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## Ask Echometer - Q & A Session 12 - August 5 2020

### Net Torque on Pumping Unit Gearbox

Regarding the chart on slide 11 (Reduced Gear Life Relative to % Overload), does the Gearbox Life assume 24 hour operation or is there a correction factor?

Question answered at time: 1:07:24

Torque doesn't really depend on whether the unit is pumping 24 hours or not. It depends on how much the speed varies, it depends on if the pump is full or not, it depends on if the pump fillage of the stroke you're monitoring has the same pump fillage it had when you set your weights. So it doesn't matter that much whether it's on a pump of controller or not. It only matters if the pump fillage has changed. If the pump fillage changes, then the net torque changes.

It really relates to overload. If the gearbox is overloaded, it's going to reduce the life whether it's on a percentage timer or a pump off controller or just on hand.

Please refer to the video for remainder of discussion on this question.

Regarding Power Probe Installation, for most oil companies, it is mandatory to have a certified electrician to take these readings. Is it really mandatory?

Question answered at time: 1:09:09

It is for this reason that with the Wireless Power Probes, we have developed a fixed power adaptor. A certified electrician can install the power probe and current sensor with the connector accessible from the outside of the panel box. The operator taking the measurement can then connect to the external connector without ever having to open the panel box.

What is the ballpark cost of moving counterweights on a pumping unit in West Texas?

Question answered at time: 1:10:20

Answered by another participant: \$200/hour and the job usually takes between 1-2 hours depending on the pumping unit size.

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Is power data more accurate than dynamometer data in order to properly balance a pump jack? Are they complimentary methods or would you lean towards one?

Question answered at time: 1:11:09

The CBM (Counter Balance Method) where you measure the distance from the crank is very accurate. The power method is also very accurate. The power method is more accurate than the CBM method if the unit has different geometry. That's why you want to try to do the power method and the mechanical method together. Because the power method is a check. Per the technical paper referenced CBE method was the least accurate of the two methods.

Please refer to recording for further discussion.

How much weight do the brakes take from the polished rod?

Question answered at time: 1:13:03

Regarding the CBE test, if the brakes have a decent spring on them and they pull away from the drum then they don't take any, or very little, weight off the brake. If the brake shoe is contacting the drum then it's going to have an impact on the weight. It's not supposed to have any load when the brake is released.

How effective is the CBE Method when performed on a well with a leaky pump?

Question answered at time: 1:14:05

It is very hard to do the CBE method with a leaky pump because you can't balance the rod loading and the weight of rods plus the weight of rods in fluid. The weight of rods in fluid is constant but the pump load is changing quickly. So you can't release the brake and catch it in balance.

There have been some critical values for the cyclic load values. Has this ever been compared?

Question answered at time: 1:14:42

We use the cyclic load factor to calculate the motor size, and the cyclic load factor is based on the RMS torque compared to the average torque. The more the torque is not near the average, the higher the cyclic load factor becomes and it means you're going to have to have more power. Most gearboxes are rated for 25 SPM without any harm so

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there's not really any speed limitations on the gearbox. The real issue about the gearbox and the cyclic load factor is that you don't want to have a high cyclic load factor because that means you're going to have to have more power. That means that the RMS torque is farther away from the average and you'll spend a lot more energy heating the motor and need more horsepower.

What sensor is more accurate when measuring torque values?

Question answered at time: 01:17:13

If you're talking about the load, then you need to use the horseshoe load cell. A donut load cell or a horseshoe load cell will give you more accurate surface loads for the rod torque. If you're comparing the net torque for power, versus the net torque for mechanical calculations, normally overlay and look similar. If they start not matching, then there's some kind of problem.

The Pumping Units that are not in the system library, can they be entered?

Question answered at time: 1:18:34

Yes. The Pumping Unit Library is editable. You can type in the API dimensions and structural balance from a manufacturer's catalogue.

Can you comment on the quick and dirty current measurement that many people use for checking balance compared to power?

Question answered at time: 1:19:19

Is the wrist pin weight taken into consideration when calculating counterbalance of different stroke lengths?

Question answered at time: 1:20:54

We're assuming that the structural imbalance takes care of that. The wrist pin is attached to the pitman arm which is not part of the crank.

So should we all agree that we should stop using amps?

Question answered at time: 1:21:42 - Please go to recording for full discussion and opinions.