

WellTempo pumpjack monitoring and optimization

This case study demonstrates significant improved profitability on a marginal well in the Permian by optimizing its timer settings with an inexpensive device that detects and reports pump off conditions.

Business need: Oilfield producers face many factors impacting production and manage their wells accordingly to maximize revenue and minimize costs. For example, they attempt to optimize pumpjack run time with one of three methods:

- 1. Manual start and stop of the well (aka running on hand)
- 2. Timer based start and stop. Two devices are commonly used an hourly timer and a pin timer
- 3. Pump Off Controller (POC) for continuous run time adjustments

The goal is to run the pumpjack just enough to lift all of the fluids that the reservoir will provide each day and no more so electrical power is not wasted and the equipment is protected from excessive wear and/or damage. Getting this balance wrong can result in downhole pump or rod string failure (added expense and downtime due to over pumping) or on the other hand missed production (under pumping).

The red spikes in the charts below indicate pump off conditions. The well on the left is running on a Lufkin pump off controller and shows optimal behavior as it is pumping off just at the end of each run cycle. The well on the right is the running on a timer and is pumped off during most of each cycle.





This lease has an automated tank gauging system that permits simple and systematic measurements of production at the tank battery. This graph shows production over a 30-day period and indicates a very stable trend. The Welltempo system was monitoring run time and total strokes at the wells over a similar period and also shows a stable trend.





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Based on pump off indications from the WellTempo system the pin timer on the well was adjusted from approximately 50% daily runtime to approximately 25%. These pictures indicate the before and after settings on the timer.





This final graph displays run time plus 10 day moving average production at the lease from the producer's automated tank gauging system for the 7-day period prior to and immediately after the timer adjustment. *Note that in spite of the dramatic drop in run time after adjusting the timer there is no loss in production as anticipated since the well was pumped off for over half of the run cycles prior to the change.*



Running the well half as much time would cause reduced wear and tear on the pumping equipment (and therefore lower repair costs and downtime) but focusing only on the easily quantified *electricity savings show about a 600% Return on Investment*

Electrical costs at this lease average \$.12 per KWhour and the 50 HP motor thus costs \$4.41 per hour to operate the well. Running the lease at the reduced timer settings will produce an annual savings of approximately \$10,000 based on:

\$4.41/hour * 365 * 24 * 50% run time - \$4.41/hour * 365 * 24 * 25% run time = \$9,658.

The WellTempo system indicates further adjustments at this lease are possible. Since the system monitors the well continuously the timer can be optimized on a monthly, weekly or even daily basis.



Appendix A WellTempo information

Telemetry Insight's WellTempo system permits simple wireless installations that monitor and control pumpjacks. The inexpensive traditional timers controlling wells typically have small motors running a clock drive and do not detect pump off. A load cell-based pump off controller is much more expensive (up to \$10,000 including installation) and thus well out of reach for marginal wells. As a third alternative the WellTempo continuously monitors the well for pump off condition and reports any such events which appear as red spikes during the run cycle. These results can permit optimal adjustments to the traditional timers resulting in substantially improved economics.

TYPICAL INSTALLATION CURRENTLY DEPLOYED: