity
- Determine adequacy of PNC capture vs. C/O logging methods for saturation calculation, especially through complicated well bores and in complex formations
- Calculate water and steam saturations from Pulsed Neutron Capture (PNC) Logs
- Correct petrophysical calculations for the influence of shaliness
- Distinguish gas/steam from liquids
- Compute oil saturation directly from Carbon/Oxygen technique

- Locate water entry and judge zonal communication
- Judge where specialty methods, such as Log-Inject-Log to estimate remaining oil vs. residual oil saturation, pseudo-density, etc., may not work
- Make appropriate tool choices
- Perform interpretation QC and plan logging jobs

Course Outline:

- Introduction to cementing
- Cement properties, powder, slurry properties, rheology
- Cement placement and hole conditions
- Cement tools
- Data analysis and interpretation
- Finding the spots of micro fractures
- Cement remedies, leaks behind casing
- Advanced analysis
- Types of corrosion tools in the market
- Basics of tools, data accuracy and validation
- The flux and eddy current
- The phase shift tools, data evaluation and processing, full analysis and accuracy
- Corrosion evaluation of multi casing strings
- The micro corrosion tools
- Production tools in vertical wells; T, P, Density, Hold Up, flowmeters, GR, and other tools
- Full data evaluation of vertical well examples
- Horizontal wells: production tools of different companies, accuracy, quick look, validation and LQC
- Data processing and evaluation
- Examples and discussion
- Reservoir monitoring tools
- The current tools and data acquired
- Validation of data

- Data fitting into reservoir simulation
- DOI, resolution, parameters used
- Data processing and analysis
- Noise log tools, basics , frequencies used and full data evaluation
- Perforation: types of gun in the market
- Choosing the right gun for your formation