

PENTA COMPLETIONS

“SUCKER ROD PUMPING SYSTEMS”

Design, Analysis and Optimization

2012 Schools

Calgary

May 8 - 10 & 15 - 17

October 2 - 4

Estevan

May 1-3

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.

Location:

Ramada Hotel

708 – 8th Avenue S.W. Calgary, Alberta

Reservations: 1-800-661-8684

Perfect Inns & Suites

134 2nd Avenue Estevan, Sask.

Reservations: 1-866-435-5555

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

This is the outline for the 3 day school

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