



“SUCKER ROD PUMPING SYSTEMS” Design, Analysis and Optimization

2019 Schools

**Calgary, AB
May 14-15-16**

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: Fred Morrow, Registered Professional Engineer. Graduate of Texas A&M University. Member of SPE. Fred has enjoyed a career closely involved with the design and manufacture of various components of sucker rod pumping systems. Author and co-author of numerous papers on artificial lift technology Fred has taught related courses worldwide including Canada for the last 25 years.

Fred was awarded the “J.C. Slonneger Award” for his outstanding contributions in Petroleum production technology and its dissemination.

Location:

Ramada Hotel
708 – 8th Avenue S.W. Calgary, Alberta
Reservations: 1-800-661-8684

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 Pumps
 - 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

REGISTRATION FORM

NAME: _____

POSITION/TITLE: _____

COMPANY REPRESENTED: _____

ADDRESS: _____

BUS PHONE: (____) _____

FAX: (____) _____

EMAIL: _____

PREFERRED SCHOOL DATE: _____

_____ **PAYMENT ENCLOSED (\$950.00 Cdn. + Tax)**
G.S.T. #868805847
(Cheques payable to Penta Completions Supply & Services)

_____ **INVOICE COMPANY P.O. #** _____

SIGNATURE _____

Return cheque to: Penta Completions Supply & Services
#610, 910 – 7th Avenue S.W.
Calgary, Alberta
T2P 3N8