PCP Failure Analysis

Course Outline

Introduction: 8:00–9:00
- Functions of a PCP System
- What is a Failure?
- Failure Terminology
  - Failure Mechanism; Failure Cause, Run-Life, Service-Life
- Importance of Failure Analysis

Description and Identification of Common Failure Mechanisms 9:00-12:00
- Stator Failure Mechanisms
  - Fatigue (missing rubber);
  - Fluid Incompatibility (swell);
  - Gas Permeation and Rapid Decompression
  - Wear
  - Heat Damage
  - High Pressure Wash
- Rotor Failure Mechanisms
  - Wear
  - Heat damage
- Rod String Failure Mechanisms
  - Rod Body Rupture
  - Rod Body Fatigue
  - Connection Failures
- Rod-Tubing Wear Failures
- Hands-on observation of failed components according to these mechanisms

Symptoms, Possible Root Causes, Possible Remedial Actions 1:00-2:30
- Overall Approach to Establishing the Main Root Cause and Contributing Factors
  - Required Data for Failure Analysis
- Conditions Associated with High/Low Torque and/or High/Low Pump Efficiency
- Discussion of Possible Root Causes and Remedial Actions
- Design and Operational Practices to Avoid Failures
- Round-Table Format
Pump Inspection Practices 3:00-3:30
- Reporting Requirements
- Criteria for Reusing Stators, Re-chroming Rotors

Failure Tracking 3:30-4:30
- How much operational and equipment data should or can one reasonably track?
- Some difficult issues: produced sand measurement, elastomer designation
- What are the minimum checks one should have in place to ensure data quality?
- How to best determine on where to focus one’s improvement efforts?

Closing Remarks 4:30-5:00
- Vendor-Operator interaction and responsibilities
- Vendor Panel Discussion