Reducing Wellhead Leaks With A Polished Rod Centralizer

Black Gold Pump & Supply

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Why Do Stuffing Boxes Leak?

- Packing rubbers wear out
  - Misalignment, over/under tightened, high SPM’s cause polished rod to “wiggle” etc…
- Once the primary seal is compromised, flow and pressure are unrestricted
  - Large spills, down time due to clean up, loss of oil production and revenue..
- Consequences of a failed stuffing box can be DEVASTATING
  - Heavy EPA fines
  - Difficult Clean up
  - Loss of production
  - Bad publicity
Quick Overview

- Polished Rod Centralizer installs just below the stuffing-box
- Polished Rod runs through the barrel
- Barrel extends down into the pumping tee
  - Submerged in produced fluid
Actual Installation

Stuffing-Box

Polished Rod Centralizer
Polished Rod Misalignment

- Misalignment causes side-load on the seals
- Brass bushings in the stuffing-box "should" handle that side-load…
  - Soft material wears easily…
  - Bushing surface area is small…
  - Polished rod is inside larger ID tubing which allows more area for the rod to buckle.
What Does The Polished Rod Centralizer Do?

- Centralizes polished rod in pumping tee
- Prevents uneven wear and extends life of stuffing box rubbers
- Prevents catastrophic blow out of stuffing box rubbers
- Reduces pressure by 60% on average off your stuffing box
Restricting Leaks

- Same principal downhole plunger seal
  - Think “Patterson Pump Slippage”
- Fluid “slips” through centralizer–polished rod clearance, but flow is restricted
- Slippage = Lubrication
Restricting Leaks Test

- 550 barrel a day well
- Installed a valve at polished rod centralizer (below stuffing box)
- In 24 hours only 3.5 barrels of fluid leaked by

Sept. 12-15, 2017
Stuffing-Box Grease

- Grease generally more viscous
- Extend time grease remains in stuffing-box
  - Your grease/oil for packing lubrication will last much longer with the Polished Rod Centralizer
Case Study

- High frequency packing failures
- Average packing life 23 days
- Reason for leaks...
  - Unit misalignment
  - High temperatures
  - Gas (H2s)
  - Well head movement

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Case Study Continuation...

- Installed (15) polished rod centralizers in most challenging environments
- Centralizer aligned the polished rod
- Pressure at stuffing box went from 100 psi down to 40psi
- Polished rod centralizer has been running for over 120 days without any leaks and still running...
Other Application Notes

- What about rod BOP’s?
  - Install centralizer below or above rod BOP
  - Less side-load mitigation, but same flow restriction up to the stuffing-box
Conclusions

- Extend the life of stuffing-box packing
  - Reduction in side-load applied to packing
  - Reduction in pressure/fluid velocity packing experiences
  - Tight clearance minimizes flow path

- Reduce the leak rate upon stuffing box failure
  - Prevent catastrophic oil spill/leaks
  - Eliminate spraying fluid out of stuffing box
  - Reduce operator costs
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