

Primary and Secondary Cementing

Course Objective:

The course will cover aspects of primary, squeeze and plug cementing, and primary cementing calculations. Participants will learn cement chemistry, manner in which additives affect the slurry, and proper selection and design of cement slurries. Rheological models used in the industry and requirements for effective mud removal are explained. Exercises worked to illustrate concepts. The course will include classroom exercises as well as an overview of cement slurry design and evaluation software. Laboratory procedures and equipment demonstration are parts of this course.

Who Should Attend:

The course is for advanced entry level and experienced drilling and completion staff interested in learning about primary and remedial cementing.

Course Instructor:

D.R. "Denis" Gaudet, P.Eng. is President of DRG Resources. He has over thirty five years of worldwide engineering, operations, and executive management experience with three international service companies (Halliburton, Newsco and Fracmaster). He has substantial international experience in the land-based and offshore service industries, with emphasis in Europe, Middle East, and Africa. In his role as President of DRG Resources Ltd. He is working in consulting operations in Canada and international operations in drilling, completions, and workover operations. Mr. Gaudet also instructs a number of courses international in the subjects of Well Completions Workovers, Hydraulic Fracture Stimulation, Drilling and Completions, Cementing, Acidizing, and Sand Control Management. Mr. Gaudet is qualified, authorized and experienced in presenting the courses. Mr. Gaudet has served as Canadian Section Chairman for the Society of Petroleum Engineers.

Course Agenda:

Day 1

Primary Cementing Overview & Calculation

Review purposes of primary cementing, typical cementing procedures including conventional plug cementing, thru-tubing, and two-stage cementing. Liner cementing, subsea wellhead cementing considerations, mixing equipment and casing hardware.

Cement Chemistry

Fundamental information regarding the manufacture, hydration and classification of Portland cements. Evaluation of the effects of various chemical and physical parameters on performance.

Day 2

Cement Additives

Mechanism of action and use of different categories of cementing additives – accelerators, retarders, extenders, weighting agents, dispersants, fluid-loss additives, lost circulation control agents, and speciality additives - to improve and reduce job costs.

Rheology and Mud Removal

Review of rheological models used in cementing – Newtonian, Bingham Plastic, Power Law and Herschel Bulkley. Effective mud removal criteria. Displacement selection in laminar and turbulent flow; application of washes and weighted spacers. Importance of stand-off.

Day 3

Gas Migration Control

Consequences of gas migration, gas migration paths, root causes for gas migration, gas-migration-control slurries.

Cementing Temperature

Overview of API Schedules, heat transfer in a well, software temperature module, temperature in deep-water conditions, static temperature determination, misuse of temperature from MWD/LWD tools, TOC temperature evaluation.

Cement Laboratory (scheduling dependent on lab availability)

Performance evaluation of slurries and equipment used to evaluate thickening time,

rheology, fluid-loss, free water, compressive strength, and slurry stability.

Day 4

Squeeze Cementing

Applications (when to use), squeeze techniques - high and low pressure, running and hesitation techniques, squeeze tools, slurry design and volume estimation, injection test, downhole tools, conventional and coiled tubing placement.

Cementing Plugs

Applications, plug placement, plug location, slurry volumes, plug balancing, avoiding Contamination.

Day 5

Equipment Overview

Quality Control

Closing comments and discussions