Common Beam Pumping Unit Reliability Issues in Remote or "Under-Supported" Areas

2006 BEAM PUMP WORKSHOP
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REMOTE!
BACKGROUND

• Beam Pumping Units can be extremely reliable with very low lifecycle cost

• Properly maintained, they will run for decades

• Outside of North America few operators realize the full potential service life of Beam Pumping Units

• Only well designed, high quality pumping units will consistently meet or exceed their design life
THE SCRAP YARD

ONE OF THE FIRST SIGNS OF A SYSTEMIC RELIABILITY PROBLEM
FOUR PRIMARY FACTORS

• Improper Assembly/Installation
• Improper Repair/Adjustment
• Lack of CONSISTENT Preventive Maintenance Program
• The Inherent Reliability of the Equipment
Assembly and Installation

• Installation issues are a common cause of failures
• Lack of understanding of the importance of a proper foundation
• Failure to recognize failure causes
  • Lack of proper foundation
  • Lack of proper tiedowns
  • Misalignment
• Failure to effectively correct problems
Set too far away from wellhead
Set on two portable bases
Tie down Bolts too long
Lack of Understanding of Failure
Cause – Patch & Pray
• Lateral Misalignment
  • Could be foundation
  • Could be structure
  • Combination of both
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Maintenance & Repair

- Preventive Maintenance varies greatly
  - Few follow Manufacturers recommendations for PM
  - Few follow Manufacturers repair procedures
  - Most fail to consistently maintain pumping units
- Run to catastrophic failure is a common strategy
- Lack of understanding of failure causes
- Use of non-specialized field personnel
- “Patch & Pray” is common repair strategy
COMMON COMPONENT PROBLEMS

• Crank Pins
  • Improper installation
  • Inadequate inspection
  • Improper repair
• Brakes – Safety Critical!
  • Improper adjustment
  • Improper maintenance
  • Improper repair
• Lack of Guarding – Safety Critical!
Damaged Crank Pin Holes
IMPROPER REPAIR
Improvised Brake Handle

No Guarding – Cranks or Belts
SPARES

• Most maintenance strategies are reactive
• Emphasis on replacement of parts
• Most operators over stock spares
• Spares often deteriorate on the shelf
300 Units using this Crank Pin Assy.

50 Replacement Assy’s in stock

Based on the expected replacement rate = 6 year supply!
In a tropical environment, this is the expected result!
NEAR TERM SOLUTIONS

- Seek input and support from Equipment Manufacturer
- Establish an Effective Preventive Maintenance Program
- Implement RCFA program
- If possible, contract with proven Specialized Pumping Unit Service Contractor:
  - Installation
  - Maintenance
  - Repair
  - Optimization Support
LONG TERM SOLUTIONS

• Establish strict technical specifications for future pumping unit requirements
  • Include design characteristics consistent with long term reliability
  • Include requirement for system design and optimization support (to insure proper equip. sizing)

• Avoid considering beam pumping unit as a “Commodity”
  • Properly operated and maintained, most properly designed Pumping Units will exceed their design life
Manufactured in 1929 – Still Operating in 2006