

BASIC ROD PUMP DESIGN AND THE EFFECTS OF TAGGING

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INTRODUCTION

With the exponential growth that our industry has experienced, Pioneer Natural Resources needed additional training for their new hires concerning basic rod pump design and how the rod pump works in a **normal pumping system**. With PNR's vendor base, pumpers, technicians and management, we worked together to develop this training presentation.

Our discussions lead us to the issue of tagging wells and the effects it has on the entire pumping system. This team realized that this school would be beneficial to all field employees, not just new hires.

DEFINITION

What is tagging? Tagging is when the rod spacing is such that the weight of the rods rest upon the pump. You can feel it, see it on a card, and sometimes hear it.

OBJECTIVES

Employees will learn about the 6 basic parts of a rod pump, and the effects of tagging a pump.

SKILLS

The basic understanding of a rod pump and how it works is very important to help prevent rod, tubing and pump failures due to tagging a pump. By reducing these failures a lease operator can help reduce lifting cost, decrease failure rates, and increase their companies bottom line.

CLASS

We will show employees the proper way to build rod pumps. This class will have an open forum with questions at any time. The key take a ways will be the effects of tagging, and tracking performance back to the lease operator.

INTERACTION

Some digital pictures will be used and we will have new and damaged equipment to compare. A downhole schematic will be used along with written diagrams on dry erase boards. The class will be very interactive with samples being passed around to attendants.

FOLLOW UP

When a rod pump comes into the pump shop, any damage that has occurred due to tagging will be communicated to the foreman of that well.

What measure will be used to track success? Failure rates and number of failures associated with each lease operator.

BASIC ROD PUMP DESIGN

- 1) Holddown
- 2) Standing valve
- 3) Traveling valve
- 4) Balls and seats
- 5) Plungers
- 6) Barrels

PUMP SPACING

Traveling valve is spaced ¼" off standing valve.

Why, to help with gas compression, and help move light to moderate solids thru the pump.

EFFECTS OF TAGGING YOUR WELLS

- 1) Rods go into compression
- 2) Tears up your pump
- 3) Loosen your pump
- 4) Break or unscrew your rods
- 5) Buckle your rods
- 6) Rod on tubing wear
- 7) Hole in tubing
- 8) Gear box damage

MINIMUM COST PER FAILURE

- 1) Pump failure - \$5000.00
- 2) Rod failure - \$10,000.00
- 3) Tubing failure - \$15,000.00

Note: these figures are to repair mechanical problems, lost production and down time are not included.

HOW DO YOU KEEP YOUR RODS IN TENSION

- 1) Correct rod design
- 2) Sinker bars
- 3) Correct pump sizing for your wells
- 4) Pump off controllers, time clocks, etc.
- 5) Monitoring fluid levels
- 6) Raising or lowering rods when necessary
- 7) Proper down hole gas separation

WHAT DO YOU DO IF A WELL IS TAGGING?

- 1) get it raised off tag immediately, if you cannot stop the tagging yourself, get a gang to raise the rods.
- 2) figure out the problem. (determine the root cause of the problem)
- 3) pressure up on the well.
- 4) check controllers or run times.
- 5) call your foreman or technician.

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