SUCKER ROD PUMPING SYSTEM
Design, Analysis and Optimization

Fall 2023 Schools

Calgary, AB
October 3-4-5 2023

This School will be of great interest to anyone involved with rod pumping systems including engineers, production technologists, production superintendents, field foreman, and service personnel.

Course Description: This course covers the necessary skills to enable you to maximize your rod pumping efficiency. (As per course outline on reverse)

Instructor: Tom Dennehy – Mr. Dennehy has devoted his career to the advancement of sucker rod lift technologies. Starting off in the field with Mid Continent Supply almost 5 decades ago, Mr. Dennehy founded Penta Completions in 1987 and has been focused on the science behind sucker rod artificial lift ever since. A long-standing affiliation with Mr. Ken Nolen, Dr Sam Gibbs and Mr. Fred Morrow going back to the development of the NABLA diagnostic and predictive technologies, combined with Mr. Dennehy's experience both in the field and on the engineering side of sucker rod lift adds a unique and valuable perspective to rod pumping, benefitting both field and office personnel.

Location:

Ramada Plaza Downtown
708-8th Ave SW
Calgary, AB

Tuition Fee: 3-Day school $950.00 CDN. Includes: tuition, course manual, continental breakfast and coffee/juice.

Refund or Cancellation Policy: Cancellations less than 2 weeks prior to school will be subject to $250.00 cancellation fee. No refund made for cancellations less than 3 working days prior to course beginning.
Penta Completions reserves the right to cancel the course for insufficient enrollment, should this happen a full refund would be issued.

COURSE OUTLINE

I. Wellbore Characteristics

A. Geological and reservoir concepts related To vertical and horizontal wells

B. Porosity and Permeability

C. Reservoir Pressure and Bubble Point Pressure

D. Vogel's and Linear Inflow Performance Relationships (I.P.R. Curves)

E. Pressure Decline and Pressure Maintenance

II. Beam Lift System Components

A. Down hole Rod Pumps
1. API Types
2. Specialty Pumps
3. Classifications
4. Fluid Load and Pressures
5. Proper Spacing and Fit

B. Rods and Tubing
1. API Steel Designs
2. Special "High Strength" Rods
3. Fiberglass Rods
4. Continuous Rods
5. Tubing Anchors and Packers

C. Unit Pumpers
1. Types of Pump Jacks
2. Counterbalance
3. Load Range Diagrams

D. Prime Movers
1. Electric Motors
2. Electric V.F.D.
3. Single Cylinder Gas Engines
4. Multi Cylinder Gas Engines

III. Design of Beam Pumping Systems

A. Design Guidelines Utilizing
1. Plunger Constants
2. Fluid Load
3. Pump Stroke and Efficiency
4. Impulse Factors
5. Pumping Speeds
6. Rod and Tubing Stretch
7. Gearbox and Structure Capacity
8. Prime Mover Selection

B. Deviated or Horizontal Rod String Design
1. Use of Guides and Roller Couplings
2. Bottom Hole Pump Guidelines

IV. Dynamometer Analysis of Existing Wells

A. Dynamometer Card Interpretation
1. Surface Cards
2. Down Hole Cards
3. Dynamometer Card Shapes

B. Fluid Levels

C. Depression Tests and Pressure Build-ups

D. Optimizing Existing Wells

V. Rod Pumping "Challenges"

A. Gas Interference
1. Cause, prevention and solutions
2. Gas Separators

B. Fluid Pound

C. Well Problems
1. Paraffin Build-up
2. Back Pressure Valves
3. Intermittent Pumping

C. Gearbox Overload

D. Sucker Rod Failures

E. Pump Off Control