SPWLA INSTRUCTOR LEAD COURSE
CLASS SUMMARY AND INSTRUCTOR BIO
DATE: April 12-14, 2023

Course Title: CEMENT EVALUATION FROM BASIC TO ADVANCED

Summary

The evaluation of cement bonding and zonal isolation is a challenge that the oil and gas industry face as wells are drilled deeper and within more hostile environments. This seminar will cover the use of both sonic and ultrasonic tools to determine the presence or lack of a cement sheath. The quality of the cement sheath is not only important for completion efforts but may also be needed to satisfy regulatory requirements. The cement Basic tool theory, quality control, interpretation of field logs, and methods of evaluating both complex cements and difficult environments will be covered. Both new and well abandonments cement examples will be examined and evaluated.

Duration and Training Method

A virtual classroom course divided into 3 webinar sessions with each session 4 hours

Expectations

Participants should leave the class with good understanding of

1. Evaluate and QC of standard cement bond log
2. Evaluate and QC of radial and segmented cement bond log
3. Evaluate and QC of ultrasonic and rotating bond logs
4. Analyze cement evaluation logs to determine TOC and channels
5. Determine complex completions and cements using computer programs or processes
6. Distinguish common pratfalls in cement evaluation

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Topic Outline

Course Content

1. Tools Covered
    a. Sonic
    b. Cement Bond Log
    c. Radial Bond Log
    d. Segmented Bond Log
2. Ultrasonic
    a. Scanning Ultrasonic
    b. Newest Generation Ultrasonic
3. Standard cement evaluation for the covered tools
    a. Calibrations
    b. Quality Control
    c. Interpretation of field logs
4. Environmental effects on logs responses for the covered tools
    a. Thin cement sheaths
    b. Third interface echo
    c. Microannulus

    d. Borehole shape
    e. Fast formations
    f. Cement curing time
5. Advanced cement evaluation
    a. Derivative analysis
    b. Raw data
    c. Composite
6. Advanced Waveform Analysis
    a. CBL
    b. Multiple waveforms
    c. Radial
    d. LWD
7. Sophisticated analysis
    a. Well abandonment
    b. Multistring
    c. Shale barrier

Lab Exercises
No

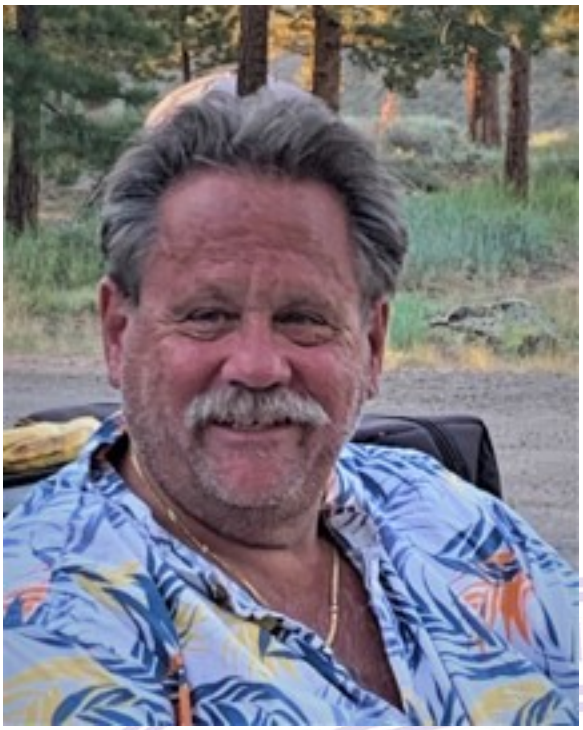
Who Should Attend ?
The course is primarily aimed for anyone who would like to improve their understanding of the cement evaluation. This includes both the beginner to knowledgeable experts.

Prerequisites
A basic understanding of logging procedures but not necessary

Teaching Methods
Lectures and exchange of ideas and experiences

Course Schedule
3 day

Are handouts provided? (optional)
Yes



Course Instructor Bio(s)

Gary Frisch has over 34 years of experience in creating, developing, interpretation of petrophysical data concentrating in the cased hole environment. He is a recognized expert in production logging, formation compaction, cement evaluation, and casing inspection. Gary has provided seminars, training and evaluation for these subject for both internal clients as well as major oil companies throughout the world for Halliburton. Currently he provides these same services for Frisch Consulting LLC.

After graduating in 1988 with a Master of Science in Petroleum Engineering from the University of Wyoming he began as an open hole field engineer with Halliburton Logging Services in Farmington New Mexico. He transferred to Houston to work in Interpretation and Development in November 1990 working on thin bed interpretation but soon migrated to the cased hole environment. He was responsible for the development and implementation the production logging interpretation software including multiprobe array tools.

In the late 90's he was assigned to develop and create interpretation techniques for Halliburton's rotating ultrasonic tool and thus the ACE programs were introduced. These leading edge computer programs provide cement evaluation for multiple type of measurements including sonic, ultrasonic and attenuation, which provides interpretation of any cement evaluation tool currently in use throughout the industry. Additional software was developed for barite settling that allowed cut and pull decisions for P&A. This included evaluation of cement sheath on the outside of a second casing string. He was responsible for both the cement and casing evaluation data for the Macondo relief wells DD1 and DD3 using data from both Halliburton and Schlumberger.

Authored more than 25 technical papers on both cased and open hole log interpretation, holds 15 U.S. patents along with several international patents. Member of Society of Petro physicists and Well Log Analysts (SPWLA) and the Society of Petroleum Engineers (SPE).